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The Public Health PBRN Program: A Summative Report

Center for Public Health Systems and Services Research

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SUMMATIVE PROGRAM REPORT
December 30, 2013

- Project:** Project 70363, Robert Wood Johnson Foundation Practice-Based Research Networks in Public Health
- Period:** October 1, 2007 to October 31, 2013
- Amount:** \$2,836,617
- Purpose:** This program seeks to expand the volume and quality of evidence on how best to organize, finance, and deliver public health services by: (1) helping to organize and develop practice-based research networks (PBRNs) comprised of public health agencies and skilled research institutions; (2) selecting grantees to receive funding and technical assistance for PBRN research projects; and (3) facilitating the successful development, implementation, and translation of research projects through PBRNs by providing technical assistance, fostering peer learning, and leading selected multi-network research activities.
- Contact:** Glen P. Mays, Ph.D.
Professor of Health Services and Systems Research
College of Public Health
University of Kentucky
121 Washington Avenue, Suite 204
Lexington, KY 40536
Telephone (859) 218-2029
Email glen.mays@uky.edu
Web: www.publichealthsystems.org/pbrn
Archive: http://works.bepress.com/glen_mays
Blog: <http://publichealtheconomics.org>

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1. What measurable goals were set for this national program, and what indicators did you use to measure your performance? To what extent has the program achieved these goals and levels of performance?

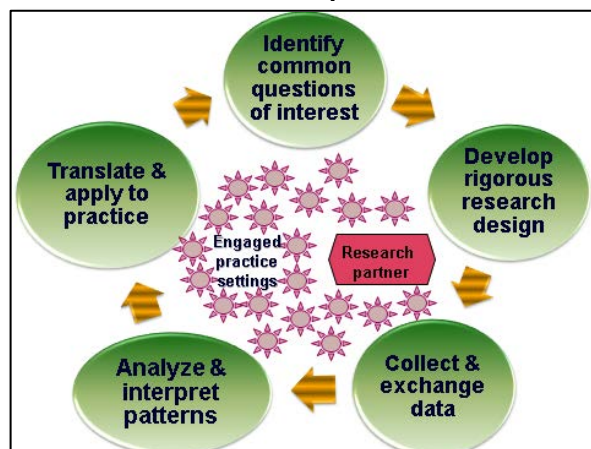
The program's overarching objectives were to (1) develop an operational model for practice-based research networks (PBRNs) that engage public health practice settings in the design, conduct, and translation of applied studies that inform public health practice and policy; (2) facilitate the development of at least 12 of these research networks distributed across the U.S.; (3) use the PBRNs to expand the volume and quality of research that is collaboratively developed and implemented by practicing public health professionals and their research partners, and (4) use the PBRNs to accelerate the translation of research findings to assist decision-makers in public health administration and policy.

Rationale for the Program: Achieving meaningful health and economic benefits from investments in prevention and public health requires knowledge about which strategies actually support improved health, at what cost, and how best to deliver these strategies to the populations that can benefit from them.¹ An expanding body of research-tested prevention programs and policies exists, such as those profiled in the CDC's *Guide to Community Prevention Services*², but large gaps persist in the adoption and implementation of these strategies across states and communities.³⁻⁹ Moreover, public health professionals are often called to act against health threats for which few if any evidence-based strategies exist, or to act in settings where evidence-based strategies are logistically, politically or economically infeasible. In these situations, innovations in public health practice occur but without the comparative research necessary to determine their impact and value.¹⁰ These missed opportunities for evidence-based practice and practice-based evidence emphasize the need for "delivery system research" that indicates how best to organize, finance, and deliver public health strategies in real-world practice settings.^{11,12} The need for delivery system research in public health is particularly acute given that public health strategies are delivered through the combined efforts of multiple governmental agencies and their private-sector and community-based counterparts, through complex relationships and using resources that vary widely across states and communities and that evolve over time.¹³⁻¹⁷ Strategies that are easily implemented in one setting often face barriers in other settings.¹⁸ Expanded delivery system research can elucidate which strategies and adaptations work best in which settings and for which populations.

