

# Applying Health Services Research to Public Health Practice: An Emerging Priority

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Achieving an effective, efficient, and equitable health system has proven to be an elusive goal for health policy makers in the United States, but the field of health services research (HSR) has become increasingly central in charting the path toward this destination. HSR has evolved in tandem with the information needs of decision makers in government and the private sector, from perennial interests in coverage and cost containment to more recent concerns about quality, safety, and health disparities. Over much of this history, the producers and users of health services research have focused heavily on the production and consumption of medical care, while giving comparatively little attention to another important component of the health system—that of public health services. These services include population-wide efforts to identify and investigate health threats, promote healthy lifestyles, prevent disease and injury, prepare for emergencies and disasters, and assure the quality of water, food, air, and other resources that affect human health (Institute of Medicine, Committee for the Study of the Future of Public Health 1988). The relative paucity of studies on this aspect of health system performance reflects the relatively low priority given to public health practice during the last half of the 20th century.

In recent years, public health has undergone a notable resurgence in visibility among both policy makers and the public at large. Concerns about gaps in the availability and quality of public health services have grown rapidly in response to both new and persistent health risks, including infectious diseases like SARS and pandemic influenza, the threat of bioterrorism, natural disasters like the 2005 Gulf hurricanes, and the rapid advance of obesity and preventable chronic diseases. Since 2001, the federal government has invested >\$10 billion in new funds to support public health activities, with a primary focus on helping communities prepare for and

respond to large-scale public health emergencies (Trust for America's Health 2006). The increased attention and resources have generated expanded interest in using the concepts and methods of health services research to develop better ways of organizing, financing, and delivering public health services. This emerging focal point within health services research has become known as public health services and systems research (Mays, Halverson, and Scutchfield 2003; Scutchfield et al. 2007).

## HISTORICAL FOUNDATIONS AND MILESTONES

While there may be a perception that research on public health services delivery is a new phenomenon, studies of this nature began at least as early as the 1910s (Turnock and Handler 1997). During that decade the American Medical Association took on the responsibility for assessing and comparing state public health agencies to ascertain their structure and operations and make recommendations for improving their services (Turnock and Handler 1997). Responsibility for conducting these types of studies, and companion research that focused on local public health agencies, was subsequently assumed by the American Public Health Association (APHA) and its Committee on Administrative Practices, which continued in some form into the 1950s (APHA, Committee on Municipal Health Department Practice 1922a, b; Armstrong et al. 1924). The culmination of this effort was Haven Emerson's report on the organizational structures and human resources needed by local health departments to perform a set of six basic public health functions, including communicable disease control, maternal and child health, vital statistics registration, public health laboratory provision, environmental health, and health education (Emerson 1948). These early studies used research methods and data that left much to be desired, but their aim of producing evidence to inform policy and practice made them influential milestones along the evolutionary path toward public health services and systems research.

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Advances in public health research slowed during the decades of the 1960s through the 1980s, when the nation's policy and research attention turned to medical care financing and cost containment through innovations such as Medicare, Medicaid, community health centers, and commercial HMOs. Several decades of inattention to public health programs and services led the National Academy of Sciences' Institute of Medicine (IOM) to release a landmark assessment of the nation's public health system in 1988, which concluded that the system was in disarray and in need of significant revitalization and restructuring (Institute of Medicine, Committee for the Study of the Future of Public Health 1988). Many of the public health research and practice initiatives launched in the years since publication of that report have been a direct response to its findings and recommendations. Among its many contributions, the report articulated a conceptual model of public health practice based on three overarching responsibilities: assessing health needs and threats within the population, developing policies and programs to address those health needs, and assuring access to health services and other resources necessary for health. These "core functions" as they became known, were subsequently expanded into a set of 10 essential services for public health by a federal work group convened, initially, to define the role of public health within President Clinton's larger health reform agenda of the early 1990s (Baker et al. 1994). These two conceptual frameworks form the underpinning of many contemporary research initiatives in public health delivery.

