GIH

STRENGTHENING THE PUBLIC HEALTH SYSTEM FOR A HEALTHIER FUTURE

GIH

GRANT MAKERS IN HEALTH

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Foreword

On November 6, 2002, Grantmakers In Health (GIH) convened a group of experts from the fields of philanthropy, research, government, and policy to examine the nation's public health infrastructure and explore opportunities for grantmakers to strengthen and sustain this fragile and troubled system. During the course of this meeting, representatives from the Institute of Medicine, which recently released a report on this topic, and the Centers for Disease Control and Prevention (CDC) discussed the role of the national public health system and reviewed weaknesses in its infrastructure.

Elaborating on these points, local public health leaders offered an on-the-ground perspective of the challenges they face as they struggle to maintain and improve the health of the public at the same time as they prepare for the possibility of bioterrorism. Finally, several foundations with experience in this area shared their strategies for helping to buttress the infrastructure so vital to the health of the nation.

This Issue Brief builds on a paper prepared in advance of the meeting by incorporating the highlights from presentations and discussions that took place at GIH's Issue Dialogue. It also incorporates comments and discussion from GIH's 2002 Fall Forum intensive breakout session *Worst Case Public Health Scenario: Can Philanthropy Respond?* Following a brief introduction to the public health system and its evolution over the past several decades, the Issue Brief discusses essential elements of the public health infrastructure, reviews the issues confronting each of these elements, and profiles various philanthropic initiatives aimed at repairing

and improving the public health infrastructure. It concludes with an in-depth look at the infrastructure issues involved in emergency preparedness.

GIH would like to acknowledge everyone who participated in the Issue Dialogue, with special thanks to the presenters:

Stephanie B.C. Bailey, M.D., M.H.S.A., director of health for the Metro Nashville/ Davidson County Health Department; Edward L. Baker, M.D., director of the Public Health Practice Program Office at the CDC; Jo Ivey Boufford, M.D., dean of the Robert F. Wagner Graduate School of Public Service at New York University; Doug Campos-Outcalt, M.D., medical director of preventive medical services for the Maricopa County Department of Public Health; Sue Hassmiller, Ph.D., R.N., F.A.A.N., senior program officer at The Robert Wood Johnson Foundation; Bruce Miyahara, M.H.A., program manager for public health at the Kansas Health Foundation; Rachel Pohl, associate director of the Jessie B. Cox Charitable Trust; Pamela Russo, M.D., M.P.H., senior program officer at The Robert Wood Johnson Foundation; Barbara Sabol, program director at the W.K. Kellogg Foundation; Charles Stokes, M.Ed., president of the CDC Foundation; and Carolyn Williams, program officer at the Kansas Health Foundation.

Lauren LeRoy, Ph.D., president and CEO of GIH moderated the day's presentations and discussion. Kate Treanor, M.S.W., and Rea Pañares, M.H.S., program associates at GIH, planned the program and wrote this report. Lise Rybowski of The Severyn Group, Inc. also contributed to this report.

About GIH

Grantmakers In Health (GIH) is a nonprofit, educational organization dedicated to helping foundations and corporate giving programs improve the nation's health. Its mission is to foster communication and collaboration among grantmakers and others and to help strengthen the grantmaking community's knowledge, skills, and effectiveness. GIH is known today as the professional home for health grantmakers and a resource for grantmakers and others seeking expertise and information on the field of health philanthropy.

GIH generates and disseminates information about health issues and grantmaking strategies that work in health by offering issue-focused forums, workshops, and large annual meetings; publications; continuing education and training; technical assistance; consultation on programmatic and operational issues; and by conducting studies of health philanthropy. Additionally, the organization brokers professional relationships and connects health grantmakers with each other as well as with others whose work has important implications for health. It also develops targeted programs and activities, and provides customized services on request to individual funders. Core programs include:

- **Resource Center on Health Philanthropy.** The Resource Center monitors the activities of health grantmakers and synthesizes lessons learned from their work. At its heart are staff with backgrounds in philanthropy and health whose expertise can help grantmakers get the information they need and an electronic database that assists them in this effort.

- **The Support Center for Health Foundations.** Established in 1997 to respond to the needs of the growing number of foundations formed from conversions of nonprofit hospitals and health plans, the Support Center now provides hands-on training, strategic guidance, and customized programs on foundation operations to organizations at any stage of development.

- **Building Bridges with Policymakers.** GIH helps grantmakers understand the importance of policy to their work and the roles they can play in informing and shaping public policy. It also works to enhance policymakers' understanding of health philanthropy and identifies opportunities for collaboration between philanthropy and government.

GIH is a 501(c)(3) organization, receiving core and program support from more than 200 foundations and corporate giving programs each year.

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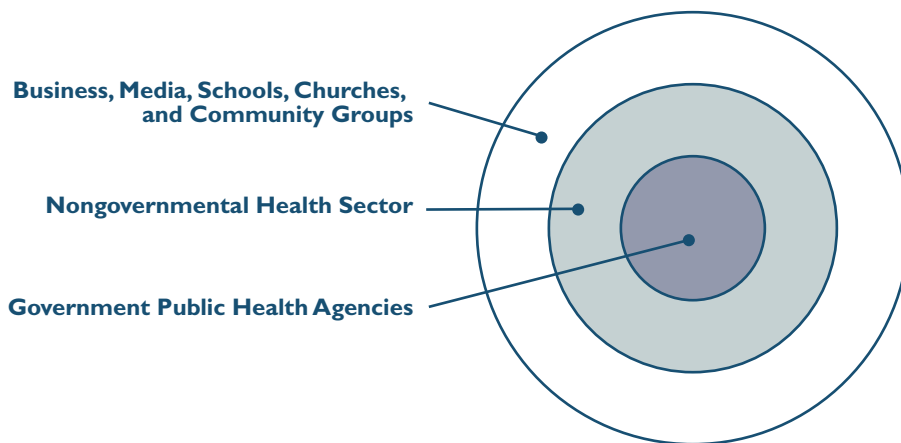
Introduction: The Public Health System

Our public health system is the first line of defense against numerous threats, ranging from infectious diseases and food-borne illnesses to natural disasters and bioterrorism. Baker and Koplan (2002) define the public health system as "the broad range of organizations and partnerships needed to carry out the essential public health services." These organizations include governmental agencies and the nongovernmental health sector, including the health care delivery system, the public health and health sciences academia, and health-focused nonprofit organizations. Other partners that may not have a specific health focus, but certainly influence health, include businesses, media, schools, churches, and community groups (Figure 1). In its 2002 report, *The Future of the Public's Health in the 21st Century*, the Institute of Medicine (IOM) identified the nation's federal, state, and local government public health agencies as the core of the public health system (IOM 2002a).

The IOM identified three core public health functions of government in its preceding, landmark report *The Future of Public Health* — assessment, policy development, and assurance (IOM 1988).

- *Assessment* refers to the activities involved in community diagnosis (such as surveillance, seeking the causes of problems, and collecting and interpreting data), monitoring and forecasting of trends, research, and evaluation. These activities help support public health decisions by public and private organizations, as well as individuals.
- *Policy development* is the process by which public and private policymakers identify problems, select goals, define and assess strategies for achieving those goals, and allocate resources.

Figure 1. *The Public Health System*

Business, Media, Schools, Churches, and Community Groups

Nongovernmental Health Sector

Government Public Health Agencies

Source: Boufford 2002.

• *Assurance* guarantees that needed services are provided. Government can either provide services directly or require the private sector to do so.

In response to the IOM's 1988 report, the Office of the Assistant Secretary for Health at the U.S. Department of Health and Human Services (HHS) formed the Public Health Functions Steering Committee. The committee developed the statement, *Public Health in America,* which expanded the IOM's three core functions into 10 essential public health services that have since become a framework for the work of many governmental agencies.

Challenges to Carrying Out Essential Services

In its efforts to deliver these essential services, the public health system faces many obstacles. A 2002 status report prepared by the Centers for Disease Control and Prevention for the U.S. Senate Appropriations Committee identified several challenges:

• *Complacency:* The public has become complacent about the need to remain cautious regarding public health threats. For example, the disappearance of many once-common infectious diseases may reduce public motivation to follow immunization recommendations for children.

• *Scope and variability of required skills:* The continuum of needed skills among public health professionals is broad. Required skills include the ability to investigate disease outbreaks, assess population health, formulate effective community prevention services, use computer and communication systems, and apply interpretive and analytic tools and methodologies.

ESSENTIAL PUBLIC HEALTH SERVICES

1) Monitor health status to identify community health problems.
2) Diagnose and investigate health problems and health hazards in the community.
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.
6) Enforce laws and regulations that protect health and ensure safety.
7) Link people to needed personal health services, and assure the provision of health care when otherwise unavailable.
8) Assure a competent public health and personal health care workforce.
9) Evaluate effectiveness, accessibility, and quality of person- and population-based health services.
10) Research for new insights and innovative solutions to health problems.

Source: Public Health Functions Steering Committee 1994.

THE EVOLUTION OF PUBLIC HEALTH AND ITS EXPANDING ROLE

Public health has evolved and shifted its focus over time to reflect the changing burdens that plague society. The discipline began as a response to local disease threats such as influenza, scarlet fever, measles, typhoid fever, smallpox, and yellow fever (Fee and Brown 2002). The majority of deaths were attributable to these infectious diseases, as well as poor hygiene, deficient nutrition, and unsafe working conditions (CDC 1999). Early public health practice focused on combatting these disease outbreaks and advocating for sanitary reform to prevent other diseases (Fee and Brown 2002). Successful interventions decreased the incidence of certain infectious diseases and, in most cases, eradicated the threat. Public health then began to expand its role and increase its activities, while still retaining its central role in fighting and preventing infectious diseases.

Today, chronic diseases, such as cancer and heart disease, are the leading causes of death. In response, public health activities have broadened to include health education and promotion at both the community and individual levels. Since many risk factors for chronic disease include individual behaviors, such as smoking and exercise, a greater emphasis is placed on personal health promotion. Additionally, since access to health care services is shown to improve health outcomes, efforts have expanded to include service delivery for vulnerable populations.

To accommodate this shift toward personal health promotion and service delivery, public health has been drawn away from some of its population-based core functions, such as epidemiology and surveillance. Public health agencies have taken on the added responsibility of providing health care services, most often to at-risk populations. Some may argue that this role belongs to the medical care system and puts a further strain on public health agencies, many of which are underfunded and overworked.

- *Relationships with other organizations:* To fulfill its mission effectively, today's public health system must rely on new partnerships with private clinicians, hospitals, community nonprofits, foundations, and many others. Collaboration and communication are critical among these potential partners.
- *Antimicrobial resistance:* Misuse and overuse of antibiotics has led to drug-resistant strains of many infectious diseases, such as tuberculosis, malaria, and gonorrhea.

