



SECTION V

Public Health Institutions and Systems

Now that we have taken a look at the U.S. healthcare institutions and healthcare system, we need to turn our attention to the public health system. Treating healthcare and public health systems as separate systems is artificial because they have many points of overlap and collaboration. However, historically public health institutions and systems have developed from different philosophies, have different goals, and have organizational structures and lines of accountability different from those of the healthcare system.

We will begin by outlining the current goals and roles of public health agencies. Then, we will look at the current system of local/state, federal, and global public health institutions and examine how they are organized. We will explore why public health agencies need to coordinate with each other to achieve the goals of public health.

We will then return to our definition of population health—the *totality of all evidence-based public and private efforts to preserve and promote health and prevent disease, disability and death*. This broad 21st century definition requires public health agencies and professionals to collaborate with a range of government agencies and healthcare professionals and institutions.

In Chapter 13, the final chapter, we will turn our attention to the roles that public health needs to play in planning for the future. We will begin by examining its role in preparing for and responding to disasters. We will then take a look at what we can learn from the past that can help us predict and prepare for the future. Finally, we will examine and illustrate the emerging approach known as systems thinking which can help us see and address the big picture issue of health.

Thus, in this final chapter of *Public Health 101*, we will examine the complex puzzle that we call population health. We will look at frameworks for putting the pieces together to address the health issues that will inevitably be part of your future. Regardless of where your career leads, you will find that public health affects every corner of your lives and every corner of our world.

Let us turn our attention in Chapter 12 to the current public health institutions and public health systems.

Public Health Institutions and Systems

LEARNING OBJECTIVES

By the end of this chapter, the student will be able to:

- identify goals of governmental public health.
- identify the ten essential services of public health.
- describe basic features of local, state, and federal public health agencies in the United States.
- identify global public health organizations and agencies and describe their basic roles.
- identify roles in public health for federal agencies not identified as health agencies.
- illustrate the need for collaboration by governmental public health agencies with other governmental and nongovernmental organizations.
- describe approaches to connecting public health and the health-care system.

A young man in your dormitory is diagnosed with tuberculosis. The health department works with the student health service to test everyone in the dorm, as well as in his classes, with a TB skin test. Those who are positive for the first time are advised to take a course of a medicine called INH. You ask: is this standard operating procedure?

You go to a public health meeting and learn that many of the speakers are not from public health agencies, but from the Departments of Labor, Commerce, Housing, and Education. You ask: what do these departments have to do with health?

You hear that a new childhood vaccine was developed by the NIH, approved by the FDA, endorsed for federal payment by the CDC and recommended for use by the American Academy of Pediatrics. You ask: do all these agencies and organizations always work so well together?

A major flood in Asia leads to disease and starvation. Some say it is due to global warming, others to bad luck. Coordinated efforts by global health agencies, assisted by nongovernmental organizations (NGOs) and outside governmental donors, help get the country back on its feet. You ask: what types of cooperation are needed to make all of this happen?

A local community health center identifies childhood obesity as a problem in their community. They collect data demonstrating that the problem begins as early as elementary school. They develop a plan that includes clinical interventions at the health center and also at the elementary school. They ask the health department to help them organize an educational campaign and assist in evaluating the results. Working together, they are able to reduce the obesity rate among elementary school children by one-half. This seems like a new way to practice public health, you conclude. What type of approach is this?

These cases all reflect the responsibilities of public health agencies at the local, federal, and global levels. They illustrate public health working the way it is supposed to work. Of course, this is not always the case. Let us start by taking a look at the goals and roles of public health agencies.

WHAT ARE THE GOALS AND ROLES OF GOVERNMENTAL PUBLIC HEALTH AGENCIES?

Public health is often equated with the work of governmental agencies. The role of government is only a portion of what we mean by public health, but it is an important component. So important, in fact, that we often define the roles of other

components in terms of how they relate to the work of governmental public health agencies.

In 1994, the United States Public Health Service put forth the “Public Health in America Statement,” which provided the framework that continues to define the goals and services of governmental public health agencies.¹ These goals should already be familiar to you. They are:

- to prevent epidemics and the spread of disease
- to protect against environmental hazards
- to prevent injuries
- to promote and encourage healthy behaviors
- to respond to disasters and assist communities in recovery
- to ensure the quality and accessibility of health services

These are ambitious and complicated goals to achieve. To be able to successfully achieve them, it is important to further define the roles that governmental public health agencies themselves play, and by implication, the roles that other governmental agencies and nongovernmental organizations need to play.

The Public Health in America Statement built upon the Institute of Medicine’s (IOM) 1988 report called *The Future of Public Health*.² The IOM defined three **core public health functions** that governmental public health agencies need to perform. The concept of “core function” implies that the job cannot be delegated to other agencies or to nongovernmental organizations. It also implies that the governmental public health agencies will work together to accomplish these functions because as a group they are responsible for public health as a whole—no one agency at the local, state, or federal level is specifically or exclusively responsible for accomplishing the essential public health services.^a

The core functions defined by the IOM are: 1) assessment, 2) policy development, and 3) assurance.²

- **Assessment** includes obtaining data that defines the health of the overall population and specific groups within the population, including defining the nature of new and persisting health problems.
- **Assurance** includes governmental public health’s oversight responsibility for ensuring that key components of an effective health system, including health care and public health, are in place even though the implementation will often be performed by others.

^a This does not imply that components of the work cannot be contracted to nongovernmental organizations. This activity is increasingly occurring. The concept of core function, however, implies that public health agencies remain responsible for these functions even when the day-to-day work is conducted through contracts with an outside organization.

- **Policy development** includes developing evidence-based recommendations and other analyses of options, such as health policy analysis, to guide implementation including efforts to educate and mobilize community partnerships.

The three core functions, while useful in providing a delineation of responsibilities and an intellectual framework for the work of governmental public health agencies, were not tangible enough to provide a clear understanding or definition of the work of public health agencies. Thus, in addition to the goals of public health, the Public Health in America Statement defined a series of **ten essential public health services** that build upon the IOM’s core functions, guide day-to-day responsibilities, and provide a mechanism for evaluating whether the core functions are fulfilled. These ten services have come to define the responsibilities of the combined local, state, and federal governmental public health system.

