



Systems for Action

Systems and Services Research to Build a Culture of Health



PHSSR Evidence Synthesis

2009-2015

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Foundational Work in Public Health Services & Systems Research

The Robert Wood Johnson Foundation's work in the field of *public health services and systems research (PHSSR)* has supported more than 140 individual studies over the past five years on these topics, applying the methods and frameworks of health services research to the public health system. Many of these studies are designed and implemented through a national cohort of Public Health Practice-Based Research Networks (PBRNs), which collectively engage more than 2,000 state and local public health organizations and more than 50 university research centers across 32 states in collaborative, practice-based research studies.

Collectively, this body of research documents wide variation in the availability and quality of core public health services and cross-cutting public health infrastructure across the United States. Communities that are underserved by public health services include people who reside in low-income, rural, and selected inner-city public health jurisdictions, and communities with larger proportions of residents from racial and ethnic minority groups. Governance structures and inter-organizational relationships within public health delivery systems play powerful roles in shaping the availability and quality of public health services. A growing body of evidence indicates that when communities make larger investments in public health services, they experience tangible health and economic gains from these investments over time, including lower rates of preventable deaths and slower growth in per-capita medical care spending.

For More Information

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Public Health Services and Systems Research

Evidence Synthesis 2009-2015

This synthesis of Public Health Services and Systems Research published from 2009 to 2015 was prepared as a background paper for discussions of the *Systems for Action* Technical Advisory Committee.

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INTRODUCTION

Public health services and systems research (PHSSR) is a multidisciplinary field of study that examines the organization, financing, delivery, and quality of public health services within communities. The [National Coordinating Center for PHSSR](#) (hereafter, the “NCC”), with funding from the [Robert Wood Johnson Foundation](#) (RWJF) since 2004, works to expand the production and application of scientific evidence that can maximize population health impact, cost-effectiveness, and health equity.

Overall, the NCC has managed nearly 140 research projects that were awarded through competitive grants to either individual investigators or to [Public Health Practice-Based Research Networks](#) (hereafter, “PBRNs”). Public health PBRNs in more than 30 states bring together more than 1,900 state and local public health agencies with more than 50 academic institutions and some 60 community-based organizations to collaborate in the design, implementation, and translation of PHSSR studies.

Studies conducted by NCC grantees have examined research questions on the organization, financing, and delivery of public health services as well as both the growing and evolving use of information and technology, and the changing roles and composition of the public health workforce. Published in 2012, the [National Research Agenda for PHSSR](#) provided a guiding framework for PHSSR studies.

Public health delivery systems comprise governmental public health agencies and a constellation of other organizations in the public and private sectors that collectively support health improvement strategies. The NCC’s extramural grants have traditionally, although not exclusively, supported research focused on *governmental* public health (i.e., state and local health departments), although the NCC’s intramural research has focused on larger systems, while the extramural portfolio has expanded in recent years to incorporate additional sectors.

As RWJF pursues a new strategic vision focused on building a [Culture of Health](#), sound scientific evidence is needed to elucidate how to achieve this vision through a broader constellation of institutions, services, and delivery systems that shape health and well-being in American communities. Research is needed on how best to align the delivery and financing systems for *public health, medical care, and social services* to realize efficiencies in resource use and reduce inequities in population health. Key social systems and service delivery sectors that are integral to RWJF’s Culture of Health “Action Model” include: public health, medical care, education and training, housing, transportation, human services, economic development and finance, and criminal justice.

This overview highlights completed, in-progress, and recently initiated studies (by both extramural grantees and intramural NCC investigators) that best align with two focus areas in the Culture of Health initiative: [Bridging Health and Health Care](#) and [Cost, Quality, and Value](#). Several key studies are listed in this overview and cross-referenced to both the project numbers assigned in the [2015 Public Health Services and Systems Research Inventory](#) and the [PHSSR website](#), where information about additional studies also can be found.

BRIDGING HEALTH AND HEALTH CARE EXTRAMURAL RESEARCH

While public health and primary care sectors share common goals of improving health, a lack of coordination in their efforts may contribute to inefficiencies and poorer health outcomes at the population level. A March 2012, Institute of Medicine [report](#) identified forms of collaboration between public health departments and primary care providers in the context of health reform implementation and encouraged health care providers and public health agencies to renegotiate their roles and responsibilities for improving population health and promoting efficient use of resources. Shared strategic processes and systems such as coordinated community health assessment efforts and coordinated data systems may present opportunities for strengthening ties

among public health agencies, health care systems, and other community partners. Below we highlight studies in key topic areas.