- *Bioterrorism:* The potential for deliberate introduction of communicable diseases into our population requires vigilance. The best defense is a strong infrastructure, the same one needed to detect and respond to other health threats (CDC 2002d).

FRAMEWORK FOR EFFECTIVE HEALTH ACTION

Jo Ivey Boufford, M.D., co-chair of the IOM committee responsible for the recent report on public health, offered a framework for effective health action at the Issue Dialogue (Figure 2). This framework looks broadly at what it takes to improve the health of the public and views health interventions along a continuum.

Figure 2. *Framework for Effective Health Action*
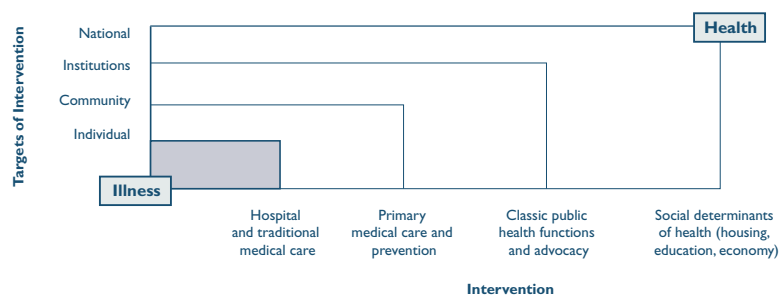
Source: Boufford 2002.

In the U.S. health care system, policy interests and financial investments are focused on the interaction of individuals with hospitals and the traditional medical system, represented in Figure 2 by the shaded box. This includes personal health care delivery services and biomedical research, which comprise 95 percent to 99 percent of health care spending. The remaining 1 percent is distributed among other interventions, many of which address broader public health and societal concerns. Working within the shaded box captures only those who access the medical care system; a broader approach would improve health for a larger segment of the population.

Moving along the continuum, Dr. Boufford explained that primary medical care and prevention efforts are steps toward a broader health agenda. The primary care system, while still a part of the medical system, expands its boundaries by incorporating the community in its approach. The primary care system is often the locus for both personal preventative care and community-based health promotion activities, such as hypertension and diabetes control programs and immunization efforts.

The next intervention on the continuum involves classic public health functions and advocacy efforts. Activities include ensuring safe water, protecting food supplies, promoting seat belt use, and advocating for reduced tobacco use. These interventions may target individuals and communities, but have a great impact at the institutional level. For example, when promoting seatbelt safety, advocates must work with executives in the automobile industry and policymakers to have a broader effect. This has the potential to improve health and prevent illness for a greater number of individuals.

Housing, education, and economic development have important influences on health. Targets of these interventions include a variety of players, from educators to urban planners and housing developers. Although improvements in these social determinants have the potential to improve health on the broadest scale, efforts are still concentrated on medical care.

The Components of a Strong Infrastructure

The term "public health infrastructure" is often thought of in different ways. To better understand the term, Edward Baker, M.D., director of the Public Health Practice Program Office at the CDC and a speaker at the Issue Dialogue, equates infrastructure with preparedness. Basic infrastructure is the foundation for an effective public health response to bioterrorism, emerging infections, and other health threats (Figure 3). In order to build an infrastructure for public health that can meet the challenges of today and prepare for those of the future, federal, state, and local public health agencies and community partners will have to work together to address three critical and interrelated elements of the public health infrastructure:

- *Organizational capacity:* the structure of the system, the physical facilities and laboratories, and the financing mechanisms required to ensure that essential services are provided.
- *Workforce capacity and competency:* the recruitment, training, and capabilities of nearly 500,000 professionals employed by federal, state, and local public health departments.
- *Information and data systems:* modern information and communication systems to monitor disease and enable efficient communication among public and private health organizations and the public, as well as up-to-date guidelines, recommendations, and health alert systems (CDC 2002d).

The following sections of this Issue Brief discuss these elements of basic infrastructure and review current efforts to strengthen each. The role of partnerships in supporting and improving the public health system are then discussed, and several examples are provided of how

Figure 3. *Pyramid of Public Health System Preparedness*

Source: CDC 2002d.
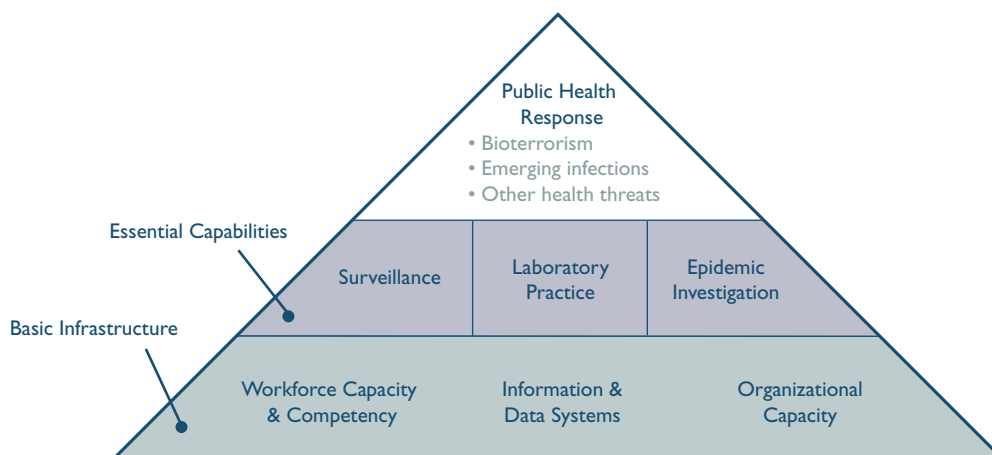
"People should have an expectation of what their local public health agency can do, both in terms of its ability to fill gaps in the health care system, as well as the focus on the population."

PATRICK LIBBEY,
NATIONAL ASSOCIATION
OF COUNTY AND CITY
HEALTH OFFICIALS

IOM: THE PUBLIC'S HEALTH IN THE 21ST CENTURY

Strengthening the Governmental Public Health Infrastructure

The Institute of Medicine has a long-standing interest in the nation's public health system. Its landmark 1988 report, *The Future of Public Health,* presented evidence of the disarray of the public health system and focused on strategies to strengthen the governmental public health infrastructure.

In November 2002, the IOM released its newest report, *The Future of the Public's Health in the 21st Century.* Charged with creating a framework for assuring population health in the future, the IOM took a broad view of health that is consistent with the vision presented in HHS' national *Healthy People 2010* initiative. As a result, this new report focuses on the public health infrastructure and the partners needed in order for the system to reach its full potential: government, community organizations, health care delivery systems, media, businesses and employers, and academics. A number of public health areas in need of further attention and change were investigated, including:

• adopting a focus on population health that includes multiple determinants of health,
• strengthening the public health infrastructure,
• building partnerships,
• developing systems of accountability,
• emphasizing evidence, and
• improving communication.

(Continues on next page)

grantmakers are playing a role in promoting collaborations to address various aspects of the public health infrastructure. The final section addresses emergency preparedness, an issue that has garnered significant attention and illustrates how a strong infrastructure contributes to an effective emergency response system. As evidenced by the events of September 11, 2001 and the subsequent anthrax attacks, a strong public health system is essential for protecting Americans from harm. The recent threats have resulted in a major emphasis on bioterrorism and emergency preparedness efforts at both the national and local levels. Government, health care organizations, civic groups, and many others are now faced with the delicate balance of preparing their communities and the nation for the unimaginable, while maintaining the day-to-day operations that ensure healthy communities. As the CDC's 2002 status report states, however, "If the public health system is fully prepared to carry out the essential services, then communities across the country will be better protected from both routine and acute health events (CDC 2002d)."

(Continued from previous page)

In order to shore up the nation's neglected public health infrastructure, the committee presents recommendations related to the need to repair and renew the components of the governmental public health infrastructure. These recommendations emphasize the value of partnerships in the public health system and the interconnectedness of all the system's components. Among these recommendations are calls to:

- assess the state of the public health system and its capacity to provide essential public health services in all communities;
- ensure and support the competency of public and private sector health workers;
- assess workforce preparedness and provide training;
- develop and support leadership training for the public health workforce;
- consider the potential of workforce credentialing;
- recognize communication as a core competency of public health practice, and implement steps to enhance communication activities and technologies;
- evaluate the status of the public health laboratory system;
- reexamine the use of categorical grants, and renew experiments with consolidation of such grants to increase flexibility in addressing health concerns at the local level and to use limited resources more effectively;
- develop a research agenda, and estimate funding needs for building the evidence base to guide policymaking for public health practice; and
- review the regulatory authorities of HHS agencies to maximize effectiveness and collaboration across federal departments and with other state and local health agencies.

The report also includes recommendations addressing the inclusion of community organizations, businesses, health care providers, and others in activities to shore up the public health infrastructure.

The full report may be viewed on the National Academies of Science Web site at www.nap.edu.

Source: IOM 2002a.

Organizational Capacity

The public health infrastructure is a network of people, systems, and organizations. In order to perform the activities and provide the services necessary to safeguard and maintain the health of a community, public health departments and laboratories must function adequately. Effective functioning requires, among other things, a responsive organizational structure, modern facilities, adequate financing, well-defined partnerships with public and private sector institutions, properly-trained personnel, and up-to-date information systems.

Federal, state, and local health departments and laboratories serve as the underpinnings of the public health infrastructure. As described earlier in this Issue Brief, however, core public health activities cannot be conducted without effective partnerships between the public and private sectors. Regulatory agencies at all levels of government enforce public health statutes, such as immunization of school-aged children, inspection of restaurants and drinking water, and investigation of environmental hazards. Unfortunately, funding cutbacks at the federal, state, and local levels; increasing responsibility as the provider of last resort; lack of support for development and implementation of information and communications systems; and other factors have taken their toll on the organizational capacity of the public health infrastructure.

This section reviews the structure of the nation's public health infrastructure at the federal, state, and local levels; provides an overview of financing issues; and discusses the role of partnerships within local communities.

Role of the Government in Public Health

Government is an essential component of public health systems. According to Turnock and Atchison (2002), government can "guarantee that public health's mission to assure the conditions in which people can be healthy is being addressed and that necessary system components are in place." State and local governments have primary

responsibility for the health of their residents. There are more than 50 state and territorial health departments and approximately 3,000 local public health agencies in the country. The federal government's role, however, is development of health policy. This includes focusing national efforts on specific public health threats and encouraging action. The federal government is also responsible for developing national health data sets and conducting research. Data and research contribute to the knowledge base that shapes public health policy decisions (IOM 1988). Finally, the federal government provides states and localities with the resources needed to strengthen the capacity of organizations and activities working to achieve national health goals (Turnock and Atchison 2002). For purposes of this Issue Brief, discussion will highlight the governmental agencies and programs that focus on building and maintaining the public health infrastructure.

