PART I

Public Health: What It Is and How It Works

The nine chapters in Part I of this book aim to present the essentials of public health from a public health system perspective. These chapters introduce fundamental concepts and link those concepts to practice. The case studies in Part II offer a different perspective on public health practice through the lens of real-world events and challenges.

The Part I topics are essential for public health students early in their academic careers, and they have become increasingly important for students in the social and political sciences and other health professions as well. This book is intended as much for public health practitioners as it is for students. It represents the belief that public health cannot be adequately taught through a text and that it is best learned through exploration and practice of its concepts and methods. In that light, this book should be viewed as a framework for learning and understanding public health rather than the definitive catalog of its principles and practices. Its real value will be its ability to encourage thinking "outside the book."

Together, the nine chapters in Part I offer a systems perspective to public health, grounded in a conceptual model that characterizes public health by its mission, functions, capacity, processes, and outcomes. This model is the unifying construct for this text. It provides a framework for examining and questioning the wisdom of our current investment strategy that directs 20 times more resources toward medical services than it spends for public health and prevention strategies—even though treatment strategies contributed only 5 of the 30 years of increased life expectancy at birth that have been achieved in the United States since 1900.

CHAPTER 1

What Is Public Health?

LEARNING OBJECTIVES

Given the historical phenomena that have shaped the development of public health, formulate a working definition and describe the functions of public health in the 21st century. Key aspects of this competency expectation include being able to:

- Articulate several different definitions of public health.
- Describe the origins and evolutionary themes of public health in the United States.
- Trace the development of the public health system in the United States.
- Broadly characterize the contributions and value of the public health field.
- Identify three or more distinguishing features of public health approaches.
- Describe public health as a system emphasizing the role of the three core functions and 10 Essential Public Health Services.
- Identify five or more Internet web sites that provide useful information on the public health system in the United States.

Introduction

The passing of one century and the early decades of the next afford a rare opportunity to look back at where public health has been and forward to the challenges that lie ahead. Imagine a world 100 years from now where life expectancy is 30 years more and infant mortality rates are 95% lower than they are today. The average human life span would be more than 107 years, and less than one of every 2,000 infants would die before their first birthday. These seem like unrealistic expectations and unlikely achievements; yet, they are no greater than the gains realized during the 20th century in the United States. In 1900, few envisioned the century of progress in public health that lay ahead. Yet by 1925 public health leaders such as C.-E.A. Winslow (1877-1957), the founder of what is now the Yale School of Public Health, were noting a nearly 50% increase in life expectancy (from 36 years to 53 years) for residents of New York City between the years 1880 and 1920.[1] Accomplishments such as these caused Winslow to speculate what might be possible through widespread application of scientific knowledge. With the even more spectacular achievements over the rest of the 20th century, we all should wonder what is possible in the 21st century.

In any given year, it may be difficult to point to a particular public health discovery, innovation, or triumph. Yet on closer examination, maybe public health gains are like rice in the story of the wise man who invented the game of chess for his king. The wise man asked for payment by having the

king place one grain of wheat on the first square of the chessboard, two on the second, four on the third, eight on the fourth, and so on, the small victories of public health over the past 120 years have resulted in cumulative gains so vast in scope that they are difficult to comprehend.

Today, there are nearly 895,000 fewer cases of measles reported per year than in 1941, over 200,000 fewer cases of diphtheria reported per year than in 1921, more than 250,000 fewer cases of whooping cough reported per year than in 1934, and 21,000 fewer cases of polio reported per year than in 1951, the peak year for reported cases for each disease, respectively.[2] The first two decades of the 21st century have seen 50 million fewer smokers than would have been expected, given trends in tobacco use through 1965. More than two million Americans are alive who otherwise would have died from heart disease and stroke, and almost 100,000 Americans are alive as a result of automobile seat belt use. Protection of the U.S. blood supply has prevented millions of hepatitis B, hepatitis C and human immunodeficiency virus (HIV) infections, as well as billions of dollars in medical costs associated with these three diseases.[3] Today, average blood lead levels in children are less than one-third of what they were just a quarter century ago. This catalog of accomplishments could be expanded many times over. **Figure 1-1** summarizes this progress, including two of the most widely followed measures of a population's health status—life expectancy and infant mortality.

These results did not occur by themselves. They came about through decisions and actions that represent the essence of what is public health. It is the story of public health and its immense value and importance in our lives that is the focus of this book. With this impressive litany of accomplishments, it would seem that public health's story would be easily told. For many reasons, however, it is not. As a result, public health remains poorly understood by its prime beneficiary—the public—as well as many of its dedicated practitioners. Although public health's results—as measured in terms of improved health status, diseases prevented, scarce resources saved, and improved quality of life—are more apparent

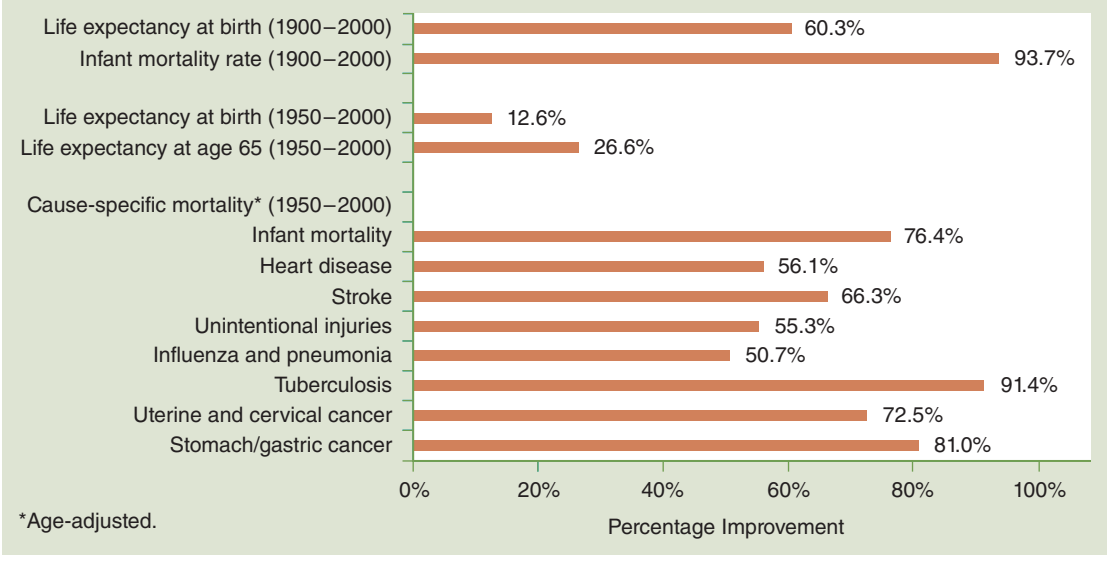

Figure 1-1 Percentage Improvement in Selected Measures of Life Expectancy and Age-Adjusted, Cause-Specific Mortality for the Time Periods 1900–2000 and 1950–2000, United States.

Data from Centers for Disease Control and Prevention, National Center for Health Statistics. Health, United States 2009. Hyattsville, MD: NCHS; 2009 and Rust G, Satcher D, Fryer GE, Levine RS, Blumenthal DS. Triangulating on success: innovation, public health, medical care, and cause-specific US mortality over a half century (1950–2000). *Am J Public Health.* 2010;100:S95-S104.

today than ever before, society seldom links the activities of the public health enterprise with its results. This suggests that the public health community must communicate more effectively what public health is and what it does, so that its results can be readily traced to their source.

This chapter is an introduction to public health that links basic concepts to practice. It considers three questions:

- What is public health?
- Where did it come from?
- Why is it important in the United States today?

To address these questions, this chapter begins with a short history of public health in the United States. It then examines several definitions and characterizations of what public health is and explores some of its distinguishing features. Finally, it offers insight into the value of public health in protecting and improving health, as well as in economic and human terms.

Taken together, these topics provide a foundation for understanding what public health is and why it is important. These concepts will then be further explored in the remaining chapters of the first section of this book. We will see that, as in the story of the blind men examining the elephant, various sectors of our society have mistaken separate components of public health for the entire system.

A Brief History of Public Health in the United States

Early Influences of Epidemics on the Development of Public Health

Although the complete history of public health is a fascinating saga in its own right, this section presents only selected highlights. When ancient cultures perceived illness as the manifestation of supernatural forces, they felt that little in the way of either personal or collective action to respond to or prevent illness was possible, except to appeal to those same supernatural forces. For many centuries, disease was synonymous with epidemic. Diseases, including horrific epidemics of infectious diseases such as the Black Death (plague), smallpox, and cholera, were phenomena to be accepted. It was not until the so-called Age of Reason and the Enlightenment that scholarly inquiry began to challenge the "givens" or accepted realities of the time. Eventually expansion of the science and knowledge base would reap substantial rewards.

With the advent of industrialism and imperialism, the stage was set for epidemic diseases to increase their terrible toll. As populations shifted to urban centers for the purpose of commerce and industry, public health conditions worsened. The mixing of dense populations living in unsanitary conditions and working long hours in unsafe and exploitative industries was a formula for disaster and resulted in wave after wave of cholera, smallpox, typhoid, tuberculosis, yellow fever, and other diseases. Such disasters struck again and again across the globe, but most seriously and most often at the industrialized seaport cities that provided the portal of entry for diseases transported by people, rats, fleas, and other stowaways alongside commercial cargo. The lack of previous exposure to these diseases and the subsequent susceptibility to severe disease complications of different cultures, partly explains how relatively small bands of Europeans were able to overcome and subjugate vast Native American cultures. Seeing the Europeans unaffected by scourges such as smallpox served to reinforce beliefs that these light-skinned visitors were supernatural figures, unaffected by natural forces.[4]

The Beginnings of Public Health in the Americas

The British colonies in North America and the new American republic bore their share of these burdens. American diaries of the 17th and 18th centuries chronicle one infectious disease onslaught after another. These epidemics left their mark on families, communities, and even history. For example, the national capital had to be moved

out of Philadelphia because of a devastating yellow fever epidemic in 1793. This epidemic also prompted the city to develop its first board of health in that same year.

The formation of local boards of distinguished citizens, the first boards of health, was one of the earliest organized responses to epidemics. This response was important in that it represented an attempt to confront disease collectively, a forerunner of the organized efforts by society to protect and improve the health of the public that are the hallmark of public health today.[5] Because science had not yet determined that specific microorganisms were the causes of epidemics, later dubbed the germ theory, avoidance of diseased individuals had long been the primary tactic used.

Boards of health began to exercise what today are called the "police powers" of public health—the government's ability to limit the actions of individuals to protect the health of the public. These police power actions included evacuating the general location of the epidemic until disease activity subsided or isolating diseased individuals and quarantining those recently exposed to diseases. At this time, many people subscribed to the miasma theory that blamed disease outbreaks on the malodorous accumulations of garbage and general filth prevalent in enlarging cities. As a result, many early boards of health also required removing garbage and keeping the streets clean. Although initially based on a mix of fear, tradition, and scientific speculation, these actions formed the basis of public health into the 20th century, and some continue to be part of public health's armamentarium today. The effectiveness of many of these actions was unclear at the time; however, several scientific and social developments in the mid-1800s were swinging the pendulum ever closer to more scientifically-based and effective public health interventions.

