LEADERSHIP IN PUBLIC HEALTH

UIC

Volume 9, Number 1:
Summer/Fall 2011

At Issue:

Practice-Based Research Networks In Public Health

UIC UNIVERSITY OF ILLINOIS AT CHICAGO MidAmerica Center for Public Health Practice
SCHOOL OF PUBLIC HEALTH

Leadership in Public Health
is a publication of the
MidAmerica Public Health Training Center*
and the
MidAmerica Regional Public Health Leadership Institute*

**Located at the University of Illinois at Chicago School of Public Health, Division of Community Health Sciences, MidAmerica Center for Public Health Practice*

1603 West Taylor Street
Chicago, Illinois 60612
www.midamericacphp.com

This publication was made possible by a grant from the U.S. Department of Health and Human Services (DHHS), Health Resources and Services Administration (HRSA), Public Health Training Centers Program. Its contents are solely the responsibility of the authors and do not necessarily represent the official view of HRSA.

UIC UNIVERSITY OF ILLINOIS AT CHICAGO MidAmerica Center for Public Health Practice SCHOOL OF PUBLIC HEALTH

Leading Improvement Through Inquiry: Practice-Based Research Networks in Public Health

Glen P. Mays, MPH, PhD, University of Kentucky, College of Public Health

The field of public health has surged in public visibility and attention in recent years due to its potential to mitigate leading risks to human health and wellbeing. Advances in prevention research provide an expanding toolbox of programs, policies, and interventions to reduce health risks attributable to persistent and emerging infectious diseases, advancing chronic diseases, and environmental health hazards that threaten the safety of food, water, and air.[1] As these advances occur, uncertainties loom large regarding how best to deliver efficacious public health strategies to the populations at greatest risk. The nation's local, state, and federal public health agencies—together with their peers and partners in the private and public sectors—represent a vast yet diffuse delivery system of actors charged, to greater or lesser degrees, with implementing these strategies.[2] Unfortunately, evidence about the most effective and efficient ways of organizing, financing, and deploying public health strategies across this delivery system is extremely limited.[3]

The science of public health practice remains relatively under-developed. Public health leaders have few research-tested guidelines, protocols, and decision aides to inform their choices regarding how to fund, staff, and manage public health activities.[4] Similarly, policy leaders have relatively little empirical guidance on how to exercise taxing, spending, and regulatory authorities most effectively in public health.[5] This dearth of evidence promotes wide variation in public health practices across communities, raising the possibility of harmful, wasteful, and inequitable differences in practice.

The Need for Practice-Based Research

Without clear evidence on effective delivery system strategies, leaders must rely on creativity and innovation in developing responses to public health problems. Innovations in public health practice create compelling opportunities for learning through structured observations and comparisons of both successes and failures. The ability to learn from innovation, however, is blunted without the capacity for mounting rigorous research designs, standardized measurement and data collection protocols, and robust analytic methodologies needed to tease out cause-and-effect relationships.[6] Optimal learning requires an ability to compare innovations against routine practices so as to detect intended and unintended effects. Similarly, optimal learning from innovation requires an ability to objectively measure implementation processes so as to support strong inferences about mechanisms of effect—to determine why an innovation does or does not work as intended. Such learning requires a unique convergence of leadership and scientific inquiry. Innovation without inquiry represents a missed opportunity for learning in public health practice.

Mounting rigorous, comparative studies of public health practices is complicated by the extreme heterogeneity in public health needs, risks, and structures that exists across communities. The "best" way to deliver public health strategies is likely to depend at least in part on institutional, political, economic, legal, social, and environmental contexts surrounding the implementation processes.[7] Producing a context-relevant evidence base for public health practice requires the ability to support comparative scientific inquiry in a variety of real-world public health practice settings. Ideally, this infrastructure for scientific inquiry should be operational before innovations in practice and policy occur, so as to maximize opportunities for learning from change.

Practice-Based Research Networks in Public Health

Practice-based Research Networks (PBRNs) have been used successfully in medical research and health services research for several decades to study clinical innovations and test quality improvement strategies in community-based medical practice settings.[8,9] These networks provide durable structures through which practicing clinicians and researchers collaborate to identify important research questions relevant to practice and to design and conduct comparative studies in real-world clinical practice settings.[10] Applying the PBRN model to public health practice settings represents a promising strategy for promoting scientific inquiry in public health practice. A Public Health PBRN brings multiple public health agencies together with research partners to design and implement comparative studies of alternatives for organizing, financing, and delivering public health strategies intended to prevent disease and injury and promote health. Participating practitioners and researchers collaborate to identify pressing research questions of interest, design rigorous and relevant studies, execute research effectively, and translate findings rapidly into practice (Figure 1). As such, PBRNs represent vehicles for expanding the volume and quality of practice-based research needed for evidence-based decision-making in public health. In keeping with concepts of participatory research, the findings produced through PBRNs are expected to be readily translated and adopted into routine public health decision-making because practitioners are actively involved throughout the research process.

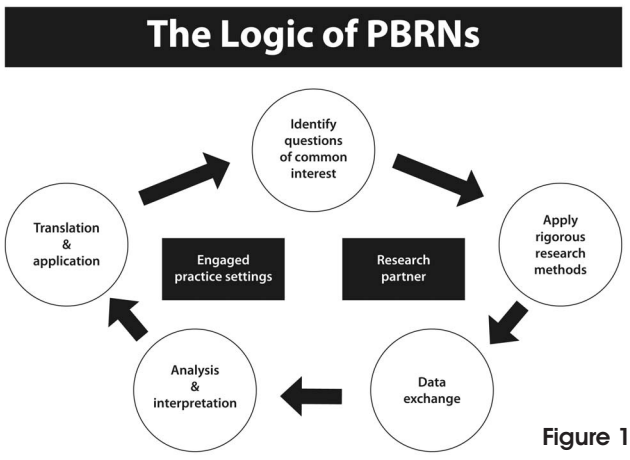


Figure 1

The Robert Wood Johnson Foundation's Public Health PBRN Program is the first national initiative in the U.S. to develop PBRNs for research in public health practice settings. Launched in 2008, the Public Health PBRN Program currently supports 12 research networks comprised of local and state governmental public health agencies, community partners, and collaborating academic research institutions. These networks are located in Colorado, Connecticut, Florida, Kentucky, Massachusetts, Minnesota, Nebraska, New York, North Carolina, Ohio, Washington, and Wisconsin (Figure 2). In addition to the 12 supported research networks, other Public Health PBRNs participate in the program as affiliate members and emerging networks under development.

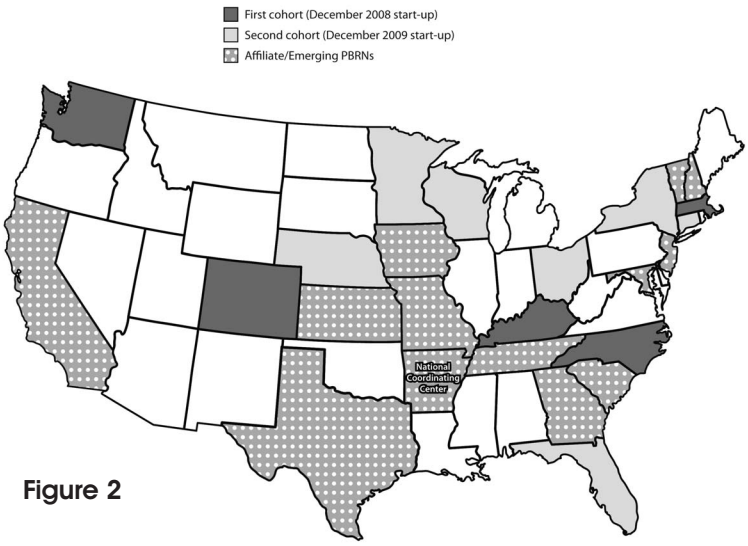


Figure 2

The National Coordinating Center for the Public Health PBRN Program, based at the University of Arkansas for Medical Sciences, provides resources and technical assistance to the networks for developing and operating research projects. The Coordinating Center also organizes cross-cutting and multi-network research studies designed to evaluate and compare public health strategies implemented across diverse practice settings.

Types of Public Health PBRN Research

Public Health PBRNs typically begin their operations with a small-scale, descriptive research project that allows participants to test their mechanisms of collaborative inquiry and gain proof of concept. After the first year of participation in the program, networks can progress to larger-scale research projects supported by Research Implementation Awards (RIAs), and networks can pursue short-term, time-sensitive research opportunities supported by Quick Strike Research Funds (QSRFs). Alongside these Foundation-supported research projects, networks and their partners pursue research funding from myriad federal, state, and nongovernmental sources for health services research and public health research support.

The range of public health practice studies that can be conducted through Public Health PBRNs is wide, including:

- Comparative case studies designed to identify problems and/or innovations in how public health activities are currently implemented in different practice settings.
- Large-scale observational studies designed to evaluate practice variation across local and/or state public health settings in order to identify opportunities for reducing unnecessary, inefficient, or harmful variation.
- Intervention studies and community trials designed to test the effectiveness and cost-effectiveness of new public health programs. Such studies may also test the effectiveness of quality improvement initiatives directed at existing programs.
- Policy evaluations and natural experiments designed to monitor the effects of key policy and administrative changes made at local and/or state levels, such as changes in laws and regulations, shifts in funding or staffing levels, and organizational restructuring such as service consolidation, regionalization or decentralization strategies.

These types of studies afford the ability to measure public health activities and outcomes in real-world practice settings, and to make valid comparisons across such settings and over time.

Current research projects underway within the Public Health PBRNs address a wide range of topics and delivery system issues. In the most general sense, all of these projects focus on elucidating the causes and/or consequences of variation in how public health services are organized, financed, or delivered across communities. As such, the projects are designed to produce findings that elucidate pathways for reducing unwarranted variation and thereby improving the effectiveness, efficiency, and/or equity of public health practice. Specific issues under investigation by PBRN research projects include:

- Variation in staffing levels across local public health agencies and their influence on delivery of essential public health services
- Variation in the implementation and impact of regionalized public health delivery models
- Variation in local health department approaches to communicable disease reporting, and its impact on disease control efforts
- Impact of a comprehensive state public health reform laws on the organization and delivery of public health services
- Causes and consequences of variation in the local public health response to H1N1 influenza
- Impact of funding reductions on the delivery of evidence-based public health programs and services
- Effectiveness of quality improvement strategies for chronic disease prevention delivered through local public health agencies
- Influence of public health agencies on the adoption of evidence-based obesity prevention strategies by local community coalitions.

Leadership Issues and Implications in Public Health PBRNs

Although still early in their developmental history, Public Health PBRNs are discovering myriad leadership opportunities and challenges associated with supporting innovation, scientific inquiry, and learning in public health practice. Productive communication and collaboration within a PBRN is sometimes challenged by the different institutional cultures and incentives that predominate within research and practice settings, and thus requires leaders who can serve as boundary-spanners and translators across the network. Cultivating a shared culture of inquiry that transcends individual institutional interests appears critical to network engagement. Clear and balanced decision-making structures help PBRNs identify shared research priorities and develop research protocols that reinforce collaboration and collective action. Yet even with these structures in place, network leaders often experience difficulties in striking the right balance among the competing objectives of scientific rigor, direct relevance to practice, operational feasibility, policy salience, and potential for extramural funding. No single study can satisfy all interests simultaneously, leading networks to pursue sequential and staged approaches to research based on the goal of small and progressive successes. As networks accumulate more and larger studies, leaders must pay careful attention to the participation incentives and constraints faced by the multiple practice-based and research-based participants.

