Schools of Public Health: Essential Infrastructure of a Responsible Society and a 21st-Century Health System

JAMES COLGROVE, PhD, MPH^a

LINDA P. FRIED, MD, MPH^a

MARY E. NORTHRIDGE, PhD,
MPH^a

DAVID ROSNER, MPH, PhD^a

The American Recovery and Reinvestment Act—better known as the stimulus package—that President Barack Obama signed into law in February 2009 included a historic investment in the national infrastructure. The Act devoted \$150 billion to strengthening systems that support the country's social and economic viability, such as public transportation, roads, bridges, dams, ports, waterworks, and broadband access.¹ In this article, we argue that schools of public health (SPHs) are also essential to the nation's health, security, and well-being. SPHs collectively serve as a platform for creating the knowledge needed to prevent disease and disability and for translating that knowledge into approaches that protect the health of all of us. At the same time, SPHs are responsible for educating the public health leaders of the future.

We begin by demonstrating that public health is an essential element of a responsible society. We then describe the critical roles the nation's 40 accredited SPHs play in protecting and improving the public's health. We contend that these SPHs are uniquely positioned to provide leadership in the design and implementation of a 21st-century health system, one with a broad and holistic view of health and focused centrally on prevention rather than post-event acute and episodic care. Finally, we argue that the ability of SPHs to fulfill their roles needs to be strengthened through mechanisms for core financial support. Because the current funding system for SPHs is piecemeal and largely reactive, we call on the federal government to provide significant and sustained support for this work through a dedicated funding stream.

PUBLIC HEALTH AS AN ESSENTIAL ELEMENT OF A RESPONSIBLE SOCIETY

We follow the World Health Organization (WHO) in defining health as “a state of physical, mental and social well-being and not merely the absence of infirmity and disease.” Health is a precondition for human flourishing and, conversely, the absence of health impedes the capacity for purposive action and fulfillment. Physical and mental well-being enables people to meet individual

^aMailman School of Public Health, Columbia University, New York, NY

Address correspondence to: James Colgrove, PhD, MPH, Mailman School of Public Health, Columbia University, 722 West 168th St., New York, NY 10032; tel. 212-305-0561; fax 212-342-1986; e-mail <jc988@columbia.edu>.

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aspirations, fulfill social roles, and engage in productive and beneficial actions for themselves, their fellow citizens, and future generations. Some definitions of health emphasize its instrumental value. For example, WHO's Ottawa Charter for Health Promotion describes it as "a resource for everyday life, not the objective of living."² Others, however, such as the economist Amartya Sen, argue that good health is not simply a means to an end, but is itself integral to conceptions of human development.³

Public health, defined as "what we as a society do collectively to assure the conditions in which people can be healthy," encompasses a wide range of activities in the public, private, and nongovernmental sectors.⁴ It is a multidisciplinary enterprise with a knowledge base grounded in the natural, biomedical, and social sciences. Its activities to enhance healthy outcomes operate at the level of individual behavior and at the level of policies and practices affecting entire communities.

The collective dimension of public health is what sets it apart from clinical medicine and also what makes it a precondition of a well-functioning society. A robust empirical and philosophical literature links public health to such principles as justice, beneficence, and dignity, which are the foundations of a society that assumes collective responsibility for all of its members.⁵⁻⁸ There is increasing recognition that public health must be linked to human rights—that its activities can and should extend to political, economic, social, and cultural aspects of human existence.⁹ This broad focus is consistent with the historical roots of public health as it arose in Europe and the United States in the 19th century, when social reformers joined forces with physicians and sanitary engineers to address fundamental material aspects of people's lives, such as housing and labor conditions.¹⁰

Moreover, public health should be thought of as a public good in the sense of that phrase's use in economics.¹¹ The term "public goods" describes goods that benefit all members of society, are available to everyone, and are not diminished by common usage (i.e., they are nonexcludable and nonrivalrous). Some public goods can only occur through collective action. In economic theory, the protection and promotion of public goods are considered core functions of government. Classic examples of public goods include national defense and broadcast television.¹² Many public health achievements, such as the maintenance of clean water supplies and prevention of the spread of infectious diseases, are widely recognized as public goods. We believe that the full spectrum of public health activities, to the extent that they lead to the absence of disease and to healthy

populations, should be considered public goods. In the closely interconnected societies that characterize the globalized world of the 21st century, individual initiative is necessary but insufficient to assure health for all. And private enterprise cannot assure optimal public health outcomes. Collective action on the part of civil society actors and government entities is needed.

The federal government has identified the public health system as an element of the critical infrastructure necessary for the country's safety and security. Since the mid-1990s, several government reports, laws, and executive orders have defined and enumerated the facilities and services that constitute the nation's critical infrastructure. In addition to public health, they include agriculture and food, water, emergency services, national defense, and banking and finance.¹³ While the public health system as a whole is considered to be a critical infrastructure, we argue that within this system, SPHs have a uniquely vital role.