Delivery system research in public health settings requires the active engagement of public health organizations in the design, implementation, and application of these studies, but historically such engagement has been limited. Data from the CDC's National Public Health Performance Standards Program, for example, consistently indicate that state and local public health organizations are much less likely to achieve national standards in research and evaluation than in other domains of practice.^{7,8,19,20} Periodic national surveys of governmental public health agencies find similarly low levels of research engagement, particularly at the local level.^{21,22} Public Health PBRNs are designed to fill this void by bringing together public health agencies and academic researchers to study the organization, financing, and delivery of public health strategies in real-world practice settings, with the goal of producing actionable evidence that can be used to improve practice and policy.^{23,24}

Conceptual Framework for the Program: PBRNs have been used in medical care research for more than three decades to support delivery system research in clinical settings. PBRNs allow community-based health professionals and their staffs to collaborate with researchers in designing, implementing, evaluating, and diffusing solutions to real-world problems in clinical practice.^{25,26} Successful PBRNs identify relevant clinical questions and link them with rigorous research methods applied within community settings (**Exhibit 1**). The result of this collaboration is scientific information that is relevant to practice, externally valid, and readily assimilated into other settings.²⁷ Clinical PBRNs have expanded rapidly in recent years as they have become increasingly central to the quality improvement initiatives promoted by federal health agencies and national medical societies.²⁸ The U.S. Agency for Healthcare Research and Quality (AHRQ) has worked since 1999 to establish such networks among primary care practices, where they have become central components of scientific efforts to encourage the diffusion of evidence-based clinical practices and the adoption of new technologies to improve quality of care. Other networks have developed with support from the U.S. Health Resources and Services Administration and medical specialty societies such as the American Academy of Pediatrics and the American Academy of Family Physicians.

Exhibit 1: The PBRN Conceptual Model



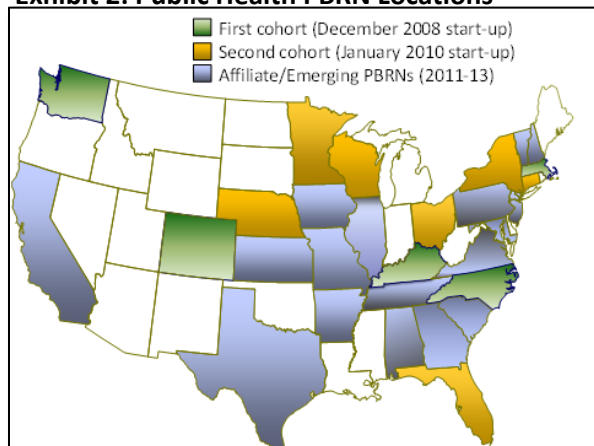
Hospital-based PBRNs also have emerged to support quality improvement research in selected medical specialty areas, such as the Vermont Oxford network of neonatal intensive care units. More recently, AHRQ extended the PBRN concept to research networks involving health plans and integrated health care delivery systems, and networks for dental care, mental health care, and school nursing also have developed. Although not all PBRNs succeed in becoming viable research enterprises, collectively these networks are responsible for producing a large and growing body of evidence around strategies for improving health outcomes and quality of care in real-world practice settings. More than 110 primary care PBRNs currently operate in the U.S., supported by a diverse mix of federal and private clinical research funding.²⁹

The experience of the PBRN model in clinical settings suggests that it may also be useful in public health settings to accelerate the production and application of evidence regarding public health delivery. 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.²⁴ 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. 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, 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.