The papers included in this issue describe the organization, developmental history, and early experiences of the initial cohort of five Public Health PBRNs that began their work in December 2008. Collectively, these five networks show considerable diversity in organizational structure, size, composition, and research interests. Washington's network is led by a local health department, while the networks in Colorado and Kentucky are coordinated through public health professional associations, and in Massachusetts and North Carolina the networks are organized through public health practice centers based at universities. These different approaches to PBRN structure and operations reflect at least in part the different contexts and capacities for public health practice and research that exist in each state. Moreover, these structures appear to give rise to some notable differences in leadership dynamics that networks must navigate. Although their structure and operation varies, the Public Health PBRNs seek to produce consistently rigorous and relevant research that is both reliable and actionable for the field of public health. The early collective experiences of these networks suggest that the PBRN model offers considerable value as a vehicle for promoting learning and improvement through scientific inquiry in public health practice.

References

1. U.S. Centers for Disease Control and Prevention (CDC). *The Guide to Community Preventive Services.* Atlanta, GA: CDC. Retrieved from http://www.thecommunityguide.org/index.html
2. Mays GP, Scutchfield FD, Bhandari MW, Smith SA. Understanding the organization of public health delivery systems: an empirical typology. Milbank Quarterly. 2010;88(1):81-111.
3. Mays GP, Smith SA, Ingram RC, Racster LJ, Lamberth CD, Lovely ES. Public health delivery systems: evidence, uncertainty, and emerging research needs. American Journal of Preventive Medicine. 2009;36(3):256-65.
4. Institute of Medicine, National Academy of Sciences. The Future of Public Health in the 21st Century. Washington, DC: National Academies Press; 2002.
5. Burris S, Wagenaar AC, Swanson J, Ibrahim JK, Wood J, Mello MM. Making the case for laws that improve health: a framework for public health law research. Milbank Quarterly. 2010;88(2):169-210.
6. Kottke TE, Solberg LI, Nelson AF, Belcher DW, Caplan W, Green LW, Lydick E, Magid DJ, Rolnick SJ, Woolf SH. Optimizing practice through research: a new perspective to solve an old problem. Annals of Family Medicine. 2008;6(5):459-62.
7. Green LW, Ottoson JM, García C, Hiatt RA. Diffusion theory and knowledge dissemination, utilization, and integration in public health. Annual Review of Public Health. 2009;30:151-74.
8. Thomas P, Griffiths F, Kai J, O'Dwyer A. Networks for research in primary health care. British Medical Journal. 2001;322:588-590.
9. Mold JW, Peterson KA. Primary care practice-based research networks: working at the interface between research and quality improvement. Annals of Family Medicine. 2005; 3(Suppl 1): S12S20.
10. Fraser I, Lanier D, Hellinger F, Eisenberg JM. Putting practice into research. Health Services Research. 2002; 37: 114.

Author information: The author is the F. Douglas Scutchfield Endowed Professor in Health Services and Systems Research at the University of Kentucky, College of Public Health. He directs the Public Health Practice-Based Research Networks Program funded by the Robert Wood Johnson Foundation, which brings together public health agencies and researchers from around the nation to study innovations in public health practice

Acknowledgement: Support for this research was provided by the Robert Wood Johnson Foundation's Public Health Practice-Based Research Networks Program (award no. 64676). Dr Mays also was supported through a Clinical and Translational Science Award from the National Center for Research Resources (award no. 1UL1RR029884).

Massachusetts Public Health Practice-Based Research Network: Generating Evidence to Improve the Equitable Delivery of Public Health Services Across the Commonwealth

Justeen Hyde, PhD, Institute for Community Health
Harold Cox, MSW, Boston University
Geoffrey W. Wilkinson, MSW, Massachusetts Department of Public Health
Kathleen MacVarish, MPH, Boston University

Introduction

The Commonwealth of Massachusetts has a complex, decentralized public health system comprised of three major components: the state health department, state-contracted service providers, and 351 local health jurisdictions. Each city and town has its own board of health that is responsible for providing or assuring access to a comprehensive set of services defined by state law and regulation. Although it ranks 13th in the nation for population size and 44th in land area, Massachusetts has more local health departments (LHDs) than any other state in the United States. With the exception of federally funded emergency preparedness regions and a limited number of local health districts that serve less than 10% of the state's population, Massachusetts has no regional or county system for local public health. Local boards of health cooperate with the state health department but are legally separate from it. Unlike local health jurisdictions in most states, they do not receive direct state financial support for core operations. Faced with inadequate funding and mounting challenges, many of the state's health departments struggle to meet basic requirements for food safety, housing and sanitary code enforcement, and communicable disease response. Very few local jurisdictions have the capacity to address issues such as chronic disease, substance abuse, or health disparities.

Although unique in structure, Massachusetts' public health system faces many of the same challenges confronted by health departments in small and rural jurisdictions across the country. In Massachusetts and elsewhere, regional cooperation — either through consolidation or shared services — is seen as a viable strategy for improving the capacity of LHDs and boards of health to meet the increasingly complex challenges and expectations of the 21st century. However, the lack of a solid evidence base has hindered efforts to make infrastructure improvements or effectively assess their impact on service delivery or health outcomes. The Massachusetts Practice-Based Research Network (PBRN) formed out of this identified need. This article provides an overview of how the PBRN was formed and one of the early studies that was initiated to mobilize local public health leaders interested in regional cooperation for service delivery.

Formation of the Massachusetts Practice-Based Research Network

Apparent disparities in scope and quality of public health services for Massachusetts residents have been a longstanding concern, but public health advocates have been without the data and resources needed to assess and address the problem. Due to lack of state funding dedicated to mandated public health services on the local level, the infrastructure to reliably monitor service delivery, workforce competence or quality assurance processes is missing.

In 2005, the Massachusetts Coalition for Local Public Health, a public health advocacy group representing health boards, health officers, public health nurses, environmental health officials, and the state APHA affiliate commissioned a study to assess the state's public health infrastructure. The results were disturbing and confirmed what many public health advocates had been asserting for years. About 78% of reporting towns with populations of fewer than 5,000 residents had no fulltime public health staff, 58% had no health inspector and 90% had no public health nurse. For towns with populations between 5,000 and 10,000, staffing was not much better. Overall, 70% of the state's local health officials reported not having enough staff to consistently meet their obligations to the public.[1]

Building on previous grassroots activism by local public health professionals who cooperated across municipal boundaries to address post-9/11 anthrax threats, organize immunization clinics, and advocate for workplace smoking bans, an ad hoc group convened in 2004 to explore how regional structures could be used to improve local public health services. In two years, the group formalized into the Working Group for the Massachusetts Public Health Regionalization Project (hereafter called the Working Group). The Working Group grew from a small number of local practitioners and academics to include representatives from the state department of public health, local public health officials from cities and towns with varying populations and governing structures, legislators, and public health experts from the academic community. Approximately 25 public health professionals and advocates now comprise the Working Group.

With the goal of equitable delivery of high quality public health services for all local jurisdictions, the Working Group early on initiated a review of public health services and systems research to identify factors associated with effective performance.[2-6] Local and state health officials were asked for their opinions about the strengths and gaps in local public health systems and services. The Working Group concluded that regionalizing

local public health would make service delivery more equitable, efficient and cost-effective for local jurisdictions regardless of size. The Working Group developed a set of principles to guide the evolution of regionalization so that the existing legal authority of local boards of health was respected and home rule was assured. The Working Group embraced a voluntary, incentive-driven approach and explicitly rejected a one-size-fits-all plan. Instead, each community was allowed to craft its own model for regionalization, select its partners and decide how to share staff and services to best meet local needs.

In 2006-2007, the Working Group received financial and networking support from the National Association of County and City Health Officials (NACCHO) to catalyze regional planning efforts. The funding was critical for building momentum for a major change that historically had been met with resistance from elected officials as well as public health leaders. The funds enabled the group to solicit an expert review and modification of public health laws that could pose challenges to regional cooperation across communities to form and coordinate sub-groups to draft recommendations for the governance, funding, staffing, and size of regional entities, and organize meetings. Ultimately, the Working Group elicited feedback on its initial recommendations from leaders of 22 public health organizations across the state.

Throughout the planning process, research questions emerged about regionalization. Some communities wanted evidence to support the contention that working in partnership with multiple communities is effective, efficient, and results in improved health outcomes. Other communities wanted information to guide their planning and implementation as they moved towards regionalization.

The Working Group saw the Robert Wood Johnson Foundation (RWJF) Public Health PBRN program as an opportunity to begin collecting answers to the questions that were emerging from its members and community stakeholders across the state. The initial award in 2008 provided start-up funds for the Massachusetts PBRN, supported a small research project, facilitated networking with other PBRNs, and has come with technical assistance from nationally recognized experts in public health services and systems research.

Initial membership of Massachusetts PBRN consisted of Working Group members, with a representative subset selected to serve on a research steering committee. The committee takes a leadership role in identifying and refining research ideas that come from the Working Group and its constituents. In order to launch its first project (see below), the PBRN met monthly during its first year, but now meets every other month.

Catalyzing Regional Leaders

The Foundation grant came at a time of no state support for the exploration or establishment of regional public health service delivery. Rather, local health services in Massachusetts were being cut or reorganized as various municipalities absorbed the twin impacts of the national recession and the ensuing state budget crisis. Public health fared worse to some degree than public safety and other areas of municipal government as local administrators struggled to define and preserve core services. In view of that, the PBRN decided to craft its initial research study so that it would yield data that would be useful as health officials moved forward with systems change.

The aim of the initial study, which was evaluative in nature, was to gather information from communities interested in regionalization that could help answer the following questions:

1. What information do local communities need in order to make decisions about reorganizing the provision of public health services?;
2. What are the recommended steps for moving from a local to a regional service delivery model?;
3. How does the PBRN raise support among local governing bodies and public health service providers for embracing the complement of services that aligns with national standards for local public health?; and,
4. How does a local community decide which regional public health model is the best fit?

The PBRN decided to offer $3,000 grants to up to three groups of communities that were interested in regional planning. Using recommendations put forth by the Working Group,[7] the PBRN developed a competitive proposal application. Eligibility criteria for groups of communities interested in applying for a grant were: 1) a service area of a population of 50,000 or more or at least 150 square miles; and, 2) obtaining signatures from local officials as an indication of their interest and commitment to exploring regional cooperation.

The grant recipients would be asked to undertake a year-long planning process, which would involve five to six meetings with community stakeholders and public health leaders to identify collective strengths and weaknesses, funding sources and governance structures, and to assess baseline performance using a nationally recognized assessment instrument (e.g., National Public Health Performance Standards, Operational Definition of a Functional Local Health Department, Public Health Accreditation Board Standards). Recipients also would be required to participate in an evaluation of their planning process.

The PBRN received proposals from five groups of communities that are all situated in the central or western part of the state where municipalities tend to be smaller and have a history of working together to provide basic public health services. Two groups of communities were deemed ineligible because they did not meet the population requirement or did not have the support of elected officials. In December of 2009, funding was granted to three groups covering a total of 20 communities, all in western Massachusetts.

As of December 2010, the three groups had been working for approximately 10 months. The following overview summarizes their progress up to that time.

Group One

Group One includes four communities that collectively serve a population of 54,000 in a 154,000 square-mile area. Three of the communities already worked together as members of a regional public health district. The group's goal was to assess the feasibility of expanding the district to include at least one larger community and potentially several smaller ones. Their planning process began with self-assessment using a survey from the Public Health Accreditation Board. The survey is based on the 10 Essential Public Health Services framework and is comprised of 11 domains, including administrative capacity and governance.