Collaborative Partnerships

- A team of researchers from both primary care and public health PBRNs in Colorado, Minnesota, Washington, and Wisconsin is currently examining primary care and public health integration across local jurisdictions in those four states. Based on first-year findings of 40 key informant interviews, investigators concluded that the term *collaboration* was much preferred to the term *integration*, and they have identified frequently cited facilitators (e.g., previous working relationships, dedicated staff time) and barriers (e.g., poor communication, lack of resources, data sharing issues) to collaboration. This three-year study will measure the degree of variation in integration and will examine how it differs based on health topic (e.g., immunizations, mental health) and whether areas of greater integration have better health outcomes [2.22, Gyllstrom].
- Based on 17 key informant interviews of senior public health and health care leaders in Tennessee, investigators identified several strategies for better primary care and public health integration, as follows: focus on targeted issues with shared interest; develop a strong, neutral convening agency (e.g., a college of public health, population health institutes); involve payers and business partners; and train the workforce for interdisciplinary work [2.20, Carlton].
- Another ongoing study has developed a measurement tool and is beginning data collection to assess the level of primary care and public health collaboration in obesity and chronic disease prevention across the United States, specifically focusing on partnerships that have operated in conjunction with joint participation in Community Health Assessment (CHA) and Community Health Improvement Plan (CHIP) processes [2.23, Simoes/Stamatakis].
- A measurement tool developed and tested by the Wisconsin PBRN [2.41, WI PBRN] has been adapted by the Ohio PBRN, which is conducting a content analysis of CHA and CHIP documents from Ohio's local health departments (LHDs) and Community Health Needs Assessments (CHNA) documents from Ohio's hospitals. (Under the Affordable Care Act, nonprofit hospitals must conduct a CHNA with input from public health experts.) The study examines how LHDs use information from assessments and explore the extent and nature of collaborations with hospitals [2.25, OH PBRN].
- The New York PBRN is currently documenting the extent of collaboration between LHDs, hospitals, and other partners that worked collaboratively to assess the health of their community [2.24, NY PBRN].
- Other NCC studies have investigated local public health departments' involvement with local public school districts [2.16, Knight], identified models of collaboration within maternal child health organizations [2.17, Mulvihill; 2.27, Smith], assessed pediatric asthma partnerships [2.59, Sandel], and explored partnerships among community-based organizations and coalitions [2.16, CO PBRN; 2.21, Williams/Chandra].
- Several recently awarded studies will examine primary care and public health partnerships in various health topics: the delivery of childhood immunization services [3.38, Do-Reynoso], mental health services [2.26, Purtle], and HIV early detection and control [2.28, Porterfield].

Provision of Clinical Services by Public Health Agencies

- Rural areas in South Carolina were significantly more affected than urban areas when the state health department transitioned from *providing* direct Early Periodic Screening, Diagnosis, and Treatment Services for Medicaid eligible children to *assuring* the provision of these services [3.06, Hale].
- Over the past decade, South Carolina's state health department experienced notable reductions in its

capacity for providing reproductive health services delivered through family planning clinics. On average, women residing in counties with notable reductions in clinical capacity, with and without a clinic closing, tended to receive fewer annual visits over time and had a higher probability of sexually transmitted infections over time. However, the marginal effects were relatively small [3.04, Hale].

- Reductions in infant mortality were significantly associated with increased staffing and with the provision of prenatal and obstetric care in North Carolina local health departments [3.03, Schenck].
- The coordination of care in pregnancy significantly reduced the risk of preterm delivery among Medicaid-enrolled women [2.44, 3.02, NC PBRN].