We adapted a conceptual model for Public Health PBRNs from the primary care PBRN model that has been used successfully in clinical settings for several decades. Based on this model, each network comprises decision-makers from multiple public health practice settings that represent the information

needs and research opportunities that exist in real-world settings, along with one or more research partners that contribute interdisciplinary scientific expertise in the design and implementation of studies within such settings. Because of the inherent intergovernmental nature of most public health work, our PBRN model requires representation from both state and local governmental public health settings, and encourages representation from nongovernmental public health partners as well. The logic of the PBRN model stresses that by engaging real-world practitioners in all stages of the research process, the scientific enterprise can identify more relevant and actionable research questions, produce higher-quality findings by incorporating the experience-based knowledge of practitioners into the scientific learning process, and accelerate the translation and application of research findings back into real-world practice settings where they can benefit society at large.

Exhibit 2: Public Health PBRN Locations



Goal I: Establish Public Health PBRNs: The program’s original goal of developing 12 operational public health PBRNs, with at least 10 practice settings engaged in each network, has been far surpassed. Currently, the program has fostered the development of **30 research networks that collectively engage more than 1500 state and local public health agencies and 46 university-based research centers** in applied research and translational activities (**Exhibit 2**). The affiliate category was added to the program in 2010 in response to the high demand among applied researchers and practitioners to collaborate in the program even without financial support from the

Foundation. Beginning in 2011, we opened eligibility to selected funding opportunities to affiliate PBRNs. However, only two-thirds of the 30 PBRNs have ever received direct financial support from the program (**Exhibit 3**), illustrating the success of PBRNs in leveraging outside funding sources and in-kind resources. Assuming each affiliate network produces an average of \$100,000 in practice-based research activities per year (the average funding level for Foundation-supported networks), these networks have generated at least \$2 million on non-RWJF supported work.

Goal II: Engage Practice Settings in Research Implementation: A second overarching goal of the program was to use the PBRNs to increase the number of public health practice settings that actively participate in research implementation and translation activities. A recent analysis conducted by the Coordinating Center found that local public health agencies who participate in one of our 14 initial PBRNs reported markedly higher levels of engagement in research implementation activities compared to a national sample of agencies not participating in PBRNs (**Exhibit 4**). PBRN participants were more than three times as likely as nonparticipants to engage in identifying research topics, and more than five times more likely to engage in planning and designing studies ($p < 0.01$). The mean composite measure of research implementation was 2.8 times larger among PBRN participants than among non-participants. These large differences in research implementation persisted after adjusting for differences in agency expenditures, population size of jurisdiction, per capita income in jurisdiction, and rural/urban location.

Exhibit 3: Organizations Participating in the Public Health PBRN Program, 2013

	<u>State Agencies</u>	<u>Local Agencies*</u>	<u>Academic Units</u>	<u>Other</u>	<u>Total</u>
Original RWJF-Supported Networks					
CO	1	55	2	15	73
CT	3	40	3	5	51
FL	1	67	3	3	74
KY	1	56	1	1	59
MA	1	356	1	2	360
MN	1	75	1	1	78
NC	2	100	1	1	104
NE	2	12	1	2	17
NY	1	56	3	2	62
OH	1	115	6	3	125
WA	1	36	2	1	40
WI	1	42	3	2	48
Affiliate Networks with RWJF-Funded Projects					
GA	1	118	1	6	126
MO	1	115	3	1	120
NJ	1	100	2	1	104
TN	1	16	2	1	20
CA	1	12	1	1	15
NH	1	16	1	1	19
KS	1	10	1	1	13
Affiliate Networks without RWJF-funded Projects					
AR	1	110	2	0	113
PA	1	7	1	0	9
VA	1	5	3	5	14
IL	1	14	2	0	17
AL	3	1	1	1	6
TX	1	15	1	2	19
VT	1	12	1	0	14
SC	1	10	1	0	12
IA	1	7	1	0	9
MS	1	15	1	0	17
TOTAL	35	1593	52	58	1738