The group encountered unexpected delays. Survey implementation and data analysis took longer than anticipated, and ultimately the group concluded that the survey did not yield the kind of information

perceived as practical at the local level and essential for planning the initial steps towards regionalization. Although the information was informative, the instrument measures key capacities rather than service delivery, funding, staffing, and other resources that are important for the day-to-day operation of a local health department. The group decided to gather additional data on services, revenue and expenditures, staffing patterns, and community health status and engaged a regional planning agency to assist with the identification of surrounding communities that may be interested in joining a regional health district.

Group Two

Group Two is located in northwestern Massachusetts and is comprised of nine communities that collectively serve a population of 37,493 within a 219 square mile area. The goal of this group is to create a regional public health district. All but two of the communities in the group serve a population of less than 5,000 residents. Most public health services are provided by a combination of volunteer boards of health and public or private contractors. The group focused initially on building relationships with local public health leaders. For example, the first two planning meetings were dedicated to identifying commonalities in strengths and challenges across communities, identifying public health priorities, and creating a vision for public health service delivery. Between the second and third meetings, survey data was collected about service delivery, staffing patterns, operating budgets, and types of governance structures in local health departments. Some health status data for the region was also obtained. At its third meeting, the group used the data as a springboard for identifying strengths that could be mobilized to form a regional health district. While participants were energized by the prospect of a regional health system, they also were overwhelmed by thinking about how to move forward with regional planning. The group has struggled to find time to continue the conversation.

Group Three

Group Three is located in the southwestern part of the state, is made up of seven communities that serve a population of about 14,126 and cover a geographic area of 184 square miles. The group has a strong leader who works part time as a health agent for one of the communities and part time for a county board of health association. As Group 2, the communities in this group rely largely on volunteer boards of health or contract with public or private agencies to obtain services. Aware of the varying knowledge and understanding among participants, the Group 3 leader invested time at the first two meetings in explaining state mandates for public health service delivery, national public health performance expectations, and emerging public health threats. This process helped the group develop a common understanding that the Massachusetts public health system as it is currently organized cannot meet national standards. The third and fourth meetings resulted in agreements to start with small steps toward regional cooperation. The association of county boards of health agreed to dedicate a portion of its administrator's time to the project so that she could draft an inter-municipal agreement to facilitate formation of a regional council and its governance. At the end of 2010, the group was seeking signatures of elected officials on its newly crafted by-laws so that its work could move forward. Several of the communities also agreed to apply for a small grant that would allow shared food inspectors to receive additional training that would facilitate consistent inspectional service practices across communities.

Lessons Learned

The PBRN has learned a great deal from the communities who have taken a leadership role in planning for regional cooperation. Major infrastructure shifts require an incredible amount of work and are very difficult to initiate and sustain on a voluntary basis with limited or no funding or support. This may be particularly challenging in small rural communities, where voluntary municipal leaders often perform multiple roles. The group that has made the most progress to date has a leader with dedicated time and funding to move the initiative forward. As other groups begin to plan for regional cooperation, a primary recommendation will be that staff is in place to play a coordinating role. Such an individual is essential for translating ideas into concrete form and sustaining momentum for a long, and sometimes difficult, process.

We have observed that it is critical for communities that are considering regional development to begin with a common understanding of the roles and responsibilities of local agencies and a vision of the changes needed to create a high quality local public health system without gaps or inequities. We also have observed that it is important to begin the planning process with information that is concrete and relevant to the work of local public health practitioners, including public health data on services and activities, funding, and governance structures.

While members of the PBRN are committed to building the capacity of local public health systems to meet accreditation standards, national assessment instruments may not provide the kinds of information about strengths and gaps in services that community and county level participants find useful to initiate planning discussions.

Although many questions continue to circulate about the best strategy for regional planning, two are noteworthy here. First, many of the groups struggled with questions of when to involve the primary decision-makers for their communities in the planning process. Under Massachusetts law, municipal leaders from different communities may enter into inter-municipal agreements to share public health services without involving boards of health. Recent experience has shown that local administrators may become interested in regionalization as a cost-saving strategy or a way to resolve challenging personnel matters. Public health officials and advocates, on the other hand, see regionalization as a way of improving the scope and quality of services using limited available resources. They express concern about whether municipal officials understand or appreciate the value of public health. They seek to preserve and augment the public health workforce, rather than to reduce it or reassign health responsibilities to other municipal departments. From this perspective, bringing municipal officials into regionalization planning “too early” can carry a risk of losing control of the initiative and its potential to advance public health goals. Since municipal officials must be involved in regionalization decisions, however, bringing them in “too late” risks wasting time and losing opportunities for education and consensus building. Thus, there is a fine balance that must be struck between smart planning and gaining buy-in from decision-makers at the right time. The balance is likely context-dependent, but a strategy for achieving it has not been clearly identified.

Second, we have heard repeatedly from public health leaders involved in regional planning efforts that they need more specific information about regionalization in order to have productive discussions with local officials, including administrators, boards of selectmen, and town meeting members (who typically approve budgets). They need evidence about the purported benefits of regionalization, and they need standards to help

guide decision-making about what staffing is required to fulfill core local health responsibilities.

Ideally, the benefits of regional cooperation would include improved health status, efficiency in the delivery of services, and high performing public health agencies. However, there is little evidence yet at the state or national level to support the case that regional service delivery models yield better organizational and health outcomes, especially for local decision-makers in jurisdictions with very small population sizes. Such evidence would be helpful to local public health leaders who are currently advocating for systems-level changes.

Looking Ahead

The first project of the Massachusetts PBRN has resulted in useful information and lessons learned about the process of planning for regional cooperation. One of the products that will be developed is a guide for communities who are interested in planning for regional public health service delivery. The timing for such a document is fortunate, as the Massachusetts Department of Public Health recently received a five-year public health infrastructure grant award from the U.S. Centers for Disease Control and Prevention (CDC). A major component of the grant entails the use of funds to support planning, start-up, and operational support over several years as incentives for groups of municipalities to form public health districts. We anticipate that new communities will begin planning together and will benefit from the work of the three PBRN-funded sites.

The CDC-funded initiative is supported under federal health care reform. PBRN members hope that it will serve as a demonstration project to convince the Massachusetts legislature about the merits of public health regionalization. In 2009, the legislature formed a special advisory council, headed by the state lieutenant governor, to examine regionalization of various municipal services. The advisory council took note of the PBRN's work in progress and adopted recommendations of the public health regionalization Working Group. Our hope is that the economic recovery will continue, enabling policymakers to invest state resources in public health infrastructure improvement based on the lessons of the PBRN and the new, CDC-funded district incentive grant program.

A second initiative that has emerged from the initial PBRN project is a statewide public health systems study, which is supported by a Robert Wood Johnson Foundation Research Implementation Award. The study will help Massachusetts public health leaders better understand how the state's public health services are organized. Our hope is that this research will shed light on the effectiveness of public and private partnerships, regional cooperation, and other organizational structures of service delivery. A leading hypothesis is that jurisdictions that work together to provide public health services will demonstrate greater capacity for service delivery and performance on the 10 essential public health services.

Massachusetts' participation in the RWJF Public Health PBRN program has provided resources to build a research network of dedicated, multi-disciplinary and cross-regional public health professionals. This partnership between academic and practice-based public health leaders will play a critical role as we advocate for higher quality and more equitable public health services for the citizens of Massachusetts.

References

1. Hyde, J. and A. Tovar, Strengthening Public Health in Massachusetts: A Call to Action. Coalition for Local Public Health 2006: http://www.mphaweb.org/resources/strength_lph_6_06.pdf.
2. Handler, A.S. and B.J. Turnock, Local health department effectiveness in addressing the core functions of public health: essential ingredients. J Public Health Policy, 1996. 17(4): p. 460-83.
3. Kennedy, V.C., A study of local public health system performance in Texas. J Public Health Manag Pract, 2003. 9(3): p. 183-7.
4. Mays, G.P., P. Halverson, and C.A. Miller, Assessing the performance of local public health systems: a survey of state health agency efforts. J Public Health Manag Pract, 1998. 4(4): p. 63-78.
5. Mays, G.P., et al., Institutional and economic determinants of public health system performance. Am J Public Health, 2006. 96(3): p. 523-31.
6. Scutchfield, F.D., et al., Local public health agency capacity and its relationship to public health system performance. J Public Health Manag Pract, 2004. 10(3): p. 204-15.
7. Regionalization, M.W.G.o. Massachusetts Public Health Regionalization Project: Status Report. 2009; Available from: http://www.ct.gov/dph/lib/dph/government_relations/local_health_council/ma_regionalization_status_report_9-1-09.pdf

North Carolina's Public Health Practice-Based Research Network

Dorothy Cilenti, DrPH, North Carolina Institute for Public Health
Rosemary Summers, DrPH, Orange County Health Department
Edward L. Baker, MSc, MD, North Carolina Institute for Public Health
Brittan Wood, MPH, North Carolina Institute for Public Health
Lisa Macon Harrison, MPH, North Carolina Institute for Public Health

Overview

North Carolina's Public Health Practice-Based Research Network (NCPBRN) aims to address the needs of local public health staff by improving the capacity of the public health system to protect the health of the public. The NCPBRN was established in 2008 with funding from the Robert Wood Johnson Foundation and administrative support from the North Carolina Institute for Public Health (NCIPH). The NCIPH is the service and outreach arm of the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill. NCIPH, with the UNC Gillings School of Global Public Health, were the initial partners for the NCPBRN that have a proven track record in participatory and translational research. Currently, NCIPH and the UNC Gillings School of Global Public Health are working to expand the number and kinds of community collaborations they engage for studies of this type. Relationships are well established across local health department directors, public health staff, and the NCIPH via the North Carolina Public Health Incubator Collaboratives and the NCPBRN.

The North Carolina Public Health Incubator Collaboratives (NC Incubator Collaboratives) is a program comprised of voluntary collaborations across the state led by local health directors who work in regional incubator groups to address public health priorities for local communities. The purpose of the NC Incubator Collaboratives is to build and sustain regional partnerships to improve public health practice. Over the past five years the NC Incubator Collaboratives has developed into an active engine of innovation for public health that works to improve the way programs and services are delivered, increase efficiency of clinic and community health initiatives, improve technology, and undertake public health interventions in many of the state's poorest counties.

The Central Incubator Collaborative is one of these regional incubator groups and is comprised of representatives from nine local public health agencies. This collaborative, known as the Central North Carolina Partnership for Public Health (CNCPPH) identified research initiatives to benefit practice as one of its main focus areas and has worked in partnership with the NCIPH to build and sustain the NCPBRN.

Structure and Membership of NCPBRN

The NCPBRN is guided by a steering committee consisting of representatives from state and local public health agencies, the Centers for Disease Control and Prevention, University of North Carolina at Chapel Hill and the NCIPH. A project coordinator provides staff support to the network, and the director of the NCIPH and a local health director share principle investigator responsibilities. Two main objectives of the NCPBRN are to 1) bridge the gap in communication and collaboration between public health practice and academia; and, 2) increase local health department capacity to effectively deliver the Ten Essential Public Health Services.

Initial Research Questions

Before the inception of the NCPBRN, the local health departments that comprise it were already focused on the development of a practice-based research agenda generated in a systematic fashion to reflect the research needs of the public health practice community. Today, the NCPBRN research agenda consists of an evolving, prioritized list of technical assistance and research questions identified by public health practitioners. The research agenda also informs scholars about important practice-related information needs and generates answers to questions of seminal use for practitioners. In order to create the research agenda, seven focus groups were conducted with 72 local public health staff and supervisors, so as to provide a venue for practitioners to voice key issues and related research questions that could inform strategies for improving the organization, financing and delivery of public health services in "real-world" community settings, thus bridging the gap in communication and collaboration between practice and academia. Participants were asked the following questions at the beginning of each focus group:

1. What activities in your daily work pertain to the Ten Essential Public Health Services?
2. For any of these activities, what would you like to know that you don't already know, or would it be helpful to organize the information you already have differently?
3. Are there techniques, tools, policies or processes that you think don't work very well that you think either take too long, foster poor service, reduce staff productivity or satisfaction, etc.?
4. Is there legislation or an administrative rule that makes your work more difficult?
5. Are there things you would change to make them work better?