Scientific and Social Developments in England

The work of public health pioneers in England such as Edward Jenner, John Snow, and Edwin Chadwick illustrates the value of public health, even when its methods are applied amid scientific uncertainty. Well before Louis Pasteur (1822-1895) conducted experiments in France to help establish the germ theory (the proposition that diseases can be caused by microorganisms) and before, Robert Koch (1843-1910) developed his four postulates in Germany that established the scientific methods for proving that a specific bacterium caused a specific disease, both Jenner and Snow used deductive logic and common sense to do battle with smallpox and cholera, respectively. In 1796, Jenner (1749-1823), an English physician, successfully used vaccination to prevent smallpox, a disease that ran rampant through communities across the globe. This was the innovation that was eventually employed in the long and arduous public health campaign that, by the year 1977, had totally eradicated smallpox from the earth; the first time human collective action had resulted in the elimination of an infectious disease. (The potential for smallpox's possible reemergence through the actions of bioterrorists is now part of public health emergency preparedness planning to detect and respond to natural and manmade infectious disease threats and disasters.)

Snow (1813-1858), also an English physician, further advanced the art and science of public health. In 1854, Snow used basic descriptive epidemiologic methods to analyze the pattern of deaths in a cholera outbreak and traced the source of the outbreak to the well water drawn from the community pump at Broad Street in a neighborhood of London. Based on this information, Snow persuaded the community leaders to remove the pump handle.[6] Although the outbreak was already waning and the number of additional cases this action prevented is debatable, this episode is one of the foundational stories of epidemiology and public health. The metaphor of "removing the pump handle" is used throughout public health to describe the actions taken to prevent further disease based on the results of an investigation by public health workers.

Snow later demonstrated that another large cholera outbreak in London could be traced to one particular water company that drew its drinking water from the Thames River from a location

that was downstream of London's drainage. He demonstrated that people supplied by that company developed cholera while people supplied by another water company that drew its water from the Thames River upstream from London did not, thus implicating the source of contamination. In both efforts, Snow's ability to collect and analyze data allowed him to determine causation, which, in turn, allowed him to recommend corrective actions that prevented additional cases. All of this occurred without benefit of the knowledge of the germ theory of disease: that an odd-shaped bacterium in the water was the cause of the disease.

England's General Board of Health conducted its own investigations of these outbreaks and concluded that air, rather than contaminated water, was the cause.[7] However, its approach was one of collecting a vast amount of information and accepting only that which supported its view of disease causation. Snow, on the other hand, systematically tested his hypothesis by exploring evidence, even when it ran contrary to his initial expectations.

Chadwick (1800-1890) was a leader of what has become known as the sanitary movement of the mid and latter half of the 19th century. In a variety of official capacities, he played a major part in structuring the government's role and responsibilities for protecting the public's health. Because of the growing concern over the social and sanitary conditions in England, Chadwick's *Report on an Inquiry into the Sanitary Conditions of the Laboring Population of Great Britain* articulated a framework for broad public actions that served as a blueprint for the growing sanitary movement. (One result was the establishment in 1848 of a General Board of Health, which examined Snow's analysis a decade later.) Interestingly, Chadwick's interest in public health had its roots in the utilitarian movement founded by Jeremy Bentham's (1748-1832), a philosopher and social reformer in England. For Chadwick, disease was viewed as causing poverty, and poverty was responsible for the great social ills of the time, including societal disorder and high taxation to provide for the general welfare.[8] Public health efforts were necessary to reduce poverty and its wider social effects. This utilitarian view recognizes a link between poverty and health, although this is in an opposite direction to current thinking about the role social determinants of health in causing poor health. Today, it is more common to consider poor health as a result of poverty, rather than as its cause, although poor health certainly also can lead to impoverishment.

Chadwick was also a key participant in the partly scientific, partly political debate that took place in British government as to whether deaths should be attributed to pathological conditions or to their underlying factors, such as hunger and poverty. It was Chadwick's view that medical and pathologic, rather than less proximal, more "upstream" (in the causal chain of disease) social and behavioral factors should be the basis for classifying deaths.[8] Chadwick's arguments prevailed then, although aspects of this debate continue to the present day. William Farr (1807-1883), sometimes called the father of modern vital statistics because he established, in England and Wales, a system of collecting death certificates detailing the cause of death that is utilized to guide public health efforts around the world today, championed the opposing view. We will return to this debate in Chapter 2.

In the latter half of the 19th century, sanitation and environmental engineering methods improved, which allowed effective interventions to prevent epidemic diseases, particularly in assuring safe drinking water and disposal of human sewage, as well as the development of new vaccines. Further, the scientific advances of this period paved the way for modern disease control efforts targeting specific microorganisms.

Outside-the-Book Thinking 1-1

Access the website of the national honorary society for public health in the United States (www.deltaomega.org) and select one of the classic historical public health documents available there. Describe its significance in the history of public health and its relevance for public health practitioners today.

Growth of Local and State Public Health in the United States

Lemuel Shattuck (1793-1859), a legislator in Massachusetts and a founder of the American Statistical Association, was the author of the *Report of the Sanitary Commission of Massachusetts* in 1850. The report outlined existing and future public health needs for that state and became the roadmap for development of a public health system in the United States. Shattuck called for the establishment of state and local governmental health departments in Massachusetts to organize public efforts aimed at sanitary inspections, communicable disease control, and food sanitation (employing the police functions of public health), as well as vital statistics (recording of births, deaths, fetal deaths, marriages, and divorces), and medical services for infants and children. Winslow called the report "the most outstanding single 'Book of Prophecy' in the history of public health."[9]

Although Shattuck's report closely paralleled Chadwick's efforts in Great Britain, acceptance of his recommendations did not occur for several decades. In the latter part of the century, his far-reaching recommendations came to be widely implemented in many states. With greater understanding of the value of environmental controls for clean drinking water and disposal of human sewage and of the role of specific control measures for specific diseases (quarantine, isolation, and vaccination), the creation of local health departments to carry out these activities supplemented—and, in some cases, supplanted—the local boards of health. These local health departments developed rapidly in major seaports and other industrial urban centers where epidemics including, smallpox, typhoid fever, plague, and yellow fever were reaching unacceptable levels. However, during this period, a common pattern repeated to this day was also established: during epidemic periods or periods of public health crisis there is a tremendous outcry and support for public health activities, but that support evaporates and objections to stringent public health measures become more strident when the epidemic subsides.

Because infectious and environmental hazards do not respect local jurisdictional boundaries, states began to develop their own health boards and health departments after 1870. These agencies often had very broad powers, including police powers, to protect the health and lives of state residents, although the clear intent at the time was to use these powers to battle epidemics of infectious diseases. In examining how law impacts governmental public health roles, we will revisit these powers and duties in Chapter 4 because they serve as both a stimulus and a limitation for what can be done to address many contemporary public health issues and problems, including, but extending beyond, infectious diseases.

Throughout the late 1800s and early 1900s, state and local health departments' main roles continued to be the application of police powers to control infectious diseases; the institution of environmental protections, particularly drinking water and sewage disposal; and the provision of services for infants and children, which were closely tied to the control of infectious diseases, the prevention of infant and child mortality, and the improvement of maternal and child health. By the 1920s, public health figures such as C.-E.A. Winslow, recognized that as infectious diseases were better-controlled, chronic diseases such as heart disease, stroke, and cancer were emerging as public health problems. Additionally, occupational diseases due to industrialization and injuries from motor vehicles and other advances of the industrial age were first recognized. This presaged a vast increase in the scope of public health activities in the 20th century to encompass all threats to health facing the population.

Outside-the-Book Thinking 1-2

Research the history of the public health department in your state, county, or city. In what year was it established? Describe how public health problems and the strategies to address them may have changed over that period. It what ways has the health department been in the news in the past year? What role is the department playing in these stories?

Federal Role in Public Health in the United States

This sketch of the development of public health in the United States would be incomplete without a brief introduction to the roles and powers of the federal government. Federal health powers, at least as enumerated in the U.S. Constitution, are minimal. It is surprising to some to learn that the word "health" does not even appear in the Constitution. As a result of not being a power explicitly granted to the federal government (such as defense, foreign diplomacy, international and interstate commerce, or printing money), health is a power to be exercised by states or reserved to the people themselves.

Two sections of the Constitution have been interpreted over time to allow for federal roles in health. These are the ability to tax in order to provide for the "general welfare" (a phrase appearing in both the preamble and body of the Constitution) and the specific power to regulate commerce, both international and interstate. These provisions allowed the federal government to establish a beachhead in health, initially through the Marine Hospital Service established in 1798 (eventually to become the U.S. Public Health Service). After the ratification of the 16th Amendment in 1916, authorizing a national income tax, the federal government acquired the ability to raise substantial sums of money, which could then be directed toward promoting the general welfare. The specific means to this end were a variety of grants-in-aid to state and local governments. Beginning in the 1950s and 1960s, federal grant-in-aid programs designed to fill gaps in the medical care system nudged state and local governments further and further into the business of medical service provision for people without access to health care. Federal grant programs for other social, substance abuse, mental health, nutrition, and community prevention services soon followed. The expansion of federal involvement into these areas, however, was not accomplished by these means alone.

Before the Great Depression during the 1930s, most Americans did not believe that the federal government should intervene in their social circumstances. Social values shifted dramatically during the Depression, a period of such great social insecurity and need that the federal government was now permitted—indeed, expected—to intercede. One result was the Social Security program, which began providing monetary benefits for persons age 65 years and older in 1935, for spouses and children of retired or deceased persons in 1939, and for disabled persons in 1954. The program provided economic resources to those in need and had a direct impact on their health. The federal role was also evident in the Hospital Services and Construction (Hill-Burton) Act of 1946, which provided support for local healthcare systems across the county. In 1966, the federal Medicare (health insurance for the elderly and disabled) and Medicaid program (health insurance for the poor, administered by the states) were established with a great ability to impact health, but interestingly were kept separate from the U.S. Public Health Service and organized public health activities.

Following World War II and into the 1980s, federal funding enabled state and local health departments to expand public health efforts more broadly than infectious diseases and maternal, infant, and child health. However, these efforts were subject to unpredictable swings in funding support as Congressional interest in specific diseases or at-risk populations waxed and waned, or funding across multiple programs areas was combined, or "block-granted," and then the overall total reduced to generate budget savings. The federal government also encouraged state and local health departments to get involved in the delivery of gap-filling clinical medical services for persons without health insurance or for whom the private medical sector declined to serve because they had Medicaid. Up to three-quarters of federal funding for state and local health departments was devoted to such care.[5]

As recent examples of the swings in Federal funding support for public health activities, following the terrorist attacks of September 11, 2001, federal resources flowed to state and local health departments for public health and

healthcare system emergency preparedness activities. Those funds have been reduced by more than half over time. The 2010 Patient Protection and Affordable Care Act (ACA) had public health provisions and provided significant additional public health funding, though these provisions and funding were increasingly at risk following the presidential election of 2016. Chapters 4 and 5 will expand on the growth of the federal government's influence on public health activities and its impact on the activities of state and local governments, including the growth of categorical federal funding for state and local programs.

The Public Health System in Crisis and the 1988 Institute of Medicine Report

By the mid-1980s, despite the achievements of recent decades, public health's mission had become diffuse and under-funded, public health departments were not prepared to face the increasing burden of chronic diseases and emerging diseases such as AIDS, the capabilities of health departments varied widely, and public health's ability to lead was questioned. At this juncture, the National Academy of Medicine (NAM) (formerly the Institute of Medicine)—part of the National Academies of Sciences, Engineering, and Medicine—issued its groundbreaking report *The Future of Public Health*. In the report, the NAM stated bluntly "this nation has lost sight of its public health goals and has allowed the system of public health to fall into 'disarray'."[10]

The NAM report highlighted the problems facing public health as summarized here:[10]

1. There is lack of agreement on the mission of public health.
2. Tension between professional expertise and politics is present throughout the nation's public health system.
3. Public health professionals appear to have been slow to develop strategies that demonstrate the worth of their efforts to legislators and the public.
4. The relationship between private medicine and public health has been uneasy.
5. Public health research has not been adequately supported.
6. The linkage between academia and public health practice needs to be strengthened.