Federal Government Activities

At the federal level, primary responsibility for public health resides within HHS. Each of the department's 12 agencies has public health responsibilities.[1] Governmental public health activities have evolved over time, largely because of changing relationships among the various HHS agencies, but also because public health priorities — or threats to the public's health — have fluctuated (Turnock and Atchison 2002).

Of the 12 HHS agencies, the CDC is the key agency charged with protecting the

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[1] HHS' 12 agencies include: Administration for Children and Families, Administration on Aging, Center for Medicare and Medicaid Services, Agency for Healthcare Research and Quality, Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, Food and Drug Administration, Health Resources and Services Administration, Indian Health Services, Substance Abuse and Mental Health Services Administration, and the Program Support Center. The Office of the Assistant Secretary for Health, also within HHS, includes the Office of Public Health and Science and the U.S. Public Health Service Commissioned Corp.

health and safety of Americans. It comprises 12 centers and offices.[2] CDC programs are the primary source of capacity building resources for state and local health departments. The agency's work emphasizes improved laboratory capacity, enhanced epidemiological expertise for the identification and control of diseases, better electronic communication and distance learning, and an expanded focus on cooperative training between public health agencies and hospitals. For example, the CDC funds the Laboratory Response Network, a system of more than 80 public health laboratories that identify pathogens that could be used for bioterrorism. Additionally, using tools such as the National Health Interview Survey and the National Vital Statistics System, the CDC's National Center for Health Statistics gathers information needed to monitor health and provide the basis for biomedical research, health policy, and public health practice.

As discussed later in this Issue Brief, training for public health professionals and performance measurement at the national, state, and local levels are also priority areas of the CDC. This work is conducted through the agency's Public Health Practice Program Office. It also supports the *Racial and Ethnic Approaches to Community Health* demonstration projects, which work to eliminate racial disparities in health (CDC 2002d).

Ensuring the delivery of quality health services is largely the responsibility of the

Health Resources and Services Administration (HRSA) and the Substance Abuse and Mental Health Services Administration (SAMHSA). HRSA works to improve and expand access to quality health care services, while SAMHSA works to improve the quality and availability of services for substance abuse and mental health. Working in a public health capacity, both agencies, for example, responded to the terrorist attacks on September 11, 2001. HRSA awarded emergency grants to community health centers in New York and northern New Jersey for services provided after September 11th. Following the terrorist attacks, these facilities experienced increased demand for services, especially for grief counseling and other mental health services (HHS 2001a). HRSA also made competitive grants available for public and private health care organizations that suffered losses because of September 11th. Eligible organizations in Connecticut, New Jersey, New York, Pennsylvania, Virginia, and the District of Columbia received grants to assist with health care expenses or lost revenues incurred because of their immediate response to this public emergency (HHS 2002c).

SAMHSA also awarded grants to address the mental health consequences of September 11th, including $10 million to improve treatment and services for children and adolescents exposed to traumatic events. SAMHSA's grantees established a network of centers to identify or develop treatments and services, collect clinical

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[2] The CDC's centers and offices include: National Center on Birth Defects and Developmental Disabilities; National Center for Chronic Disease Prevention and Health; National Center for Environmental Health; National Center for Health Statistics; National Center for HIV, STDs, and TB Prevention; National Center for Infectious Disease; National Center for Injury Prevention and Control; National Immunization Program; National Institute for Occupational Safety and Health; Epidemiology Program Office; Public Health Practice Program Office; and Office of the Director.

data, develop resources on trauma for professionals, and develop trauma-focused public education (HHS 2001b). In addition, grants totaling $6.8 million were given to eight states and the District of Columbia to support crisis mental health services and supplement existing mental health and substance abuse systems. Nine of the 23 grants awarded support state mental health needs assessments, and 14 supplement current hotline crisis counseling capacities and enhance substance abuse prevention activities (HHS 2001a).

State and Local Support for Infrastructure

States have the primary responsibility for the health and well-being of their citizens. Public health capacities vary between states, but each has a designated lead agency that conducts assessments, develops policies, and assures access to services. Like the federal government, states can either provide services directly or require private providers to do so (Hajat, Brown, and Fraser 2001). A study of the public health infrastructure by the National Association of County and City Health Officials (NACCHO), funded by The Robert Wood Johnson Foundation, found that most states have a decentralized public health system, meaning that each county or jurisdiction maintains its own public health department. Only one-quarter of states have centralized systems in which the state health department is the functional health unit at the local level (Frazer 1998).

State and local public health systems also may be structured in several ways, usually based on the size of the population they serve. More than 60 percent of the nation's 3,000 local departments serve individual counties, whereas municipal departments tend to serve cities with more than 100,000 residents. Municipal public health departments also tend to have larger staff with diverse responsibilities, compared to county departments, which may only have a single public health nurse or environmental health worker (Hajat, Brown, and Fraser 2001).

Local departments have several responsibilities for public health, including:

- serving as public health leadership at the local level;
- ensuring access to personal health services, such as immunizations and prenatal care;
- providing a mechanism for implementation and integration of an array of services;
- performing these functions based on professional and community-specific knowledge and consistent with community values and individual rights; and
- conveying information on local needs, priorities, and program effects to the state and national levels (Hajat, Brown, and Fraser 2001).

Financing the Public Health Infrastructure

Historical investments in public health services and infrastructure have paid off. In the last century, deaths due to infectious diseases have declined rapidly; polio, smallpox, and many childhood diseases rarely occur in the U.S. today due to scientific advances in immunization and widespread vaccination programs. Current leading causes of death are chronic conditions such as cancer and heart disease.

Financing of public health programs also corresponds to the nation's health priorities. Over time, funding for public health activities has moved from sanitation and quarantine as methods to control the spread of disease to individual health services and categorical public health programs.

Spending for public health, however, is a small fraction of total health spending in the U.S. As a result of the ambiguity created by the lack of a commonly-shared definition of what programs and services are encompassed by public health, it is difficult to gauge public health spending. According to Frist (2002), total federal health spending in the U.S. rose from $26.7 billion in 1960 to $1.3 trillion in 2000. Of this amount, he estimates that public health expenditures were $192 million in 1960 and $17 billion in 2000 (0.72 percent of total health spending in 1960 and 1.32 percent in 2000), an increase of less than one percentage point over this 40-year period.

Funding for public health decreased throughout the 1990s, and this has had a direct impact on the quality, provision, and organization of public health services. In 1993, an estimated $8.4 billion went to public health, 2.7 percent lower than 1990 spending (Center for Studying Health System Change 1996). The majority of this money is categorical, meaning that it is designated for specific services or programs, making it difficult for state and local public health departments to respond to unexpected events, such as outbreaks of food-borne illness or West Nile virus.

Support for Bioterrorism Preparedness
While federal spending on public health activities has declined in recent years, the events of September 11th resulted in a huge influx of funds into the public health system. The majority of this funding is designed to improve the response to future acts of terrorism.

As discussed later in this report, funds have gone to states and localities, either directly or through grants from the CDC, HRSA, SAMHSA, and other federal agencies. Additional federal support has been given to the CDC and other public and private institutions for biomedical research, the purchasing of vaccines, capacity building, and other activities in response to the terrorist attacks. Several participants at the GIH Issue Dialogue noted, however, that as a result of soft state budgets, local public health systems might lose as much funding from states as they gain from the federal government. It is also not clear whether a couple of years of funding can create sustainable change. Some states are already expressing concern about what happens to public health services when the current stream of funding ends.

Others are concerned that while investments in emergency preparedness are critical to the safety of Americans, this type of targeted spending may compromise public health work (Akhter 2002). For example, some local health departments are reporting that they will have to cut back on some public health services — such as screenings for TB, heart disease, and cancer; children's dental services; and prenatal care — to meet the requirements of the federal government's smallpox vaccination program (Altman and O'Connor 2003).

"The investments that we have in infrastructure have a dual utility. They serve not only to help us in the event of a terrorist incident, but also to help us do the business of prevention in communities everyday."

EDWARD BAKER,
CDC

That said, several participants at the GIH Issue Dialogue noted that current funding aimed at preparing for crises (such as terrorism or West Nile virus) has a dual utility in that it can be used to both build and prepare the infrastructure required to sustain the public health system's day-to-day responsibilities.

Federal Spending for Fiscal Year 2003

Many public health-related activities are included in the President's fiscal year (FY) 2003 budget. Of the $488.8 billion proposed for HHS, only $5.8 billion is designated for the CDC, a decrease of 15 percent from FY 2002 (HHS 2002e). Most of the CDC's funding, however, is extramural, with an estimated 75 percent to be passed on to state and local health departments.

In keeping with the nation's health priorities, disease prevention and health promotion will receive the largest share of CDC funding. In fact, $4.1 billion or three-quarters of the CDC budget is earmarked for such activities. Of this amount, $345 million (a $10 million decrease from FY 2002) will go toward activities such as reduction of emerging infections and food-borne diseases and enhanced laboratory support for HIV/AIDS, tuberculosis, and immunization programs (HHS 2002e).

As previously discussed, bioterrorism is also a priority. Federal funding for biomedical research, vaccine development and stockpiles, and emergency preparedness efforts has increased. Approximately $1.63 billion of the CDC's budget is dedicated to bioterrorism activities. Of this, $940 million, the

PUBLIC HEALTH FACILITIES
Ailing Infrastructure, Inadequate Financing

Commenting on the realities of today's public health system at the Issue Dialogue, Doug Campos-Outcalt, M.D., medical director of preventive medicine at the Maricopa County (Arizona) Department of Public Health, emphasized technology as a critical component for the public health workforce to perform effectively. The capacity of Arizona's public health facilities were also described as poor; specifically, many areas of the state have no public hospital system, which could make it impossible for those areas to handle a sudden surge in demand.

The federal governmental infrastructure is also weak. For example, a lack of state-of-the-art equipment at some CDC facilities has contributed to the agency's struggle to recruit and retain top scientists. It is estimated that the CDC needs $1.5 billion to improve its physical infrastructure. To address this problem, the CDC Foundation convened meetings with community leaders in Atlanta to educate them about the CDC and its work. As a result, several major business leaders lobbied Congress for increased funding for laboratories and succeeded in moving the agency closer to its target.