SPHs AS ESSENTIAL INFRASTRUCTURE

As the Institute of Medicine (IOM) noted in its 2003 report, *The Future of the Public's Health in the 21st Century*, academia is one of the key components of the U.S. public health system.⁴ There are 40 accredited SPHs in the U.S., which undergo rigorous, ongoing certification to ensure that their curricula, faculty, and programs meet the highest standards.

IOM set forth three broad areas in which academia plays a key role in public health: teaching, research, and practice.⁴ First, SPHs provide education and training of master's and doctoral students who will serve as critically needed leaders in many sectors. More than 7,300 public health professionals receive master's and doctoral degrees each year from accredited schools of public health. Second, SPHs conduct research that provides a science-based understanding of the origins of public health problems and the basis for effective prevention of disease and disability. Third, they improve practice by translating knowledge into the design of innovative service programs.

We extend this tripartite framework by identifying a fourth category of activity: SPHs lead in informing and advancing policy to ensure that enhancement of the public's health is optimized throughout society. Health is influenced by myriad factors that have not traditionally been targeted by prevention science. Efforts to enhance public health must, therefore, include the shaping of policies in realms that affect health but have sometimes fallen outside the formal rubric of health.¹⁴ A focus on addressing multiple determinants of health through varied and complementary policy interventions

is central to the “population health” concept that has gained increasing attention in recent years, especially in Canada and the United Kingdom.¹⁵

Two examples illustrate the value of extending prevention-oriented thinking into policies throughout society: urban planning and healthy aging. Policies for the built environment related to parks, public transportation, commercial zoning, and traffic flow all have a profound impact on the health of urban populations.¹⁶ With more than two-thirds of the world’s population expected to be living in cities by 2050, urban environments must be designed to support healthy lifestyles and prevent environmental degradation that has long-term adverse effects on health. Such an effort will require a far-reaching research agenda to identify the mechanisms through which the natural and built environments positively and negatively affect health, as well as leadership to assure that research findings are operationalized via health-enhancing policies and practices.¹⁷

Similarly, our population’s increasing longevity demands a broad-based, multisector response that can develop and translate discoveries into effective approaches to healthy aging in our now-longer lives. With one in five Americans reaching 65 years of age or older by the year 2030, new approaches will have to be found to enable people to live longer, productive, fulfilling lives with minimal illness and disability. Enhancing healthy aging involves assuring a life-course approach to prevention for the individual as well as creating environments that support people’s ability to remain active and engaged. Many of the barriers to healthy aging, such as chronic illness, financial dependence and poverty, primary care-taking responsibilities, lack of productive roles, inadequate long-term care, and social isolation, are too difficult for an individual to overcome. Rather, these challenges need to be addressed through research and education that can lead to more effective health systems and social policies that value older adults’ contributions and support their needs.¹⁸

As IOM noted in its 2003 report, responsibility for advancing public health is dispersed among several sectors of society: academia, government, employers/businesses, the health-care delivery system, communities/community organizations, and the media.⁴ Because of this diffuse nature, public health action in the U.S. too often lacks vision, direction, and coherence. We contend that SPHs have untapped potential to provide the visionary leadership and knowledge creation that are now missing.

Of the varied components that comprise the U.S. public health system, only academic institutions have

the mandate and the capacity to take a long view and see beyond immediate demands and crises. SPHs can identify and set priorities, envision strategies, and chart courses not simply for the next fiscal year or the next election cycle, but for 10, 20, and even 50 years into the future. Moreover, only SPHs have the capacity to generate new knowledge and innovation, translate advances into effective practices and policies, and create curricula for future leaders who will implement them.

Breadth of expertise is key to this leadership capacity. SPHs merge science- and practice-based expertise and are distinctive among academia’s professional schools in the extent to which their faculties comprise both experienced practitioners and scholars from across the university. A dual mission spanning theoretical and applied realms has been present since the founding of the first SPH in 1916.¹⁹ Drawing on perspectives from the physical and biological sciences, the social sciences, and the humanities, SPHs are notable for the multidisciplinary diversity of their faculty.²⁰ More than any other component of the university, an SPH can provide leadership to integrate the efforts from other professional schools, such as business, engineering, social work, law, and public policy, into public health knowledge and applications. For these reasons, public health education is much more than a technical field; it embodies the humanistic traditions that are a critical part of the university ideal. Reflecting the university’s broad mission with roots in the Enlightenment, SPHs produce ideas that transcend the immediacy of the moment.