To address these issues, the report spelled out the mission and three core functions of public health, and led to the formulation of the 10 Essential Public Health Services (discussed below and in Chapter 5). The recommendations of the 1988 NAM report and subsequent NAM reports (see Appendix) form the basis for the definition of public health, its mission and its functions that are the focus of improving public health efforts to the present day and are referred to repeatedly throughout this book.

Public Health 1.0, 2.0, and 3.0

In order to provide some structure to the historical development of public health, described above, and to lay down the challenges of the next era of public health, in 2016 Karen DeSalvo, the acting Assistant Secretary for Health in the U.S. Department of Health and Human Services, and colleagues proposed the evolution of public health in the United States occurring in three phases, which they dubbed Public Health 1.0, 2.0, and 3.0.[11] Public Health 1.0 encompassed the development of public health from the mid 19th century up to the time of the 1988 NAM report (**Figure 1-2**). As we have seen, this was the era of incredible growth of scientific knowledge about medicine and health, the development of the scientific disciplines of epidemiology, engineering and vaccinology, and the building of public health programs aimed primarily at combating infectious diseases, providing gap-filling medical services, and addressing health issues in specific populations such as maternal and child health. However, the growing demands to broaden public health's role combined with the lack of adequate resources and uneven access to public health services around the country, led to the crisis that the NAM report sought to address.

The 1988 NAM report ushered in the era of Public Health 2.0. This era saw the systematic

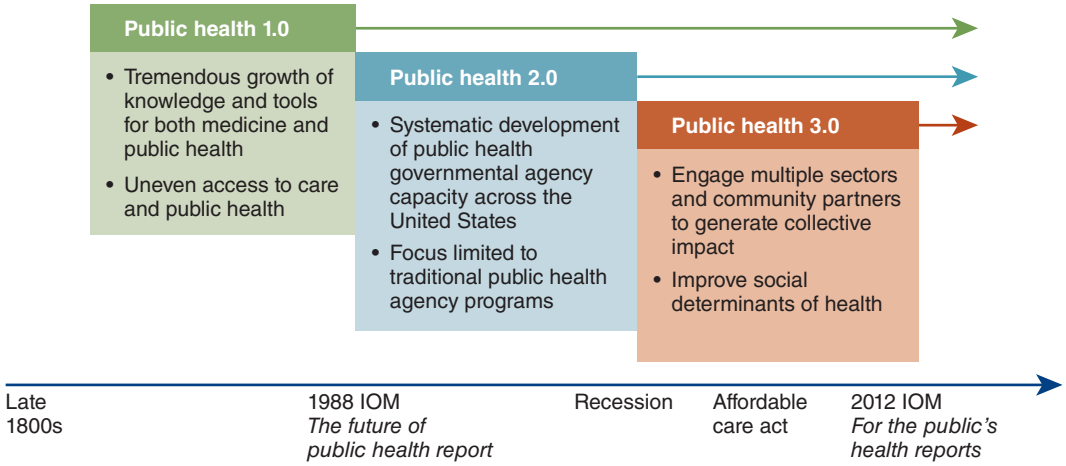

Figure 1-2 Evolution of Public Health in the United States.

DeSalvo KB, Wang YC, Harris A, Auerbach J, Koo D, O'Carroll P. Public Health 3.0: A Call to Action for Public Health to Meet the Challenges of the 21st Century. *Prev Chronic Dis.* 2017;14:170017.

development of the capacity of state and local public health departments. This included categorical funding for immunizations, specific infectious diseases, and chronic diseases, which were traditional public health program areas. There was also an increased focus on developing state and local public health agency capacity through funding, for example, to encourage strategic planning and quality improvement activities. A system for national accreditation of state and local health departments was established in 2007 in an effort to improve public health practices and the organization of public health services. Accreditation will be discussed further in Chapter 5.

Despite these efforts, funding remained inadequate to scale up evidence-based programs to serve all populations in all states. The categorically funded programs were often almost totally reliant on federal funding, an approach that lacked flexibility to respond to local priorities. Many funding streams followed a familiar pattern of funding reductions when the perception of a crisis in a particular area had faded. Additionally, state and local public health programs lost funding and staff during the economic recession of 2007-2009 from which they had difficulty recovering. It is estimated that local health departments alone lost over 50,000 staff as a result of the recession.[12]

These and other factors prompted the need to move beyond Public Health 2.0, which DeSalvo and coauthors show lasting roughly 20 years (Figure 1-2). First, the ACA resulted in dramatic increases of people with health insurance able to get health services within the healthcare system. This reduced the need for the provision of gap-filling medical services by public health agencies for the uninsured and those on Medicaid, a need that had been already waning in many areas with the advent of Medicaid managed care plans in many states. There was also increased attention focused on the social determinants of health (a discussion in one form or another dating back to Chadwick), the leading role that behaviors played in the risk of poor health, and the vast disparities in health status among different populations, for example by race and ethnicity or by socioeconomic status. Finally, the NAM issued additional reports, for example the 2003 *The Future of the Public's Health in the 21st Century*,[13] further developing the ideas in the *Future of Public Health* that highlighted the need for public health to engage more sectors of society and for the health departments to lead their communities in an understanding of the importance of public health principles and approaches.

The need to move beyond Public Health 2.0 was eloquently summarized by DeSalvo et al. as

follows: "Despite nearly $3.0 trillion in annual healthcare spending, the United States ranks 27th in the world in life expectancy, and relatively low in many other measures of health and well-being. Worse yet, for the poor in this country, life expectancy is actually decreasing. Given these trends, and persistent gaps in health status, it's time for a major upgrade to Public Health 3.0."[11]

The definition of Public Health 3.0 in a nutshell is "cross sector collaboration and environmental, policy, and systems-level actions that directly affect the social determinants of Health."[11] The main recommendations of the Public Health 3.0 report (**Table 1-1**) include enhancing state and local public health departments' leadership and workforce to take on the mantle of the community's "chief health strategist"; engaging new partners in support of public health in sectors such as employers and business, the media, academia, the healthcare delivery system, and community organizations and communities themselves; encouraging state and local health departments to seek formal national accreditation; developing adequate data and metrics to measure success; and seek additional funding for these efforts. It is important to recognize that Public Health 3.0 did not abandon the principles developed in Public Health 2.0, but expanded upon them. These points will be discussed in more detail in the coming pages.

Definitions of Public Health

Early 20th Century Definitions

Having now briefly reviewed the history of the development of public health in the United States and understanding the broad context of public health today and the challenges of the next phase of public health development, it is appropriate to pause and formally define public health more precisely. A century ago in 1920, C.-E.A. Winslow delivered an address at the second annual meeting of the American Association for the Advancement

Table 1-1 Final Recommendations from the Public Health 3.0 Report

1. Public health leaders should embrace the role of **Chief Health Strategist for their communities**—working with all relevant partners so that they can drive initiatives, including those that explicitly address "upstream" social determinants of health. Specialized Public Health 3.0 training should be available for those preparing to enter or already within the public health workforce.
2. Public health departments should engage with community stakeholders—from both the public and private sectors—to form vibrant, **structured, cross-sector partnerships** designed to develop and guide Public Health 3.0–style initiatives and to foster shared funding, services, governance, and collective action.
3. Public Health Accreditation Board (PHAB) criteria and processes for department **accreditation should be enhanced** and supported so as to best foster Public Health 3.0 principles, as we strive to ensure that every person in the United States is served by nationally accredited health departments.
4. Timely, reliable, granular (i.e., sub-county), and **actionable data** should be made accessible to communities throughout the country, and **clear metrics** to document success in public health practice should be developed in order to guide, focus, and assess the impact of prevention initiatives, including those targeting the social determinants of health and enhancing equity.
5. **Funding for public health should be enhanced and substantially modified**, and innovative funding models should be explored so as to expand financial support for Public Health 3.0–style leadership and prevention initiatives. Blending and braiding of funds from multiple sources should be encouraged and allowed, including the recapturing and reinvesting of generated revenue. Funding should be identified to support core infrastructure as well as community-level work to address the social determinants of health.

Public Health 3.0. A Call to Action to Create a 21st Century Public Health Infrastructure. Office of the Assistant Secretary for Health. U.S. Department of Health and Human Services. https://www.healthypeople.gov/sites/default/files/Public-Health-3.0-White-Paper.pdf

of Science titled "The Untilled the Fields of Public Health" in which he provided a definition of public health that describes both what public health does and how it gets it done. It is a comprehensive definition that has stood the test of time, and forms the basis against which to compare all subsequent definitions. Winslow characterized public health as

> ". . . the science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort for the sanitation of the environment, the control of communicable infections, the education of the individual in personal hygiene, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and for the development of the social machinery to insure everyone a standard of living adequate for the maintenance of health, so organizing these benefits as to enable every citizen to realize his birthright of health and longevity."[14]

To this he added:

> "Public health conceived in these terms will be something vastly different from the exercise of the purely police power which has been its principal manifestation in the past."[14]

There is much to consider in Winslow's definition. The phrases, "science and art," "organized community effort," and "birthright of health and longevity" capture the substance and aims of public health and foreshadow the 1988 NAM report. Winslow's catalog of methods illuminates the scope of the endeavor, embracing public health's initial targeting of infectious and environmental risks, as well as current activities related to the organization, financing, and accountability of medical care services. His allusion to the "social machinery to insure everyone a standard of living adequate for the maintenance of health" speaks to the relationship between social conditions and health in all societies.

Outside-the-Book Thinking 1-3

Read Winslow's 1920 speech titled "The Untilled Fields of Public Health." What does Winslow recommend be done to improve public health in 1920? What aspects of his speech ring true today?

The 1988 National Academy of Medicine Definition of Public Health

The 1988 NAM *The Future of Public Health* report provides a useful definition of public health in the United States. The NAM report characterized public health's mission as "fulfilling society's interest in assuring conditions in which people can be healthy."[10] The definition directs attention to the many conditions that influence health and wellness, underscoring the broad scope of public health and legitimizing its interest in social, environmental, economic, political, and medical care factors that affect health and illness. The definition's premise that society has an interest in the health of all its members implies that everyone benefits when the conditions and health status of the population improve. This is a core value of public health. The NAM report's characterization of public health stands as a bold philosophical statement of mission and purpose. Importantly, the NAM does not see this definition as applying only to government, but to all sectors of society, including the public itself.