Data coordination

- Through the development and evaluation of a *Public Health Information Technology (PHIT) Maturity Index*, integration is being investigated across multiple PHIT systems including electronic health records (EHRs), public health surveillance systems, and health information exchanges (HIEs) [4.21, Agarwal].
- To improve vaccine-preventable disease outbreaks, a study using Indiana's robust HIE network investigates an intervention designed to pre-populate the official communicable disease reporting form with patient demographics, lab results, and provider information available through EHRs [4.17, Dixon].
- An in-progress study is examining whether location data stored in EHRs may improve abilities to examine health disparities and develop public health interventions with community health measures, such as disease prevalence and health outcomes measures, at various geographic areas (e.g., zip code, neighborhood) that are smaller than the more generally available county-level measures [4.03, Dixon].
- An evaluation of an innovative EHR surveillance system in New York City translates patient data into population-level prevalence estimates that can monitor trends in population health outcomes to broadly inform public health programs and policies [4.04, McVeigh].

COST, QUALITY, AND VALUE EXTRAMURAL RESEARCH

Resource constraints in a shifting public health landscape create a growing need to fully understand the costs, effectiveness, and value of public health strategies and the delivery systems that support those strategies. Studies that estimate the health and economic impact of public health strategies can help answer the important question faced by administrators, policymakers, and other key decision-makers: *where can we best allocate resources?*

Topics of interest within this focus area include cross-jurisdictional sharing arrangements and quality improvement initiatives. Cross-jurisdictional sharing (CJS) is the deliberate exercise of governmental authority to enable collaboration across jurisdictional boundaries to support the implementation of public health strategies. Additionally, some local jurisdictions have consolidated with neighboring jurisdictions to improve the efficiency and delivery of specific public health services.

Quality improvement (QI) projects in public health involve the systematic evaluation and improvement of processes that can improve public health services and systems. Many health agencies are engaging in QI initiatives in preparation to seek accreditation from the Public Health Accreditation Board (PHAB). This voluntary accreditation program for state, local, tribal, and territorial governmental public health agencies was launched in September 2011 as a mechanism for establishing national achievement standards for health departments, and funders may soon prioritize the allocation of their dollars to PHAB-accredited health departments.

Studies completed by NCC grantees in this domain have produced findings such as:

- Using revenue and expenditure data from Wisconsin LHDs, the Wisconsin PBRN created a “forecasting strategy” for each revenue source and found that on a per capita basis, LHD revenues were forecasted to decline by 6.6 percent between 2012 and 2014 [3.09, WI PBRN].
- A study of the variation in the expenditures of California LHDs estimated that a \$10 per capita increase in public health expenditures would reduce all-cause mortality by 9.1 deaths per 100,000 [3.19, Brown].
- In an analysis of 102 LHD jurisdictions in Washington and Florida, LHD expenditures on maternal child health services had a beneficial relationship with county-level low birth weight rates, particularly in counties with high concentrations of poverty [3.23, Bekemeier].

QI and Public Health Accreditation Readiness

- To enhance the evidence base for QI in public health, the Minnesota PBRN developed standardized case definitions, common metrics, and a taxonomy describing public health QI projects. This PBRN also identified a set of 10 questions from a previously validated *QI Maturity Tool* and incorporated these into an annual reporting system, enabling stakeholders to monitor changes in Minnesota LHDs’ QI scores [2.46, 2.53, MN PBRN].
- The Nebraska PBRN also assessed QI activities in its LHDs in a coordinated approach with Minnesota to enable cross-state comparisons [2.54, NE PBRN]. The Nebraska PBRN expanded its QI work in a DACS study that estimated the costs of QI initiatives and in a collaborative DIRECTIVE study (with the Kansas and Colorado PBRNs) that assesses both QI and accreditation readiness [2.43, NE PBRN].