Just as they integrate efforts across the university, SPHs have the capacity to take a leadership role in partnerships that bring together actors across the sectors that comprise the public health system. By virtue of their interdisciplinary and broad-based perspective and expertise, SPHs are uniquely and ideally positioned to ensure that health is a central focus and goal in policies throughout government and civil society. They should be considered part of the essential infrastructure of a responsible society and, therefore, should be invested in so that their potential can be realized.

DESIGNING A 21ST-CENTURY HEALTH SYSTEM

Even as it confronts a daunting set of economic and political challenges that extend globally, the U.S. is embarking on an ambitious effort to reform a health system widely seen as costly and dysfunctional. For almost a century, periodic attempts have been made to refashion the way the nation finances and delivers

health care. These efforts have been characterized by investment in curative medicine at the expense of prevention and resistance to governmental assurance of access to health care for all.^{21–23}

Current concern is focused on Americans who lack health insurance—a figure that now stands at approximately 46 million, having grown by some 9 million during the past decade. Extending coverage to the uninsured is critical, especially as the severe economic downturn threatens an increasing number of Americans with the loss of employment-based coverage. However, this focus is incomplete. “Health” in this debate is usually defined as coterminous with “health care”—acute, post-event medical intervention, often supported by high technology. As Mann and colleagues noted in a seminal 1994 article, “Only a small fraction of the variance of health status among populations can reasonably be attributed to health care; health care is necessary but clearly not sufficient for health.”²⁴ Yet, as much as 95% of health spending in the U.S. is directed toward medicine or medical care and less than 3% toward prevention.²⁵

As such, a central task in the months and years ahead must be to reorient the terms of the debate so that our leaders design a health system that fully integrates the myriad functions—often invisible yet always critical—of public health. If we focus solely on extending health insurance, and fail to broaden the scope of the discussion to include prevention and wellness, we are destined to recreate the poor health outcomes, inequities, and inefficiencies that characterize our current acute care-oriented system, which is not organized or financed to support primary care, much less preventive care or community-based health promotion. SPHs can and should lead efforts to redesign our health system because they have the preventive perspective and expertise that are necessary to bridge clinical and community-based approaches to health promotion.

In an era when chronic conditions are the dominant health problems in the U.S., our health system must be structured to prevent, as well as treat, these conditions. The U.S. has historically underinvested in disease prevention, both research and practice, even though prevention produces a sixfold return on investment.²⁶ Investing \$10 per person in healthier communities would save some \$16 billion in medical care expenses in just five years. It is well known that the U.S. spends a far larger proportion of its gross domestic product on health care than other industrialized nations, yet it experiences worse outcomes on key indicators such as life expectancy and infant mortality. The emphasis on

early disease prevention in nations whose systems integrate and coordinate health promotion with medical care delivery is associated with better outcomes and greater cost-effectiveness and efficiency.²⁷

Chronic diseases are highly amenable to prevention and early intervention. Yet, too often the nation’s public health system has done an inadequate job of preventing chronic conditions such as obesity, cardiovascular disease, hypertension, and diabetes.²⁸ SPHs are a source of evidence-based practices and policies to prevent chronic illnesses and can take a leadership role in developing goals and methods for implementing them throughout society.

A restructuring of the U.S. health system should be informed by the emerging sciences of system design, which draw upon operations research, human factors engineering, and new understandings of complex adaptive systems.^{29,30} These sciences examine the optimal ways of providing services that are highly interdependent and centered around human needs. They emphasize the importance of experimentation, the application of simple rules, and the evolution of the organization and the environment. Because of their broad interdisciplinary approach and their central focus on prevention science research, SPHs are well positioned to provide leadership in this design.

There are encouraging signs that the Obama administration and Congress recognize the importance of prevention to a humane, efficient, and cost-effective health system. In addition to support of the nation’s infrastructure, the economic stimulus package passed in February 2009 allocated \$1 billion for prevention and wellness activities, including \$650 million for chronic disease prevention, \$350 million for immunization, and \$50 million for reducing nosocomial infections.³¹ These resources represent an important first step. However, such support must not be limited to emergency measures in times of recession and global fiscal crisis. A dedicated and ongoing source of support that remains steady through all economic cycles is necessary.

SUSTAINING OUR INFRASTRUCTURE TO IMPROVE OUR HEALTH

Given the centrality of public health to human flourishing and a just and responsible society, and given the essential role of academia in advancing the public’s health, federal investment in SPHs must be seen as analogous to the support the government provides to such public goods as national defense and the transportation infrastructure.