Figure 4. *Flow of Public Health Resources for a Family in Need of Services*
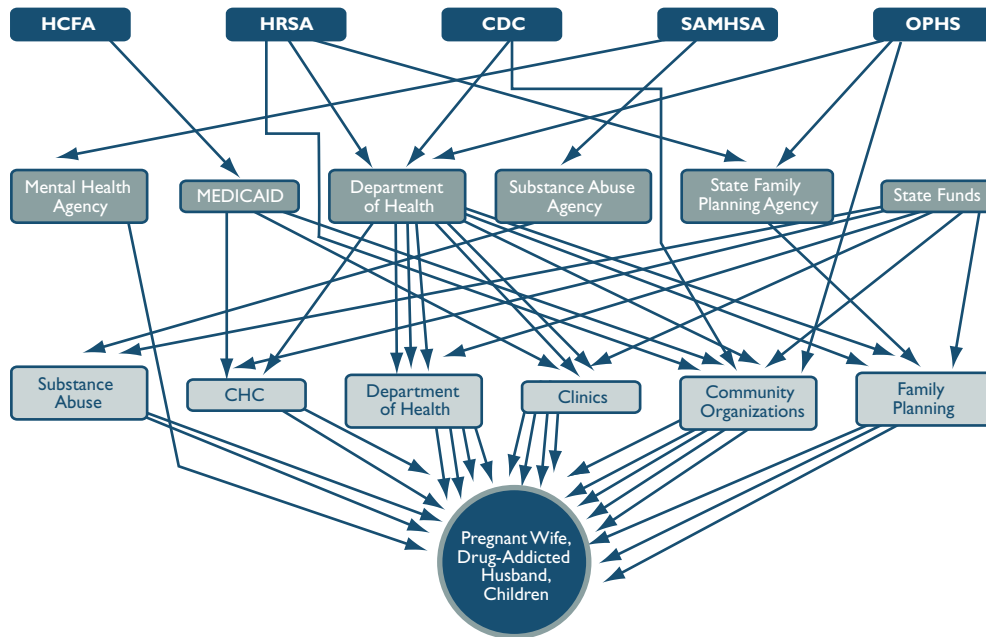
Source: Bailey 2002.

same as FY 2002, will pass through to state and local health departments for programs that will help build the overall public health infrastructure (HHS 2002e).

State and Local Public Health Funding
Turnock and Atchison (2002) estimate that in 1995, state and local governments financed two-thirds of all funding for essential public health services. States and communities also receive support from other sources, including foundations. A strong public health system requires sustained funding that can be leveraged to improve infrastructure, as well as to build leadership, maintain accountability, and protect against unanticipated public health threats (CDC 2002d).

Local agencies are juggling a complex array of funds to meet the needs of their communities. Stephanie Bailey, M.D.,

M.H.S.A., director of health for the Metro Nashville/Davidson County Health Department, illustrated this problem by depicting the flow of resources from a variety of sources to one family with a given set of health issues (Figure 4). This compilation of funding streams — each with its own administrative criteria and reporting requirements — creates a difficult situation for local departments. Little is known, however, about the extent of financial need in local public health systems or which kinds of financing mechanisms could be most helpful. These issues point to the need for research to fill the gaps in knowledge about how to coordinate the financing of public health and how to strike a balance between categorical funding and general funding.

Workforce Capacity and Competency

Who is considered a part of the public health workforce? Does it include the health educator who works for a private health plan or the policy analyst in charge of researching tobacco control programs? Most agree that federal, state, and local government officials working in public health or health and human services agencies are part of the public health workforce, but what about those in private, for-profit and nonprofit organizations that promote public health efforts? A recent IOM report, *Who Will Keep the Public Healthy? Educating Public Health Professionals for the 21st Century* (IOM 2002b) broadly defines a public health professional as "a person educated in public health or a related discipline who is employed to improve health through a population focus." Related disciplines may include: medicine, nursing, dentistry, social work, allied health, pharmacy, law, public administration, veterinary medicine, engineering, environmental sciences, biology, microbiology, and journalism. Having a diversity of training, from medicine to social work to public administration, is a valuable asset to the field of public health.

All workers whose primary function is to improve health can be considered a part of the public health workforce. Professionals may reside in a variety of settings, such as community-based organizations, private nonprofit associations, and educational institutions (Figure 5). Therefore, countless individuals share the responsibility for ensuring a healthy society. It is essential to recognize, however, that within this broad definition, there exists an indispensable core: workers in official public health agencies, whether they are federal, state, or local employees. They are often at the front lines, responsible for tracking disease trends; implementing community-wide immunization campaigns; and responding to emerging threats and outbreaks. Much

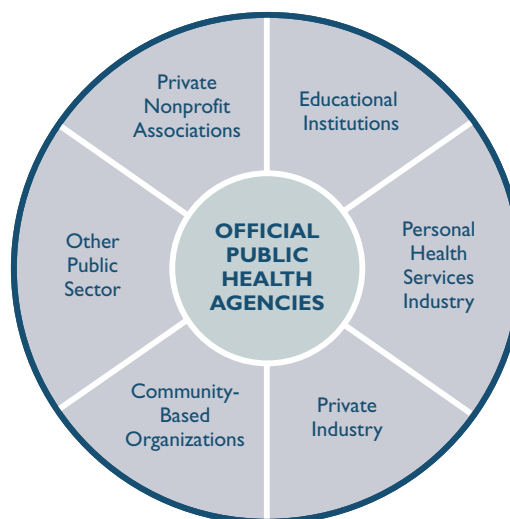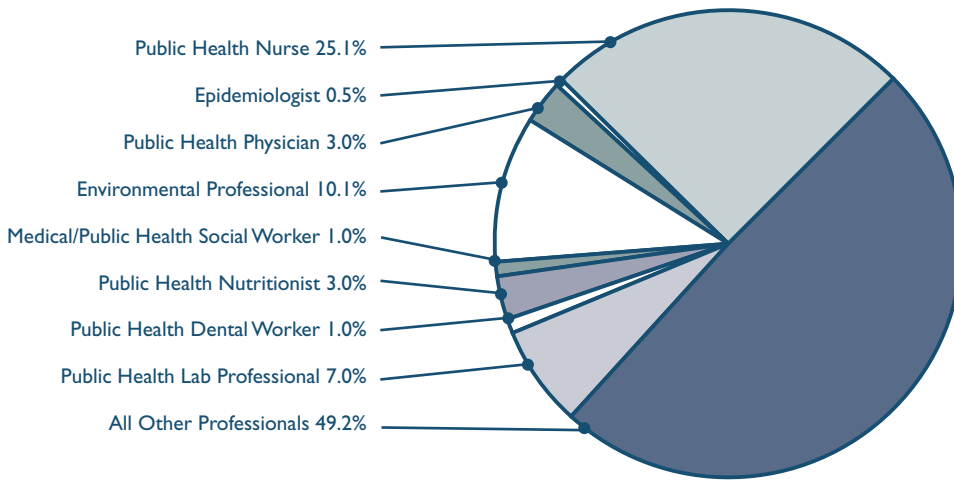**Figure 5.** *The Professional Public Health Workforce by Setting*

Source: CDC 2002d.

Figure 6. *The Professional Public Health Workforce by Occupational Title*

Public Health Nurse 25.1%
Epidemiologist 0.5%
Public Health Physician 3.0%
Environmental Professional 10.1%
Medical/Public Health Social Worker 1.0%
Public Health Nutritionist 3.0%
Public Health Dental Worker 1.0%
Public Health Lab Professional 7.0%
All Other Professionals 49.2%

Source: Gebbie 2001.

of the discussion in this Issue Brief for improving the public health workforce applies to this central core.

The first step in strengthening the public health workforce is to understand its current size and composition. Unfortunately, almost half of the nation's 500,000 employed public health workers are not even classified (Figure 6). This makes it extremely difficult to determine shortage areas and identify and plan adequate recruitment and training policies.

Dr. Baker pointed to assessments of the public health workforce at the state level as one of several areas in which foundations could make a useful contribution. Building on a formal count and classification of personnel, assessments could identify gaps in the workforce relative to public health needs, as well as any competency issues that need to be addressed. He noted that the assessment function is an especially fruitful role for grantmakers because

private organizations are in a position to comment on the state of the workforce in ways not available to government agencies.

The next step is to ensure that core public health workers are adequately educated, trained, and certified to perform their essential job functions. The IOM recommends that schools of public health embrace as their primary educational mission the preparation of individuals for positions of senior responsibility in public health practice, research, and training, although it recognizes that some schools will continue to educate the broader public health workforce (IOM 2002b). Unlike other health professional fields, there is little uniformity and standardization in public health training, both prior to entry into the field and throughout one's career. Admission into the public health profession may be accomplished through several different routes, from formal training in an accredited school of public health to a high school diploma with a willingness and aptitude for learning. Moreover, public health

does not have continuing education nor certification opportunities. Dr. Baker and other speakers at the Issue Dialogue called for the development of competency-based training and education, as well as competency certification. The IOM recommends voluntary certification for masters-trained individuals in order to ensure a qualified and capable cadre of public health practitioners (IOM 2002b). Continuing education and professional development of the public health professional is essential, particularly in light of emerging threats and health issues. Several participants stressed the importance of programs aimed at leadership development and management training for public health workers.

Lastly, in order to retain highly-skilled and competent workers, salaries and incentives for the public health workforce must not be taken lightly. Even workers who gain psychic income from contributing to a valuable mission are concerned with salary and other tangible benefits, such as portable retirement plans. This is difficult in an environment where public health departments are facing budget cuts and fragmented funding streams are oriented toward categorical programs rather than basic infrastructure needs, such as the workforce. Departments are often unable to recruit and retain public health professionals because of competition from the private sector. According to one state public health official, once recent graduates receive necessary job training and experience from the state, they leave for jobs in industries that pay roughly double their public salary.

Government Activities to Support Workforce Capacity

The federal government has traditionally supported a variety of programs to enhance public health workforce capacity. HRSA, for example, has several grant programs devoted to public health professional development and training, including:

- training centers to assess workforce learning needs and provide distance learning and other educational programs;
- special projects to promote community-academic partnerships that improve the skills and competencies of public health professionals and provide distance learning, curriculum revision, and course content in areas of emerging importance;
- traineeships for eligible individuals in public health disciplines experiencing critical shortages;
- preventive medicine residencies to develop new and support existing residency training programs;
- health administration traineeships and special projects to increase the number of underrepresented minority health administrators, as well as the number of health administrators in underserved areas; and
- academic and field practice linkages.

Over the last decade, the CDC has also provided valuable opportunities for state and local public health leaders and professionals. The following chart illustrates some of the CDC's main programs geared towards strengthening the public health workforce (CDC 2002e).