The NAM report also sought to further define the scope of public health by identifying the three core functions of governmental public health agencies: assessment, policy development, and assurance. These core functions broadly describe what public health does—to help better explain what it is. There is a temporal order in the core functions, similar to the sequence in clinical medicine of diagnosis, treatment and treatment monitoring and modification, if necessary (this last step brings the process back to the beginning of re-diagnosis). Assessment identifies health problems, policy development devises policies and

programs to address them, and assurance monitors the application and success of these policies and programs. The process cycles back around to reassessing the health status and leading to further development and application of policies. The NAM core public health functions are defined more formally here:

- Assessment is the analogue of diagnosis, except that the diagnosis is made for a group or population of individuals. It calls for public health to regularly and systematically collect, assemble, analyze, and make available information on the health of the community, including statistics on health status, community health needs, and epidemiologic and other studies of health problems. Not every agency is large enough to conduct these activities directly; intergovernmental and interagency cooperation is essential. Nevertheless, each agency bears the responsibility for seeing that the assessment function is fulfilled. This basic function of public health cannot be delegated.[10(p7)] Assessment will be discussed in more detail in Chapter 2.
- Policy development is a responsibility of every public health agency. The NAM calls for public health to serve the public interest in the development of comprehensive public health policies by promoting the use of the scientific knowledge base in decision making about public health and by leading in developing public health policy. Policy makers in health departments and elsewhere in government should use the technical knowledge and professional expertise of public health agency staffs in developing new policies. However, they must also take a strategic approach, developed on the basis of a positive appreciation for the democratic political process, in order for this expertise to have the most impact in developing well-founded policies that will receive political support.[10(p8)] Policy development will be discussed in more detail in Chapters 3, 4, and 5.
- Assurance calls for public health to ensure their constituents that services necessary to achieve agreed on goals are provided, either by encouraging actions by other entities (private or public), by requiring such action through regulation or by providing services directly. Each public health agency should involve key policy makers and the general public in determining a set of high-priority personal and community-wide health services that government will guarantee to every member of the community. This guarantee should include subsidization or direct provision of high-priority personal health services for those unable to afford them.[10(p8)] The assurance function will be discussed in more detail in Chapters 4 and 5.

Outside-the-Book Thinking 1-4

Read the Summary and Recommendations of the 1988 NAM report on The Future of Public Health. What are the main issues that necessitated the report? What are the report's main recommendations for improving public health? How have the recommendations in the report fared in the last 30 years?

The 10 Essential Public Health Services

In response to the 1988 NAM report, a national Working Group of the Core Public Health Functions Steering Committee was assembled by the U.S. Public Health Service in 1994. The working group developed a consensus statement of what public health is and does in language understandable to those both inside and outside the field of public health, describing in greater detail that the mission of public health is to "promote physical and mental health and prevent disease, injury and disability." The working group also further operationalized the three core functions by developing 10 corresponding essential public health services. The statement was published in a document titled "Public Health in America."[15] (For a comparison of different definitions of public health, see **Table 1-2**).

Table 1-3 and **Figure 1-3** present the results of the Working Groups' efforts.[15] The table and figure demonstrate how the 10 Essential Public Health

Table 1-2 Selected Definitions of Public Health

- "The science and art of preventing disease, prolonging life, and promoting health and efficiency through organized community effort"
- "Fulfilling society's interest in assuring conditions in which people can be healthy"
- "Promote physical and mental health and prevent disease, injury and disability."

Data from Winslow CEA. The untilled field of public health. *Mod Med.* 1920;2:183-191. National Academy Medicine (formerly the Institute of Medicine), National Academies of Sciences, Engineering and Medicine. The Future of Public Health. Washington, DC: National Academy Press; 1988. Public Health Functions Steering Committee. Public Health in America. Washington, DC: U.S. Public Health Service; 1995.

Table 1-3 Public Health in America

Vision: *Healthy People in Healthy Communities*

Mission: *Promote Physical and Mental Health and Prevent Disease, Injury, and Disability*

Purposes of Public Health

- Prevents epidemics and the spread of disease
- Protects against environmental hazards
- Prevents injuries
- Promotes and encourages healthy behaviors
- Responds to disasters and assists communities in recovery
- Assures the quality and accessibility of services

Ten Essential Public Health Services

Assessment Core Function

1. Monitor health status to identify and solve community health problems.
2. Diagnose and investigate health problems and health hazards in the community.

Policy Development Core Function

3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.

Assurance Core Function

6. Enforce laws and regulations that protect health and ensure safety.
7. Link people with needed personal health services and assure the provision of health care when otherwise unavailable.
8. Assure a competent public health and personal healthcare workforce.
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services.

Cross Cutting

10. Research for new insights and innovative solutions to health problems.

Data from Essential Public Health Services Working Group of the Core Public Health Functions Steering Committee, U.S. Public Health Service, 1994. https://www.cdc.gov/publichealthgateway /publichealthservices/essentialhealthservices.html. (Accessed January 15, 2019).

Services relate to the three core public health functions identified in the 1988 NAM report. Figure 1-3 also illustrates the temporal relationship between the core functions and their corresponding essential services. Assessment identifies problems, which then leads to the development of policy solutions, which then leads to the implementation of public health measures, and finally to the assurance that they are being carried out. But the job of public health is never done. As the

Figure 1-3 Public Health Core Functions and 10 Essential Services.

Data from Centers for Disease Control and Prevention, National Public Health Performance Standards. Available at https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html. Accessed January 15, 2019.

arrows in the figure indicate, the process cycles back to assessment to see if the problem has been solved, and to be ever vigilant to arising new problems. The essential service on research is in the center of the circle, indicating its important role in each of the other services. The 10 essential services will be discussed in more detail in Chapter 5.

Outside-the-Book Thinking 1-5

Which of the definitions of public health presented in this chapter (see Table 1-3) best describes public health in the 21st century? What are the strengths and limitations of each definition in painting a full picture of what public health is and what it does?

The Understanding of "Public Health" by the Public

The term "public health" evokes different images among the general public, professionals in other fields, and even among some who work in public health. It is important, therefore, when talking or writing about public health, to understand how others may be using the term and to define your own use of it in order to avoid confusion.

To some, the term describes the workforce of professionals whose job it is to solve certain important health problems. When they use the term public health, they are referring to the people who respond to the disease outbreak or other health issue of concern to their community at the moment. This definition is sometimes limiting because it does not acknowledge the broad array of what constitutes public health, nor does it appreciate that all segments of the community play a part in protecting and improving health.

Another image of public health is that of a body of knowledge and techniques that can be applied to health-related problems. Here, public health is seen as what public health does.

Similarly, many people perceive public health primarily as the activities ascribed to governmental public health agencies, sometimes with the common view that public health primarily involves the provision of medical care to indigent populations. In recent years, however, public health's mission has been much broader. Since 2001, for example, it has emerged as a front-line defense against bioterrorism and other threats to personal security taking on a public safety role.

To many, public health may be described as the activities that the government takes to address health threats. While the government at all levels is the central player in public health, as described earlier in this chapter, this image of public health is also too narrow to fully capture what "public health" encompasses.

Another understanding of public health is that of its intended outcomes, literally the health of the public, as measured in terms of health and illness in a population. The term "population health" has been frequently used in recent years, but it too may have different meanings to different people. Its meaning may be similar to "public health" if it is meant to be addressing the health of the entire population in an area.[16] However, population health may also be used to refer to the population for which a particular employer

Table 1-4 Understandings of the Term "Public Health"

- Public Health: the profession
- Public Health: the methods, knowledge, and techniques
- Public Health: governmental agencies and health services
- Public Health: the health of the public
- Public Health: the system and social enterprise

or healthcare provider is responsible. This may not be the entire population in an area in need of public health services and is not synonymous with "public health."[17] The concept of population health will be discussed further in Chapter 3.

Finally, public health can mean the broader system of organizations, agencies, and people who may impact the health of the population in any way, ranging from providing individual medical care at one end of the spectrum to addressing the broad social determinants of health on a population level at the other. To only a relative few outside of the field of public health, does the term describe a broad social enterprise or system, an understanding of public health that will be discussed in detail. As summarized in **Table 1-4**, the profession, the methods, the governmental agencies and health services, the ultimate health outcomes, and even the broad social enterprise itself are all commonly encountered understandings of what public health is today. This chapter will focus primarily on public health as a social enterprise or system.

Public Health as a System

The Public Health System Players and Their Roles

The 1988 NAM report *The Future of Public Health* defined the public health system as encompassing "activities undertaken within the formal structure of government and the associated efforts of private and voluntary organizations and individuals."[10] Subsequent NAM reports provided more detail on who the non-governmental players in the public health system should be (See Appendix). **Figure 1-4** provides a depiction of many of the key sectors in the system. At the center of the system diagram is the governmental public health infrastructure, the combination of local, state, and federal health agencies, the programs they operate and the body of laws and regulations that define their powers and responsibilities. They also serve to coordinate the efforts of the broader public health system, provide data on the health of the population and on evidence-based interventions to protect and improve health, and finally to serve as the "chief health strategist" for their communities.[18] Their central location in the figure indicates the critical function that these governmental public health agencies have.

Around this center in Figure 1-4 are arrayed the other sectors of society that play a role in protecting and improving health. These include governmental agencies other than public health departments, for example agencies that protect the environment or promote adequate housing. There are also members of the healthcare delivery system that play a key role not only in providing curative medical care but also mental health and preventive medical services. There are other partners that at first glance might not appear to have a direct role but that actually do, for example, employers and businesses and unions that provide or advocate providing health insurance and safe working environments for employees or for improved living conditions in their communities. The media and academia play a role in bringing attention to health issues, determining effective interventions (academia), and educating the public. Philanthropy may fund innovative pilot programs that demonstrate how to deliver new and more effective public health measures. Community organizations may provide supportive services to populations at risk and advocacy on behalf of needed public health programs. Policy makers and elected officials play a key role in assuring that laws and funding are adequate to support public health activities, and highlight the very political nature of public health, to be discussed later in this chapter. And last but not least, the community itself is part of the public health system, representing individuals and groups whose health is the final goal. Without

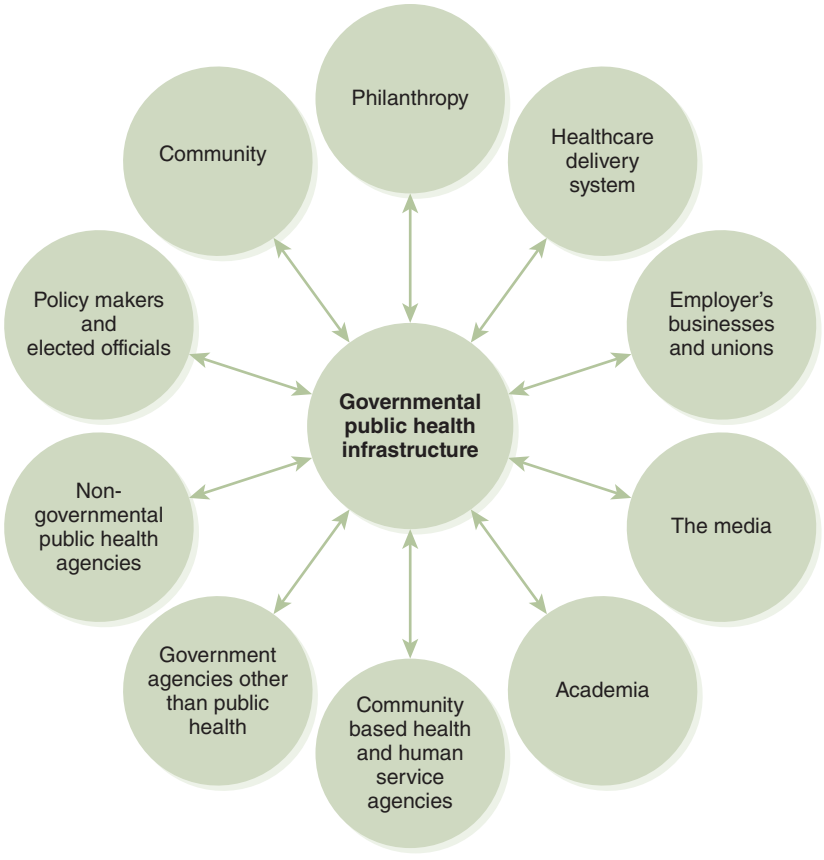

Figure 1-4 The Public Health System.