*Includes all agencies that participate in PBRN studies

Goal III: Expand the Volume and Quality of Research on Public Health Practice: From 2009 through 2013, the 18 PBRNs that have received funding from the program have implemented a total of 62 individual research projects, and the program has produced a total of 68 peer-reviewed scientific articles, 74 reports and other publications for policy and practice audiences in the grey literature, and 165 research presentations, workshops and webinars at scientific and professional meetings. Peer-reviewed publications have appeared in some of the most widely used venues for the public health profession, including the *American Journal of Preventive Medicine*, *Public Health Reports*, *Health Affairs*, and the *Journal of Public Health Management and Practice*, along with the widely-accessible open-access journal created by the program, *Frontiers in PHSSR*. It is important to recognize that most PBRN studies are small-scale projects of under \$100,000 and 12-18 month timeframes, and that 20 of the 62 research projects have not yet completed their implementation and dissemination phases. With this contextual information in mind, the research productivity from the PBRNs is especially notable, averaging >2 peer-reviewed publications, >2 applied publications, and >5 presentations/workshops per completed project.

Exhibit 4: Local Public Health Agency Engagement in Research Implementation Activities: PBRN Participants Compared with a National Sample of Agencies

Variable	PBRN Agencies	National Sample	
	Percent/Mean (S.D.)	Percent/Mean (S.D.)	
Identifying research topics	94.1%	27.5%	***
Planning/designing studies	81.6%	15.8%	***
Implementing recruitment, data collection & analysis	79.6%	50.3%	**
Disseminating study results	84.5%	36.6%	**
Applying findings in own organization	87.4%	32.1%	**
Helping others apply findings	76.5%	18.0%	***
Research implementation composite measure	84.04 (27.38)	30.20 (31.38)	**
N	103	505	

Source: Mays GP, Hogg RA, Castellanos-Cruz DM, Hoover AG, Fowler LC. Public health research implementation and translation: evidence from practice-based research networks. *American Journal of Preventive Medicine* 2013;45(6):752-762. ***p<0.01 **p<0.05 *p<0.10

Goal IV: Accelerate the Translation of Research into Practice and Policy Decision-making: Research translation is a particularly difficult mechanism to measure quantitatively, but a collection of proxy measures indicate that the PBRN program is achieving success with moving research results into use by public health practice and policy stakeholders. The evaluation results shown in **Exhibit 4** above indicate that the vast majority of local public health professionals who participate in PBRNs report actively working to apply research findings within their own organizations and to help peer organizations apply these findings – at rates nearly 3 times higher than comparable professionals who are not connected to PBRNs. The utilization statistics from some of our most prominent research dissemination and communication vehicles also indicate high usage of research projects, with our open-access journal [Frontiers in PHSSR](#) registering 8950 article downloads during its 18-month history of operation (since April 2012), 5360 downloads from our [PBRN and PHSSR Digital Research Archive](#) during its 12-month operational time frame, and more than 1000 views of our blog [PublicHealthEconomics.org](#) during its first 3 months of operation. Briefings on PBRN research findings have been requested by a wide array of key stakeholders in public health administration and practice, including leaders at CDC, HRSA, the HHS Assistant Secretary for Preparedness and Response, the U.S. Food and Drug Administration, the White

House Office of Management and Budget, the Congressional Budget Office, the Government Accountability Office, NACCHO, ASTHO, APHL, Oregon's Legislative Taskforce on Public Health System Reform, the Ohio Legislature's Public Health Futures Initiative, and many others. Specific examples of research utilization and impact are described under Question 7 and Question 10 below.