WHAT ARE THE TEN ESSENTIAL PUBLIC HEALTH SERVICES?

Table 12-1 outlines the ten essential public health services and organizes them according to which IOM core function they aim to fulfill.¹ A description of each service is presented in column two and examples of these essential services are listed in column three.

We have now looked at the core public health functions and the ten essential services of public health agencies. Figure 12-1 puts these together to allow you to see the connections.

These public health services are delivered through a complex web of local and federal agencies, as well as via increasing involvement of global organizations. Let us take a look at the work of public health agencies at each of these levels.

Figure 12-2 provides a framework to guide our review of the delivery of public health services. It diagrams the central role of governmental public health agencies and the complicated connections required to accomplish their responsibilities. We will begin by taking a look at the structure and function of governmental public health agencies at the local/state, federal, and global levels. Then, we will examine the key connections with other governmental agencies, community, and private organizations, and finally with the healthcare delivery system as a whole.

WHAT ARE THE ROLES OF LOCAL AND STATE PUBLIC HEALTH AGENCIES?

The United States Constitution does not mention public health. Thus, public health is first and foremost a state responsibility. States may retain the authority, voluntarily request or

TABLE 12-1 Ten Essential Public Health Services

Essential service	Meaning of essential service	Example
ASSESSMENT—Core function		
1. Monitor health status to identify and solve community health problems	This service includes accurate diagnosis of the community's health status; identification of threats to health and assessment of health service needs; timely collection, analysis, and publication of information on access, utilization, costs, and outcomes of personal health services; attention to the vital statistics and health status of specific groups that are at a higher risk than the total population; and collaboration to manage integrated information systems with private providers and health benefit plans.	Vital Statistics Health Surveys Surveillance, including reportable diseases
2. Diagnose and investigate health problems and health hazards in the community	This service includes epidemiologic identification of emerging health threats; public health laboratory capability using modern technology to conduct rapid screening and high-volume testing; active infectious disease epidemiology programs; and technical capacity for epidemiologic investigation of disease outbreaks and patterns of chronic disease and injury.	Epidemic investigations CDC—Epidemiology Intelligence Service State Public Health Laboratories
POLICY DEVELOPMENT—Core function		
3. Inform, educate, and empower people about health issues	This service includes social marketing and media communications; providing accessible health information resources at community levels; active collaboration with personal health care providers to reinforce health promotion messages and programs; and joint health education programs with schools, churches, and worksites.	Health education campaigns, such as comprehensive state tobacco programs
4. Mobilize community partnerships and action to identify and solve health problems	This service includes convening and facilitating community groups and associations, including those not typically considered to be health-related, in undertaking defined preventive, screening, rehabilitation, and support programs; and skilled coalition-building to draw upon the full range of potential human and material resources in the case of community health.	Lead control programs: testing and follow-up of children, reduction of lead exposure, educational follow-up, and addressing underlying causes
5. Develop policies and plans that support individual and community health efforts	This service requires leadership development at all levels of public health; systematic community and state-level planning for health improvement in all jurisdictions; tracking of measurable health objectives as a part of continuous quality improvement strategies; joint evaluation with the medical health care system to define consistent policy regarding prevention and treatment services; and development of codes, regulations, and legislation to guide public health practice.	Newborn screening program for PKU and other genetic and congenital diseases

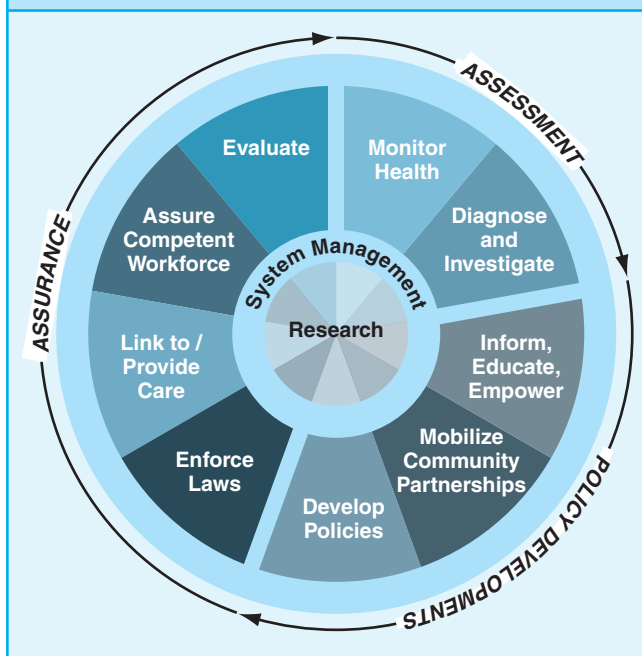
continues

TABLE 12-1 Ten Essential Public Health Services (continued)

Essential service	Meaning of essential service	Example
ASSURANCE—Core function		
6. Enforce laws and regulations that protect health and ensure safety	This service involves full enforcement of sanitary codes, especially in the food industry; full protection of drinking water supplies; enforcement of clean air standards; timely follow-up of hazards, preventable injuries, and exposure-related diseases identified in occupational and community settings; monitoring quality of medical services (e.g. laboratory, nursing home, and home health care); and timely review of new drug, biological, and medical device applications.	Local: Fluoridation and chlorination of water State: Regulation of nursing homes Federal: FDA drug approval and food safety
7. Link people to needed personal health services and ensure the provision of health care when otherwise unavailable	This service (often referred to as “outreach” or “enabling” service) includes ensuring effective entry for socially disadvantaged people into a coordinated system of clinical care; culturally- and linguistically-appropriate materials and staff to ensure linkage to services for special population groups; ongoing “care management”; and transportation.	Community Health Centers
8. Ensure the provision of a competent public and personal health care workforce	This service includes education and training for personnel to meet the needs for public and personal health services; efficient processes for licensure of professionals and certification of facilities with regular verification and inspection follow-up; adoption of continuous quality improvement and lifelong learning within all licensure and certification programs; active partnerships with professional training programs to ensure community-relevant learning experiences for all students; and continuing education in management and leadership development programs for those charged with administrative/executive roles.	Licensure of physicians, nurses, and other health professionals
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services	This service calls for ongoing evaluation of health programs, based on analysis of health status and service utilization data, to assess program effectiveness and to provide information necessary for allocating resources and reshaping programs.	Development of evidence-based recommendations
ALL THREE IOM—Core function		
10. Research for new insights and innovative solutions to health problems	This service includes continuous linkage with appropriate institutions of higher learning and research and an internal capacity to mount timely epidemiologic and economic analyses and conduct needed health services research.	NIH, CDC, AHRQ other federal agencies

Source: Data from Public Health in America. Essential Public Health Services. Available at <http://www.health.gov/phfunctions/public.htm>. Accessed November 8, 2008.