Efforts in Public Health Workforce Development

Sponsored by the CDC and its partners

Year	Name	Main Activities/Accomplishments
1989	National Laboratory Training Network (NLTN)	• Co-sponsored by American Public Health Laboratories • Established six regional offices to identify training needs, deliver courses, and evaluate training • Provided clinical, environmental, and public health laboratory training courses
1991	Public Health Leadership Institute (PHLI)	• Mission is to increase access to leadership programs • Two-year training program geared for senior- to mid-level managers • Resulted in formation of National Public Health Leadership Development Network in 1994
1993	Public Health Training Network (PHTN)	• Created to meet the training needs of public health workers on a variety of topics • Delivered by various media • PHTN's Web site allows users to search a calendar of events, link to resources, and register for continuing education credits • To date, has delivered nearly 1 million training opportunities
1994	National Public Health Leadership Development Network (PHLDN)	• Network formed from the PHLI • Coordinated with Associated Schools of Public Health and required collaboration between schools of public health and state health departments • Outlined seven model elements for developing a leadership program

(Continues on next page)

States are actively developing ways to strengthen their public health workforce. For example, New Jersey established credentials and competency-based training requirements for public health workers. A New Jersey statute requires local health officers to have a masters degree and successfully complete a written examination for licensure. To maintain licensure, health officers must complete 15 hours of approved continuing education courses annually, 8 hours of which must be in leadership training. A public health professional continuing education committee that includes members of various professional health organizations in New Jersey serves as an advisory body and recommends curricula (HRSA 2001).

Efforts in Public Health Workforce Development

(Continued from previous page)

Year	Name	Main Activities/Accomplishments
1999	Management Academy for Public Health (MAPH)	• Partnership among CDC, HRSA, The Robert Wood Johnson Foundation, and the W.K. Kellogg Foundation • Established regional training programs for local and state public health managers and leaders • Collaboration between UNC schools of business and public health • Since 1990, 600 participants from four states (NC, SC, GA, and VA) • Future plans include a nationwide expansion and an on-line public health management certificate program
2000	Strategic Plan for Public Health Workforce Development	• Developed in collaboration with the Agency for Toxic Substances and Disease Registry • Recommended improving front-line public health workers by 1) monitoring workforce composition, 2) identifying competencies and developing a curriculum, 3) designing an integrated learning system, 4) using incentives to assure competency, 5) conducting evaluation and research, and 6) assuring financial support
2001	Council on Linkages Competency Project	• Developed a consensus set of core competencies applicable to front-line public health workers and senior and supervisory management staff • Included eight skill sets: analytic/assessment, basic public health science, cultural competency, communication, community dimensions, financial planning/management, leadership/systems thinking, and policy development/program planning

Source: CDC 2002e.

Local health departments are also concerned with workforce development. In 1999, the Allegheny County Health Department in Pennsylvania joined the University of Pittsburgh Center for Public Health Practice to create a partnership for faculty and workforce development. Health department staff presented public health case studies to university faculty and students. The first of these concerned a water-borne infectious disease outbreak in a private swim club. During these discussions, the health department staff learned more about new technologies in disease surveillance and intervention, while university faculty and students learned about the interplay of various disciplines in solving a health problem (HRSA 2001).

Foundations Funding the Public Health Workforce

Foundations help build public health workforce capacity by providing grants to schools of public health, funding education and training opportunities at the state and local level, supporting research, and sponsoring national conferences. Additionally, Dr. Baker noted that other opportunities for philanthropic organizations to collaborate with public health include funding workforce forecasts; supporting leadership and management development programs; and arranging focused institutes for public health leaders on topics such as data use, public health law and policy, and forensic epidemiology.

Several foundations have supported state and local efforts to enhance public health education and training in their areas. Since 1998, public health has been a funding priority for the Kansas Health Foundation; it secured a joint master of public health program at the University of Kansas Medical School, University of Kansas Medical Center, and Wichita State University with a $2.7 million foundation grant. In addition, the foundation has provided continuing education scholarships for personnel at most of the state's 95 health departments; worked to increase the number of epidemiologists at the state health department to ensure that accurate health data are collected and analyzed; and supported a fellowship at the Kansas Hospital Association to increase understanding of the public health system in the medical system.

The Rose Community Foundation in Denver provides funding to support the Leadership Training Program, which fosters leadership among middle- and senior-level health professionals in the health and environmental fields. Participants come from both the private and public sectors, but all share the commitment of improving health outcomes in their communities. The program lasts for one year. During this time, participants attend quarterly meetings that address substantive health issues and develop leadership skills. In addition to these events, participants complete interactive assignments, participate in on-line discussions, complete self-assessments, and conduct public health projects. At the end of the program, public health professionals are better equipped to provide strategic vision and identify collaborative leadership opportunities.

Foundations also support national training programs to support workforce development across the nation. Following its mission to improve health and well-being by enhancing the impact of the CDC, the CDC Foundation has developed partnerships to improve public health education and training throughout the country. The foundation administers $4 million in grants from The Robert Wood Johnson Foundation, the W.K. Kellogg Foundation, HRSA, and CDC for the Management Academy for Public Health. Based on the premise that management is an important public health tool, the academy trains public health officials to guide their local health departments and face challenges within their communities. The academy is a comprehensive nine-month course held at the University of North Carolina at Chapel Hill, as well as via satellite and the Internet. Participants learn about finance, accounting, human resources, and other management topics

IOM RELEASES RECOMMENDATIONS ON WORKFORCE TRAINING AND DEVELOPMENT

In November 2002, the IOM released *Who Will Keep the Public Healthy? Educating Public Health Professionals for the 21st Century*. This report examines the education of public health professionals and provides a framework and recommendations for strengthening public health education, research, and practice. Specifically, the IOM report discusses the importance of an ecological model of health that emphasizes the linkages and relationships among the multiple determinants of health, including biology, behavior, and the environment. This model also stresses the important role played by societal factors; social engagement and networks, for example, can slow the rate of cognitive decline in aging people and improve overall quality of life. By adopting an ecological perspective on public health, the report encourages strategies that identify and address myriad factors that can improve and undermine health.

In light of this view of public health, the report recommends that graduate-level public health education programs include not only the long-recognized core components of public health (epidemiology, biostatistics, environmental health, health services administration, and social and behavioral science), but encompass eight critical new areas: informatics, genomics, communication, cultural competence, community-based participatory research, global health, policy and law, and public health ethics. More specifically, the report urges schools of public health to emphasize the importance of the ecological approach, expand supervised practice opportunities and sites, and establish new relationships with other schools and organizations to foster transdisciplinary research, among other things. It also calls on medical schools to provide students with basic public health training in population-based prevention approaches to health and to train them in the ecological approach to public health at the master's level. Nursing schools, as well, should provide students with an understanding of this model, as well as opportunities for clinical experience in public health environments. Finally, the report suggests ways in which public health agencies could contribute to assessing and meeting workforce development needs, such as by exchanging faculty and staff and otherwise collaborating with public health programs and schools, and supporting other interactions between schools and public health programs.

Source: IOM 2002b.

essential for making health departments run more efficiently. Upon completion of the academy, teams of public health professionals use their skills to develop a plan to address a specific public health problem, such as teen pregnancy or youth violence, in their community. The Robert Wood Johnson Foundation sponsors the State Health Leadership Initiative, which brings together new state health officers so that they can create networks, find mentors among seasoned officers, and take advantage of Web-based resources.

In the research area, The Robert Wood Johnson Foundation funded the IOM's study on public health workforce issues, which was released in November 2002 in tandem with the IOM's report on *The Future of the Public Health in the 21st Century.*

To bridge the gap between the public and private dental sectors, the Washington Dental Service Foundation provides local funding to the Access for Babies and Children to Dentistry (ABCD) program. The overall goal of the program is to prevent and control major dental problems and provide restorative treatments in young children through early intervention. Since one barrier to obtaining dental care is often caregiver attitude, a component of the program trains private practice dentists to work specifically with low-income children. Dentists receiving the training then become eligible for enhanced state Medicaid payments. As a result, some ABCD counties have seen an increase in enrollment for Medicaid dental benefits.

Information and Data Systems

The delivery of effective public health services depends on timely and reliable information and data. A local health department cannot protect its citizens from a disease outbreak or detect emerging health threats without the right information. Public health officials cannot initiate effective disease management programs without knowing disease incidence and prevalence in their community. Information and data are the tools for planning and conducting appropriate public health interventions.

Role of Information in Surveillance Function

One function critical to public health research and practice is surveillance, which is defined as "the ongoing, systematic collection, analysis, and interpretation of health-related data." Surveillance systems provide data on such things as illness, disability, and death from acute and chronic conditions; injuries; personal, environmental, and occupational risk factors; preventive and treatment services; and program costs (CDC 2002f). Data from these systems can be useful in prevention efforts by functioning as early warning signals for new and emerging conditions (such as in the recent outbreaks of West Nile virus). Data also facilitate planning; for example, public health agencies use data on disease prevalence in a community to develop programs. When data are not available or are missing, health problems may not be identified in high-risk populations or public interventions may not be timely.

Surveillance involves active cooperation among federal, tribal, state, and local health care agencies, private organizations, and the general public. Although federal agencies take the lead in collecting national public health data, these agencies are only a fraction of the many necessary partners that collect, analyze, and translate these data. For example, the Vital Statistics Cooperative Program obtains information on births, deaths, marriages, and divorces from all 50 States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. Programs in each area collect vital information from local communities, including from funeral directors, medical examiners, coroners, hospitals, religious

authorities, and justices of the peace. Other data collection systems, based on surveys, depend upon the participation of private citizens nationwide. Still other systems rely on the administrative records and surveys of public and private health care organizations (CDC 2002f).

Inadequate Access to Technology

Despite advances in technology, many health departments still lack access to basic information system capabilities. State and local public health department staff need access to the Internet and other electronic information systems to perform their job functions. In 1999, the CDC and NACCHO tested local health departments via e-mail to see how quickly information could be delivered in the event of an emergency. Only 35 percent of the test e-mails were delivered successfully. In that same year, a NACCHO survey found that only 45 percent of local health departments had the capacity to send broadcast fax alerts (i.e., multiple faxes sent simultaneously to laboratories, physicians, state health departments, the CDC, and others). Furthermore, fewer than half had continuous, high-speed access to the Internet, and 20 percent lacked e-mail capabilities (CDC 2002d).

Having a staff that is trained to use these systems is also essential. The IOM identifies public health informatics — the systematic application of information and computer science and technology to public health practice, research, and learning — as an emerging content area that should be incorporated in public health training programs (IOM 2002b). In order for information systems to be effective,

individuals must know how to use them. As Dr. Campos-Outcalt pointed out at the Issue Dialogue, even when software programs can be downloaded for free from the CDC or other sources, staff must be trained on how to use them. This can end up costing a lot in terms of staff time and training. Furthermore, once data are accessed and retrieved, public health workers must be able to analyze this information and use it to develop appropriate policies.

Deficiencies in information technology — from being unable to access information to not having the staff capability to retrieve and analyze the data — make it difficult to conduct internal business and collaborate with other health departments, private clinicians, and patients. These shortfalls in basic information infrastructure are troubling on a day-to-day basis, but can be deadly in emergency situations where the public health system may be called upon to respond to terrorist attempts, natural disasters, or disease outbreaks.