Cross-Jurisdictional Sharing and/or Consolidation of Public Health Agencies

- After collecting public health service and cost data from all 67 Florida local health districts for 2008 and 2010, investigators built models of operating efficiencies for five core public health activities (communicable disease surveillance, chronic disease prevention, food hygiene, on-site sewer treatment, and vital records). The analysis showed that *economies of scale*, (i.e., the cost per unit decreases as more units are produced) were found in most activities, suggesting that consolidating or regionalization might lower the unit cost for select public health activities [3.15, Singh].
- The Ohio PBRN completed an analysis of the full consolidation, or merging, of 20 Ohio LHDs. Findings indicated that health departments sought to save money (82%) and improve services (65%) through consolidation, and that overall city government factors such as budget deficits and the structure of the city leadership are influential in promoting consolidations. Analyses of Annual Financial Reports indicated that consolidation was associated with a significant reduction in per capita total expenditures (18%) and that consolidation did not lead to increases in the tax burden for public health services on the county jurisdictions [3.16, OH PBRN].
- An ongoing study examines the characteristics and performance of CJS arrangements created by local and tribal health departments (LTHDs) in Wisconsin. Preliminary findings of data extraction from 85 unique CJS arrangements indicate that the most common types of CJS were among service provision and staffing, and the most common programmatic area with CJS arrangements was in public health preparedness [2.10, Zahner]. A related survey conducted in 2012 found that 71 percent of Wisconsin LTHDs shared services with other health departments and that more frequent CJS arrangements were present in programmatic areas than in departmental operations [2.07, WI PBRN].

Cost, Quality, and Value Research in Public Health Practice-Based Research Networks

A large portion of the *Cost, Quality, and Value* work has been conducted through three major awards granted to public health PBRNs: the Multi-Network Practice and Outcome Variation Studies (MPROVE), the Public Health Delivery and Cost Studies (DACs), and the Dissemination and Implementation Research in

Public Health Settings Studies (DIRECTIVE).

Multi-Network Practice and Outcome Variation Studies (MPROVE)

MPROVE was launched in 2012 to produce a measurement and analytic foundation for investigating the causes and consequences of practice variation in local public health settings. With coordination from the NCC, six PBRNs ([Colorado \[2.36\]](#), [Florida \[4.07\]](#), [Minnesota \[2.35\]](#), [New Jersey \[4.08\]](#), [Tennessee \[2.33\]](#), and [Washington \[2.34\]](#)) worked collaboratively to establish a standardized set of local public health service delivery measures.

The measures characterized the volume, intensity, quality, efficiency, and equity of public health service delivery in three core domains: 1) chronic disease prevention, 2) communicable disease control, and 3) environmental health protection. The final set of 32 measures documented activities and services conducted by both governmental public health agencies (e.g., “Was your LHD involved in an initiative to increase access to healthy foods in the community in the past 12 months?”) and by other community partners (e.g., “Which of the following community-wide physical activity interventions have been underway within your jurisdiction during the past 12 months?”). Once collected across more than 300 local practice settings among these six states, these measures profiled the wide geographic variation in the delivery of selected public health services across local communities.

The [Public Health Activities and Services Tracking \(PHAST\)](#) collaborative, led by Betty Bekemeier, PhD, of the University of Washington, is currently refining the MPROVE measures in consultation with public health practitioners, content experts, and public health systems researchers. The revised measures will serve as the template for a nationwide system for standardized reporting of public health activities and services and ideally will be integrated into existing statewide data collection mechanisms.

Public Health Delivery and Cost Studies (DACS)

In 2013, DACS provided funding for public health PBRNs in 11 states to estimate the costs of delivering high-value public health services and to identify public health system characteristics that generate cost variation across practice settings and communities. The NCC worked with investigators to standardize the measurement and analytic methods used across projects and provided technical and scientific assistance to the projects.

The DACS studies ranged from estimating the cost of delivering core/foundational public health services in [Colorado \[3.25\]](#), [Ohio \[3.33\]](#), and [Washington \[3.34\]](#) to measuring the cost of implementing QI initiatives in selected [Nebraska \[3.28\]](#) local health departments. More importantly, the studies provided the opportunity to develop and apply various cost-estimation methodologies in practice settings while generating novel empirical results that contribute to better-informed policy and decision-making.

Some of the notable preliminary findings include a longitudinal analysis of environmental service inspections by 74 [Connecticut \[3.26\]](#) local health districts from 2005-2012 that suggest efficiency gains from decreasing the number of inspections. Novel findings were also generated from an economic evaluation of HIV/STD partner services (PS) strategies implemented by New York state and local public health agencies. The [New York \[3.31\]](#) DACS project utilized validated quality measures to determine the cost-effectiveness of PS strategies to help identify areas where newer strategic approaches could be more cost-effective than existing models, leading to better prioritization of staffing resources, increased efficiency in PS program delivery, and a return on investment through the reduced transmission of HIV/STDs.