Focus group discussions were embraced by local public health agency staff as a means to define the questions that needed answers. Transcripts were reviewed to identify themes and a coding structure. Phrases within transcripts were assigned codes for data entry, and a content analysis was conducted using ATLAS-ti software. Priority themes that emerged included public health workforce, laws and regulations, funding and the economy, and programs and services. A preliminary set of practice-based issues and related questions were ranked, and the findings were vetted among CNCPPH local health directors, the NCPBRN Steering Committee, and with a select group of UNC faculty. A working group distilled the focus group findings and questions into a set of prioritized "meta-questions" that represented key areas of possible research.

NCPBRN Practice-Based Research Agenda

Meta- questions were used to initiate discussion with stakeholders and researchers about content areas in which researchers might have interest. Questions that related to public health systems and capacity were of particular interest to the NCPBRN.

The meta-questions from the focus group findings that were identified for further consideration included:

1. What are adequate/optimal staffing levels for local public health?
2. What impact does an economic slowdown have on local health departments (LHDs), and how can LHDs best respond to these effects?
3. What strategies should community colleges, universities and LHDs employ in order to assure the best fit for students as newly hired employees, and to assure the greatest value for the LHD as the new employer?
4. What is the impact of federal, state and local regulations on decisions, resource allocations, and overall performance in LHDs and on public health outcomes?
5. What is the impact of program mandates on how LHDs are organized, and how they prioritize and provide services?
6. How do the complex set of funding sources that typically support LHDs influence departmental decision-making and the ability to pursue community health priorities?
7. How large should a health department be such that it is "local" and in touch with the local communities yet large enough to provide an effective set of core services?
8. Does being accredited make a difference in LHD performance and public health outcomes?

Since the development of the practice-based research agenda, the NCPBRN has been working to engage researchers through regular meetings with faculty representatives across the UNC Gillings School of Global Public Health and through individual meetings with selected researchers regarding specific research questions. The NCPBRN also sponsored a practitioner/faculty workshop featuring guest speaker Lawrence Green, DrPH in order to generate greater awareness of the network and its practice-based research priorities. Two of the proposals developed collaboratively by public health practitioners and academic researchers and funded by the Robert Wood Johnson Foundation are described below.

Examples of Research Activity

The Robert Wood Johnson Foundation made a research implementation award (RIA) grant in February 2009 to Dr. Rebecca Wells at the UNC Gillings School of Global Public Health to conduct public health systems and services research on a key policy change recently enacted in North Carolina that affects staffing and delivery of maternal and child health services in local public health agencies throughout the state. The project examined consequences of reduced Medicaid funding for a program that, since the late 1980s, has provided case management to low-income pregnant and postpartum women and their children and has contributed to improved birth outcomes in these vulnerable populations.

Directors of LHDs throughout the state were alarmed by the potential consequences of the funding and policy change, and communicated their concerns to legislators and policymakers. However, they had little evidence to demonstrate that decrease in funding would impact the birth outcomes and wellbeing of these women and children.

The RIA grant makes it possible for researchers to work with the NCPBRN to answer the following questions:

1. How will public health case management revenue cuts and restructuring affect case management service provision and outcomes?
2. Will revenue cuts and restructuring of public health case management affect LHD core capacity in other service areas?
3. What aspects of LHD capacity and coping strategies may reduce the impact of case management funding cuts and restructuring on service provision?

The research team is currently using a combination of quantitative and qualitative methods to examine the impact of reduced funding for, and restructuring of, maternal and children's case management services in LHDs. To date, 75 (89%) of LHDs have returned completed surveys, and data preparation and analyses are underway.

A second NCPBRN research study, also funded by the Robert Wood Johnson Foundation, was conducted in August 2009. The study consisted of a population-based needs assessment in two counties covered by the CNCPPH to measure knowledge of, and intention to receive, seasonal and novel influenza vaccines, including the ability to comply with isolation recommendations. Of 258 households visited, 207 (80%) were interviewed. The findings, published in the Morbidity and Mortality Weekly Report (MMWR) and elsewhere, suggested that knowledge of, and intention to receive, both novel and seasonal vaccines were high; however, the ability to comply with community mitigation strategies could be complicated by the high proportion of workers without paid sick leave (Moore 2009). With respect to this study, the existence of the NCPBRN and the partnerships with the LHD directors enabled a quick launch of the project. Additionally, the strong relationship between the NCPBRN, the NCIPH, and the North Carolina Division of Public Health led to a practical application of the findings in planning for the H1N1 outbreak.

Plans to Mobilize Change and Improve Public Health

The NCPBRN has provided a structure for connecting practitioners and faculty to carry out important public health research with the potential to change public health policies, processes and practice. As research questions are generated from the field, practitioners become more vested in the academic findings and are more likely to use results to improve public health practice. Of course, changes to policies and processes take time; however, translating research to practice is much more likely if local and state public health partners have a stake in the research early on.

The NCPBRN is exploring ways to expand its reach statewide to include health departments beyond the CNCPPH. In addition, there is interest in broadening faculty participation beyond the UNC Gillings School of Global Public Health to other colleges and universities. The NCPBRN has already reached out to a researcher at The Pennsylvania State University to explore the evidence base for maternal and children's case management using the data collected through the original study described earlier. With continued administrative support from the NCIPH and ongoing involvement of state and local public health practitioners, the future of practice-based public health research looks promising in North Carolina.

References

Harrison LM. Central North Carolina Partnership for Public Health Public Health Practice-Based Research Network Meta-Questions Summary. Available at: www.ncpbrn.org

Moore Z, Standberry N, Bergmire-Sweat D, Maillard JM, Horney JA, MacDonald PDM, Fleischauer AT, Dailey NJ. A community-based rapid needs assessment of knowledge and intent to receive seasonal and pandemic influenza vaccines- North Carolina, 2009. Morbidity and Mortality Weekly Report 58 (50).Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5850a1.htm

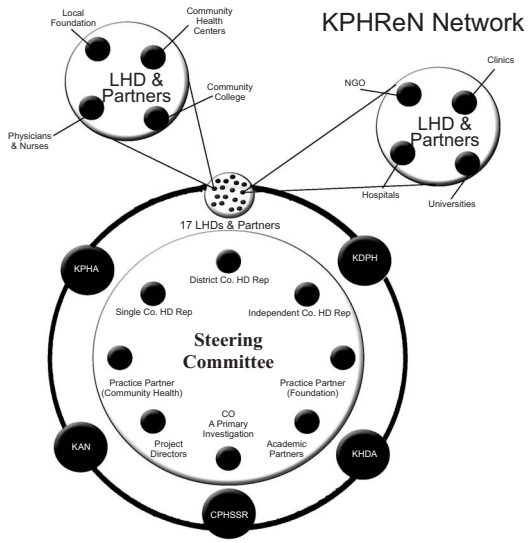
Summers R. North Carolina Practice-Based Research Network (NCPBRN). Presented at the Practice-Based Research in Public Health Forum, UNC at Chapel Hill, October 29, 2009. Retrieved from http://nciph.sph.unc.edu/incubator/partnerships/central/index.htm

The Kentucky Public Health Research Network: Collaborating With Public Health System Partners to Improve the Health of All Kentuckians

Richard Ingram, DrPH, University of Kentucky, College of Public Health
Robin Pendley, MPH, University of Kentucky, College of Public Health
Angela Dearinger, MD, MPH, Office of the Commissioner, Kentucky Department for Public Health
Sarah Wilding, MPA, RN, University of Kentucky, College of Medicine and College of Public Health

The Kentucky Public Health Research Network (KPHReN), one of the first five public health practice-based research networks (PBRNs) funded by the Robert Wood Johnson Foundation in 2008, functions as a nexus of communication between state and local public health agencies and academic institutions in the Commonwealth of Kentucky. It is administered by the Kentucky Public Health Association (KPHA), and includes the Kentucky Department of Public Health (KDPH) and 17of the 56 local health departments in the Commonwealth (serving 53 of the 120 counties in Kentucky). The local health department (LHD) members of KPHReN are made up of single-county, district, and independent departments, and are distributed throughout the state. These departments were chosen to be founding members of KPHReN because of their interest and involvement in public health research and innovation. Academic partners of KPHReN include the University of Kentucky (UK) College Of Public Health, particularly its Center for Public Health Systems and Services Research, and the UK Center for Clinical and Translational Sciences. KPHReN is advised by a steering committee consisting of LHD directors, academic partner representatives, and community partner representatives. The steering committee provides strategic direction for the network, including the establishment of research priorities, and oversight of the quality and integrity of research endeavors. Figure 1 is a visual representation of the KPHReN structure.

Figure 1: KPHReN Network Structure



In addition to the public health PBRN, Kentucky is home to practice-based research networks in other disciplines, as well. The Kentucky Ambulatory Network (KAN) is a primary care PBRN that includes over 300 family medicine physicians throughout the state. Kentucky also has a dental PBRN, the Kentucky Oral Health Network (KOHN), and a pharmacy PBRN, the Kentucky Pharmacy Practice-Based Research Network, KPHReN has been able to rely heavily on partnerships with these PBRNs to develop and implement cross cutting research projects. KPHReN has developed a particularly strong relationship with the Kentucky Ambulatory Network (KAN) and has used KAN in a supporting role on many research projects. KAN provides KPHReN with access to a large number of physicians, and serves as a bridge between primary care physicians and the public health agencies that serve many of their patients. This partnership enables KPHReN to integrate these important members of the public health system in research activities, which not only allows KPHReN to conduct more comprehensive research activities, but also strengthen the relationship between public health and primary care in the Commonwealth.

The goal of KPHReN is to provide a link between public health practice and research, and to promote the development of research projects with immediate and direct relevance to public health practitioners in Kentucky. KPHReN has three main research objectives. The first of these is to stimulate and support research focusing on public health partnerships in the Commonwealth. This is intended to determine the optimal way public health can share resources to improve community health. The second research objective of KPHReN is to stimulate and support research regarding most effective ways to reduce health disparities between Kentucky and the nation, and within the Commonwealth. Kentucky trails the nation in many health indicators, and much variation in health status exists between various regions of the state. By utilizing the shared wisdom of health professionals in Kentucky, a goal of KPHReN is to develop strategies to close the gap in Kentucky. The third research objective is to stimulate and support research focused on developing tailored strategies to improve the quality of public health practice in Kentucky. KPHReN members feel that creating and refining a culture of continuous quality improvement (QI) will produce the infrastructure necessary to support KPHReN's current and future research objectives.

KPHReN is poised to play a key role in the efforts of LHDs to successfully obtain accreditation by the new voluntary accreditation program developed by the Public Health Accreditation Board. Domain 10 in these accreditation standards focuses on contributing to the evidence base of public health, and applying evidence-based practices. KPHReN is able to support efforts related to both these areas – it can both conduct research, and aid in the translation of research to practice. As a result, KPHReN members should have an obvious advantage when seeking to meet the particular standards and measures associated with Domain 10. In addition, KPHReN is able to provide logistical support for other QI efforts related to accreditation, such as the completion of community health assessments, the implementation of health improvement plans, and assisting departments in the translation of research that impacts public health. KPHReN is equipped to advise LHDs on strategies for strengthening areas of perceived weakness relative to accreditation standards and measures.