The IOM report stimulated a flurry of initiatives during the 1990s that were designed to measure and improve the delivery of public health services. At the beginning of the decade, the U.S. Department of Health and Human Services established as one of its *Healthy People 2000* national health objectives that, by the year 2000, at least 90 percent of the population would be served by a public health department that effectively carries out the IOM core functions of assessment, policy development, and assurance. In response, professional associations such as the National Association of County and City Health Officials (NACCHO) developed guidelines and self-assessment tools to help public health agencies translate and apply the IOM concepts to practice. These tools included NACCHO's Assessment Protocol for Excellence in Public Health and subsequent protocols designed to guide agencies through the process of community health assessment. At the same time, the U.S. Centers for Disease Control and Prevention (CDC) commissioned a series of research projects to develop strategies for measuring how well public health agencies performed the IOM core functions and related services. These projects are some of the earliest efforts to develop and apply performance

measures to national samples of public health agencies in order to assess variation and change in public health practice (Miller et al. 1994; Turnock et al. 1994; Handler et al. 1995; Richards et al. 1995; Turnock, Handler, and Miller 1998). During this same period, NACCHO began to field periodic surveys of the nation's local health departments, providing national data about the organization, operation, and staffing of local public health agencies (Gerzoff, Gordon, and Richards 1996).

The domestic acts of terrorism and bioterrorism in 2001 ushered in a period of heightened visibility for the U.S. public health system and allowed public health improvement efforts to transition from a diverse collection of small and independent projects to coordinated, large-scale initiatives.

CDC and several national public health associations launched the National Public Health Performance Standards Program (NPHPSP) in 2002 to develop a consensus-based set of performance standards for state and local public health delivery systems, along with a process for collecting and comparing measures of compliance with these standards (Corso et al. 2000). Designed as a voluntary, self-assessment process, the NPHPSP focuses on the performance of public health systems—defined as the collective efforts governmental and private organizations to deliver public health services for a defined community or state. Since its launch, more than 18 states and 750 local public health systems have participated in the assessment process, and the self-reported data collected through the program have been used to support several important studies of performance variation (Scutchfield et al. 2004; Mays et al. 2006).

At the same time, accreditation programs for public health agencies began to develop as mechanisms for stimulating widespread involvement in performance measurement and improvement activities. Several states launched accreditation programs for public health agencies during this period, including programs in Michigan, Missouri, and North Carolina (Beitsch et al. 2006a, b). Many other states developed formal performance review and reporting initiatives designed to achieve similar objectives (Mays et al. 2007). With support from the Robert Wood Johnson Foundation, a group of these states began convening in 2006 to develop and test new strategies for measuring and improving performance, in what became known as the Multi-State Learning Collaborative. In that same year, an agreement was reached to develop a voluntary, national accreditation program for state and local public health agencies, with the involvement of CDC, NACCHO, the Association of State and Territorial Health Officials, National Association of Local Boards of Health, the American Public Health Association, and the Robert Wood Johnson Foundation.

## CURRENT STATE OF THE FIELD

In recent years, practice-based initiatives to improve public health delivery have far outpaced the development of rigorous research studies in public health practice that are needed to inform and guide the public health system's attempt to improve its performance and community health status. As a result, the methods currently used to measure performance and stimulate improvements stand on a relatively thin scientific base. The IOM acknowledged this problem in 2003 in a follow-up to its original 1988 report on the public health system, noting in its preamble:

The Committee had hoped to provide specific guidance elaborating on the types and levels of workforce, infrastructure, related resources, and financial investments necessary to ensure the availability of essential public health services to all of the nation's communities. However, such evidence is limited, and there is no agenda or support for this type of research, despite the critical need for such data to promote and protect the nation's health. (Institute of Medicine, Committee on Assuring the Health of the Public in the 21st Century 2003)

Much of the existing research on public health services and delivery systems is descriptive in nature, providing an important base for future studies but offering little specific guidance to public health decision makers concerning how to improve practice. For example, recent studies provide a detailed view of how public health agencies are organized, what types of services they provide, and how these agencies are staffed and financed (Tilson and Gebbie 2004; Baker et al. 2005; Beitsch et al. 2006a, b). These studies highlight the extreme heterogeneity in organization and operation that exists across the nation's public health system. Data from 2005, for example, indicate that the smallest local public health agencies spend <\$1 per capita on their operations while the largest agencies spend >\$200 per capita (NACCHO 2006). This heterogeneity complicates the task of conducting rigorous, comparative studies of public health practice. Nevertheless, recent work has demonstrated the feasibility of classifying public health agencies and delivery systems into relatively homogenous groups for the purposes of analysis and comparison.