Types of PBRN Research Projects: Over its six-year history, the program has organized research through six types of competitive mechanisms that collectively have helped networks develop a broad base of research skills and capacities: (1) two-year **developmental awards** provided to the first two cohorts of PBRNs (n=12 awards at \$90,000 each over 24 months) to support initial network development activities and small-scale **Proof of Concept (POC) studies**; (2) larger-scale **Research Implementation Awards (RIA)** (n=10, awards at \$150,000 each over 18 months) to support implementation of more complex and intensive research projects; (3) **Research Acceleration and Capacity Enhancement (RACE)** awards (n=4 awards at \$50,000 each for 12 months; n=4 awards at \$100,000 each for 18 months) provided to allow networks to add supplemental research investigations to existing studies and to increase the size and diversity of their research teams; (4) **Quick Strike Research Fund (QSRF)** awards (n=12, awards at \$25,000 each for 3-6 months, n=4 awards at \$50,000 each for quality improvement studies) that support short-term, small-scale studies on time-sensitive topics that have the potential to lead to larger-scale investigations; (5) the **Multi-Network Practice and Outcome Variation (MPROVE)** studies (n=6, awards at \$50,000 each for 18 months) which allow six PBRNs to collaborate in the development of a common set of measures of public health service delivery and to pool data across networks for analysis using a standardized research protocol; and (6) most recently the **Public Health Delivery and Cost (DACS)** studies (n=4 awards at \$50,000 each for 12 months; and n=7 awards at \$150,000 each for 18 months) which allow PBRNs to undertake studies that examine the costs of delivering high-value public health services and to analyze the causes and consequences of cost variation using standardized approaches to measurement and analysis. Over time, PBRNs have also experienced success in competing for funded research projects from other RWJF research programs (e.g. Public Health Law Research, National Coordinating Center for Public Health Services and Systems Research, Changes in Health Care Financing and Organization) and from federal and state funding sources. A total of 60 extramurally funded research projects have been undertaken through the PBRNs to date. Research implementation and dissemination activities are still underway for MPROVE and DACS projects, as well as QSRF projects implemented during the 2013-14 cycle.

The research projects supported through the Public Health PBRN Program fall into four topical domains that reflect priority issues and information needs identified in the PHSSR National Research Agenda developed by RWJF and CDC in 2012:

- Economics, financing, and resource allocation in public health practice
- Quality measurement, improvement, and accreditation
- Regionalization, consolidation, and service-sharing in public health
- Public health responses to equity and health disparities issues

The specific PBRN studies undertaken in each of these areas are shown in **Exhibit 5** (note that this list does not include the 12 small POC studies undertaken during the first two years of network development).

Exhibit 5: Research Studies of Public Health PBRNs by Topical Domain**Network Topic/Title*****I. Economics, Financing, and Resource Allocation in Public Health***

11 nwks	Public Health Delivery and Cost Studies: Causes and Consequences of Cost Variation
CO	Public Health Roles in Local Resource Allocation Decisions for Safe Routes to Schools Programming
CT	Effects of Financial Constraints and Regionalization Incentives on Local Public Health Delivery
FL	Local Spending Variation in Essential Public Health Service Domains
MN	Effects of Local Tax Levies on Local Public Health Services
NC	Effects of Medicaid MCH Payment Changes on Local Public Health Practices and Outcomes
NC	Comparative Effectiveness Research Tools for Examining Public Health Services and Outcomes
OH	Financial Effects of Local Health Department Consolidations
OH	Estimating the Costs of a Minimum Package of Public Health Services
WA	Effects of Economic Shocks and Evidence-Based Decision-Making in Public Health
WI	Forecasting the Impact of the Economic Recession on Public Health Financing