KPHReN is also well positioned to conduct both long-term research activities intended to elicit transformational change in the public health system, and short-term "quick strike" research projects intended to provide data that can be immediately translated to improve public health practice in the Commonwealth. Quick strike projects are intended to address areas of immediate need in Kentucky; long-term projects are intended to improve the public health infrastructure in the Commonwealth. KPHReN members have participated in both long-term and short-term research endeavors which have played distinct yet complementary roles in efforts to improve the health of the citizens of Kentucky.

Short Term Research

The Robert Wood Johnson Foundation's 2009 grant for Quick Strike Research Funds for H1N1 response studies was an excellent opportunity to conduct a short-term research project with potentially immediate application to emergency response practices by local and state health departments. As one of the recipients of this award, KPHReN designed a study to assess the effectiveness of communication efforts between three key participants in pandemic mitigation efforts in Kentucky: LHDs, primary care physicians, and pharmacists. Local health departments in Kentucky serve as a clearing house for up-to-date information regarding pandemic disease, play an important surveillance role in tracking the spread of disease, and can distribute stockpiles of medication if circumstances necessitate. Primary care physicians play the primary role in disease diagnosis and treatment; it is vitally important that they have up-to-date information from health departments regarding case identification and treatment, and that they know if medications are available. Pharmacists are the primary hub for the distribution of medication, and can play a supporting role in identifying potential cases of disease and encouraging those suspected of infection to see a physician; thus, it is vitally important that they also have current information regarding disease symptoms and the availability of stockpiled medication, if their stores run low.

KPHReN adapted a survey, developed by Dr. Glen Mays at the University of Arkansas for Medical Sciences and based on other documents from the RAND corporation, CDC and other organizations, that not only assessed levels of communication between LHDs, pharmacists, and primary care physicians in Kentucky, but also gathered information on sources and the usefulness of information utilized by pharmacists and physicians with regard to H1N1. The purpose of the survey was to determine levels of knowledge in the pharmacist and physician communities regarding public health agency (LHDs, state health department, and federal agencies) pandemic response resources, and the levels of concordance between reported distribution of information by LHDs, and the reported receipt and perceived usefulness of pandemic-related information distributed by public health agencies to pharmacists and physicians. KPHReN felt that this data would inform future attempts to respond to pandemic disease, and would identify any communication deficits that existed between the members of the public health system that were surveyed.

The Kentucky Department of Public Health (KDPH), a key member of KPHReN, served as a venue through which KPHReN was able to gain access to all LHDs in Kentucky. KDPH requested that all local health departments in the state participate in the survey. KDPH provided a list of LHD directors in Kentucky, and allowed KPHReN to use the list to email the KPHReN H1N1 survey to all members, as well as to send follow up emails to non-respondents. Local health department members of KPHReN played a key role in modifying the H1N1 survey, ensuring that it contained questions and addressed areas relevant to the public health system in Kentucky.

KAN also played an important role in the H1N1 project. KAN was the portal that KPHReN used to gain access to primary care physicians throughout Kentucky. Through their association with the Kentucky Academy of Family Physicians (KAFP), KAN helped to obtain contact information for most family physicians in the state in order to include them in the study. KAN representatives also aided in the modification of the physician survey, and helped ensure that it solicited information that was relevant to the primary care environment in Kentucky. The Kentucky Pharmacy PBRN was the means by which KPHReN contacted the pharmacy community in Kentucky – they served as the bridge between KPHReN and the Kentucky Pharmacist Association (KPhA), an organization that includes all Kentucky pharmacists. KPHReN felt that the pharmacy community played a crucial but often overlooked role in pandemic preparedness, so reaching this constituency was a key to the success of the project. Through the KPhA, all pharmacists in Kentucky were sent a survey on communication efforts with public health agencies during the H1N1 outbreak. Pharmacy PBRN members also helped vet the survey prior to administration.

Due to the active participation of KPHReN partners, the H1N1 survey was distributed quickly to all the targeted parties. After the end of the survey (approximately three weeks) KPHReN researchers quickly tabulated and analyzed data to determine the key gaps in communication between LHDs, pharmacists and primary care physicians. Rapid dissemination of the results of the survey would be a cornerstone in efforts to improve communication between these bodies in preparation for the next pandemic; therefore, results were disseminated through three venues. Rapid dissemination, primarily of recommendations on how to better prepare for the next pandemic, was done though the KPHReN newsletter and data presentation at the KDPH. Dissemination also occurred through the more traditional routes of peer-reviewed journals and presentations. The first manuscript about the results of the survey was published in the January/ February issue of the *Journal of Public Health Management and Practice*. In addition, findings of the survey have been presented at the 2010 Academy Health Annual Research Meeting, the 2010 American Public Health Association Meeting, the 2010 Emergency Management Summit, and the annual meetings of the National Association of Local Boards of Health, and the National Association of County and City Health Officials.

Long-term Research

KPHReN is also currently in the process of conducting a long-term research project focused on developing and implementing tailored QI strategies in a group of LHDs in Kentucky. KPHReN chose to focus the

QI project on diabetes because of the inordinate burden of this illness in Kentucky – 11% of Kentuckians suffer from type 2 diabetes. In 2009, the Kentucky rate for diagnosed diabetes was the 4th highest in the nation, and 40% of Kentuckians are classified as pre-diabetic. Diabetes is the 6th leading cause of death in Kentucky. The human and financial costs of diabetes in Kentucky are immense.

The aim of KPHReN's current project, Community Outreach and Change for Diabetes Management (COACH 4-DM), is to evaluate the extent to which organizational QI strategies influence the adoption and implementation of evidence-based interventions as identified in the CDC Community Guide to Preventive Services. The specific intervention it seeks to evaluate is the recommendation that diabetes self-management education (DSME) be provided to adults with type 2 diabetes in community gathering places. The COACH 4DM project is being conducted in six LHDs which are designated Diabetes Centers of Excellence (DCOE) and members of the KPHReN. This project will implement and test an evidence-based, systems approach to QI that includes the use of change facilitation to promote improvement in existing DSME services delivered to adults enrolled in each DCOE. Experienced change facilitators will be providing training and assistance to each DCOE for their QI projects.

Summary

KPHReN's PBRN partner, KAN, and academic partner, the UK Center for Clinical and Translational Science Department of Research and Engagement for Community Health (REACH) played key roles in the development and implementation of this project, particularly in logistical support. The methods for system change utilized in this project are adapted from a proven model developed and refined by KAN. In addition, the experienced change facilitators providing QI training and implementation to the DCOEs for COACH 4-DM, are employed by the UK CCTS.

The H1N1 project and DCOE project both serve as excellent examples of the benefits available to public health PBRNs that have strong relationships with PBRNs and other organizations in areas related to public health, as well as the benefits to being located in an area with a strong culture and commitment to QI. Partner PBRNs and practice organizations in Kentucky have given KPHReN access to additional members of the public health system in Kentucky. KPHReN has benefitted greatly from the collective wisdom of these organizations in the guidance of KPHReN projects, and the usefulness of resources to help execute research endeavors. The strong culture and commitment to QI in Kentucky has provided the support to make these efforts possible, and has helped to ensure that organizations cooperate to engage in activities that will promote public health in Kentucky. KPHReN hopes to continue to work with partners in projects that will improve the health of all Kentuckians.

Colorado Public Health Practice-Based Research Network: Leadership in the Early Stages of Network Development

Julie A. Marshall, PhD
Lisa VanRaemdonck, MSW, MPH
Lucinda Bryant, PhD, MBA, MSHA
Emily Burns, MD, MSPH
Lee Thielen, MPA

Public Health in Colorado and Readiness to Develop a Public Health Practice-Based Research Network

In Colorado, a confluence of events contributed to the development of the Colorado Public Health Practice-Based Research Network (the Network): legislation that restructured the public health system, new collaborations among professional organizations, creation of the first school of public health in the region, previous and ongoing practice-based research efforts, the national influence of accreditation, collaborative leadership, and willingness to create a shared vision.

Colorado Public Health System and the Public Health Act of 2008. Colorado's diverse landscape for planning and delivery of public health services encompasses 64 counties categorized as 17 urban, 24 rural and 23 frontier[1], with 81% of the population living in 11 counties in the metropolitan areas east of the Rocky Mountains (Fort Collins, Boulder, Denver, Colorado Springs, Pueblo). Governmental public health, charged with assuring the health of all Coloradoans, is decentralized in Colorado with 54 local public health jurisdictions, including four district public health agencies that serve more than one county. Across the jurisdictions, there is large variation in population density and size of geographic area, as well as other factors that influence the need for services. For example, in 2007, the estimated percentage of children living in poverty ranged from 2.6% to 45.6% across counties, and the percentage of residents who identify as Hispanic ranged from 5% to 38% in urban areas and from 2% to 68% in rural areas.

Health indicators like overweight, obesity and chronic disease rates also vary. In a statewide, school-based random sample of kindergarten and third graders, the proportion of children above the 85th percentile for body mass index varied from 5% to 45% across schools (Marshall et al, 2008).

[1]Less than 6 people per square mile

In 2008, the prevalence of diabetes in adults ranged from 3.8% to 7.1% across counties (CDC, 2008). In Colorado, as in the nation, burden of disease and social determinants of health vary by race and ethnicity, and data over the last decade indicate little progress has been made in reducing these disparities (OHD CDPHE 2009).

In terms of governance, Colorado is a home rule state, where policymakers value local control. County commissioners, the key decision-makers at the local level, allocate local resources, and make decisions on public health and other county services that influence health. County infrastructure, community economics, environmental conditions, human and environmental health services, and access to health resources vary widely across the state. Taken together, these factors contribute to diversity in needs and available resources for health promotion and disease prevention, disease control and medical care.

Prior to 2008, Colorado had two types of local public health agencies nursing services (72%) and organized health departments (28%). These entities were governed by different state statutes and regulations, and the scope of services varied considerably from one jurisdiction to the next. Most nursing services agencies offered more direct care and less comprehensive public health services, especially in the area of environmental health (NACCHO, 2008). In 2008, mobilization of the Colorado public health professional community led to the passage of the Public Health Reauthorization Act (the "Act"). The Act, which incorporated portions of the Turning Point Model State Public Health Act, restructured the public health system and updated Colorado public health laws. The goal of the Colorado Act is to assure provision of basic public health services to all residents regardless of where they live, to increase state and local collaboration, and to do so in a way that is financially feasible and that supports functional regionalization and sharing of services. Among other things, the Act eliminated the regulatory differences between nursing services and organized health departments and created one type of public health agency, directed by a public health director meeting specific educational and experience standards, guided by a local board of health, and required to provide a core set of public health services that meet quality standards.

The Public Health Alliance of Colorado. The Public Health Alliance of Colorado (the Alliance), created in 2006, has been instrumental in the movement to examine and restructure the public health system. The Alliance, housed and managed by the Colorado Association of Local Public Health Officials (CALPHO), provides shared infrastructure for the state's 10 public health professional organizations. This infrastructure includes a common system for membership management, website maintenance, financial management, conference and meeting support, and provides a neutral place for in-depth policy discussions and collaboration. Its professional members, infrastructure, and non-profit status make the Alliance an ideal institutional home for projects that include multiple public health agencies and cross-sector approaches, especially for understanding and impacting the public health system.

The Alliance has close connections with the state public health department (Colorado Department of Public Health and Environment, CDPHE) and has a focus on system-level improvements. CALPHO and the Alliance consistently collaborate with CDPHE through the Office of Local Liaison (prior to 2009), now the restructured and renamed Office of Planning and Partnerships (OPP). Prior to the development of the Network, CDPHE contracted with the Alliance to conduct studies on regional approaches to local emergency preparedness and local chronic disease prevention staffing and activities, and to convene local public health officials and staff to provide input to CDPHE programs. Recently, the Alliance partnered with OPP to gather input for the statewide improvement plan, and provided formal feedback to the Public Health Accreditation Board on accreditation standards and measures. Private foundations have also funded the Alliance to work on statewide system improvement initiatives.