Modified from National Academy of Medicine (formerly the Institute of Medicine), Committee on Public Health Strategies to Improve Health, Board on Population Health and Public Health Practice. (June 2011). For the Public's Health: Revitalizing Law and Policy to Meet New Challenges, Figure 1-1, page 17. Washington, DC: The National Academies Press.

their support and understanding, and without an appreciation of what they view the issues impacting their health to be, no governmental programs can succeed.

Outside-the-Book Thinking 1-6

Select one of the sectors of the public health system and describe its role in promoting public health. What does that sector bring to addressing public health issues that no other sector can? How does promoting public health mesh with the mission of that sector? How does that sector interact with the governmental public health infrastructure to protect and improve health?

One Health

An example of where very disparate parts of the broad public health system described here need to work together is in addressing zoonoses (animal diseases that affect humans). The One Health initiative involves the interdisciplinary collaboration of professionals involved with human health, animal health, and environmental health.[19] For example, this collaboration involves biosurveillance to track pathogens and diseases in people, animals, and the environment and to link them to their source and identify means of transmission. An area of focus for One Health is the problem of antimicrobial resistance, which can arise through use of antibiotics in food animals, be spread to humans in food products, and be present in the environment

if farm animal waste is not properly disposed of or if people improperly dispose of unused antibiotics. At the federal level in the United States, One Health collaboration involves the CDC, the Food and Drug Administration, the Department of Agriculture, and the Environmental Protection Agency. These agencies in turn engage their state and local counterparts. While each agency is concerned with the health of those entities under its jurisdiction, there is recognition that the problem must also be addressed globally for it to be controlled locally. Therefore, collaboration is not only helpful, but is also necessary to fully address the problem.

Outside-the-Book Thinking 1-7

Review the CDC's One Health website at www.cdc.gov/onehealth. What One Health measures are being taken to address antimicrobial resistance in the United States in humans, animals, and the environment? What other One Health activities address important health issues in your state?

The Social-Ecological Model of the Determinants of Health

Why do the particular sectors in the public health system, described above, play such an important role in assuring the public's health? The answer comes from a consideration of the many factors that help to determine health and health status, and how the sectors making up the public health system can impact these factors. A useful way of thinking about these determinants of health can be found in the social ecological model shown in **Figure 1-5**.

At the center of the social-ecological model are the individual human beings whose health is at stake. Their biological make-up, genetic profile, age, sex and other individual constitutional factors play a role determining their health now and in the future. These individual characteristics are often not modifiable, although their impacts on health may be ameliorated, for example through following dietary and exercise recommendations for

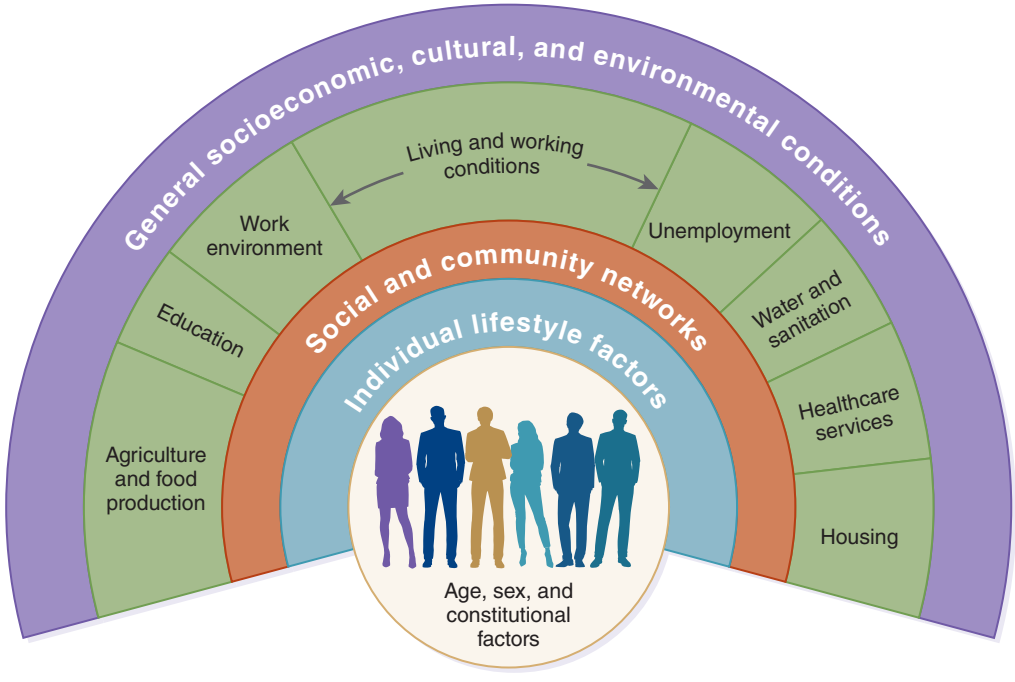

Figure 1-5 The Social Ecological Model of the Determinants of Health.

Dahlgren G, Whitehead M. 1991. Policies and Strategies to Promote Social Equity in Health. Stockholm, Sweden: Institute for Futures Studies.

persons with a genetic risk for heart disease. Moving outward in the figure, the impact of individuals' behaviors and lifestyle factors on their health is seen. These factors may have a greater impact on health than the innate biological factors. The public health system can have a role in impacting behavior and lifestyle, for example through health education, through smoke-free laws that prevent smoking in many settings and encourage quitting, or through community designs that enable and encourage physical activity.

All people live in a social and community framework, shown in the next concentric ring in Figure 1-5, which can also impact their health for better or for worse. As examples, social or community factors may reduce or increase the stresses that individuals are under and they can also provide support, or not, for healthy behaviors and lifestyle. These socials and community networks can be recruited to support individual's efforts to be healthy. The next ring, labeled living and working conditions, illustrates more specifically how the different sectors of the public health system can play a role. The local health department is not likely to be able to directly impact the quality of people's housing, the nature of their work environment, whether they have health insurance, or the quality of their education or the food on their table, but these other sectors can. These outermost rings make up the general socioeconomic, cultural, and environmental conditions that form the foundations of our ability to lead healthy lives. The social ecological model will be discussed more in Chapter 3.

Health in All Policies

Because of the breadth of the range determinants of health that are part of the social-ecological model and the different governmental agencies that can impact them, it is critical to engage these agencies in order to improve health. Governmental public health agencies can engage their counterparts in other agencies and encourage the adoption of a "health in all policies" (HiAP) approach to government policy making.[20] While some areas require an environmental impact statement before large construction projects can be approved, government agencies involved in social, housing, labor, environmental, and other programs are encouraged to analyze the health impact of any actions or new programs they are considering, and even to be guided by health considerations in the design of such programs. In this way, these agencies and the constituencies they serve can be recruited to be active and purposeful in their actions in support of the broader public health system. This will be discussed further in Chapter 4.

Outside-the-Book Thinking 1-8

List the agencies that make up your local or state government. What role could each of them play in a health-in-all-policies framework to address the problem of obesity in your community? Asthma? Substance use?

Framework for Public Health Action: The Health Impact Pyramid

The central role of the social-ecological model in public health thinking also forms the basis for a framework for public health action proposed by Tom Frieden, the former director of the CDC[21] (**Figure 1-6**). The framework for action is displayed as a pyramid with its base encompassing the broad socioeconomic determinants of health such as poverty, education, and housing. Actions taken at this level are often outside of the direct purview of governmental public health agencies but may have the greatest potential impact on the health of the population over time and require the least effort directed one-on-one at individuals. Other partners in the public health system, including elected officials, need to act to impact this level of the pyramid, although public health departments can still play a key role in providing the health data that highlight the problems and in tracking the impact of any actions taken. However, interventions that impact socioeconomic status may take many years to bear fruit in terms of improved health.

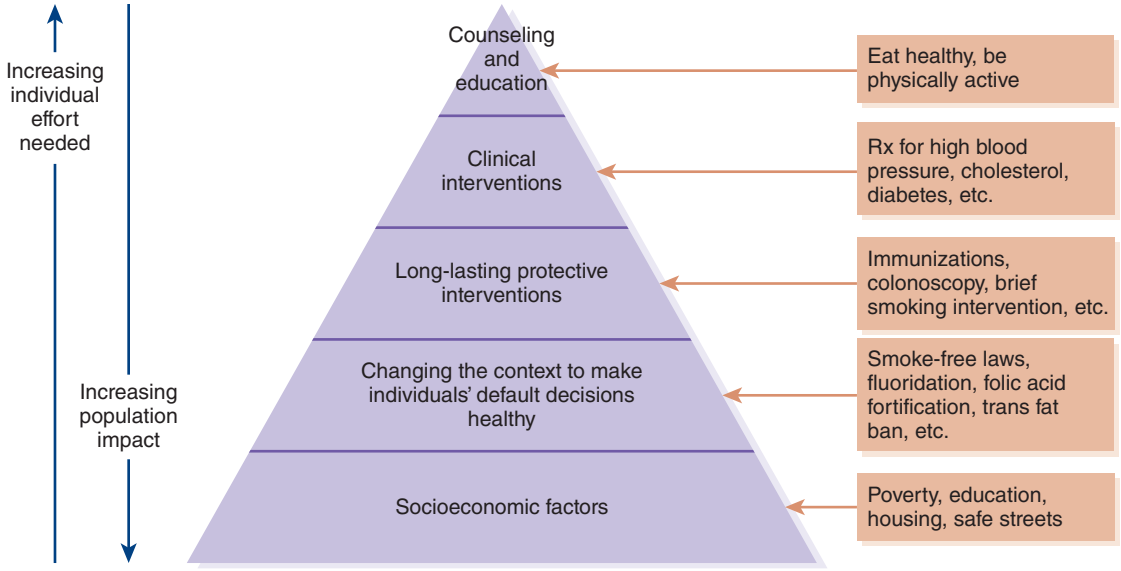

Figure 1-6 A Framework for Public Health Action: The Health Impact Pyramid with Examples of Public Health Interventions at Each Level.

Modified from Frieden TR. A framework for public health action: the health impact pyramid. *Am J Public Health.* 2010;100(4):590-595.

The next level up in the pyramid addresses steps that can be taken to change health behaviors or to otherwise incentivize healthy behaviors so that the default behavior becomes the healthy one. Examples include smoke-free indoor air laws to prevent secondhand smoke exposure, fluoridation of drinking water to prevent dental caries, folic acid fortification of flour to prevent neural tube defects in newborns, and a ban on trans fats in foods to prevent cardiovascular disease. Benefiting from these public health interventions requires no conscious decision or learned behavior on the part of individuals; they obtain health benefits simply by accepting the default choice. Again, the public health system partners involved in making these changes to the living environment extend beyond the health department, although the health department should inform and encourage these actions.

The upper levels of the pyramid move more into the provision of health care with preventive screenings and treatment of risk factors such as high cholesterol to prevent cardiovascular disease. Many of these actions will take place within healthcare delivery, but public health can play an important role by, for example, educating the public about the importance of such interventions, assuring that they have insurance coverage and access to health services, and monitoring the outcomes in the whole population. This will be discussed more in Chapters 3 and 4.

As actions move up the pyramid, they become more directed at individuals, meaning more effort is needed to carry them out. The peak of the pyramid calls for individual counseling and education. Actions taken at all levels of the pyramid are important, but those taken at the base of the pyramid may be more impactful, for more people, in the long run by preventing disease so that actions at the top of the pyramid are less needed. CDC has launched the "High Impact in 5 Years" (HI-5) initiative promoting evidence-based interventions in the first two levels of the pyramid.[22]

Characteristics of a Public Health Approach

From the foregoing discussion of the public health system, the social-ecological model of determinants of health, and the framework for public

Table 1-5 Selected Characteristics of a Public Health Approach

Public Health is . . .