II. Quality Measurement, Improvement, and Accreditation in Public Health

6 nwks	Multi-Network Practice and Outcome Variation Examination Study (MPROVE)
CO	Effects of Community Partnerships on Adoption of Evidence-Based Prevention
CT	Measuring Quality in Local Public Health Emergency Preparedness During the H1N1 Outbreak
FL	Local Public Health Responses to the County Health Rankings
GA	Effects of Health Information Exchange on Public Health – Primary Care Alliances
KY	Effects of a Public Health QI Intervention on Evidence-Based Diabetes Prevention
KY	Local Variation in H1N1 Communication and Response in Kentucky
MA	Local Variation in Food Safety and Infectious Disease Control Practices
MN	Measuring the QI Continuum and Correlates in Public Health Settings
MN	A Taxonomy of QI Methods, Techniques and Results in Public Health
MO	Effects of Public Health Accreditation on Quality Improvement Philosophy
NC	Local Variation in H1N1 Response in North Carolina
NY	Effects of Integrated HIV/AIDS and STD Service Delivery in New York: A Natural Experiment
OH	Local Variation in Prevention, Investigation, and Intervention Practices for Foodborne Illness in Ohio
OH	Variation in Local Enforcement of a State Clean Indoor Air Law
OH	Analyzing Concordance between Position Descriptions and Practice Standards for Public Health Nurses
OH	Direct Observation Methods in Local Public Health Settings: Foodborne Outbreak Practices in Ohio
WA	Public Health Activities and Services Tracking Study: Measuring Variation in Service Delivery
WI	Measuring the Quality of Community Health Improvement Planning and Implementation
WI	Utility of Electronic Information Systems for Studying Local Public Health Practices and Outcomes

III. Regionalization, Consolidation, and Shared Services in Public Health Delivery

CO	Public Health Law and Regionalization
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Exhibit 5: Research Studies of Public Health PBRNs by Topical Domain (Continued)**Network Topic/Title**

CT	Effects of Financial Constraints and Regionalization Incentives on Local Public Health Delivery
GA	Feasibility and Effectiveness of Multi-Jurisdictional QI Collaboratives for Small and Rural Public Health Settings
GA	Comparative Effectiveness of State vs. Regional Approaches to QI in Public Health
MA	Effects of State Incentives on Development and Implementation of Regional Public Health Delivery Models
NE	Quality Improvement Strategies and Regional Public Health Structures
NE	Regional Public Health Structures and Readiness for Accreditation and QI
WI	Local Variation in Multi-Jurisdictional Models of Public Health Shared Service Delivery

IV. Equity, Health Disparities and Public Health Delivery

CT	Utilization and Effectiveness of a Health Equity Index in Mobilizing Local Public Health Action
KY	Effects of Cultural Competency Training on Local Health Departments: A Randomized Trial
MN	Variation in Local Public Health Actions to Address Health Inequities
WA	Evaluation of a Quality Improvement Project to Improve Workforce Diversity
WA	Local Health Department Workforce Reductions: Implications for Diversity and Health Disparities

A few of the most salient findings from this collection of PBRN studies include:

- Washington PBRN’s proof-of-concept investigation of local health department practices for communicable disease investigation and control found that rates of adherence to evidence based guidelines for rabies post-exposure prophylaxis varied by a factor of 2 between regions of the state, and that adherence to evidence-based guidelines for management of close contacts of pertussis cases varied nearly seven-fold between the regions.³⁰ The findings demonstrate how wide practice variation in local public health settings can result in unequal protection from communicable disease threats in Washington. The study has triggered program and policy developments designed reduce unwarranted practice variation in the state, including the dissemination of practice guidelines for local health departments, the development of quality improvement initiatives focused on communicable disease control, and new continuing education and training opportunities for health department staff.
- Ohio PBRN’s QSRF study of local health department practices to enforce elements of a statewide clean air law found that three-quarters of agencies enforce the law through complaint investigations and inspections, but more two-thirds of these agencies are at risk of reducing their enforcement activities because they are financed exclusively through local collection of fines and fees, resulting in lost revenue from unpaid violation assessments. Communities with the highest violations faced the largest financial vulnerabilities to diminished enforcement. The findings suggest the need for more sustainable funding models for implementation of state tobacco control policies in order to reduce geographic disparities in tobacco control enforcement.³¹
- Connecticut PBRN’s RIA study of incentives for local public health agency regionalization found that a 2008 state policy change that reduced state public health funding for agencies below a population threshold of 50,000 residents had the intended effect of increasing the number of small municipalities that are considering or implementing actions to join regional public health districts.