FIGURE 12-1 Essential public health services and IOM core functions



Source: Reprinted from Public Health in America. Essential Public Health Services. Available at <http://www.health.gov/phfunctions/public.htm>. Accessed November 8, 2008.

accept help from the federal government, or delegate their responsibility and/or authority to local agencies at the city, county, or other local levels.^b

Box 12-1 describes a brief history of public health agencies in the United States. It is a complex history and has resulted in more structures than there are states—more because large cities often have their own public health systems.³ In addition, the District of Columbia and several U.S. territories have their own systems and often have authority to make public health system decisions as if they were states.

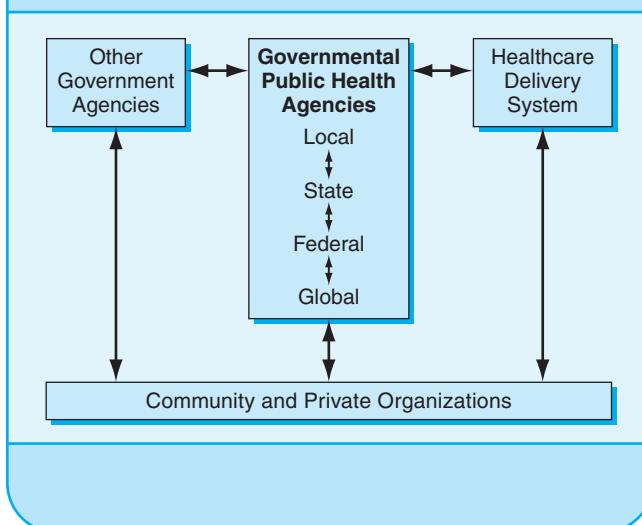
To understand the role of local health departments, it is useful to think of two models.⁴ In the first model, which we will call the home rule or local autonomy model, authority is delegated from the state to the local health department. The local health department, or the local government, has a great deal of autonomy in setting its own structure and function and often raising its own funding.

In the second model, which we will call the branch office model, the local health department can be viewed as a branch office of the state agency with little or no independent authority or funding. Most health departments lie somewhere in between these two extreme models, however these models provide a framework for understanding the many varieties of department structures. Thus, when we speak of local public health, we may be speaking of a state agency with branch offices or a relatively independent local agency. Regardless of which model a state uses, many public health responsibilities of local public health departments are quite similar and they usually have authority and responsibility for at least the following:⁴

- immunizations for those not covered by the private system
- communicable disease surveillance and initial investigation of outbreaks
- communicable disease control, often including at a minimum tuberculosis and syphilis case finding and treatment
- inspection and licensing of restaurants
- environmental health surveillance
- coordinating public health screening programs, including newborn and lead screenings
- tobacco control programs
- public health preparedness and response to disasters

Health departments in many parts of the United States have also served as the healthcare provider for those without

FIGURE 12-2 Framework for viewing governmental public health agencies and their complicated connections



^b This delegation may occur at the discretion of the state government or it may be included in the state's constitution providing what is called **home rule authority** to local jurisdictions. In general, jurisdictions with home rule authority exercise substantially more autonomy.

BOX 12-1 Brief History of American Public Health Agencies.

An understanding of the history of American public health institutions requires an understanding of the response of local, state, and federal governments to public health crises and the complex interactions between these levels of government.

The colonial period in America saw repeated epidemics of smallpox, cholera, and yellow fever focused in the port cities. These epidemics brought fear and disruption of commerce, along with accompanying disease and death. One epidemic in Philadelphia in 1793 in what was then the nation's capital nearly shut down the federal government. These early public health crises brought about the first municipal Boards of Health, made up of respected citizens authorized to act in the community's interest to implement quarantine, evacuation, and other public health interventions of the day. The federal government's early role in combating epidemics led to the establishment in 1798 of what later became known as the U.S. Public Health Service.

Major changes in public health awaited the last half of the 19th century with the great expansion of understanding of disease and the ability to control it through community actions. The Shattuck Commission in Massachusetts in 1850 outlined the roles of state health departments as responsible for: sanitary inspections, communicable disease control, food sanitation, vital statistics, and services for infants and children. Over the next 50 years, the states gradually took the lead in developing public health institutions based upon delivery of these services.

Local health departments outside of the largest cities did not exist until the 20th century. The Rockefeller Foundation stimulated and helped fund early local health departments and campaigns in part to combat specific diseases, such as hookworm. There was no standard model for local health departments. Local health departments developed in at least 50 different ways in the 50 states and were chronically underfunded.

The federal government played a very small role in public health throughout the 1800s and well into the 20th century. An occasional public health crisis stimulated in part by media attention did bring about federal action. The founding of the Food and Drug Administration in 1906 resulted in large part from the journalistic activity known as "muckraking," which exposed the status of food and drug safety. The early years of the 20th century set the stage for expansion of the federal government's role in public health through the passage of the 16th Amendment to the Constitution authorizing federal income tax as a major source of federal government funding.

The Great Depression, in general, and the Social Security Act of 1935, in particular, brought about a new era in which federal funding became a major source of financial resources for state and local public health departments and nongovernmental organizations. The founding of the what was then called the Communicable Disease Centers (CDC) in 1946 led to a national and eventually international leadership role for the CDC which attempts to connect and hold together the complex local, state, and federal public health efforts and integrate them into global public health efforts.

The Johnson Administration's War on Poverty, as well as the Medicare and Medicaid programs, brought about greatly expanded funding for health care services and led many health departments to provide direct healthcare services especially for those without other sources of care. The late 1980s and 1990s saw a redefinition of the roles of governmental public health including the Institute of Medicine's definition of core functions and the development of the 10 Essential Public Health Services. These documents have guided the development of a broad population focus for public health and a move away from the direct provision of healthcare services.