Further, for almost half a century, the federal government has properly assumed a role in ensuring a stable supply of physicians by providing substantial financial support to education and training in medicine. The largest source of support is through Medicare's graduate medical education program, which reimburses teaching hospitals for the training of residents, nurses, and allied health professionals.³² In addition, Title VII and Title VIII of the U.S. Public Health Service Act support the training of professionals in medicine, dentistry, and nursing. The provisions of these titles have been revised several times during the past 45 years in response to evolving needs and the changing composition of the medical workforce.³³ Ten years ago, for example, the act was amended to enable the Health Resources and Services Administration to provide grants for traineeships in epidemiology, environmental health, and maternal and child health.³⁴ Many of the professionals funded through Titles VII and VIII are valuable members of the public health workforce.

However, no dedicated, stable funding stream exists to support the vital work of SPHs. The contributions of their faculty and graduates in research, practice, and policy are as critical to the public's well-being as those of their peer institutions in medicine. Although grants through government agencies such as the Centers for Disease Control and Prevention provide the capacity to respond to emerging issues and crises, SPHs are constrained in their ability to identify cutting-edge issues, develop faculty and facilities, and innovate in curriculum to address the broad systemic problems we currently face, much less to anticipate the future and prepare for upcoming challenges.

Funding is needed to support two broad areas: (1) educating and expanding the public health workforce and (2) conducting research for discovery in areas in which innovation is critically needed, such as improving the health system, preventing obesity, preparing for an aging society, and ensuring health during the life course.

In the area of education, funding should support tuition and stipends to educate the increased number of master's and doctoral students needed to assume leadership roles and to diversify the public health workforce so that it reflects the overall demographics of the public. Even as the U.S. population has increased dramatically in recent decades, the public health workforce has shrunk. The Association of Schools of Public Health (ASPH) estimates that nearly one-quarter of the current workforce will be eligible for retirement by 2012, and some 250,000 additional public health workers will be needed in the coming

decade.³⁵ These shortages threaten the nation's ability to conduct critical health promotion and disease prevention activities.

As a corollary to financial aid for students, support is also required to sustain and increase the teaching workforce in SPHs to ensure an adequate number of well-trained instructors for the student body. This support would also aid curricular innovation and improvement so that the instruction in SPHs anticipates future needs and incorporates the state of the art in effective pedagogy.

In the area of research, funding is needed to provide core support for junior faculty investigators and mentoring programs to ensure their success and longevity; foster interdisciplinary collaboration on key issues; upgrade infrastructure such as computers, laboratories, and equipment; and provide increased investment in new programmatic areas in which investigator-initiated research and innovation are needed. For example, it is especially important to develop a stronger science of how to translate discoveries into practice.³⁶ This translation includes generating a more sophisticated understanding of when evidence is sufficient to warrant implementation, increasing knowledge of how to create behavior change for better health, and creating research agendas and guidelines in areas such as life-course approaches to health promotion.

ASPH has called upon the Obama administration to invest \$200 million in the academic public health system via mechanisms such as loan repayment and scholarships and stipends. An encouraging sign that the need for this support may be increasingly recognized is the bill under consideration in Congress that would provide federal funds to repay the educational loans of students pursuing a public health degree in return for service in a state, local, or tribal health department. Such a program would address the problem of students' large accumulation of debt, which is often cited as a major barrier to pursuing graduate education in public health. It would also serve to diversify the public health workforce by enabling members of underrepresented minority groups to pursue careers in which they could assist underserved communities.

THE CHALLENGES AHEAD

In his speech marking the bicentennial of Abraham Lincoln's birth, President Obama recalled Lincoln's definition of the legitimate object of government: "to do for the people what needs to be done, but which they can not, by individual effort, do at all, or do so well, by themselves."³⁷ Obama invoked such successful government initiatives as the establishment of

land-grant colleges and the building of the transcontinental railroad.

Like those past efforts, a permanent federal financial commitment to supporting accredited SPHs will strengthen the essential infrastructure. The costs of such support will be more than offset by the benefits that will redound to all sectors of society, including improved health outcomes for the entire population and substantial economic savings. A vigorous public health system that assures healthy conditions for all members of society fits squarely in the tradition of essential public goods that can only be realized with the support of government enacting the collective will of the people.

CONCLUSION

We acknowledge that powerful political and economic interests may resist policies that enhance the public's health. Effectively addressing the global epidemic of tobacco-related morbidity and mortality, for example, has required engagement with one of the country's most powerful industries, which has resisted placing the population's well-being above the pursuit of profits.³⁸ Similar challenges will no doubt be faced in the efforts to build more sustainable urban environments, confront threats related to climate change, and reduce the burden of morbidities related to diet and obesity. Nevertheless, it is essential that we invest in educating future leaders who understand the multiple factors that affect health and, thus, can meet the prevention challenges of the 21st century.

Leaders in accredited SPHs must forcefully and continually demonstrate the value of prevention and the benefits of health promotion as integral to all social policies. They must be skillful communicators and educators of the public to secure the necessary political will to make the vision of a healthy society a reality.

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