However, the study also found an unintended side effect of the move to district health department structures in that state. Price competition among the state's multi-municipality district health departments for membership from cities and towns has placed downward pressure on public health expenditures in these districts. This competitive incentive contributes to disparities in resources among local health departments, and over time it has the potential to drive larger numbers of municipalities into lower-resource district structures, potentially weakening overall levels of public health infrastructure in the state.

- Minnesota PBRN's RIA study of the policy development powers held by local health departments in the state found that stand-alone public health agencies were more than 40% more likely than combined health-human service agencies to have direct authority over agency budget decisions and authority to directly consult with local elected officials on health policy issues.³² This finding suggests that the recent policy push toward combined agencies may have unintended and adverse effects on the policy development capacities of local public health agencies.
- Georgia PBRN's RACE study of quality improvement activities (QI) among that state's 115 county health departments show that Georgia's multi-county district structures appear to increase significantly the capacity of county health departments to adopt and implement QI processes and to carry out essential public health services, by factors ranging from 15-35%.³³ The enhancements appear to accrue not only through enhanced human and financial resources provided at the district level, but also through the ability of the districts to function as quality improvement collaboratives that facilitate peer learning and information exchange among the member county agencies.
- Kentucky PBRN's RIA quasi-experimental study of a QI program implemented by local health department staff to facilitate the delivery of an evidence-based diabetes self-management program in community settings found that the program increased overall participation in the program by 14%, and increased completion rates among diabetics who entered the program by more than 100%.³⁴ The findings demonstrate that local public health agencies can serve as effective vehicles for extending the reach and quality of evidence-based chronic disease prevention programs, particularly when QI principles are used as part of implementation.
- Wisconsin PBRN's QSRF study to forecast the effects of the economic recession and recovery on local health department financial resources found wide variation in the financial vulnerability of agencies based on their tax bases and demographic mix, with about 6% of agencies projected to experience a greater than 25% reduction in per-capita revenue during 2009-14, another 46% experiencing reductions of less than 25%, and the remaining 48% experiencing revenue increases. The project also produced a financial forecasting model that can be used to generate customized estimates for individual agencies.
- Connecticut PBRN's RACE study of the development and use of a data-driven, community-level health equity index among local health departments found that departments serving economically disadvantaged communities and racially and ethnically diverse populations were more likely than their counterparts to access and use the index for assessment and policy development purposes.³⁵ Utilization was also greater among agencies governed by a board of health, agencies with longer-serving administrators, and agencies with higher proportions of MPH-level staff. Findings suggest that a combination of factors need to be addressed in supporting agencies to undertake work on health equity and disparities issues in their communities, including issue awareness and interest

among leaders and staff, engagement of governance and leadership structures, and workforce training and skills.

2. How has the program managing institution supported the program's accomplishments?

The PBRN Coordinating Center hosts a wide range of engagement activities and supports to facilitate the design, implementation, translation, dissemination and application of PBRN studies, including:

- **A monthly virtual meeting** supported by web-based teleconferencing that includes representatives from all PBRNs. Each edition of this meeting includes a Research-in-Progress session led by a different PBRN each month, sharing real-time experiences with scientific, administrative, logistical, and substantive dimensions of their research projects. Networks present issues that emerge during all phases of the research process, from conceptualization of questions, to measurement, data collection, analysis, and interpretation. Considerable dialog and discussion occurs as part of the question and answer sessions that follow each monthly presentation. Each monthly meeting also includes a research administration component for sharing information on a wide range of topics including network development, professional and community engagement, dissemination strategies, funding opportunities, and grants management processes.
- **Targeted monthly virtual meetings for multi-network collaborative research projects.** Both the MPROVE and DACS studies have dedicated monthly virtual meetings where participating networks can share strategies and resources, raise questions, and brainstorm solutions to problems. The Coordinating Center uses these meetings to provide scientific direction and technical assistance on methodological issues, to facilitate standardization and comparability in the methods used across individual studies, and to identify opportunities for pooled analyses across individual projects.
- **An electronic newsletter** produced weekly during the first two years of the program and monthly thereafter, containing highlights of PBRN research findings, notices of related research resources and tools relevant to PBRN research, funding opportunities, publication and dissemination opportunities, and upcoming related meetings and events. During 2013 we consolidated this PBRN newsletter with the PHSSR electronic newsletter produced by the National Coordinating Center for PHSSR.
- **Quarterly skill-building webinars** are organized on both scientific and administrative topics that are identified by PBRN collaborators, and archived on the program website. Topics have ranged widely and included: network analytic methods, community engagement methods, costing methods and economic evaluation, research network development strategies, IRB and human subjects protection issues, and administrative data sources in public health.
- **Quarterly Research-to-Action (RE-ACT) Podcasts** are produced that highlight emerging PBRN research findings and the lessons for public health practice and policy that derive from them. These features are archived on the program website and featured in newsletters.
- **[Electronic resources and guidance documents](#)** that are maintained on the program website and its digital research archive, covering topics such as how to organize PBRN, start-up activities for building