As we will explore in Chapter 13, the terrorism of 9/11 and the subsequent anthrax scare moved public health institutions to the center of efforts to protect the public's health through emergency and disaster preparedness. The development of flexible efforts to respond to expected and unexpected hazards is now a central feature of public health institutions' roles and funding. The success of these efforts requires new levels of coordination of local, state, federal, and global public health agencies utilizing state-of-the-art surveillance, laboratory technology, and communications systems.

other sources of health care. This has been called the **health-care safety net**. In recent years, many health departments have reduced or discontinued these services often transferring them to the healthcare system or integrating their efforts into community health centers. The concept of core functions holds that while these activities can be performed by other organizations or agencies, the public health agencies still retain re-

sponsibility for ensuring access to and the quality of these services.

The work of local public health agencies cannot be viewed in isolation. The State Health Department usually retains important roles even in those states where the local departments have home rule authority. These responsibilities often include: collecting vital statistics, running a public health laboratory,

licensing of health professionals, administering nutrition programs, and regulation of health facilities, such as nursing homes. In addition, drinking water regulation, administration of the state Medicaid program, and the office of the medical examiner may also fall under the authority of the State Health Department.

Today, the federal government has a great deal of involvement in national and global issues of public health and often works closely with local agencies. Let us take a look at the structure and role of the federal government in public health.

WHAT ARE THE ROLES OF FEDERAL PUBLIC HEALTH AGENCIES?

As we saw in Chapter 5, the federal government's role in public health does not explicitly appear in the United States Constitution. It has been justified largely by the Interstate Commerce clause, which provides federal government authority to regulate commerce between the states. Federal public health authority often rests on the voluntary acceptance by the states of funding provided by the federal government. This funding may come with requirements for state action in order to qualify for the funding.

The Department of Health and Human Services (HHS) is the central public health agency of the federal government. It includes operating agencies each of which report directly to the cabinet-level Secretary of HHS. Table 12-2 outlines most of these agencies, their roles and authority, and their basic public health structure and activities.⁵

The National Institutes of Health (NIH) is far and away the largest agency within HHS with a budget of over \$30 billion—as much as all the other six agencies' budgets combined. However, most of its efforts are devoted to basic science research and the translation of research into clinical practice. Some of the federal agencies, such as the Health Services and Resources Administration (HRSA), Substance Abuse and Mental Health Services Administration (SAMHSA), and the Indian Health Service, provide or fund individually-oriented health services in addition to population-oriented preventive services. The Indian Health Service is unique because it is responsible for both public health and healthcare services for a defined population.

The Centers for Disease Control and Prevention (CDC) is perhaps the agency most closely identified with public health at the federal level. Box 12-2 describes its first 50 years from 1946 to 1996 in a reprint of its official history first published in the *Morbidity and Mortality Weekly Report* (MMWR), a weekly publication of agency.⁶

Today, the CDC's role in connecting federal, state, and local governmental public health efforts is central to the suc-

cess of the system. Approximately half of the CDC's current approximately \$10 billion budget is channeled to state and local health departments. A key function of the CDC is to provide national leadership and to coordinate the efforts of local/state and federal public health agencies.

To understand the local/state and federal public health system, it is important to appreciate that only five percent of all health-related funding goes to public health and of that, less than half goes to population-based prevention as opposed to providing healthcare services as a safety net for individuals. In addition, the role of governmental public health is limited by social attitudes toward government. For instance, we have seen that there are constitutional limitations on the authority of public health and other government agencies to impose actions on individuals. These may limit public health agencies' abilities to address issues ranging from tuberculosis and HIV control to responses to emergencies. The social attitudes of Americans may also limit the authority and resources provided to public health agencies. Americans often favor individual or private efforts over governmental interventions when they believe that individuals and private organizations are capable of success. For instance, some Americans resist active efforts in the schools to provide information and access to contraceptives, while others resist the type of case-finding efforts for HIV/AIDS that have been used successfully in investigating and controlling other communicable diseases.

Today, governmental public health is a global enterprise. Let us take a look at the roles of global health organizations and agencies.

WHAT ARE THE ROLES OF GLOBAL HEALTH ORGANIZATIONS AND AGENCIES?

Public health is increasingly becoming a global enterprise. Global governmental efforts have grown dramatically in recent years. The World Health Organization (WHO) was created in 1948. Its impact has become more prominent in the 21st century with the increasing importance of global health issues. The WHO is a part of the United Nations organizations, which also include the United Nations Infant and Child Emergency Fund (UNICEF) and the Joint United Nations Programme on AIDS/HIV (UNAIDS).⁷

Today, the World Bank and other multilateral financial institutions are the largest funding source for global health efforts.⁸ National governmental aid programs, including the United States Agency for International Development (USAID), also play an important role in public health. Table 12-3 outlines the structure/governance, roles, and limitations of global public health agencies.

TABLE 12-2 Key Federal Health Agencies of the Department of Health and Human Services

Agency	Roles/Authority	Examples of Structures/Activities
Centers for Disease Control and Prevention (CDC) and Agency for Toxic Substances and Disease Registry (ATSDR)	CDC is the lead agency for prevention, health data, epidemic investigation, and public health measures aimed at disease control and prevention. The CDC administers ATSDR, which works with the Environmental Protection Agency to provide guidance on health hazards of toxic exposures.	The CDC and ATSDR work extensively with state and local health departments. The CDC's Epidemiology Intelligence Service (EIS) functions domestically and internationally at the request of governments.
National Institutes of Health (NIH)	Lead research agency. Also funds training programs and communication of health information to the professional community and the public.	17 institutes in all—the largest being the National Cancer Institute. The National Library of Medicine is part of NIH Centers. The Centers include the John E. Fogarty International Center for Advanced Study in the Health Sciences. NIH is the world's largest biomedical research enterprise with intramural research at NIH and extramural research grants throughout the world.
Food and Drug Administration (FDA)	Consumer protection agency with authority for safety of foods and safety and efficacy of drugs, vaccines and other medical and public health interventions	Divisions responsible for food safety, medical devices, drug efficacy and safety pre- and post- approval
Health Resources and Services Administration (HRSA)	Seeks to ensure equitable access to comprehensive quality health care	Funds community health centers, HIV/AIDS services, scholarships for health professional students
Agency for Healthcare Research and Quality (AHRQ)	Research agenda to improve the outcomes and quality of health care, including patient safety and access to services	Supports U.S. Preventive Services Task Force, Evidence-based medicine research, and Guidelines Clearinghouse
Substance Abuse and Mental Health Services Administration (SAMHSA)	Works to improve quality and availability of prevention, treatment, and rehabilitation for substance abuse and mental illness	Research, data collection and funding of local services
Indian Health Service (IHS)	Provides direct health care and public health services to federally-recognized tribes	Services provided to 550 federally-recognized tribes in 35 states. Only comprehensive federal responsibility for health care, plus public health services

BOX 12-2 History of the CDC.