Colorado School of Public Health. Satisfying a long-documented need, the Colorado School of Public Health (CSPH) officially opened its doors in 2008. While individual researchers had collaborated with state health department programs and local health departments over the years, relatively few active research collaborations could be documented in 2008. The new school leverages the strengths of its three partner institutions, University of Colorado Denver, Colorado State University and University of Northern Colorado, and provides a recognized venue for public health practitioners and academics to collaboratively investigate public health issues across the spectrum from etiology to policy, with expertise in all core areas of public health. It was anticipated that the proposed doctorate in public health (DrPH), still in development when the Network was created, would train applied researchers and leaders in the field and that the new Center for Public Health Practice (CPHP) would support linkages with the practice community for students and workforce development throughout the region. Work continues to strengthen connections between CSPH and the Network to conduct even stronger public health systems and services research (PHSSR) as the DrPH and CPHP evolve.

With the opening of the CSPH, the Rocky Mountain Prevention Research Center (RMPRC), funded by the Centers for Disease Control and Prevention since 1998 to "translate knowledge into public health practice," became a school-wide center in the CSPH. The RMPRC collaborates with community partners and focuses on development, testing, dissemination and sustainability of community-based chronic disease prevention and control strategies. In 2007, as an outgrowth of community-based research projects, conducting community-based program evaluations and collaborations with state partners on obesity and diabetes surveillance, the Center began looking for opportunities to better integrate research and practice. The rationale for a more coordinated collaboration between practitioners and researchers includes a) reduced time and cost and increased success translating discoveries into effective, sustainable practice; b) shared infrastructure to address common needs, e.g. the need for local data; and c) increased capacity of practice and research partners to contribute to the evidence base of public health.

Public Health Practice-Based Research Networks. In 2008, the Robert Wood Johnson Foundation (RWJF) announced an initiative to evaluate the degree to which the primary care practicebased research network (PBRN) model could be applied in public health to build evidence for how public health systems and services should be structured and financed. Several factors put Colorado in an exceptional place to help develop this national initiative: practice variation and changes anticipated with implementation of the 2008 public health reorganization law, already established infrastructure that can facilitate networking of local public health, a new school to support public health training and research, and a long history of primary care PBRNs in the state (Green et al., 2006).

In December 2008, Colorado partners received funding to engage public health practitioners in the 54 public health agencies and CDPHE along with researchers from the CSPH to establish a public health PBRN to support informed and strategic research based on questions that address practice needs, in a setting that allows effective strategies to be rapidly put into practice.

Developing an Infrastructure to Support Practice-Based Research

Building Awareness and Developing Partnerships. Two ingredients that are key to initial and ongoing success of the Network are consistently building awareness of its purpose and potential value, and fostering trusting relationships that contribute to the mission and work of all partners. During the grant development phase, individuals from the Alliance, CDPHE and the CSPH/RMPRC jointly developed the application with input from the local health department directors and the CSPH founding dean. With RWJF funding, several strategies were used to build awareness, seek advice, and create understanding about and interest in practice-based research as well as PHSSR. Early in the Network's development, staff gave presentations to the state board of health, public health professionals and researchers at their business meetings and professional conferences, and as a featured seminar in the CSPH. These communications highlighted early efforts by other PBRNs in the RWJF network, seminal PHSSR findings, and examples of potential research projects. As a way to spread the word about the Network and assess interest in the Colorado public health community, two web-based surveys were conducted, one with local public health professionals and one with all faculty on the three campuses of the CSPH. Respondents included 58 practitioners and 89 researchers. The surveys provided background information on the Network to survey participants, determined level of interest and readiness to participate in the Network, and identified areas of research interest.

Prior to the establishment of the Network, the Alliance had engaged in exploratory research, but because of a lack of formal research expertise, mostly relied on outside consultants to develop methodology. Furthermore, numerous researchers were approaching a limited number of the more well resourced local public health agencies with requests to participate in projects without a clear resource to consult on system-level attributes and potential readiness to participate. At the same time, as academic researchers were seeking to develop projects within practice communities, no centralized structures existed to enable practitioners to engage in the research process.

Partnerships and relationships grew out of personal meetings and connections, targeted introductions and meetings with faculty, the new RWJF research funding opportunities, and the Public Health Practice-Based Research Networks National Coordinating Center. A webpage and fact sheet were created to help staff and partners explain network goals, projects and how to become involved in network activities to potential partners and colleagues in formal and informal settings. In addition, an e-newsletter was started that shares the network's activities with interested professionals.

Founding Steering Committee. The Founding Steering Committee (FSC) provided input and guidance to the Network during the initial grant funding, and developed structures for the successful operation of the on-going steering committee. Members of the FSC were recruited from respondents to the web-based survey (described above) who expressed an interest in participating in the network as well as other practitioners and partners who had shown interest in practice-based research. Developing the FSC provided an opportunity to reach out to highly motivated, research-oriented public health staff who may have had limited opportunities to participate in research but nonetheless saw the importance of a strong evidence-base in public health. Initial FSC members included CSPH faculty and local and state practitioners who had at least some research experience, and the capacity to share information and committee experience within their organization or agency. Additional steering committee members were recruited from the CSPH Center for Public Health Practice, a local health foundation, the School of Public Affairs at the University of Colorado Denver and a local Area Health Education Center.

The FSC was tasked with creating a vision, mission and guiding principles (Table 1), approving the development of standards and procedures for creating a project advisory committee (PAC), and identifying future steering committee members. At least one FSC member serves on each of the current PACs. FSC members have been provided literature on PBRNs (Green LE et al., 2005; PH PBRN NCC, 2008) and the emerging field of PHSSR, as well as other resources, to assist them in brainstorming and development of project ideas.

Other work by the FSC includes developing guidelines for the ongoing Steering Committee that will carry on as the primary guiding body beginning in 2011; formalizing procedures for setting research priorities and the facilitation of investigator-initiated projects; and continuing outreach to fellow public health professionals.

Table 1. Colorado Public Health Practice-Based Research Network: Vision, mission, guiding values and principles, and initial research questions

Vision, Mission and Guiding Values and Principles				
Vision: *Actively engaged public health professionals, researchers and community members working together to ask and answer questions that directly influence the public health system and public health practice to improve the quality and effectiveness of public health services and improve community health in Colorado and across the region.*				
Mission: *To provide the infrastructure and leadership necessary to develop and support a research agenda, and to conduct research, aimed at providing the evidence to improve the practices of the Colorado Public Health System to meet the ever-evolving needs within our communities.*				
Guiding Values and Principles: *Innovative • Integrity • Population and System Focused • Leadership and Support • Collaborative • Relevant and Actionable • Diverse Partners • Engaging and Respectful • Timely and Forward Thinking*				
	Source†			
Funded Research Questions:	S	FSC	PM	F
How does the Colorado Public Health Act of 2008 change staffing, qualifications, services, partnerships, budgets and structure of local public health agencies?	v			
How is law used to create and maintain regional approaches to public health service delivery?	v			
How does the public health delivery system influence adoption and implementation of evidence-based public health practices for chronic disease prevention [through coalition work]?		v		v
What agency/collaborative structure characteristics or proposal content lead to a funded Safe Routes to School grant proposal in Colorado?		v		
Which strategy of reminder/recall is most cost-effective and produces higher influenza immunization rates among pre-school aged children: Provider-based reminder/recall or Population-based reminder/recall?			v	
Are collaborative approaches to influenza vaccine delivery, involving public health entities and private practices, more effective in increasing influenza rates for children than traditional delivery in the private practice setting?			v	

†Source of research questions: S=Network Staff; FSC=Founding Steering Committee; PM=Partner Meetings; F=Funder Initiative

Making the Case for Practice-Based Public Health Systems and Services Research. While it takes leadership and management skills to develop the infrastructure of a PBRN, the real leadership work happened as the network attempted to make the case for the value of PHSSR, the importance of conducting it in the practice setting, and the mutual benefits of strengthening collaboration between practitioners and researchers.

PHSSR is a relatively new area of research (Mays et al., 2003) and not one that was familiar to most researchers and practitioners. A view expressed by some practitioners is that "if you have seen one health department, you have seen one health department," and that study findings would either not be generalizable or not used by policymakers. All partners and potential partners require information about the need for practice-based evidence (Green, 2008, Green et al., 2009), previous PHSSR work, clear examples of research questions, information about potential data sets, and expected impacts of results, to be able to conceptualize their potential involvement in the network. As network staff and partners learned more about PHSSR, a larger number of potential research questions arose at organizational meetings, especially around issues regarding implementation of the Act. Through the Alliance organizations, network staff facilitated three, large-group discussions of potential practice-based research topics and questions. Research topics related to implementation of the Act include areas such as minimum qualifications for public health directors, community assessment methods, staffing needs (quantity and qualifications), funding and service sharing arrangements, defining core public health services, service delivery in rural and frontier areas, professional competencies and others, all with an eye toward system improvements to influence community health outcomes. Beyond implementation of the Act, there is the potential for a wide range of practice-based research topics that could build evidence to directly impact public health in Colorado.

Even with an abundance of potentially useful research topics, barriers to PHSSR practice-based research remain. A key challenge is the lack of a shared vision across multiple, diverse partners with varying interests and needs. Potential research ideas must be feasible and fundable as well as informative and of key interest in Colorado and nationally. Time constraints keep partners from fully engaging in development of potential projects if they are without research funding to support their efforts. Both researchers and practitioners need to be engaged in the network. Researchers have to believe that this work is valuable, fundable and can produce publishable results while understanding that much of the primary descriptive research is yet to be done. The work needs to build on their research expertise, career goals and how they will be evaluated for advancement in their field. Practitioners must believe that it is their role to help identify researchable questions and must see how they can implement change based on research results. They need the support of public health leadership who may not have a background in research but see it as an organic way to build a culture of inquiry and the skills to conduct evidence-based practice. In these early stages, and with the quickly evolving health landscape, the network has not yet defined a research agenda. Discussions to date suggest the need for both core research priorities that are more actively pursued as well as flexibility to address emergent or member-specific interests that network partners are willing to support.

Developing Projects. As of November 2010, the network has four current projects, all funded by the RWJF, and has consulted on two additional projects that were funded through NIH ARRA funds and a CDC grant (Table 1). Similar to all RWJF-funded public health PBRNs, the Network was charged with launching a small "pilot project" as a way to quickly engage its partners in research and help it define infrastructure needs. The Colorado Network chose to utilize the implementation of the 2008 public health reorganization law as a natural experiment. Investigators compiled a set of indicators, drawing from the National Association of County and City Health Officials (NACCHO) Profile survey and the annual report that local public health agencies provide to the state, in order to track changes in local public health staffing, governance, director-level education, activities and partnerships. Survey and report data from 2008 will be compared with data from 2010 and supplemented with qualitative data to describe changes during early implementation of the law.

In 2009, the network applied to the pilot research program of the Colorado Clinical and Translational Science Institute (CCTSI) for funding to describe and examine regional approaches to public health service delivery across Colorado. With such widespread and sparse populations, it is often stated that counties should share services to increase reach and maximize efficiency and public health impact. While examples of service sharing are known to exist, it remains unclear how often it occurs, the range of services shared, how these partnerships function, and the degree of success it brings. The application proposed compiling this information statewide and developing a typology that could be used to plan a larger study about regionalization of public health services. While this proposal was not funded, development of the idea led to ongoing conceptualizing by practice and research partners. When the RWJF Public Health Law Research Program was announced in 2009, network staff and partners were even more convinced that this was an area that needed formal examination. The public health law perspective added a critical component to the original research idea with its focus on how law is used to develop and maintain shared services. A subsequent proposal not only was funded but also helped forge new relationships among researchers, legal scholars, and practicing public health attorneys. The project will be completed in June 2011.