Government Activities to Improve Technology

The CDC has partnered with local and state health agencies, as well as national public health organizations, to develop the Health Alert Network (HAN), a nationwide, integrated information and communications system capable of distributing health alerts, prevention guidelines, and other information. Main activities of this system include:

• connecting local health agencies to the Internet by funding initial purchase and installation of computer and communications technology, including equipment for satellite- and Internet-based training;

- developing and administering training in the use of information technology to prepare public health workers to respond to bioterrorist threats;
- developing electronic tools to support bioterrorism preparedness and response, disease threat surveillance, and rapid dissemination of health warnings;
- deploying authoritative preparedness, diagnosis, and treatment guidelines; and
- developing science-based, local health department performance standards related to domestic terrorism and other health services (CDC 2002a).

Another program sponsored by the CDC, the National Electronic Disease Surveillance System, was launched in 2000 to provide national standards, specifications, and working prototypes so that information collected by local health departments can be used to detect and manage outbreaks that affect more than one jurisdiction. Funding and support are provided to 46 states and three large metropolitan areas. This system is critical because events such as food-borne illnesses, West Nile virus outbreaks, and bioterrorist attacks could involve widely-dispersed geographic areas (CDC 2002b).

Partners in Information Access for Public Health Professionals is a collaborative project between 10 public and private health organizations, including the National Library of Medicine (NLM), CDC, HRSA, the Public Health Foundation, and many others. Initiated in 1998, its purpose is to provide public health professionals with timely, convenient access to information resources to aid them in improving the health of the American public. Funding responsibility is shared between NLM, CDC, and HRSA (NLM 2002). Specific project activities include:

- developing tools and other resources for public health professionals in grant writing, needs assessment, and training;
- sponsoring meetings, workshops, and satellite broadcasts geared toward improving content of and access to information needed by public health professionals and the information professionals who work with them;
- developing distance-learning materials and fostering partnerships for distance-learning initiatives;
- providing ongoing information on funding opportunities and training available to public health professionals; and
- directly funding projects to train and provide outreach to public health professionals.

Grantmakers Fund Technology

Foundations have provided the resources necessary for public health departments to purchase, update, and utilize information and communication technology. They are also funding initiatives to support private organizations to collect information relevant to their communities.

The Kansas Health Foundation has supported the development and installation of the Kansas Integrated Public Health System (KIPHS). This comprehensive health information system is designed to enhance the quality, effectiveness, and efficiency of public health practice. It assists state and local health departments in obtaining accurate data on health issues and integrating data from multiple sources.

For example, the system is connected to the CDC's national surveillance system. In October 1998, the Kansas Health Foundation awarded a $1.8 million grant to implement the KIPHS software throughout the state, and it has since been installed in several county health departments. A central data clearinghouse has been established, as well as an office within the Kansas Department of Health and the Environment. The Kansas Health Institute administers the grant, and the CDC provides additional support.

Other foundations have funded surveillance efforts to track the effectiveness of public health interventions. In 2000, The California Wellness Foundation awarded $310,000 to the California Health Department's Epidemiology and Prevention for Injury Control Branch to continue data collection efforts on the relationship between firearms and violent injury and to expand its surveillance to encompass data on all violent injuries in California. This helped to establish and sustain the Firearms Injury Surveillance Project (FISP), which documents deaths; serious, nonfatal injuries; and risk factors associated with firearms. FISP provides valuable information to legislators and advocacy groups, who use the data to promote policies aimed primarily at firearms-related injury prevention. FISP will also focus on putting its data to work, relying mainly on the Internet to make its findings readily available to policymakers, law enforcement, health professionals, community advocates, and the general public.

One result of this undertaking is an economic analysis of firearm injuries that calculates how much they cost the state in terms of lost lives, hospitalization, other medical costs, lost productivity, and police services. In the same year, the Independence Foundation made a grant to the Community College of Philadelphia to develop a software application that described the client population of local health centers and documented the array of public health services and programs provided by these centers.

Private organizations and public agencies are concerned with monitoring the status of vulnerable populations, particularly minorities who often experience worse health outcomes. The Jessie B. Cox Charitable Trust funded the New England Coalition for Health Equity, a coalition of six minority health organizations that focuses on critiquing public health data and its capacity to provide the information necessary for meeting the needs of different populations in the region. The coalition also serves as a mechanism for integrating and creating linkages between health and environmental data in order to better understand environmental influences on health and health outcomes.

Similarly, the Columbus Medical Association Foundation provided a $25,000 grant to the Columbus Health Department to conduct an analysis of health risk data at the ZIP code level. The study's purpose was to improve the reliability of statistical analyses of hard-to-reach populations and allow for a countywide trend analysis on risky health and behavior problems.

Grantmakers have also supported technology designed to track health-related information for children. For example, The Healthcare Foundation of New Jersey provided the New Jersey Department of

Health with $92,200 for a computerized immunization tracking system to ensure that children in the south ward of Newark, New Jersey receive full and timely immunizations. Baptist Community Ministries awarded $400,000 to Children's Hospital New Orleans to support an innovative computerized immunization registry that allows hospitals, doctors, and parents to know the type and number of immunizations administered to each child and when the next immunizations are due. Since 1998, nurses at participating hospitals have recorded more than 10,000 newborns and children in the registry. An additional 2,500 have been entered from a mobile immunization unit providing free immunizations at routinely-scheduled locations. The network is a broad-based initiative with many participating hospitals in the area.

The Quantum Foundation in West Palm Beach, Florida, provided an initial $350,000 grant in 1999 to establish a school health information system including both hardware and software that will help school nurses track student health records. The grantee, Palm Beach County Health Care District, then contributed $400,000 toward implementation and maintenance of the information system, including personnel, training, and support. The foundation subsequently provided additional support in the amount of $188,050 in 2002 for updates to the system.

Public health agencies and organizations realize the benefits of standardizing information systems and transmitting data rapidly and effectively, but need the resources and capacity to do so. The Robert Wood Johnson Foundation is embarking upon a new initiative to improve public

health informatics. In August of 2002, the foundation developed a national program, the Public Health Informatics Institute, which aims to facilitate the standardization of information systems. The program will address concerns that public health agencies are relying on scarce resources to "reinvent the wheel," rather than using and borrowing from those information systems that already exist. A pilot project is currently under way with public health laboratories to develop an information system that may be shared among all.

Partnering to Improve the Public Health Infrastructure and Capabilities

As described throughout this Issue Brief, partnerships between the public and private sectors are critical to ensuring a strong public health infrastructure. Collaboration and cooperation take place at all levels of government and between and among government agencies, nonprofit organizations, health care organizations, school systems, philanthropy, and many others. Throughout the IOM's (2002a) report, emphasis is placed on the importance of partnerships. Governmental public health agencies; community organizations; health care delivery systems; academia; and even businesses, employers, and the media all influence the public's health and should be regarded as potential partners in the public health system, especially at the community level. The challenge to the federal government, then,

IOM: THE PUBLIC'S HEALTH IN THE 21ST CENTURY

Involving Community Organizations, Health Care Delivery Systems, Employers, Academia, and the Media

The IOM's latest report, *The Future of the Public's Health in the 21st Century,* suggests that the public health system is everyone's responsibility and calls for partnerships across various stakeholders. Specifically, it recommends the following:

- Promoting more full involvement of communities in the public health system in order to sustain change,

- Creating a stronger relationship between the health care delivery system and government public health agencies,

- Recognizing the role of the corporate community in shaping the conditions for health and furthering population health goals,

- Enhancing the potential role of the media in promoting and protecting the public's health, and

- Strengthening academia's role within the public health system through support of prevention and community-based collaborative research.

Source: IOM 2002a.

is to "begin to motivate partners and provide them with the evidence they need to get them engaged (Boufford 2002)."

From a local perspective, Dr. Campos-Outcalt recommended that public health agencies consider nontraditional partners, such as law enforcement personnel and firefighters, especially in the context of emergency preparedness. He noted that these relationships can be challenging because of the philosophical differences between public health and other parties, such as the business community and the police.

Tackling health issues such as HIV/AIDS, immunization, obesity, or substance abuse within a community requires cooperation from many entities. As a result, public

health departments have to supplement their expertise in surveillance and laboratory services with the skills and resources required to build community trust, provide objective data, and partner effectively (CDC 2002d). Given the broad canvas of today's public health system, Dr. Boufford urged local agencies to think strategically about educating and motivating different partners, particularly the less traditional ones, and nurturing their relationships so that their commitment to collaborating to support public health lasts beyond a specific project. While partnerships may begin with specific tasks and goals, agencies should not have to create new partnerships for every new problem. To do this, government agencies will have to become better at engaging in dialogues with various participants in the system, rather than

relying on one-way messages. They will also have to identify and communicate the benefits of participating in a partnership with public health entities.

Building Partnerships and Supporting the Infrastructure: A National Effort

Many foundations are committed to improving the public health infrastructure by fostering partnerships between public health agencies and others at the local, state, and national levels. Their work reflects a commitment to helping public health agencies improve information technology, collect and track health data, develop leadership skills, and improve public health system functioning. One of the largest foundation initiatives bringing together state and local public health departments, nonprofits, health care providers, and others is *Turning Point: Collaborating for a New Century in Public Health,* a collaboration between the W.K. Kellogg Foundation and The Robert Wood Johnson Foundation.

Turning Point provides support for state and local communities to improve the performance of their public health systems through strategic development and implementation processes. Its efforts draw upon the strength of collaborations and involve key public and private sector partners. At both the state and local level, these processes include:

- planning to address public health challenges;
- restructuring public health agencies, where appropriate;
- evaluating the use of technology;
- analyzing financial and human resources needs; and

- implementing local plans, as directed by local and state priorities.

With combined commitments from two foundations, a total of $24.25 million supports this program. *Turning Point* national program offices are located at the National Association of County and City Health Officials for the communities and the University of Washington School of Public Health and Community Medicine for the states. Through *Turning Point,* The Robert Wood Johnson Foundation initially funded a cohort of 14 state partnerships with two-year grants and later funded seven additional state partnerships. Meanwhile, the W.K. Kellogg Foundation funded 41 local communities within these 14 states. Although each foundation's total financial commitment to the initiative was large, Barbara Sabol, program director at the W.K. Kellogg Foundation, noted that the foundation invested only $20,000 in each community each year for three years. This strategy was effective because the communities leveraged the small grants over time, generating an investment greater than the foundation could have provided.

Another component of *Turning Point* is the National Excellence Collaborative. Developed with national level partners, such as the CDC, HRSA, Association of State and Territorial Health Officials, and NACCHO, the collaborative addresses modernization of public health statutes, the creation of accountable systems to measure performance, utilization of information technology, investments in social marketing, and the development of leadership.

Partnerships are the base of the *Turning Point* program, and grantees recruited an

"Relationships are primary; all else is derivative."