The Communicable Disease Center was organized in Atlanta, Georgia on July 1, 1946; its founder, Dr. Joseph W. Mountin, was a visionary public health leader who had high hopes for this small and comparatively insignificant branch of the Public Health Service (PHS). It occupied only one floor of the Volunteer Building on Peachtree Street and had fewer than 400 employees, most of whom were engineers and entomologists. Until the previous day, they had worked for Malaria Control in War Areas, the predecessor of CDC, which had successfully kept the southeastern states malaria-free during World War II and, for approximately 1 year, from murine typhus fever. The new institution would expand its interests to include all communicable diseases and would be the servant of the states, providing practical help whenever called.

Distinguished scientists soon filled CDC's laboratories, and many states and foreign countries sent their public health staffs to Atlanta for training....Medical epidemiologists were scarce, and it was not until 1949 that Dr. Alexander Langmuir arrived to head the epidemiology branch. Within months, he launched the first-ever disease surveillance program, which confirmed his suspicion that malaria, on which CDC spent the largest portion of its budget, had long since disappeared. Subsequently, disease surveillance became the cornerstone on which CDC's mission of service to the states was built and, in time, changed the practice of public health.

The outbreak of the Korean War in 1950 was the impetus for creating CDC's Epidemiological Intelligence Service (EIS). The threat of biological warfare loomed, and Dr. Langmuir, the most knowledgeable person in PHS about this arcane subject, saw an opportunity to train epidemiologists who would guard against ordinary threats to public health while watching out for alien germs. The first class of EIS officers arrived in Atlanta for training in 1951 and pledged to go wherever they were called for the next 2 years. These "disease detectives" quickly gained fame for "shoe-leather epidemiology" through which they ferreted out the cause of disease outbreaks.

The survival of CDC as an institution was not at all certain in the 1950s. In 1947, Emory University gave land on Clifton Road for a headquarters, but construction did not begin for more than a decade. PHS was so intent on research and the rapid growth of the National Institutes of Health that it showed little interest in what happened in Atlanta. Congress, despite the long delay in appropriating money for new buildings, was much more receptive to CDC's pleas for support than either PHS or the Bureau of the Budget.

Two major health crises in the mid-1950s established CDC's credibility and ensured its survival. In 1955, when poliomyelitis appeared in children who had received the recently approved Salk vaccine, the national inoculation program was stopped. The cases were traced to contaminated vaccine from a laboratory in California; the problem was corrected, and the inoculation program, at least for first and second graders, was resumed. The resistance of these 6- and 7-year-olds to polio, compared with that of older children, proved the effectiveness of the vaccine. Two years later, surveillance was used again to trace the course of a massive influenza epidemic. From the data gathered in 1957 and subsequent years, the national guidelines for influenza vaccine were developed.

CDC grew by acquisition....When CDC joined the international malaria-eradication program and accepted responsibility for protecting the earth from moon germs and vice versa, CDC's mission stretched overseas and into space.

CDC played a key role in one of the greatest triumphs of public health, the eradication of smallpox. In 1962 it established a smallpox surveillance unit, and a year later tested a newly developed jet gun and vaccine in the Pacific island nation of Tonga....CDC also achieved notable success at home tracking new and mysterious disease outbreaks. In the mid-1970s and early 1980s, it found the cause of Legionnaires disease and toxic-shock syndrome. A fatal disease, subsequently named acquired immunodeficiency syndrome (AIDS), was first mentioned in the June 5, 1981, issue of *MMWR*.

Although CDC succeeded more often than it failed, it did not escape criticism. For example, television and press reports about the Tuskegee study on long-term effects of untreated syphilis in black men created a storm of protest in 1972. This study had been initiated by PHS and other organizations in 1932 and was transferred to CDC in 1957. Although the effectiveness of penicillin as a therapy for syphilis had been established during the late 1940s, participants in this study remained untreated until the study was brought to public attention. CDC was also criticized because of the 1976 effort to vaccinate the U.S. population against swine flu, the infamous killer of 1918–1919. When some vaccinees developed Guillain-Barre syndrome, the campaign was stopped immediately; the epidemic never occurred.

As the scope of CDC's activities expanded far beyond communicable diseases, its name had to be changed. In 1970 it became the Center for Disease Control and in 1981, after extensive reorganization, Center became Centers. The words "and Prevention" were added in 1992, but, by law, the well-known three-letter acronym was retained. In health emergencies CDC means an answer to SOS calls from anywhere in the world, such as the recent one from Zaire where Ebola fever raged.

Fifty years ago CDC's agenda was non-controversial (hardly anyone objected to the pursuit of germs), and Atlanta was a backwater. In 1996, CDC's programs are often tied to economic, political, and social issues, and Atlanta is as near Washington as the tap of a keyboard.

Source: Reprinted from Centers for Disease Control and Prevention, *MMWR* 1996;45: 526–528.