Dissemination and Implementation Research in Public Health Settings Studies (DIRECTIVE)

Four consortia of two or more public health PBRNs received 24-month DIRECTIVE awards in 2014. Building directly upon MPROVE and DACS measures and methods, these studies will examine the types of resources, infrastructures, partnerships, and inter-organizational coordination that best facilitate the

implementation of evidence-based prevention programs and services by public health agencies and their community partners. Investigators will assess both the quality and the costs associated with alternative strategies for delivering public health services, in order to draw conclusions about their comparative effectiveness and value.

- The [California and Alabama PBRNs \[3.39\]](#) seek to identify best approaches for implementing sexually transmitted disease (STD) prevention, screening, and treatment services across public health agencies and their community partners. The PBRNs will investigate how the organizational and financial arrangements of STD services influence the reach, effectiveness, and treatments costs of evidence-based STD interventions.
- The [Colorado, Nebraska, and Kansas PBRNs \[3.40\]](#) are examining how state and other system-level dissemination and implementation initiatives and investments affect LHD implementation of QI projects, as well as LHD readiness to seek nationally recognized voluntary accreditation. The PBRNs will assess how local context and network connections among LHDs and state-level partners impact QI and accreditation readiness at the local level.
- The [Connecticut and Massachusetts PBRNs \[3.41\]](#) are assessing the impact of cross-jurisdictional service sharing arrangements on the implementation of evidence-based food inspections, enteric disease investigations, and obesity prevention services. They will also investigate political influence on the implementation of these services.
- The [Washington, Wisconsin, New York, and Oregon PBRNs \[3.42\]](#) are examining how cross-jurisdictional sharing of staff, money, and other resources influences the quality and cost of LHD service delivery, focusing on immunizations, sexually transmitted infections, and enteric disease. The study will identify sharing-related factors that promote and inhibit the efficient provision of evidence-based practice.

INTRAMURAL RESEARCH CONDUCTED BY THE NATIONAL COORDINATING CENTER

Foundational Public Health Services

The Institute of Medicine's 2012 [report](#) on public health financing called for the convening of expert panels to identify the components of a “minimum package” of public health services and cross-cutting capabilities that should be available in every U.S. community to protect and improve population health, and to identify the resources required to make these services universally available across the country. With support from the RWJF, an expert panel developed an initial set of definitions for [Foundational Public Health Services \(FPHS\)](#), informed by state-level definitions developed in Washington, Ohio, and Colorado. The NCC used an expert panel process to develop a methodology for estimating the costs required to implement the FPHS at national, state, and local levels.

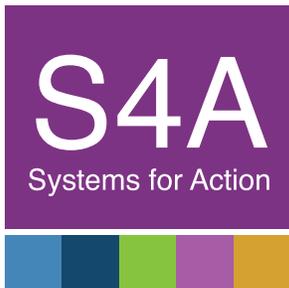
The resulting [FPHS Cost Estimation Methodology](#) uses a self-administered survey instrument to capture information from state and local public health agency administrators about the labor and non-labor resources currently used by their agencies to implement activities specified in the FPHS definitions. The survey was pilot-tested with public health agencies in Kentucky, and is now being fielded with a national sample of state and local public health agencies to generate national estimates of cost and resource requirements.

National Longitudinal Survey of Public Health Systems (NLSPHS)

The [NLSPHS survey](#), fielded and maintained by the NCC, follows a nationally-representative selection of 350 U.S. communities to analyze the scope of public health activities provided in each community, the range of organizations involved in performing each activity, and the perceived effectiveness of each activity as assessed by the local health officer.

Originally fielded in 1998 with CDC funding, the survey was re-administered with RWJF support in 2006 and 2012. The survey is currently in the field (December 2014-March 2015), collecting data on the standard cohort of 250 metropolitan communities that have been followed longitudinally since 1998 but also including a supplementary sample of small and rural nonmetropolitan communities that were last surveyed in 2006.

An analysis of previous waves of the survey found that local public health activities fell by nearly 5 percent in the average community between 2006 and 2012, with public health delivery falling most sharply among communities experiencing the largest increases in unemployment and the largest reductions in governmental public health spending [Mays, 2015]. The 2014 survey will allow investigations of the differences in public health delivery between rural and urban settings, Medicaid expansion states and non-expansion states, and communities that do and do not receive funding from key Affordable Care Act programs.



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