In a similar vein, researchers have used measures of performance from self-assessment instruments such as the NPHSP to document wide variation in the range of activities performed by public health agencies, and to explore the institutional and economic characteristics that account for some of this variation (Mays et al. 2004, 2006; Scutchfield et al. 2004). While these types of

studies offer important insight into the delivery of public health services, their utility and relevance are limited by the fact that there are currently no objective, validated methods for measuring the quality of public health practice along dimensions such as effectiveness, timeliness, efficiency, and equity. Fortunately, advances in the fields of behavioral research and prevention research are leading to the discovery of an expanding collection of efficacious public health interventions, which then can be translated into evidence-based guidelines for public health practice in sources such as the U.S. Department of Health and Human Services' *Guide to Community Preventive Services*. These types of guidelines offer a starting point for creating process-based quality measures that reflect the extent to which public health agencies provide guideline-concordant services. Researchers recently have begun to explore methods of measuring guideline-concordant public health practice in areas such as emergency preparedness (Lurie et al. 2004) and obesity prevention (Brownson et al. 2007; Slater, Powell, and Chaloupka 2007), but further methodological advances are needed.

Policy and administrative decision makers are increasingly interested in understanding the health and economic impact of investments in public health activities, but so far relatively few studies have progressed to the stage of being able to isolate these effects reliably. Conducting outcomes research on public health practice is complicated by the fact that many population health outcomes are determined by the cumulative impact of multiple factors over relatively long periods of time, making it difficult to isolate the contributions made by the actions of public health agencies. Heavy reliance on observational research designs and aggregated measures of population health makes these studies vulnerable to problems of selection bias, confounding, endogeneity, and ecological fallacy. Moreover, these studies often focus on outcomes that are relatively rare events—such as infectious disease outbreaks, natural disasters, or deaths from specific, preventable causes. Achieving sufficient statistical power and precision to estimate the impact of public health agencies and actions on these types of outcomes can be challenging, particularly in small areas.

## STRENGTHENING THE SCIENCE BASE

A number of federal, state, and foundation-supported initiatives are now underway to expand the quantity and quality of research on public health services and systems. At the federal level, CDC began convening groups of

researchers, public health officials, and other stakeholders as early as 2002 to stimulate thinking on new avenues of inquiry. An early product of CDC's effort was the establishment of an interest group dedicated to public health systems and services research within AcademyHealth, the professional association for health services researchers. Now supported by the Robert Wood Johnson Foundation, this interest group organizes annual scientific meetings where researchers share insight from ongoing research projects and discuss issues encountered in applying the methods of health services research to problems in public health practice (Mays, Halverson, and Scutchfield 2003). At about the same time, CDC brought together a diverse collection of researchers and public health officials to develop the first national research agenda for public health services and systems (Lenaway et al. 2006). This broad-based agenda was later supplemented with research agendas devoted to public health workforce issues (Cioffi, Lichtveld, and Tilson 2004), public health finance and economics (Carande-Kulis, Getzen, and Thacker 2007), public health preparedness (IOM 2008), and rural public health practice (Meit 2007).

Efforts are also underway to expand the limited funding available for studies of public health services and delivery systems—a fact that has long constrained the development of this field of inquiry. The CDC's Public Health Practice Program Office periodically secured modest funding levels for this type of research during the 1990s and early 2000s, but a stable and ongoing source of support did not exist at CDC, and the demise of this office during CDC's 2004 reorganization placed continued federal funding in question. In 2005, the Robert Wood Johnson Foundation made a significant commitment to this field of research by establishing a competitive research grant program in public health services and systems research, administered through its Changes in Health Care Financing and Organization (HCFO) program housed at AcademyHealth. The Foundation committed \$10 million in research funding over a 3-year period to this effort. Additionally, the Foundation partnered with the University of Kentucky to launch a mini-grant program offering small research awards to fund dissertation research and pilot studies by junior researchers. More recently, the foundation has made additional funding available for targeted research studies in public health involving practice-based research networks, public health policy and law, and quality improvement research. At the same time, the federal government has stepped up investments in this area of research through the creation of a network of university-based centers for public health systems research related to emergency preparedness (IOM 2008).