TABLE 12-3 Global Public Health Organizations

Type of agency	Structure/Governance	Role(s)	Limitations
World Health Organization	United Nations Organization Seven “regional” semi-independent components, e.g., Pan American Health Organization covers North and South America	Policy development, e.g., tobacco treaty, epidemic control policies Coordination of services, e.g., SARS control, vaccine development Data collection and standardization, e.g., measures of health care quality, measures of health status	Limited ability to enforce global recommendations, limited funding and complex international administration
International organizations with focused agenda	UNICEF UNAIDS	Focus on childhood vaccinations Focus on AIDS	Limited agendas and limited financing
International financing organizations	The World Bank Other multilateral regional banks, e.g., InterAmerican and Asian Development Banks	World Bank is largest international funder. Increasingly supports “human capital” projects and reform of health care delivery systems and population and nutrition efforts Provides funding and technical assistance primarily as loans	Criticized for standardized approach with few local modifications
Bilateral governmental aid organizations	USAID Many other developed countries have their own organizations and contribute a higher percentage of their gross domestic product to those agencies than does the United States	Often focused on specific countries and specific types of programs, such as the United States’ focus on HIV/AIDS, and maternal and child health	May be tied to domestic politics and global economic, political, or military agendas

The complexity of local, state, federal, and global public health agencies raises the question of whether or not these agencies can and do work together. It should not surprise you that close collaboration, while the goal, is often difficult to achieve with so many organizations involved. Thus, it is important to ask: how can public health agencies work together?

HOW CAN PUBLIC HEALTH AGENCIES WORK TOGETHER?

Coordination among public health agencies has been a major challenge that is built into our local, state, and federal system

of governance. Increasingly, coordination also requires a global aspect as well. Efforts on all levels have a long way to go. There are signs of hope with the recent progress in such fields as tobacco control, food safety, and most notably, the response to SARS. Box 12-3 discusses the dramatic events of the 2003 SARS epidemic, providing an example of what can be done and what needs to be done to address future public health emergencies.⁹

Collaboration needs to be an everyday effort, and not just a requirement for emergencies or epidemics. Let us look at the relationships and needed collaboration among governmental

BOX 12-3 SARS and the Public Health Response.

The SARS epidemic of 2003 began with little notice, most likely somewhere in the heartland of China and then spread to other areas of Asia. The world took notice after television screens filled with reports of public health researchers sent to Asia to investigate the illness subsequently contracting and dying from the disease. Not an easily transmissible disease except for those in very close contact, such as investigators, family members, and healthcare providers, the disease spread slowly but steadily through areas of China. Among those infected, the case-fatality rate was very high especially without the benefits of modern intensive care facilities.

The disease did not respond to antibiotics and was thought to be a viral disease by its epidemiological pattern of spread and transmission, but at first no cause was known. The outside world soon felt the impact of the brewing epidemic when cases appeared in Hong Kong that could be traced to a traveler from mainland China. Fear spread when cases were recognized that could not be explained by close personal contact with a SARS victim.

The epidemic continued to spread jumping thousands of miles to Toronto, Canada, where the second greatest concentration of disease appeared. Soon, the whole world was on high alert, if not quite on the verge of panic. At least 8000 people worldwide became sick and almost 10 percent of them died. Fortunately, progress came quite quickly. Researchers coordinated by the World Health Organization (WHO) were able to put together the epidemiological information and laboratory data and establish a presumed cause, a new form of the coronavirus never before seen in humans leading to the rapid introduction of testing.

The WHO and the CDC put forth recommendations for isolation, travel restrictions, and intensive monitoring that rapidly controlled the disease even in the absence of an effective treatment aimed at a cure. SARS disappeared as rapidly as it emerged, especially after systematic efforts to control spread were put in place in China. Not eliminated, but no longer a worldwide threat, SARS left a lasting global impact. The WHO established new approaches for reporting and responding to epidemics—these now have the widespread formal acceptance of most governments.

Once the world could step back and evaluate what happened, it was recognized that the potential burden of disease posed by the SARS epidemic had worldwide implications and raised the threat of interruption of travel and trade. Local, national, and global public health agencies collaborated quickly and effectively. Infection control recommendations made at the global level were rapidly translated into efforts to identify disease at the local level and manage individual patients in hospitals throughout the world. It is a model of communicable disease control that will be needed in the future.

public health and other governmental agencies, nongovernmental organizations, and the healthcare delivery system.

WHAT OTHER GOVERNMENT AGENCIES ARE INVOLVED IN HEALTH ISSUES?

To address health issues, it is important to recognize the important roles that government agencies not designated as health agencies play in public health. Such agencies exist at the local/state, federal, and global levels. To illustrate the involvement of these agencies in health issues, let's begin with the roles of nonhealth agencies at the federal level.

A number of federal agencies serve public health functions even though they are not defined as health agencies. The roles they play are important especially when we take the population health perspective that includes the totality of efforts to promote and protect health and prevent disease, disability, and death.

Environmental health issues are an important part of the role of the Environmental Protection Agency (EPA). Reducing

injury and hazardous exposures in the workplace are key goals of the Occupational Safety and Health Administration (OSHA), which is part of the Department of Labor.

Protecting health as part of preparation and response to disasters and terrorism is central to the role of the Department of Homeland Security. The Department of Agriculture shares with the FDA the role of protecting the nation's food supply. The Department of Housing and Urban Development influences the built environment and its impacts on health. The Department of Energy plays important roles in setting radiation safety standards for nuclear power plants and other sources of energy.

The multiple federal agencies involved in health-related matters often means that coordination and collaboration are required across agencies. This is certainly the case with food safety and disaster planning and response. It is true as well for efforts to address problems that cut across agencies, such as lead exposure or efforts to reduce the environmental causes of asthma.

WHAT ROLES DO NONGOVERNMENTAL ORGANIZATIONS PLAY IN PUBLIC HEALTH?

Nongovernmental organizations play increasingly important roles in public health in the United States and around the world. The United States has a long tradition of private groups organizing to advocate for public health causes, delivering public health services, and providing funding to support public health efforts. In recent years, these efforts have been expanding globally as well.

The American Red Cross and its network of international affiliates represent a major international effort to provide public health services. The organization plays a central role in obtaining volunteers for blood donations and ensuring the safety and effectiveness of the U.S. and world supply of blood products in collaboration with the U.S. Food and Drug Administration. The ability of the Red Cross to obtain donations, mobilize volunteers, and publicize the need for disaster assistance has allowed it to play a central role in providing lifesaving public health services.

Many private organizations provide public health education, support research, develop evidence-based recommendations, and provide other public health services. Many of these are organized around specific diseases or types of disease, such as the American Cancer Association, the American Heart Association, the American Lung Association and the March of Dimes, which focuses on birth defects. Other private organizations focus primarily on advocacy for individuals with specific diseases, but these organizations also may advocate for specific public health interventions. For instance, Mothers Against Drunk Driving (MADD) has had a major impact on the passage and enforcement of drunk driving laws. HIV/AIDS advocacy groups have influenced policies on confidentiality, funding, and public education.