- Grounded in science
- Focused on prevention as a primary strategy
- Founded on social justice and health equity philosophies
- Dedicated to ethical principles
- Linked with government
- Based on an inherently political nature
- Reliant on the broader public health system/health in all policies approaches
- Engaged as a multidisciplinary culture with common bonds
- Dynamic, with an ever-expanding agenda

health action, several characteristic features of a public approach to protecting and improving health are apparent. These are highlighted in **Table 1-5** and each is discussed in detail below. The first four characteristic features in the table represent the values of public health. The remaining five characteristics reflect the practical realities of working in public health.

Grounded in Science

A fundamental characteristic of public health is that it is grounded in science. This relationship is clear for science that governs our understanding of the biologic aspects of human beings, microorganisms, and disease vectors, as well as the risks present in our physical environments. However, it is also true for the social sciences of anthropology, sociology, psychology, and economics that affect our understanding of human culture and behaviors influencing health and illness. The quantitative sciences of epidemiology and biostatistics remain essential tools and methods of public health practice.

As we have seen, the history of public health began based on the so-called hard sciences underlying environmental sanitation and communicable disease control, which was supplemented in the 20th century by the rapid growth of biomedical science leading to antibiotics, vaccines, and other equally significant advances. Epidemiology and biostatistics have also matured and advanced to become, with the assistance of computers, very powerful tools to help determine what the true risk factors for disease are and whether interventions to improve health are indeed working (see Chapter 2). These "harder" sciences have been further supplemented by the social, behavioral, and economic sciences, which have become important tools for addressing the behavioral and social determinants of health. Although this latter group has been viewed in the past as "soft" sciences, in fact they employ the same scientific and statistical approaches as epidemiology and clinical medicine.

These sciences have in common the scientific method and the appreciation for the replication of findings to lend strength to scientific arguments, although this can be difficult in the often-uncontrolled settings in which public health practice occurs. These sciences also share the important vehicle of peer-reviewed scientific publications to share their findings and to ultimately advance knowledge in each discipline. The journals that are important for public health are as diverse as the field itself, but focus on biomedical journals (e.g., the *New England Journal of Medicine*, the *Journal of the American Medical Association*) and general public health journals (e.g., the *American Journal of Public Health, Morbidity and Mortality Weekly Report*, the *Journal of Public Health Management and Practice*, and *Public Health Reports*), as well as specialty journals in all of the fields mentioned above.

Outside-the-Book Thinking 1-9

Pick a major public health journal and read its table of contents for the last three issues. What is the range of public health subjects that is covered? Pick one paper that studies a public health intervention. How strong is the evidence in favor of the practices described? Is this intervention ready to be implemented in the community?

The publication of one article, even with eye-opening findings, usually does not change medical or public health practice overnight. Often there is a range of findings in published papers that may not all agree on any given topic. This is the nature of science. How, then, is the evidence base for public health established and agreed upon? An important part of advancing evidence-based public health practice is a series of governmental and professional advisory bodies that sift through the medical and public heath literature and develop recommendations based on the best data available, often applying strict scoring systems to grade the strength of the evidence in peer-reviewed publications.[23,24] Some important public health advisory groups include the U.S. Preventive Services Task Force (for prevention recommendations related to clinical medical practice, such as disease screening recommendations), the Community Preventive Services Task Force (for recommendations related to community-based public health programs), the Advisory Committee on Immunization Practices (ACIP), and the Healthcare Infection Control Practices Advisory Committee; the latter three are based at CDC. These committees may have strong, statutory-based influence over the public health system. For example, clinical screening recommendations from the U.S. Preventive Services Task Force with Grade A or B evidence and ACIP recommendations have to be covered without co-pay by health insurance plans covered by the Affordable Care Act.[25] Also, the ACIP indicates which vaccines are eligible for coverage under the national Vaccines For Children Program, a program that provides vaccines free of charge to physicians to administer to children who do not have health insurance coverage for vaccinations, who are covered by Medicaid, or are Native American or Alaskan Native.

CDC maintains a list of evidence-based practices for public health and additional sites for specific advisory committees as listed in **Table 1-6**. In addition, CDC maintains lists of "best" or "promising" practices (see Table 1-6, last two items), which appear to be beneficial but do not yet have high-level evidence to support them. Work is ongoing to validate these as evidence-based practices.

Outside-the-Book Thinking 1-10

Review the meeting minutes or watch the archived meeting video from the most recent meeting of one of the committees listed in Table 1-6 or another legitimate public health advisory committee. How often are evidence-based practices referred to? Is the strength of the evidence under discussion referred by the committee members? How important is the consideration of the evidence in the committee's final recommendations?

Focused on Prevention

If public health professionals were pressed to provide a one-word synonym for public health, the most frequent response would probably be prevention. Generally, prevention characterizes actions that are taken to reduce the possibility that something will happen or in hopes of minimizing the damage that may occur if it does happen. Although prevention is considered by many

Table 1-6 Resources for Evidence-Based Public Health Practice

- Evidence-Based Practices in Public Health https://www.cdc.gov/publichealthgateway/program/resources/evidence.html
- Guide to Community Preventive Services https://www.thecommunityguide.org/about/about-community-guide
- Advisory Committee on Immunization Practices https://www.cdc.gov/vaccines/acip/index.html
- The Healthcare Infection Control Practices Advisory Committee https://www.cdc.gov/hicpac/index.html
- U.S. Preventive Services Task Force https://www.uspreventiveservicestaskforce.org /Page/Name/home
- CDC Best Practices for Cardiovascular Disease Prevention Programs https://www.cdc.gov/dhdsp/pubs/guides/best-practices/index.htm
- CDC Best Practices for Comprehensive Tobacco Control Programs https://www.cdc.gov/tobacco/stateandcommunity/best_practices/index.htm

to be the purpose of public health, the specific intentions of prevention can vary greatly. Prevention can target deaths, hospital admissions, days lost from school, consumption of human and fiscal resources, and many other ends. There are as many targets for prevention as there are various health outcomes and effects to be avoided.

It is often hard to marshal support for prevention efforts because their success results in outcomes that are often unseen: if prevention works, disease does not happen. Because these consequences are unseen, people are less likely to develop an attachment for or support the efforts preventing them. In arguing for more programmatic resources, advocates for such causes as mental health services, care for individuals with developmental disabilities, and organ transplants, for example, can point to the direct needs of people who would receive program services, and indeed, these are worthy and important causes. In contrast, it is difficult to rally the millions of people who did not get measles because of successful vaccination programs—they are part of an invisible constituency. Additionally, the long lag time before many preventive interventions bear fruit can be a barrier to marshalling support. For example, programs to improve diet and increase opportunities for physical activity may take decades to show results in terms of reducing cardiovascular disease. From this perspective, the undervaluation of public health is understandable; the majority of the beneficiaries of recent and current public health prevention efforts have not yet been born! Despite its lack of recognition, prevention as a strategy has been remarkably successful. Its success is exemplified in many of the 10 great achievements of the 20th century, discussed later in this chapter.

Primary, Secondary, and Tertiary Prevention

Public health and medical professionals think of three types of prevention, which employ different strategies and are carried out by different parts of the public health system. Primary prevention involves preventing disease from occurring at all, such as vaccinations to prevent communicable diseases or dietary and exercise measures to prevent heart disease. Secondary prevention involves identifying disease that is present before it causes symptoms such as screening for high blood pressure or breast cancer. In these cases, early identification of disease can result in treatment to prevent disease from progressing (e.g., treating high blood pressure) or curing it outright (surgery to remove early cancer). When a disease is already present and causing symptoms, tertiary prevention involves steps aimed at preventing further disease progression and disability. Examples are treatment of persons with a heart attack to reduce cholesterol and control blood pressure to prevent further heart damage.

Outside-the-Book Thinking 1-11

Pick a disease of public health importance. Identify the primary, secondary, and tertiary prevention approaches to dealing with this disease.

Three Buckets of Prevention

Prevention has also been the focus of recent efforts to encourage more collaboration between the public health and healthcare systems. CDC has proposed a framework of three prevention domains, or "buckets," that span the spectrum between purely clinical prevention and community-based prevention (**Figure 1-7**).[26] This approach is intended to impress on the healthcare system, clinicians, health insurers, and public health professionals the importance of not only applying current clinical recommendations in the office setting, but also thinking outside the office to the broader community. The first bucket is in the clinical setting and calls for full implementation of evidence-based preventive measures such as cancer screenings. The second bucket involves increased services delivered outside the clinical setting, such as home visits to asthma patients to assure their adherence with prescribed asthma medications, and to check their home environment to remove asthma triggers. The third bucket involves measures aimed at engaging the

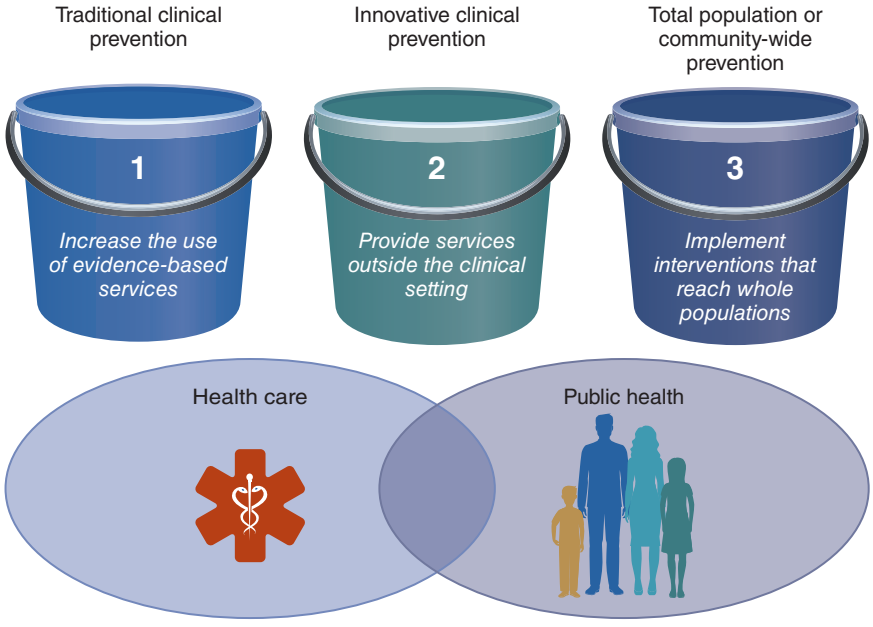

Figure 1-7 Three Buckets of Prevention.

HI-5 14 Evidence-Based Community-Wide Interventions Slides. Centers for Disease Control and Prevention. https://www.cdc.gov/policy/hst/hi5/slides/index.html

whole population in the community, not just the patients of a given healthcare practice, with preventive interventions. These include things like advocating for safe spaces in the community to exercise and making sure that healthy foods are available and accessible in local grocery stores, so peoples' food choices are not limited to fast food. Additional examples are at CDC's Community Health Improvement Navigator site.[27] The three buckets of prevention will be covered in more detail in Chapter 3.

Return on Investment in Prevention

In addition to the human aspect of improving health, there is an economic argument to be made for prevention. In the business world, the concept of "return on investment" (ROI) is an important one in determining where to invest new resources (see Chapter 3). It is easier to put money upfront into a project that will return the initial investment and more in the future. The same principle holds in public health. An analysis by the Trust for America's Health showed that strategic investment in proven community-based prevention programs to increase physical activity, improve nutrition, and prevent smoking and other tobacco use could yield an ROI of 1.4-to-1 in one year and 7-to-1 in 5 years.[28]

Public health professionals should take every opportunity to educate the public and policy makers about the strength of prevention as an approach. Often a hard business case can be made for prevention, albeit with a sometimes-long time horizon to realize monetary returns. However, prevention is the right course even if it is not cost neutral, if the definition of public health is to be honored.