With the development of new projects, network staff and local public health directors are refining their sense of which of their questions may be researchable. During directors' monthly meetings and other meetings regarding the implementation of the Act, it is not uncommon for a staff member or director to comment about challenges that are potential research projects.

During this early phase of the network's development, project topics have been molded by staff with input from practice and research partners in response to requirements of specific funding opportunities. A spectrum of practice-based research development includes "investigator-initiated" projects on one hand and "practitioner-initiated" ones on the other, with the middle ground evolving as more research and practice partners develop research ideas together. Over time, the goal of the network is to host a variety of projects along this continuum.

To sustain infrastructure, the network will continue to develop projects that directly fund its staff to conduct research and disseminate results to a wide variety of audiences. With future growth, network leaders anticipate both a more diverse funding portfolio (e.g., CDC, NIH, AHRQ in addition to RWJF), and that the fiscal home and location of project staff will vary depending on the specific needs of the project. Increasing effort will be devoted to developing partnerships between researchers and practitioners, both in public health agencies and other community-based organizations that are part of the larger public health system. In addition, administrative infrastructure (e.g., resource sharing, IRB review) is being put in place that

facilitates collaboration and completion of projects without direct involvement by network staff. The facilitation of these relationships takes a considerable amount of work and ongoing relationship building. The intent is to fully integrate that process into the overall work of the Alliance and the RMPRC.

Showing the Impact of PHSSR. Building a base of support in Colorado for PHSSR and practice-based research is challenging without findings that have direct relevance for current and potential partners. Sharing articles and results from other projects can help show the possibilities, but that does not replace the influence of a project with direct links to Colorado practitioners. In summer 2011, results from the pilot study and Public Health Law project will be disseminated to all local public health directors, elected officials, and other practice and research partners. It is anticipated that the analysis of the changes in the public health system since the early implementation of the Act will inspire reflection on all that has been accomplished in the past two years, as well as help answer questions about future resource allocation. The Public Health Law project will produce a map of shared-service arrangements including descriptions of the many legal instruments used to create and maintain agreements. The project team anticipates that this array of models will serve as a springboard for directors, elected officials and decision-makers as they think about and structure their own regional approaches. These models will also inform the development of a typology for shared services that can be used to evaluate relationships between types of service sharing and performance or outcome measures in Colorado and across the country.

Lessons Learned

Throughout development of the network, lessons were learned from successes and missteps. First, while it can be challenging to develop relationships and partnerships when there is no funding or project to bring partners "to the table," it is time well spent. Begin building these relationships early, nurture the connections along the way, and clarify the decision-making authority and requisite documentation for all collaborative activities and resource sharing. It will be easier to respond to research-funding opportunities if relationships have been established with a shared understanding of the principles of practice-based research and each partner's roles and responsibilities. Second, as partnerships are developed, it is important to clarify how resources and data will be shared. To this end, the network is collaborating with the CCTSI and other organizations in Colorado to develop data-sharing guidelines, and the steering committee will produce standards and example agreement templates for its partners. Third, partnership-building entails creating a shared vision of what a public health system could be with robust evidence about optimal structures and services. It is possible to spark interest by highlighting local practice issues and looking beyond immediate solutions to applications of knowledge on a systems level. Last, while the Colorado Public Health PBRN is currently funded solely through the RWJF, network staff is seeking other funding sources. This effort has been slow because of limited staff and resources, but it is critical to the future success of the network.

References

Centers for Disease Control and Prevention (CDC): National Diabetes Surveillance System. Retrieved 11/27/2010 from http://www.cdc.gov/diabetes/statistics/index.htm

Green, LA, Hickner J. (2006) A short history of primary care practice-based research networks: From concept to essential research laboratories. *Journal of the American Board of Family Practice* 19(1):1-8.

Green, LE, White, LL, Barry, HC, Nease, DE, Hudson, BL. (2005) Infrastructure requirements for practice-based research networks. *Annals of Family Practice* 3(Suppl 1):S5-S11.

Green, LW. (2008) Making research relevant: If it is an evidence-based practice, where's the practice-based evidence? *Family Practice* 25(suppl 1):i20-i24.

Green, LW, Ottoson, JM, Garcia, C, Hiatt, RA. (2009) Diffusion theory and knowledge dissemination, utilization, and integration in public health. *Annual Review of Public Health* 30:151-74.

Marshall, JA, Poniers, A, Drisko, J, White, C, Tenney, M. (2008) Obesity Surveillance in Colorado children. Presented at the Colorado Public Health Association annual meeting,

Breckenridge, CO. Retrieved 12/1/2010 from http://ucdenver.edu/academics/colleges/PublicHealth/research/centers/RMPRC/resources/Pages/Presentations.aspx

Mays, GP, Halverson PK, Scutchfield, FD. (2003) Behind the curve? What we know and need to learn from public health systems research. *Journal of Public Health Management and Practice* 9(3):170-182.

Public Health Practice-Based Research Network National Coordinating Center (PH PBRN NCC) (2008) Key concepts: Designing a successful practice-based research network in public health. Retrieved 12/1/2010 from http://www.publichealthsystems.org/media/file/PBRNKeyFeaturesBooklet.pdf

Acknowledgements

This work was supported by a grant from the Robert Wood Johnson Foundation and Centers for Disease Control and Prevention Cooperative Agreement U48 Dp001938.

Washington State's Practice-Based Research Network: Establishing the Evidence Base and Improving Public Health Practice

Karen Hartfield, MPH
David Fleming, MD
Betty Bekemeier, PhD, MPH, RN
Anthony L-T Chen, MD, MPH
Hanne Thiede, DVM, MPH
Nadine Chan, PhD, MPH

Washington State has a long history of strong partnerships among local health jurisdictions, academic institutions and state public health. All of these partners are committed to evidence-based public health systems and services, but the lack of funding and expertise is a barrier to addressing critical research questions. Public health leaders and their academic partners identified the need for a formal system to engage practitioners in descriptive, inferential and translational research without compromising the other important work we do. That was the genesis of the Washington Public Health Practice-Based Research Network (WA PBRN).

In December 2008, Washington State was among the first five networks awarded funding from the Robert Wood Johnson Foundation (RWJF) to establish a formal public health PBRN. In the two-year funding period, the WA PBRN recruited members, formed an executive committee, developed a charter, established a decision-making process, identified research priorities, secured funding to carry out three research projects, began dissemination of findings, joined with public health PBRNs in other states in a multi-network study, re-visited network research priorities, and laid plans for sustaining the network. In this paper, we briefly review the steps taken since the WA PBRN's infancy and conclude with next steps as we look ahead to the future work of our network.

The WA PBRN's mission is to identify and address key questions that directly affect the delivery and effectiveness of public health services and systems in improving the health of communities in Washington. Our specific goals are to:

1. Develop a sustainable network infrastructure;
2. Identify practice questions of interest to network members;
3. Obtain funds to address practice-driven questions through descriptive and inferential research; and,
4. Translate and disseminate research findings into practice.

Washington State is organized with a state-level health department and multiple autonomous independent jurisdictions at the local level. The state has 39 counties and 35 local health jurisdictions (LHJs) which include county departments, joint city-county departments and multi-county districts. To create a robust network of practitioners and academics from around the state, the WA PBRN brought together representatives from the nine largest LHJs, the University of Washington Schools of Public Health and Nursing, the Washington State Department of Health (WA DOH) and the Washington State Association of Local Public Health Officials (WSALPHO). The nine WA PBRN LHJs are mid- and large-sized health departments that span Washington State and are home to 77% of the state's population. Each of these LHJs serves as a lead jurisdiction for its smaller LHJ counterparts in regions throughout the state. These smaller LHJs that are not formally part of the WA PBRN are engaged in the PBRN through WSALPHO. In keeping with the network's emphasis on practice engagement and leadership, and at the encouragement of the RWJF, the PBRN is led by a practice agency, the Public Health – Seattle & King County (PHSKC) rather than by traditional researchers. PHSKC is uniquely poised to lead this work because it provides the full range of public health services yet has a longstanding history of academic-practice teaching and research partnerships.

Infrastructure Development and the Decision-Making Process

Given the WA PBRN's relatively large membership and minimal staffing, it was important to establish an organizational and decision-making structure that was participatory and collaborative, clearly defined, and efficient. To that end, PHSKC recruited an ad hoc Executive Committee made up of practice and academic members and lead agency staff. The Executive Committee worked with the full network membership to develop a charter to guide network operations. The charter, ratified at our first network meeting, specified the following roles and responsibilities:

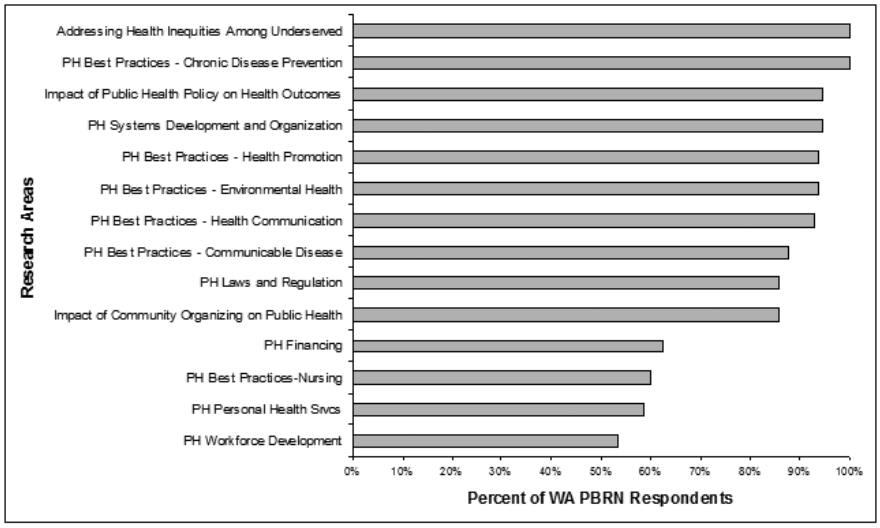
1. Lead agency (PHSKC): convenes, guides and coordinates the network; maintains network communications; manages administrative and fiscal aspects of the PBRN grants; and carries out the initial research project.
2. Executive Committee: establishes strategic direction for the network, reviews the network's work and sustainability plans, reviews proposals and identifies priority projects, recruits researchers, plans full network meetings; and meets at least quarterly to accomplish the above activities. Membership must include at least two LHJ partners, one state department of health representative, at least two academic partner representatives, and lead agency staff.
3. Full network: identifies and prioritizes research questions; responds to relevant funding opportunities; serves as a champion for practice-based research within home organizations and LHJs; and promotes translation of research into practice.

The charter also outlines the WA PBRN's decision-making process. Because timely decisions about pursuing grants often need to be made in response to funding opportunities with imminent deadlines, the Executive Committee was charged with sorting through grant opportunities and making recommendations about what projects to forward to the full network for adoption. The full network was empowered to make final selections about which grants to pursue as a network.