BARBARA SABOL, W.K. KELLOGG FOUNDATION

"The juice was worth the squeeze. The impact was worth the effort."

BARBARA SABOL,
W.K. KELLOGG
FOUNDATION

array of members to engage the states and communities in public health activities. At the state level, partners collaborate to influence public health policy, expand information technology so that data are available to local communities for addressing health concerns, and stimulate state departments and organizations to develop comprehensive public health plans for the state. The community partnerships, which are located in the 21 *Turning Point* states, are working to collect data and develop pictures of community health status; reach a consensus on priority health issues; mobilize local resources to develop action plans to address priority areas; and communicate local needs, priorities, and activities to elected officials and state agencies to assist in the development of effective health policy.

A three-year evaluation of the *Turning Point* communities funded by the W.K. Kellogg Foundation found that community partnerships included traditional members, such as public health agencies, health care providers, colleges and universities, and insurers. They also included nontraditional members, such as mental health and social service organizations, community groups, elected officials, seniors' groups, faith-based communities, environmental organizations, law enforcement, fire and EMS departments, media, and tribal organizations. The lessons learned from this evaluation will help assure a continuing community focus on public health and the diverse community participation needed to improve the health of communities. Key lessons learned include:

• community engagement evolves over time,

• public health activities require partnerships with an array of members throughout the community,

• public health planning and decisionmaking require partnerships with diverse community representation,

• decisionmaking and public health improvements require community mobilization and civic involvement, and

• explicit policy and resource investments are needed to sustain or institutionalize community participation.

Ms. Sabol also noted that it is no easier for foundations to partner than it is for their grantees. One issue that has to be resolved, for example, is who will get the credit for the program — especially since all foundation boards want to see what they are getting for their investment. But she was emphatic in her conclusion that the results of a collaboration make up for the difficulties and urged foundations to work together to build the public will necessary for fostering political support for public health and creating a flexible, sustainable system.

**Partnership for the Public's Health:
Creating Action at the State Level**
In 1999, The California Endowment launched a $40 million, five-year initiative in partnership with the Public Health Institute to create *Partnership for the Public's Health (PPH)*. Its goal is to build strong, effective partnerships between local public health departments and the communities they serve. In addition, it supports implementation of statewide advocacy, networking, and learning opportunities to improve public health policies and practices that impact the ability of communities to address public health problems.

PPH is a large and diverse initiative, with 53 individual grantees and 39 partnerships (each of which consists of one community group and one health department) in 14 different California health jurisdictions (12 counties and two cities). Approximately $25 million in grants will be awarded to communities and local health departments over four years. The grants support community partnerships to influence government and other institutions to establish public health improvement goals, redesign systems, and mobilize action to protect and improve the community's health. They also help local health departments to be more responsive to community-based priorities and more effectively perform core public health functions of assessment, assurance, and policy development in the context of community health.

During the partnership's first year, local health departments worked with selected community groups to develop strategic action plans to improve the capacity of public health systems and communities to define and address community health issues and prevent public health problems. During subsequent years, community groups and health departments will carry out their strategic plans and work to build strong relationships that will support health improvement over time.

Although *PPH* is still in its early years, community activities and findings reveal several lessons, such as:

- development of community resident leadership is essential;
- effective partnerships and relationships are based on respect, commitment, and caring;

- capacity to communicate across language and cultural difference advances community health;
- capacity for strategic planning supports innovation and sustainability;
- planning together for health improvement creates new alliances for effective policy advocacy; and
- equal partnerships promote shared responsibility.

The DELTA Project: A Local Initiative
While *Turning Point* and *Partnership for the Public's Health* have received national attention for their work to strengthen public health, smaller local and regional foundations have developed successful initiatives and partnerships. The Horizon Foundation, based in Columbia, Maryland, has made a substantial commitment to improving the public health system in Howard County. The *DELTA Project (Drug Abuse: Evaluation of Legal and Treatment Alternatives)*, a joint initiative of the foundation and the Howard County Government, has mobilized community partners to address substance abuse health care, treatment, prevention, and the criminal justice system. This initiative is an example of a partnership between county government and philanthropy that is designed to produce systemic changes at the local level to address a specific public health issue.

To generate action among the parties involved in substance abuse within the county, a planning process within the Howard County Office of Substance Abuse Impact Services was developed. The *DELTA Project* also worked with a local alcohol and drug abuse advisory board to examine the extent of substance abuse in Howard County, develop interventions,

and launch a plan. During the planning phase, specific goals for substance abuse reduction, service improvement, etc., were established. Project planners also examined the benefits and costs of alternative strategies, assessed the feasibility of a comprehensive communitywide approach, and developed an action plan. Finally, *DELTA Project* participants identified appropriate target dates, objectives, and responsible parties to put the recommendations into effect and provided recommendations to the county executive as to the type of organizational oversight that would assure accountability for progress in implementing the plan.

The *DELTA Project* recently released a blueprint for substance abuse in the county. It is hoped that the blueprint will spur a series of actions that lead to progress on a variety of fronts, including oversight of county-level interventions, prevention, treatment, and criminal justice.

In addition to the *DELTA Project,* The Horizon Foundation has supported a number of projects to improve Howard County's health by enhancing the public health infrastructure. Among these are two grants to the Howard County Health Department. One grant was used to expand the department's comprehensive health planning process and allow the project's working and steering committees to construct a health blueprint for the county. The second grant funded a study to identify and evaluate effective models of transitional housing and residential treatment for individuals with substance abuse problems. This information was also used by the *DELTA Project* for its substance abuse prevention and treatment recommendations.

Emergency Preparedness: Building the Public Health Infrastructure

In order for the public health system to respond in a timely and effective manner to natural disasters, chemical or biological events, or disease outbreaks, a stable infrastructure must be in place. Public health departments at all levels must have the capacity to prepare for, detect, and respond to emerging threats (Hajat, Brown, and Fraser 2001). Improvements made to federal, state, and local preparedness capacity will also affect how the system responds to communicable disease outbreaks, emerging viruses, food-borne illnesses, and weather-related disasters.

Most state and local public health departments, however, are not fully prepared in the event of an emergency. As evidenced by the September 11, 2001 terrorist attacks and subsequent anthrax attacks, these systems lack key elements needed to respond adequately (National Conference of State Legislatures 2002).

Federal Level Preparedness Activities

More than 20 federal agencies have a role in preparing for or responding to public health emergencies. The Federal Emergency Management Agency and HHS play key roles in disbursing federal funds, collecting and disseminating data, and evaluating programs.

Two important pieces of federal legislation help state and local public health systems respond to threats — the *Public Health Improvement Act of 2000* and *the Public Health Security and Bioterrorism Response Act of 2002.*

The *Public Health Improvement Act* is a comprehensive package of 10 separate public health bills. For example, it authorizes grants to state and local public health departments to update laboratories, improve electronic information and emergency response systems, and train public health professionals and emergency first responders (National Conference of State Legislatures 2002).

The *Public Health Security and Bioterrorism Response Act* addresses national, state, and local preparedness; response planning; and security issues. It authorizes $1.6 billion in FY 2003 to implement state preparedness plans and conduct preparedness activities. Approximately $1.08 billion will be distributed to states in the form of block grants. Another $520 million will go to states for enhancing the preparedness of hospitals, clinics, and primary care facilities. Finally, the act also includes provisions regarding new controls on biological agents and toxins; additional safety and security measures affecting the supply of food, drugs, and drinking water; measures affecting the nation's vaccine stockpile; and the development of bioterrorism countermeasures.

In addition to legislative efforts, existing programs such as the Laboratory Response Network (LRN) also address federal, state, and local laboratory capacity to respond to bioterrorist events. Developed by the CDC, the Association of Public Health Laboratories, and the Federal Bureau of Investigation, LRN is a network of laboratories that can provide essential diagnostic capabilities in all states, territories, and large metropolitan areas; regional reference diagnostic services; and a national reference capacity located at the CDC. Similarly, the Rapid Response and Advanced Technology laboratory can quickly identify biological agents rarely seen in the United States, such as anthrax (CDC 2002d).

The Federal Response to September 11th
In reaction to September 11th, HHS announced $1.1 billion in grants available to states, territories, and three major cities (Chicago, Los Angeles, and New York) to strengthen local capabilities. Twenty percent of the total HHS funds were immediately released to jurisdictions. Specifically, the funds are to be used to:

- develop comprehensive bioterrorism preparedness plans;
- upgrade infectious disease surveillance plans and investigation capabilities;
- enhance the readiness of hospital systems that deal with large numbers of patients;
- expand public health laboratory and communications capacities; and
- improve connections between hospitals and state, local, and city health departments to enhance disease reporting (HHS 2002d).

The CDC is responsible for distributing the majority of the HHS funds (approximately $918 million) to support bioterrorism, infectious disease, and public health emergency preparedness activities at the state and local levels. According to Julie Gerberding, M.D., director of the CDC, the funds are specifically designed to provide for the critical elements of

"I wouldn't say that we're unprepared. I wouldn't say that we're fully prepared. But it's clearly evident that we're underprepared."

EDWARD BAKER,
CDC

"The real message is that all of the preparedness that was successful in the fall [of 2001] really begins and ends at the local level, whether it's in the field or in the health care system or in the laboratory."

JULIE GERBERDING,
CDC

terrorism preparedness. The CDC will provide grants to states and localities for planning and development of emergency plans, product procurement, personnel hiring and training, and practice simulations. In order to access funds, states and localities are required to submit comprehensive plans meeting 17 benchmark criteria. As of June 2002, 24 states and two cities had received the total funding available to them. An additional 24 states and one city received most available funds; two states, the District of Columbia, and territories were given extensions to further refine their plans (HHS 2002d).

The CDC funds, although specified for preparedness purposes, have a dual functionality. Speaking at GIH's 2002 Fall Forum, Dr. Gerberding explained, "We are building terrorism preparedness on the foundation of public health, and that's a pretty shaky foundation in a lot of areas. So, we are hoping that these investments really will shore up the foundation, as well as enhance our preparedness. This is a benefit that will have far-reaching consequences beyond biological, chemical, or radiologic terrorism." While federal funds were made available in response to the terrorist attacks, ultimately they will enhance and strengthen the nation's public health system, whether it is in response to a biological threat or confronting a flu epidemic (HHS 2002d).

Other federal agencies will also distribute HHS emergency preparedness funds. HRSA is distributing $135 million to assist states in developing regional hospital plans to respond in the event of a terrorist attack. With the goal of positioning hospitals to be a part of the community response to a mass medical emergency, HRSA funds are going

to the state health officer, secretary, or commissioner. The challenge for state health departments, according to William Raub, Ph.D. (2002), deputy assistant secretary of HHS' Office of Public Health Preparedness, is the lack of relationships with health care providers. In essence, the health departments are building a new structure of relationships and procedures to be able to think about and make the investments needed at the community level.