National Prevention Strategy

Prevention plays such a central role in public health that the Surgeon General released the National Prevention Strategy (NPS) in 2011 with the goal to increase the number of Americans who are healthy at each stage to life.[29] The NPS has seven priority areas: Tobacco Free Living; Preventing Drug Abuse and Excessive Alcohol Use; Healthy Eating; Active Living; Injury and Violence

Free Living; Reproductive and Sexual Health; and Mental and Emotional Well-Being. These priorities are addressed through acting on the recommendations of four strategic domains: Healthy and Safe Community Environments; Clinical and Community Preventive Services; Empowered People; and Elimination of Health Disparities.

Founded on Social Justice and Health Equity Philosophies

Social justice, the idea that all members of a society should be treated fairly and justly, is the foundation of public health. Social justice argues that public health is properly a public matter and that its results in terms of death, disease, health, and well-being reflect the decisions and actions that a society takes, for good or for ill.[30] It is vital to recognize the social justice orientation as a fundamental characteristic of a public health approach and critical to understand the potential for conflict and confrontation that it generates.

The World Health Organization Constitution recognizes health as a human right.[31] Achieving health equity, the idea that all people should have an equal chance to live healthy lives, means addressing the social and other determinants of health, not just access to health care. The recognition of a widespread lack of health equity in the population, resulting in dramatic disparities in health status in people with different racial, ethnic, socioeconomic, geographic backgrounds, and other characteristics, is a main driver of the social justice approach in public health practice today. Health inequity means social injustice.

The concept of social justice first emerged around 1848, a time that might be considered the birth of modern public health. It has been an important element of public health practice ever since. For example, in 1911, Hermann Biggs, who revolutionized public health practice in New York City, and later became the third New York State Health Commissioner, succinctly stated "Public health is purchasable. Within natural limitations a community can determine its own death-rate."[32] He further explained:

> "Disease is largely a removable evil. It continues to afflict humanity, not only because of incomplete knowledge of its causes and lack of adequate individual and public hygiene, but also because it is extensively fostered by harsh economic and industrial conditions and by wretched housing in congested communities. These conditions and consequently the diseases which spring from them can be removed by better social organization. No duty of society, acting through its governmental agencies, is paramount to this obligation to attack the removable causes of disease."[32]

The potential for conflict and confrontation about the "duty of society" to address "removable causes of disease" arises from disagreements over the responsibility. The concept of "market justice" emphasizes personal responsibility of the individual as the basis for distributing burdens and benefits. In terms of health, individuals assume primary responsibility for their own health. There is little expectation that society should act to protect or promote the health of its members beyond addressing risks that cannot be controlled through individual action.

In contrast, "social justice" argues that there are significant factors outside of individuals' control that can impede the fair distribution of benefits and burdens.[33] Thus, there are times when collective action is needed to address these impediments. When the necessary collective actions are not taken, even the most important public policy problems remain unsolved, despite periodically becoming highly visible.[33] This explains our inadequate responses to such intractable American problems as inadequate housing, poor public education systems, racial discrimination, and poverty. This is also true for public health problems such as tobacco-related illnesses, infant mortality, substance abuse, lack of mental health and long-term care services, and environmental pollution. The bitter political conflict accompanying the enactment of national health reform legislation in the form of the Affordable Care Act of 2010 and the subsequent

pulling back from the commitments in the law reflect these same themes.

These and similar examples suggest that a critical challenge for public health as a social enterprise lies in overcoming the social and ethical barriers that prevent us from doing more with the knowledge and tools already available to us.[33] Extending the frontiers of science and knowledge may not be as effective for improving public health as shifting the collective values of our society to act on what we already know. Recent public health successes, such as public attitudes toward smoking in both public and private locations and operating motor vehicles after alcohol consumption, provide evidence in support of this assertion. These advances came through changes in social norms, rather than through bigger and better science. Even more important for achieving equity in health status are concerted efforts to improve health status in population groups with the greatest disadvantage, mechanisms to monitor health status and contributing factors across all population groups, and participation of disadvantaged population groups in the key political decision-making processes within the society.[34]

Dedicated to Ethical Principles

From the previous discussion of social justice, it should be clear that public health has strong moral underpinnings. Given that public health has strong principles to live up to and has, in the case of governmental public health departments, strong police and other legal powers, it is imperative that public health has a strong code of ethics to assure that it is serving the best interests of the communities it is responsible for and to avoid potential abuses of power. Such a code of ethics for public health, targeting primarily traditional public health institutions such as health departments and schools of public health, was developed in 2000–2001 with extensive input from the public health community.[35] The 12 principles are shown in **Table 1-7**.

Linked with Government

A fifth characteristic of public health is its close link with government, which should be clear from reviewing the history and the definition of public health, the 10 Essential Public Health

Table 1-7 Principles of the Ethical Practice of Public Health

Public health and its institutions and employees should:

1. Address the fundamental causes of disease and requirements for health.
2. Respects the rights of members of the community.
3. Develop and evaluate policies, programs, and priorities providing opportunities for input from community members.
4. Advocate and strive for the empowerment of disenfranchised communities and ensure that the conditions necessary for health are accessible to all.
5. Seek the information needed to implement effective policies and programs.
6. Provide communities with the information needed to develop policies or programs and should implement them only with the community's consent.
7. Act in a timely manner on the available information within their resources and mandates.
8. Develop programs and policies informed by and respecting the diverse values, beliefs, and cultures in the community.
9. Implement programs and policies in ways that most enhance the physical and social environment.
10. Protect the confidentiality of individuals or the community unless there is a high likelihood of significant harm to an individual or the community.
11. Ensure the professional competence of their employees.
12. Collaborate in ways that build the public's trust and their effectiveness.

Data from Thomas JC, Sage M, Dillenberg J, Guillory VJ. A code of ethics for public health. *Am J Public Health.* 2002 Jul;92(7):1057-1059.

Services, and the central role of government in the public health system, discussed earlier. Although public health is far more than the aggregate activities of federal, state, and local health agencies, many people think only of governmental public health agencies when they think of public health. Government does play a unique role in seeing that the key elements are in place and that public health's mission gets addressed. Only government can exercise the enforcement provisions of the public laws, regulations and policies that limit the personal and property rights of individuals and corporations in areas such as retail food establishments, sewage and water systems, occupational health and safety, consumer product safety, infectious disease control, and drug efficacy and safety (see Chapter 4).

Government also can play the convener and facilitator role for identifying and prioritizing health problems that might be addressed through public resources and actions. This is a primary role of government in the broader public health system, as previously discussed, and is critical for the identification of public health problems and the implementation of public health program solutions that meet the community's needs and have the support of communities, public health partners, and other interested parties. Government also has a role as part of the political process of determining the budget for public health programs and developing new public health laws. Additionally, government has a strong role in developing evidence-based and best practice recommendations for public health programs to follow, and in providing and marshaling the scientific expertise in the community to make the evidence base the best possible. Advisory body recommendations are strengthened by being developed in as unbiased and transparent a process as possible, which government can be in a position to achieve. Since government is a major funder of public health activities, it can also require implementing evidence-based practices with the funding it provides. This in turn can help their dissemination and adoption and can decrease the implementation of non-evidence-based programs. Health departments can also engage their sister governmental agencies to take a HiAP approach, as discussed earlier.

As noted previously, the link between government and public health can make for a particularly precarious funding situation for governmental public health agencies. The conflicting value systems of public health and the wider community, and the difficulty in making the argument for prevention may translate into public health agencies having to document their failures in terms of poorer health, increased disease, and disease outbreaks in order to make progress. It is said that only the squeaky wheel gets the grease; in public health, it often takes an outbreak, disaster, or other tragedy to demonstrate public health's value. Following the terrorist attacks of September 11, 2001 and the subsequent anthrax attacks, a massive infusion of federal funding occurred. However, that funding shrank by more than half in the succeeding decade.

A more recent example of a public health crisis is the epidemic of opioid use and overdose deaths. The epidemic has superseded the AIDS epidemic in terms of number of deaths per year, has resulted in a decline in life expectancy in some groups, and has been associated with outbreaks of HIV and hepatitis C among injection drug users in states like Indiana and elsewhere. This comes despite years of warnings from public health agencies about the growing risk and the failure to adequately control opioid prescriptions, fund drug treatment programs, or adopt policies like syringe exchange to reduce infectious diseases. Whether adequate funding to address this issue will be made available, and how long it will last, are open questions.

Based on an Inherently Political Nature

The social justice underpinnings of public health serve to stimulate political conflict. Public health is both publicly visible and political in nature. It serves populations, which are composites of many different communities, cultures, and values. Politics allow for issues to be considered, negotiated, and finally determined within societies. At the core of political processes are differing values and perspectives as to both the ends to be achieved and the means for achieving those ends. Advocating

causes and agitating various segments of society to identify and address unacceptable conditions that adversely affect health status often lead to increased expectations and demands on society, generally through government. As a result, public health advocates at times appear as antigovernment and anti-institutional. Governmental public health agencies seeking to serve the interests of both government and public health are frequently caught in the middle. This creates tensions and conflict that can put these public health professionals at odds with governmental leaders on the one hand and external public health advocates on the other.

Reliant on the Broader Public Health System/ Health in All Policies Approaches

As discussed earlier, public health can only work when all members of the broader public health system are collaboratively engaged. Individual agencies, community organizations, and even the public itself, may engage in activities that promote the public health, whether they recognize that as the goal or not. Only working together, however, can the public's health be optimized. It is important for the members of the broader system to take a HiAP approach in their work.

Engaged with a Multidisciplinary Professional Culture with Common Bonds

The multidisciplinary nature of public health and its need to engage a wide range of partners in the public health system appear to be both a strength and weakness. The ties that bind public health professionals are neither a common preparation through education and training, nor a common set of work experiences and work settings. Public health is unique in that the common links are a set of intended outcomes and characteristics, as outlined in this section, toward which many different sciences, arts, and methods can contribute. As a result, public health professionals include anthropologists, sociologists, psychologists, physicians, nurses, nutritionists, lawyers, economists, political scientists, social workers, laboratory workers, managers, sanitarians, engineers, epidemiologists, biostatisticians, gerontologists, disability specialists, and dozens of other professions and disciplines. All are bound to common ends and all employ somewhat different perspectives from their diverse education, training, and work experiences. "Whatever it takes to get the job done" is the theme, suggesting that the basic task is one of problem solving around health issues. This aspect of public health is the foundation for strategies and methods that of necessity must rely heavily on collaborations and partnerships.

This multidisciplinary and interdisciplinary approach is unique among professions, calling into question whether public health is really a unified profession at all. An argument can be made that public health is not a profession. There is no minimum credential or training that distinguishes public health professionals from either other professionals or nonprofessionals. Only a tiny proportion of those who work in organizations dedicated to improving the health of the public possess one of the academic public health degrees (the Master of Public Health degree and several other master and doctoral degrees granted by schools of public health and other institutions). With the vast majority of public health workers not formally trained in public health, it is difficult to characterize its workforce as a profession.

Outside-the-Book Thinking 1-12

Which of its characteristic features distinguish public health from medicine as a profession? The law? Other disciplines? Which distinguish it from social work?