Globally, nongovernmental organizations (NGOs) increasingly play a key role in providing services and advocating for public health policies. CARE and OXFAM are examples of the types of organizations involved in global health-related crises. Physician groups, including Physicians for Social Responsibility and Doctors without Borders, have been active in advocating for public health efforts, seeking funding for public health needs, and addressing the ethical implementation of public health programs.

New combinations of governmental and nongovernmental organizations are increasingly developing to fill in the gaps. At the global level, the Global Fund to Fight AIDS, Tuberculosis and Malaria, a public-private effort, provides funding for evidence-based interventions to address these diseases. It is funded not only by governments, but also by private foundations, such as the Bill and Melinda Gates Foundation.

Private foundations have played major roles in funding public health efforts and also stimulating governmental funding. The Rockefeller Foundation's efforts were instrumental in developing local health departments and initiating Schools of Public Health in the United States during the early years of the 20th century. The Kellogg Foundation, the Robert Wood Johnson Foundation, and most recently the Gates Foundation have all played key roles in advancing public health efforts in areas ranging from nutrition to tobacco control to advancing new public health technologies.

Foundation funding has been the catalyst in initiating new funding efforts and sustaining those that are not adequately funded by governments. They cannot be expected, however, to provide long-term support for basic public health services. Thus, additional strategies are required. One key strategy is to link public health efforts with the efforts of healthcare professionals and the healthcare system.

HOW CAN PUBLIC HEALTH AGENCIES PARTNER WITH HEALTH CARE TO IMPROVE THE RESPONSE TO HEALTH PROBLEMS?

We have already seen a number of traditional connections between public health and health care. Clinicians and public health professionals increasingly share a common commitment to evidence-based thinking, cost-effective delivery of services, and computerized and confidential data systems. They also increasingly share a commitment to provide quality services to the entire population and eliminate health disparities. The potential for successful collaboration between public health and health care is illustrated by the National Vaccine Plan, which is discussed in Box 12-4.¹⁰

In the mid-1990s, a Medicine-Public Health Initiative was initiated to investigate better ways to connect public health with medicine, in particular, and health care, in general. Connecting these two fields has not always had easy or successful results. Additional structures are needed to formalize effective and efficient bonds. Models do exist and new ideas are being put forth to connect clinical care and public health. Box 12-5 discusses one such model called **community-oriented primary care (COPC)**.¹¹

Despite efforts in the healthcare system to reach out to the community and address public health issues (such as COPC), it remains the primary responsibility of public health to organize and mobilize community-based efforts. Working with nongovernmental organizations and healthcare professionals and organizations is imperative to effectively and efficiently accomplish the goals of public health. But, how exactly can public health agencies accomplish these goals?

BOX 12-4 National Vaccine Plan.

In 1994, a National Vaccine Plan was developed as part of a coordinated effort to accomplish the following goals:

1. Develop new and improved vaccines.
2. Ensure the optimal safety and effectiveness of vaccines and immunizations.
3. Better educate the public and members of the health profession on the benefits and risks of immunizations.

A recent Institute of Medicine (IOM) report evaluated progress since 1994 on achieving the above goals and made recommendations for the development of a revised National Vaccine Plan.¹⁰ The IOM highlighted a number of successes since 1994 in achieving each of the goals of the Plan. These successes illustrate the potential for improved collaboration between public health systems and healthcare systems.

In terms of the development of new and improved vaccines since 1994, over 20 new vaccine products resulting from the collaborative efforts of the National Institutes of Health (NIH), academic, and industry researchers were approved by the Food and Drug Administration (FDA). Novel vaccines introduced include vaccines against pediatric pneumococcal disease, meningococcal disease, and the human papillomavirus (HPV)—a cause of cervical cancer.

In terms of safety, vaccines and vaccination approaches with improved safety have been developed since 1994, including those directed against rotavirus, pertussis (whooping cough), and polio. The FDA Center for Biologics Evaluation and Research (CBER), which regulates vaccines, now has an expanded array of regulatory tools to facilitate the review and approval of safe and efficacious vaccines. The FDA and the Centers for Disease Control and Prevention (CDC) have collaborated on surveillance for and evaluation of adverse events. Efforts have also been made to increase collaboration with the Centers for Medicare and Medicaid, the Department of Defense, and the Department of Veterans Affairs to improve surveillance and reporting of adverse events following immunization in the adult populations these agencies serve.

In terms of better education of health professionals and the public, progress has also been made. The American Academy of Pediatrics (AAP) collaborates with the CDC for its Childhood Immunization Support. The American Medical Association (AMA) cosponsors the annual National Influenza Vaccine Summit, a group that represents 100 public and private organizations interested in preventing influenza.

Despite the growing collaboration and success in vaccine development and use, new issues have appeared in recent years. Vaccines are now correctly viewed by the health professionals and the public as having both benefits and harms. In recent years, the public has grown more concerned about the safety of vaccines, including the issue of the use of large numbers of vaccines in children. The limitations of vaccines to address problems, such as HIV/AIDS, have also been increasingly recognized. Hopefully, the new National Vaccine Plan will build upon these recent successes and address the new realities and opportunities.

HOW CAN PUBLIC HEALTH TAKE THE LEAD IN MOBILIZING COMMUNITY PARTNERSHIPS TO IDENTIFY AND SOLVE HEALTH PROBLEMS?

An essential service of public health is the mobilization of community partnerships and action to identify and solve health problems. These efforts by public health agencies are critical to putting the pieces of the health system together to protect and promote health and prevent disability and death.

Examples of successful collaboration include state tobacco control programs that have been led by public health agencies, but rely heavily on nongovernmental organizations, healthcare professionals and other governmental agencies. These efforts have been able to substantially reduce statewide cigarette smoking rates.

Efforts to organize coordinated programs for lead control have also met with some success. Collaborative efforts between public health and health care have identified and treated children with elevated lead levels. Cooperation with other agencies has provided for the removal of lead paint from homes and testing and control of lead in playgrounds, water, and most recently, toys.