Those efforts are beginning to bear fruit, as is evidenced by this supplement. Papers herein address a range of issues. For example, understanding that it is challenging to aggregate findings across studies that are conducted differently, Merrill, Keeling, and Gebbie (2009) offer a starting point with an empirically derived taxonomy for the essential work of public health departments. This should support the use of common variable definitions in studies that use public health system structural measures as variables. Wholey, Gregg, and Moscovice (2009) attempt to examine aspects of the structure of public health systems, proposing, as have others, that social network analysis can be used to characterize the ways health departments partner with others in their work. Approaching the field from a systems perspective, Riley et al. (2009) report on their experience with introducing quality improvement techniques to public health departments in Minnesota. Their work complements recent work by Lotstein et al. by suggesting that the quality improvement approaches can lead to enhanced system performance. At the same time, Riley and Lotstein use different approaches to introducing these skills to health departments, raising a typical HSR question—whether different processes lead to different outcomes. Finally, two papers address the critical issue of how public health is financed. Understanding that taxpayers must get value for their investments in public health, Jacobson and Neumann (2009) offer a framework with which to consider the valuation of public health services. And, looking at financing from a variations perspective, Mays and Smith (2009) demonstrate that regional medical care expenditures are inversely related to public health expenditures. In other words, communities with the highest per capita health care expenditures have the lowest public health expenditures, and vice versa. Each of these papers, in turn, raises additional questions about how public health services should be organized and financed, and at least indirectly, raises the critical issue of how to better integrate and align our medical care and public health systems.

While some of these papers make use of available national data, important efforts are underway to build and enhance core data resources that reflect key elements of the public health delivery system. While national data sources exist to support the study of hospitals, physicians, health insurers, and other elements of the medical care system, similar data sources do not exist for studying the organizations and workforce involved in delivering public health services. To begin to address this issue, the Robert Wood Johnson Foundation recently funded three national public health associations to collect longitudinal data through periodic surveys of the nation's local public health agencies, state health agencies, and local boards of health. These new data

sources will extend and expand upon the survey data collected in the past by NACCHO. At the same time, the University of Kentucky has begun an effort with foundation support to “harmonize” the data being collected through these surveys, thereby ensuring that comparable data on organization, staffing, financing, and service delivery are collected at multiple levels of the public health system. Additionally, the University of Kentucky has worked together with the National Library of Medicine to develop a searchable database of publicly available data sources to assist researchers in identifying data for use in public health services and systems research (NICHSR 2009).

## ENHANCING TRANSLATION AND IMPACT

The field of public health services and systems research has the potential to fill an important gap in the nation’s efforts to translate and apply biomedical and behavioral research to solve human health problems. Translational research has become a touchstone of the National Institutes of Health and other federal research agencies as they attempt to realize greater health impact from the nation’s investments in scientific research. However, current initiatives to strengthen translation have focused primarily on “bench to bedside” issues of moving findings from research settings into routine patient care settings like hospitals and physician practices, with relatively little emphasis given to the need to engage community settings and public health settings in these processes of knowledge transfer. Public health agencies are becoming increasingly important links in the chain of research translation, particularly for the growing body of biomedical and behavioral discoveries involving disease prevention and health promotion. As such, the field of public health services and systems research is ideally positioned to produce studies that can shed light on how best to incorporate new biomedical and behavioral discoveries into routine public health practice.

The current policy discourse around health reform increasingly reflects the need for greater emphasis on prevention as part of the pathway toward a higher-performing health system. This objective will require more and better information about how to deliver effective prevention strategies to the populations that can benefit most from them. Although it is still early in its development, the field of public health services and systems research promises to contribute this type of evidence. As this field produces more and stronger evidence, policy makers and practitioners increasingly will look to these studies for guidance in making decisions that protect and promote health at the

population level. The result, we hope, will allow the public health system to move in tandem with the medical care system toward greater impact, value, equity, and accountability.

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