Until only recently, public health has lacked key characteristics that distinguish professions from occupations. Significant progress has been made such that public health now meets several of the defining criteria of a profession, including: (1) a distinct body of knowledge, (2) an educational

credential offered by schools and programs accredited by a specialized accrediting body, (3) career paths that include autonomous practice, and (4) an independent national credential, Certified in Public Health (CPH), indicative of self-regulation based on the recently launched examination of the National Board of Public Health Examiners.[36]

Nonetheless, several obstacles will continue to challenge an independent professional status for public health, including the viability of the new credential and variability in the content of graduate training programs. The new educational requirements of the Council of Education for Public Health for accreditation of schools and programs in public health go a long way to address this latter concern.[37] The impact of complete professionalization could be considerable in terms of recruitment into the field, autonomy of practice, ultimate strengthening of the public health infrastructure, and impact on public health policy and outcomes.

Dynamic, with an Ever-Expanding Agenda

One inevitable characteristic of public health is its broad and ever-increasing scope. Traditional domains of public health interest include biology, environment, behavior, and health services organization. Within each of these domains are many factors that affect health status. In recent decades, many new public policy problems have been moved onto the public health agenda as their predisposing factors have been identified and found to fall into one or more of these domains. Additionally, in response to several NAM reports, public health has expanded its work to encompass the broader public health system and all the components of the social ecological model.

The assuming of new problems to the public health agenda is an ever-evolving phenomenon. For example, before 1900, the primary problems addressed by public health were infectious diseases and related environmental risks. After 1900, the focus expanded to include problems and needs of children and mothers to be addressed through health education and maternal and child health services as public sentiment over the health and safety of children increased. In the middle of the century, chronic disease prevention and medical care fell into public health's realm as an epidemiologic revolution began to identify causative agents for chronic diseases and links between use of health services and health outcomes. Later, substance abuse, mental illness, teen pregnancy, long-term care, chronic diseases, and injuries fell to public health, as did several emerging problems, most notably the epidemics of violence and HIV infections. The public health agenda expanded even further as a result of the recent national dialogue over health reform and how health services will be organized and managed. Bioterrorism preparedness is an even more recent addition to this agenda amidst heightened concerns and expectations after the events of September 11, 2001, and the anthrax attacks the following month. Infectious diseases, thought to be controllable by antimicrobials and good medical care are now recognized to be constantly changing with new diseases emerging or being recognized. These emerging and reemerging diseases include pandemic influenza, antimicrobial-resistant organisms, and the Zika and Ebola virus infections among many other potential threats. Noncommunicable diseases have emerged as well. The epidemic of opioid use is only the latest crisis to engage public health. The history of public health is the continual emergence and recognition of disease threats that need a response.

The Value of Public Health

How can we measure the contributions of public health and use them to engender among policy makers and the public an appreciation of the value of public health efforts? This question is addressed both directly and indirectly throughout this text. Some initial information presented here will set the stage for greater detail on diseases prevented and lives and dollars saved in Chapter 2.

10 Great Public Health Achievements of the 20th Century

The 20th century was a time of dramatic improvements in the public's health in the United States. At the end of the century, CDC compiled a list of the 10 great public health achievements of the past 100 years (**Table 1-8**).[38] This list gives an idea of the breadth of public health as a field and underscores how much improvement is possible through public health actions over time.

While these may appear to be distant and sterile accomplishments, each also tells the story of public health in very human terms. A good example is the achievement of reductions in communicable diseases due to vaccination programs. In the 1950s the United States was in the midst of a terrorizing polio epidemic. Public fear was so great that public libraries, community swimming pools, and other group activities were closed during the summers when the disease was most prevalent. Biomedical research had discovered a possible weapon against epidemic polio in the form of the Salk killed polio virus vaccine, which was developed in 1954 and licensed for use one year later. A massive and unprecedented campaign to immunize the public was quickly begun, setting the stage for a triumph of public health.

Table 1-8 Ten Great Public Health Achievements—United States, 1900–1999

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

Reproduced from Centers for Disease Control and Prevention. Ten great public health achievements—United States, 1900–1999. *MMWR*. 1999;48(12):241-243.

Almost seven decades later, wild poliovirus has been eradicated from the western hemisphere and much of the rest of the world. However, public health always has its challenges and vaccinations are not an exception. Unless a disease is eliminated, vaccination efforts need to continue even when disease rates are low. The elimination or near elimination of diseases like polio and measles has led to anti-vaccination concerns by parents for whom vaccination seems like a bigger threat than diseases they have never experienced. The resulting under vaccination has led to recurring outbreaks of vaccine-preventable diseases in recent years. Similar stories accompany many of other the top 10 achievements.

Reduced Morality and Increased Life Expectancy

The accomplishments in reducing communicable diseases, heart disease, and stroke point to a second way to appreciate the value of public health through looking at broad measures of the public's health as shown in mortality and life expectancy data. The dramatic reduction in deaths due to infectious diseases, particularly in the first half of the century, is seen in **Figure 1-8**. This serves as a reminder of impact that new and unexpected diseases, such as pandemic influenza, can emerge and have devastating consequences, underscoring the need to be prepared.

Studies have concluded that public health's prevention efforts are responsible for 25 years of the nearly 30-year improvement in life expectancy at birth in the United States since 1900 with only 5 years of the improvement resulting from better medical care.[39] Even within these 5 years, medical treatment accounted for 3.7 years, while clinical preventive services (such as immunizations and screening tests) accounted for 1.5 years. The remaining 25 years of improvement have resulted largely from prevention efforts in the form of improved sanitation, better living conditions, social policies, community actions, and personal behavior change. Similarly a study of life years gained from modern health disease treatments and changes in population risk factors in England

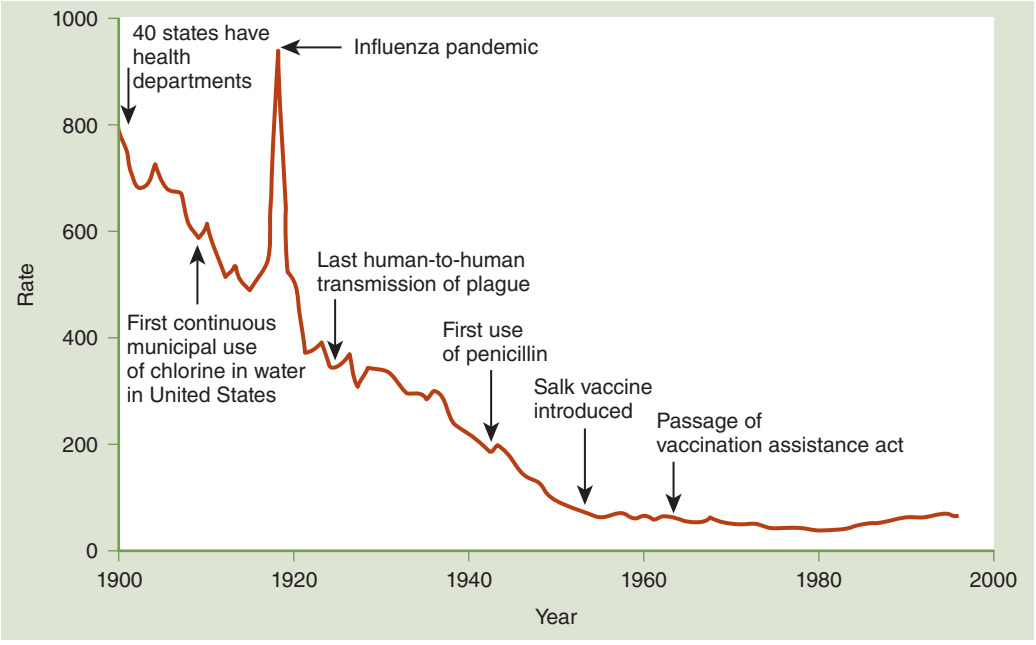

Figure 1-8 Crude Death Rate (per 100,000) for Infectious Diseases, United States, 1900–1996.

Reproduced from Centers of Disease Control and Prevention. Public health achievements, United States, 1900-1999: control of infectious diseases. *MMWR*. 1999;48:621-629.

and Wales from 1981 to 2000 concluded that 79% of the increase in life years gained was attributed to reductions in major risk factors. Only 21% of the life years gained could be attributed to medical and surgical treatments of coronary heart disease.[40]

As with recent challenges with vaccination programs described above, declines in mortality and gains in life expectancy have reversed in selected populations since 2015.[41] These changes bring attention to the opioid epidemic and increases in suicide, and the need for public health to respond. This is further discussed in Chapter 9.

The Value of Public Health to the Public

Perhaps the most important group to gain an understanding and appreciate the value of public health is the public itself, given that they elect the political leadership at all levels of government and that their cooperation and support are critical to the success of public health programs. Public opinion polls conducted suggest that public health is already highly valued in the United States.[42] Public opinion surveys suggest that the overwhelming majority of the public rate a variety of key public health services as "very important." Substantially more Americans believe that "public health/protecting populations from disease" is more important than "medicine/treating people who are sick." Public opinion surveys such as these suggest that public health's contributions to health and quality of life have not gone unnoticed.

More recent assessments of the public's view of the value of public health support this contention. A summary of public opinion surveys on public health published in 2010 found that only 42% of respondents rated the nation's system for protecting the public from health threats and preventing illness as excellent/good, and 75% of respondents, a higher proportion than any other area except education, said the federal government expenditures for improving and protecting the nation's health were too low.[43] This indicates a level of concern on the part of the public that might be leveraged to help marshal more support for public

health. A majority felt more spending was needed to address problems of chronic disease, infectious diseases like pandemic influenza and AIDS, and to provide vaccines, although there were large differences along party lines. Of concern, only a minority supported more funding to support state health departments, reduce tobacco use, improve the health of minorities, and assure preparedness for man-made and natural disasters (again with wide partisan differences).

These data indicate that the public is concerned about health and values public health efforts to improve health, although their support is spotty and divided. Much more needs to be done to impress on the public the value of public health.

Outside-the-Book Thinking 1-13

Visit the American Public Health Association website "What is Public Health" at https://www.apha.org/what-is-public-health. Review the various tabs on what and who public health is. Does this information help increase your appreciation of the value of public health and what it is? Do you think it would help the public and policy makers to better understand public health?

Conclusion

Public health evokes different images for different people, and, even to the same people, it can mean different things in different contexts. The intent of this chapter has been to define public health and to describe the characteristics of a public health approach to improving health. In defining and describing public health, we have tried to address the common perceptions of public health in the United States, which may in part be the cause of the uncertain valuing of public health by the public. Public health should be thought of as a complex, dynamic, social enterprise, akin to a movement. Public health can also mean a goal of improved health outcomes and health status. Or it can be the collection of activities and a profession dedicated to that goal. Finally, it may be viewed as both the actions of official governmental health agencies and a system made up of many sectors and partners whose collaboration is key to achieving the goal. Public health encompasses all of these descriptions, and more.

By carefully examining the various dimensions of the public health system and assessing what the three core public health functions and 10 Essential Public Health Services consist of, we can gain insight into what public health does, how it works, and how it can be improved. Understanding the public health system and the characteristics of a public health approach are necessary to improving the public's health, a theme that recurs throughout this text. Public health efforts have been major contributors to recent improvements in health status and can contribute even more in a new century with new challenges.

Discussion Questions

1. Pick a major historical public health figure mentioned in this chapter or of whom you are aware. What was the most important contribution of this individual to the evolution of public health? Why was it important? What is this individual's enduring legacy to public health?
2. How does each of the characteristic features of a public health approach described in this chapter distinguish it from other fields, or not?
3. Review the news headlines for the last week. How many stories are related to health? Are these predominantly stories about health care or about public health, or both? To what extent is prevention of disease highlighted in the news? Is health equity mentioned? What other themes are mentioned?

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