It is possible to view the coordinated mobilization of public and private efforts as **community-oriented public health (COPH)**. We can see this as a parallel to COPC. In COPC, healthcare efforts are expanded to take on additional public health roles. In COPH, public health efforts are expanded to collaborate with healthcare delivery institutions, as well as other community and governmental efforts. Child oral health, an example of COPH, is illustrated in Box 12-6.¹²

BOX 12-5 Community Oriented Primary Care (COPC).

Community-oriented primary care (COPC) is a structured effort to expand the delivery of health services from a focus on the individual to also include an additional focus on the needs of communities. Serving the needs of communities brings healthcare and public health efforts together. COPC can be seen as an effort on the part of healthcare delivery sites, such as community health centers, to reach out to their community and to governmental public health institutions.

Table 12-4 outlines the six steps in the COPC process and presents a question to ask when addressing each of these steps. Notice the parallels between COPC and the evidence-based approach that we have outlined. In both cases, the process is actually circular because evaluation efforts often lead to recycling to move the process ahead.

TABLE 12-4 The Six Sequential Steps of Community-Oriented Primary Care (COPC)

Steps in the COPC process	Questions to ask
1. Community definition	How is the community defined based upon geography, institutional affiliation, or other common characteristics, e.g., use of an Internet site?
2. Community characterization	What are the demographic and health characteristics of the community and what are its health issues?
3. Prioritization	What are the most important health issues facing the community and how should they be prioritized based upon objective data and perceived need?
4. Detailed assessment of the selected health problem	What are the most effective and efficient interventions for addressing the selected health problem based upon an evidence-based assessment?
5. Intervention	What strategies will be used to implement the intervention?
6. Evaluation	How can the success of the intervention be evaluated?

Source: Data from District of Columbia Area Health Education Center. The Conceptual Framework for COPC. Available at: <http://dcahec.gwumc.edu/education/session4/index.html>. Accessed November 8, 2008.

A series of principles underlies COPC including:

- Healthcare needs are defined by examining the community as a whole, not just those who seek care.
- Needed healthcare services are provided to everyone within a defined population or community.
- Preventive, curative, and rehabilitative care are integrated within a coordinated delivery system.
- Members of the community directly participate in all stages of the COPC process.

The concept of COPC, if not the specific structure, has been widely accepted as an approach for connecting the organized delivery of primary health care with public health. It implies that public health issues can and should be addressed when possible at the level of the community with the involvement of healthcare providers and the community members themselves.

Developing community partnerships is a time-consuming and highly political process that requires great leadership and diplomatic skills. Central authority and command and control approaches are generally not effective in the complex organizational structures of the United States. New approaches

and new strategies are needed to bring together the organizations and individuals who can get the job done.

We have now looked at the organization of the public health system and the challenges it faces in accomplishing its core functions and providing its essential services. The role of

BOX 12-6 Child Oral Health and Community Oriented Public Health (COPH).

The problem of childhood dental disease illustrates the potential for community-oriented public health (COPH). A lack of regular dental care remains a major problem for children in developed, as well as developing countries. The need for this type of care is often high on the agenda of parents, teachers, and even the children themselves.

Public health efforts to improve oral health go back to the late 19th- and early 20th centuries when toothbrushing and toothpaste were new and improved technologies. The public health campaigns of the early 20th century were very instrumental in making toothbrushing a routine part of American life. The history of public health interventions in childhood oral health is a story of great hope and partial success. The benefits of the fluoridation of drinking water were well grounded in evidence. The American Dental Association and the American Medical Association have supported this intervention for over half a century. Resistance from those who view it as an intrusion of governmental authority, however, has prevented universal use of fluoridation in the United States. After over a half century of effort, fluoridation has reached less than two-thirds of Americans through the water supply.

Today, new technologies from dental sealants to more cost-effective methods for treating cavities have again made oral health a public health priority. However, the number of dentists has not grown in recent years to keep up with the growing population. In addition, dental care for those without the resources to pay for it is often inadequate and inaccessible. Thus, a new approach is needed to bringing dental care to those in need. Perhaps a new strategy of COPH can make this happen.

Community-oriented public health can reach beyond the institutional and geographical constraints that COPC faces when based in a community health center or other institutions serving a geographically defined population or community. COPH as a governmentally led effort allows a greater range of options for intervention includes those that require changes in laws, incentives and governmental procedures. These might include: authorizing new types of clinicians, providing services in nontraditional settings such as schools, funding innovations to put new technologies into practice, and addressing the regulatory barriers to rapid and cost-effective delivery of services.

public health cannot be viewed only in its current form. Understanding public health also requires considering its future and how we can plan for the expected and the unexpected. Let us take a look at the role of public health in planning for the future in Chapter 13.

Key Words

- Core public health functions
- Assessment
- Assurance
- Policy development
- Ten essential public health services
- Home rule authority
- Healthcare safety net
- Community-oriented primary care (COPC)
- Community-oriented public health (COPH)



Discussion Questions

Take a look at the questions posed in the following scenarios which were presented at the beginning of this chapter. See now whether you can answer them.

1. A young man in your dormitory is diagnosed with tuberculosis. The health department works with the student health service to test everyone in the dorm, as well as in his classes, with a TB skin test. Those who are positive for the first time are advised to take a course of a medicine called INH. You ask: is this standard operating procedure?
2. You go to a public health meeting and learn that many of the speakers are not from public health agencies, but from the Departments of Labor, Commerce, Housing, and Education. You ask: what do these departments have to do with health?
3. You hear that a new childhood vaccine was developed by the NIH, approved by the FDA, endorsed for federal payment by the CDC and recommended for use by the American Academy of Pediatrics. You ask: do all these agencies and organizations always work so well together?
4. A major flood in Asia leads to disease and starvation. Some say it is due to global warming, others to bad luck. Coordinated efforts by global health agencies, assisted by nongovernmental organizations (NGOs) and outside governmental donors, help get the country back on its feet. You ask: what types of cooperation are needed to make all of this happen?
5. A local community health center identifies childhood obesity as a problem in their community. They collect data demonstrating that the problem begins as early as elementary school. They develop a plan that includes clinical interventions at the health center and also at the elementary school. They ask the health department to

help them organize an educational campaign and assist in evaluating the results. Working together, they are able to reduce the obesity rate among elementary school children by one-half. This seems like a new way to practice public health, you conclude. What type of approach is this?

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