The federal Office of Personnel Management is providing approximately $15 million to communities to strengthen the Metropolitan Medical Response System (MMRS). As a result, an additional 25 cities will be covered by the MMRS plan. MMRS contracts enable local jurisdictions to improve their response to any event involving mass casualties.

State and Local Preparedness Efforts

Many states have public health laws that predate modern threats and medical advances. As they evaluate their public health capacity, some have implemented programs aimed at strengthening the public health infrastructure. For example, Colorado enacted legislation in 2000 creating an emergency epidemic response committee to advise the governor on appropriate measures to prevent or reduce the spread of diseases, agents, and toxins. The committee also developed a supplement to the state's disaster plan that outlines the public health response to acts of bioterrorism, pandemic influenza, and epidemics caused by new or fatal infectious agents (National Conference of State Legislatures 2002). In 1997, Maryland established the Maryland Terrorism Forum,

a multidisciplinary, 120-member forum of organizations and agencies that meet to discuss the state's terrorism response.

As previously mentioned, states receive assistance from the CDC to strengthen their public health systems' abilities to respond to emergency situations. For example, the CDC supported the Center for Law and the Public's Health (housed at Johns Hopkins and Georgetown Universities) to draft a model state emergency health powers act. This draft act would give state governors power to declare an emergency in the event of a public health threat caused by an act of terrorism or a communicable disease. Under the act, a state governor would confer with an appointed commission charged with developing an emergency preparedness plan. During a declared emergency, the governor could use available state resources, suspend laws that hinder a response, direct actions of state personnel, and work with other states to coordinate aid (National Conference of State Legislatures 2002). The draft act is under review by national organizations such as the National Governors Association, the National Conference of State Legislatures, and the Association of Attorneys General.

A critical challenge to state and local health departments is that public health crises, whether an outbreak of West Nile virus or a bioterrorist attack, do not have borders. As Julie Casani, M.D., M.P.H., medical coordinator for emergency preparedness in Maryland's Department of Health and Mental Hygiene explains, "One of the problems that state agencies face is that we very commonly look to geopolitical borders and focus on states and county lines. Populations don't. The first anthrax

case [in 2001] in the national capital region was a Maryland resident who worked in the District of Columbia and who was hospitalized in northern Virginia." Communication and cooperation across boundaries are critical, but often do not exist. In an effort to overcome this challenge, Maryland looked to a successful hurricane program designed for the Delmarva Peninsula, an area that includes Maryland, Delaware, and Virginia.

Partnerships for Preparedness

In an emergency situation, an effective public health response requires partnerships between public health departments and health care providers, nonprofit organizations, and other agencies within a community. Developing new or enhancing existing emergency preparedness plans can contribute to strengthening the overall public health infrastructure. The tools needed to identify and respond to disease outbreaks are the same as those needed for a bioterrorist event. Health care providers are often the first to see patients with disease symptoms, whether West Nile or anthrax. Communicating information about such patients to public health departments and coordinating efforts to track and contain disease are critical, but cannot take place unless the necessary relationships and tools — the infrastructure — are in place.

Philanthropic Involvement in Emergency Preparedness

Grantmakers have been involved in emergency preparedness activities on many fronts — typically by planning for and responding to natural disasters, such as earthquakes and floods, and the terrorist and anthrax attacks of 2001. Some health

funders tried to address the risks of terrorism before last year but had trouble getting others to appreciate the potential threat. For example, several years ago, the California HealthCare Foundation supported a study investigating the possibility of developing a single system for bioterrorism surveillance. At the time, however, interest in the issue was insufficient for the foundation to attract key stakeholders to a meeting on the topic. Today, the same report, *Web-based Public Health Reporting in California: A Feasibility Study,* is being used as a blueprint for improved surveillance.

Foundations have also supported basic infrastructure needs in order to ensure that services will be provided in a timely and efficient manner if and when they are needed. For example, Portsmouth General Hospital Foundation in Portsmouth, Virginia, gave a $20,775 grant in 1999 to the local chapter of the American Red Cross to purchase the equipment needed at city shelters during an emergency. Similarly, the Assisi Foundation of Memphis, Inc. addressed the need for training of emergency responders and health care providers with a $10,000 grant in 2002 to the Mid-South Community College Foundation. The grant funded an analysis of the potential for an emergency management training center for the Mississippi Delta region. The center would provide training for federal emergency response certification, search and rescue services, and support expansion of existing emergency medical technician training and recertification programs.

After the events of September 11, 2001, many foundations assessed their abilities to support the public health system and

contribute to building a strong infrastructure. The Williamsburg Community Health Foundation, a small foundation located in Williamsburg, Virginia, gives less than $1 million in grants each year. To help determine the best use of its funds for disaster-related activities, the foundation conducted a survey of 92 community leaders, representing government, social services, and law enforcement. The survey found that education and training of the public on what to do during an emergency was the top priority of community leaders. The foundation dedicated 10 percent of its funds to focus on emergency preparedness and made a $16,000 grant to enable a local hospital to purchase disaster readiness supplies. Also, a portion of the foundation's 2002 grant funds was set aside to support agencies focusing on disaster relief, economic downturn, and the effects of military deployment in the region. To garner additional regional support for its efforts, the foundation convened area funders to discuss future opportunities to support disaster preparedness.

Working with local hospitals and health care providers, the Palm Healthcare Foundation in Palm Beach, Florida, provided $250,000 in funding for a bioterrorism preparedness project. It will enhance local hospitals' capacity to handle possible bioterrorism attacks by standardizing communication, response, and other systems across the area's 14 hospitals. It also includes funding for equipment, such as portable decontamination units and hazmat suits, and for training hospital emergency room workers. The foundation's efforts allowed Palm Beach area hospitals to work together to quickly design and implement an emergency response system.

Other foundations collaborated with federal, state, and local government. The CDC Foundation set up a special fund to provide workers from the CDC with resources to deal with the immediate needs during the September 11th terrorist attacks, the anthrax crises, and future events. The fund will provide for four basic areas of need: emergency purchasing power, short-term staffing needs, consulting services for strategic preparedness planning and crisis management, and rapid procurement of equipment and technology. In the state of Kansas, the chief epidemiologist was struggling with how to communicate information to health professionals about their role in emergencies. The Kansas Health Foundation quickly provided funding so that briefings sponsored by the University of Kansas Medical Center could reach physicians, nurses, pharmacists, and others throughout the state. More recently, the foundation has been working with state government officials to figure out how to make the best use of federal dollars now available for emergency preparedness planning, particularly in creating communication systems between health departments and health professionals in the community.

At the request of the county executive, The Horizon Foundation in Columbia, Maryland, formed a Community Emergency Response Network (CERN). The 35-person network includes representatives from institutions throughout Howard County, Maryland, including local government, fire and police, health care organizations, and the local community college. The goal of CERN is to develop a citizen's emergency response plan for the county — one that incorporates major

nongovernmental institutions, public education, and other organizations and is functionally integrated with Howard County government's emergency response plan and, where applicable, related state and federal plans. The foundation has also signed a formal partnership with the county public school system to coordinate in the area of community emergency preparedness planning. In addition, it provided a grant to the local chapter of the American Red Cross to disseminate information to county residents on developing individual family plans in case of emergency situations.

As demonstrated by these examples, grantmakers can play key roles in assisting communities to prepare for emergencies. By convening stakeholders, funding health departments' and providers' capacity to respond with up-to-date equipment and data, or training public health staff and health care workers, there are ample opportunities for foundations to contribute to enhancing the public health infra-structure and keeping the nation safe.

Conclusion

A strong public health infrastructure makes it possible to conduct work that will alleviate disease, control disease outbreaks, promote healthy behaviors, eliminate health inequities, and protect the nation from emerging health threats. While the risks of bioterrorism and other unusual events dominate the current agenda, one positive outcome of this sense of urgency is that the public health system is benefiting from an unprecedented level of attention and resources. Philanthropic organizations and others involved in supporting public

TEN GREAT PUBLIC HEALTH ACHIEVEMENTS IN THE 20ᵀᴴ CENTURY

1. Vaccination
2. Motor vehicle safety
3. Safer workplaces
4. Control of infectious diseases
5. Decline in deaths from coronary heart disease and stroke
6. Safer and healthier foods
7. Healthier mothers and babies
8. Family planning
9. Fluoridation of drinking water
10. Recognition of tobacco as a health hazard

health can take advantage of this window of opportunity to improve the infrastructure so that it is capable of handling emergencies, as well as the day-to-day health needs of communities.

Three basic components form the foundation of this infrastructure and make it possible to conduct programs that promote the health of the nation: organizational capacity, workforce capacity and competency, and information and data systems. While funding and support for population- or disease-specific interventions is important, communities must first have the necessary tools to build the foundation necessary for these programs to prosper.

Philanthropy can play a significant role in these efforts by partnering with federal, state, and local health departments, as well as with academic institutions and community groups that contribute to the public's health. Specific activities for foundations to consider include:

- linking schools of public health with state and local departments to give each a better understanding of the academic and practical components of the field;
- funding educational and training opportunities for public health staff through conferences and Internet-based and other distance-learning programs;
- providing resources to local health departments for communication and technological needs;
- supporting data collection and analysis to better inform the development of public health priorities and programs;
- supporting efforts to advocate with public and private policymakers, as well as to educate the general public about public health issues;
- funding research to generate evidence on the impact of changes in the public health infrastructure;
- encouraging researchers to show how results can be applied to facilitate the translation of research into practice;
- conducting community-level appraisals of different aspects of the current system (for example, elements of the workforce,

public health laws and regulations), the impact of current systems, and the effects of budget cutbacks;

- helping to engage members of the community not ordinarily involved in public health, such as the business community and law enforcement;

- serving as an advocate for a sustained, strategic approach to building the public health infrastructure;

- sponsoring the development of public health report cards at the local level so that stakeholders can assess changes in the performance and capabilities of the infrastructure over time; and

- strengthening the emergency response capabilities of a particular locality by facilitating partnerships among health departments, hospitals and clinics, law enforcement, and fire and rescue personnel.

Philanthropic organizations can also use the new IOM report on public health as a springboard for stimulating a dialogue in their communities about specific infrastructure issues and the ways in which the report's recommendations could be applied at the local or regional level.

By working together, public health professionals from government, academia, community-based organizations, and philanthropy can improve the nation's health and protect individuals from health threats. Over the last century, public health has played an important role. Its achievements have been dramatic. The public health system, however, faces many new challenges as it continues its vital work to stop the spread of infectious diseases such as HIV/AIDS, ensure access to vaccines and other disease prevention measures, and prepare for the possible use of biological weapons. Building and maintaining a strong public health infrastructure will ensure that the system's achievements will continue now and into the future.

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