Developing an Actionable Program of Research

Our next task was to develop a thoughtful program of research as well as assess our capacity to carry out practice-based research. Using an Internet-based survey, we asked members to select and prioritize their interests from a list of research areas developed by the Executive Committee (Table 1). The list was intentionally broad as we planned to use these data to jumpstart small group discussions at our first network

Table 1: Top Ten WA PBRN Research Interests – April 2009



During the retreat, small groups used the survey data to define near- and long-term research goals and priorities:

1. Impact of funding losses on public health services and health outcomes;
2. Role and effectiveness of community-based organizations and coalitions in public health service provision;
3. Effectiveness of core public health interventions (e.g. immunizations, food service inspection, partner notification, HIV prevention); and,
4. Impact of emergency preparation communication programming on effective emergency management.

A year and a half later, the entire network was engaged to review the four research priorities to assure ownership of the research agenda and ensure that it was still relevant, timely and of practical value. A survey asked network members to rank seven broad thematic areas identified by the Executive Committee, as well as research questions within each area. The thematic areas represented a synthesis of the research questions identified in the first survey.

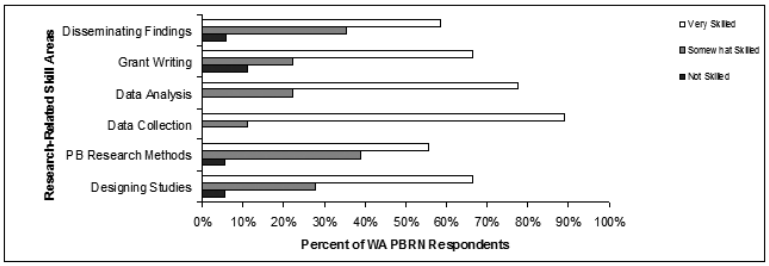
The research questions identified as high priority were in the thematic areas of financing, decision-making and economics, public health workforce characteristics and needs, public health law and policy, variation in public health practice, and quality improvement. Interestingly, in the second survey, public health financing and workforce development were identified as top priorities for the network, highlighting the importance of ongoing assessment of network interests. Network members indicated that the recent state budget crises and concerns about workforce succession planning influenced priorities. The updated research agenda will allow the PBRN to be focused in its search for funding opportunities and nimble in responses to calls for proposals in 2011.

The initial 2009 survey also assessed the network membership's capacity in areas relevant to PHSSR (Table 2). More than 65% of network members rated themselves overall as very skilled as researchers, but more than 30% rated themselves as somewhat or not skilled in practice-based research methods and dissemination of findings. However, members suggested others within their jurisdictions that had requisite skills and were willing to share their expertise.

There is a pressing need for public health decision-making to follow standardized processes, be guided by shared priorities and organizational strategies, and be grounded in evidence. Once we understand how financing and resource allocation decisions are currently made, we can identify barriers and develop strategies to encourage adoption of standardized processes, shared priorities, organizational strategies, performance measures, and evidence-based public health practices.

A Washington State local health director, October 2009

Table 2: Network Member Assessment of Research and Evaluation Capacity, 2009, WA PBRN



Significant Research Projects Underway

In its first year, the WA PBRN was funded to conduct three research projects and is participating in a multi-state study involving several RWJF-funded PBRNs. The theme that weaves the projects together is the WA PBRN's overarching interest in research that examines variation in public health practice across local jurisdictions. Beyond mere description of variation, researchers hope to apply findings, test practices and otherwise standardize and improve public health practice in Washington.

Our first research project focused on variation in emergency planning and response activities during the fall 2009 H1N1 outbreak. This study described H1N1 mass vaccination planning and implementation activities at four points: pre-outbreak, early outbreak, late outbreak and post-outbreak. The study, which was funded by the WA DOH, put into practice an approach recommended by the PBRN by securing a portion of existing program funds to support practice-based research. An assessment consisting of four telephone surveys and two online surveys with 15 Washington LHJs identified factors that facilitated different response activities, barriers encountered and actionable items prioritized for future work. We have disseminated the results through five reports as well as presentations at several statewide meetings. We are currently working with the WA DOH to translate these findings into practice and evaluate the translation process.

Our second research project focuses on the impact of funding losses on public health services triggered by the 2008 national economic downturn, with an eye toward developing strategies that a) support thoughtful and consistent decision-making, b) reduce barriers to the utilization of best evidence in prioritizing resources and, c) address the needs of marginalized populations. We are midway through this study, which examines variation in program cuts made by Washington State LHJs between 2008 and 2009. In 2009, Washington State was one of 25 states in the nation in which more than half of the state's LHJs cut programs for "budgetary reasons" (NACCHO, 2009). By May 2010, Washington was one of 11 states in the nation in which more than three-quarters of the state's LHJs had experienced further budget cuts (excluding a onetime federal stimulus funding), thus resulting in even smaller budgets than the previous difficult year. These dramatic cuts illustrate the need for evidence to guide LHJ decisions about effective use of limited resources. The project investigates the influence of evidence-based practices, such as those supported by the *Community Guide to Preventive Services* (CDC 2009), in the LHJs' budgetary decisions during 2008 and 2009. The study will also identify barriers to evidence-based decision-making and practice and potentially effective strategies for implementation.

The study, co-led by academic and practice principal investigators, uses a mixed method approach, combining analyses of existing local survey data and primary data collected through key informant interviews. These data go beyond capturing current levels of service, to measuring change and variation in public health service delivery across the state and over time. Existing data sources include the Washington State Activities and Services Inventory (WSALPHO), county-level budget reports and the WSALPHO annual LHJ survey. These sources provide information on the impacts of budget cuts and types of budgetary adaptations such as reductions in service, program elimination, and the retention or elimination of evidence-based programs. A representative sample of LHJs is being selected for key informant interviews. Qualitative data from these interviews will provide insight into how LHJ leaders made program decisions, whether measures of effectiveness were used, and what factors facilitated or hindered their preferred approaches.

Findings from this study, along with discussions and validity checks with a research advisory group and other WA PBRN partners, are expected to provide guidance to LHJs on strategies for, and overcoming barriers to, evidence-driven decision-making that would benefit the health of their communities and marginalized populations.

Our third research project focuses on communicable disease (CD) investigation, an essential public health service, and examines variation in CD investigation activities in all 35 Washington State LHJs. Topics of interest include animal bite reporting and post-exposure prophylaxis, pertussis and the criteria for post-exposure prophylaxis, salmonella and food worker policy, and hepatitis C investigation criteria. With an on-line survey and review of LHJ CD investigation protocols, we hope to set the stage for an inferential study that identifies characteristics of systems with the most efficient and timely CD investigation practices.

Most recently our network has committed to joining with several other PBRNs in a multi-state study intended to establish a system for tracking changes in and variation among activities and services provided by local health departments. Launched last fall under the direction of WA PBRN's Betty Bekemeier, the Public Health Activities and Services Tracking (PHAST) study will use the current national financial crisis and associated changes in local public health service delivery as a natural experiment. It is a natural extension of the WA PBRN's second research project and seeks to emulate health services and systems research which monitored geographic variation in and changes to medical care delivery across the nation. Such research has radically changed our understanding of the effectiveness of our health care system and provides an evidence base for reforming practice and making more effective use of resources. With the engagement of public health PBRNs from across the country, the PHAST study is an opportunity to establish a common mechanism for examining variation and change in local public health service delivery and outcomes. This will provide the basis for developing best practices and interventions that will lead to more efficient and effective public health practice.

Successes and Challenges

The WA PBRN's success to date can be attributed to our ability to recruit and sustain a network of enthusiastic academic and public health practice partners, establish an infrastructure, develop a relevant and timely practice-focused research agenda, and secure funding to conduct several practical studies in a short time period. The strong and established partnerships between local and state health departments and academic institutions have allowed us to move efficiently into collaborative and productive practice-based research. In its first year, the WA PBRN applied for and received funding for projects addressing three of its four research priorities.

Over the past 20 months, interest in the WA PBRN has increased, particularly since we disseminated our H1N1 study reports and made presentations about the network at local and national meetings. We find that potential partners are easier to engage when they see how the network actually influences public health practice. Our ability to conduct real-time assessments and feed the results back to LHJs within weeks of data collection keeps our partners both engaged and invested in the work.

Local and national recognition that descriptive and inferential practice-based research is perceived as improving the quality of public health practice has also positively affected our ability to achieve our goals. Funding for PHSSR appears to be increasing, and our network is now poised to take advantage of upcoming grant opportunities.

Our greatest challenge is sustainability. Our seed grant from the RWJF ended in December 2010, and it is difficult to allocate flexible public health funds to maintain an infrastructure in a time of diminished resources. Securing funds that will support infrastructure as well as research is a network imperative. Another challenge has been recruiting academic principal investigators to write grants and lead studies. This appears to be due to a lack of seasoned and available principal investigators, but we are beginning to see an emerging new generation of trained PHSSR researchers.

Conclusion: Future Plans

Public health services and systems research is often viewed along a continuum of descriptive, inferential and translational research. Our first two years focused primarily on descriptive research, but over the next year, we plan to build on our descriptive studies and conduct inferential and translational studies. The nature of our network allows for a strategy of setting aside practice grant dollars for the implementation and evaluation of PBRN activities. In the coming months, the WA PBRN will focus on securing funds to address our highest-priority research questions and our infrastructure needs, as well as recruiting more academic principal investigators interested in spending most of their time on PHSSR. We will also disseminate the results of the funding losses study and the CD investigation assessment, and hope to secure funding that helps us determine the consequences of the practice variation described in our initial studies. From there, our plan is to test strategies to improve health outcomes by reducing potentially harmful variation in public health practice.

References

Centers for Disease Control and Prevention. The Community Guide to Preventive Services. 2009 [cited 2009 January 4]; Retrieved 1/10/11 from http://www.thecommunityguide.org/index.html

Friedly J, Chan L, Deyo R. Geographic Variation in Epidural Steroid Injection Use in Medicare Patients. *J Bone Joint Surg Am.* August 1, 2008 2008;90(8):1730-1737.

Mays GP, Smith SA, Ingram RC, Racster LJ, Lamberth CD, Lovely ES. Public health delivery systems: evidence, uncertainty, and emerging research needs. *Am J Prev Med.* Mar 2009;36(3):256-265.

National Association of County & City Health Officials. Survey of Local Health Department Job Losses and Program Cuts. Washington DC; 2009.

National Association of County & City Health Officials. Research Brief Job Loss and Program Cuts. Washington DC; 2010. Retrieved 1/10/11 from http://www.naccho.org/topics/infrastructure/lhdbudget/upload/Job-Losses-and-Program-Cuts-5-10.pdf

The Dartmouth Institute for Health Policy and Clinical Practice. The Dartmouth Atlas of Health Care. 2009; http://www.dartmouthatlas.org/. Accessed January 12, 2010.

Washington State Department of Health (2009). Public Health Improvement Partnership. Retrieved 1/10/11 from http://www.doh.wa.gov/phip/intiative/phas/2009.htm

Washington State Department of Health (2010). Public Health Activities and Services Workgroup Charter. Retrieved 1/10/11 from http://www.doh.wa.gov/phip/doc/phas/charter.pdf

Weinstein JN, Lurie JD, Olson PR, Bronner KK, Fisher ES. United States' Trends and Regional Variations in Lumbar Spine Surgery: 1992-2003. Spine. 2006;31(23):2707-2714.

Acknowledgements:

Susan Allan, MD, JD, MPH, University of Washington School of Public Health; Larry Jecha, MD, MPH, Benton-Franklin Health District; Barry Kling, MSPH, Chelan-Douglas Health Department; John Wiesman, MPH, Clark County Health Department; Scott Lindquist, MD, MPH, Kitsap County Health Department; Gary Goldbaum, MD, MPH, Snohomish County Health Department; Joel McCullough, MD, Spokane County Health District; Sherri McDonald, RN, MPA, Thurston County Health and Social Services Department; Allene Mares, Washington State Department of Health, RN, MPH; Lois Smith, Washington State Association of Local Health Officials