a research portfolio, funding and sustainability strategies, policy translation strategies, research agendas, and evaluation strategies.

- [**A PBRN program website**](#) that contains descriptions of each network and a one-stop location for overview and guidance documents, descriptions of research initiatives, funding and dissemination opportunities, and related resources.
- [**The PBRN and PHSSR Digital Research Archive**](#) that contains research presentations and publications, research protocols, media coverage, and other resources generated by the Coordinating Center 's leadership for PBRN and PHSSR studies. The archive generated 5360 downloads during its initial 12 months of operation.
- [**Frontiers in PHSSR**](#), a peer-reviewed, open-access journal launched by the PBRN program in 2012 as a vehicle for PBRN investigators and other PHSSR scholars to rapidly share their emerging findings and their practice and policy implications in a peer-reviewed publication that is freely available to both authors and readers. Two full volumes that include a total of 10 issues and more than 60 individual research articles have been published to date, along with commentaries from policy and practice perspectives. The journal registered 8950 article downloads during its first 18-months of operation.
- [**The Public Health Economics**](#) blog, which features discussions of PBRN studies and related PHSSR work, with a focus on the economic and financial issues at play in this work. This resource was newly developed in Fall 2013 in response to the growing portfolio of economic and financial research underway within the PBRN and PHSSR programs. It generated more than 1000 views during its initial 3 months of operation.
- **The Annual Public Health PBRN Grantee Meeting**, held in conjunction with the Keeneland Conference on PHSSR each April, provides an opportunity for in-depth and in-person networking, peer-learning, and collaborative project development among PBRN collaborators and members of the Coordinating Center.
- **Customized Scientific, Technical, and Administrative Assistance** provided by Coordinating Center staff to individual PBRN research teams on an as-needed and on-demand basis. These episodes range from periodic teleconference consultations to on-site visits scheduled with individual PBRNs, and provide support to all phases of the research process. Over the course of the program Center staff have conducted in-person visits to all but two of the 30 PBRNs in person.
- **Project-specific web-based information-sharing resources** are maintained by the Coordinating Center for individual research needs. For example, the multi-network collaborative research projects MPROVE and DACS utilize dedicated Drop-Box sites for sharing research protocols and other documents, and periodically use GooglePlus online discussion forums.
- [**The PBRN Network Analysis**](#), conducted by the Coordinating Center in 2010 and 2012, and planned again for 2014, provides networks with thought-provoking visual and numeric representations of the patterns of collaboration that occur among practitioners and researchers within their networks. We share customized and comparative results from this analysis with all network members, and assist them with engaging their network members in collaborative interpretation activities. Networks

compare how their own patterns of interaction compare with other networks, and share strategies on how to fill structural holes in their networks, how to support participants at both the core and the periphery of their networks, and how to best manage the density of communication and information flows across their networks.

- ***The National Longitudinal Survey of Public Health Systems***, which tracks changes in public health activity in a national cohort of 360 communities across the U.S., is maintained by the Coordinating Center to facilitate research on public health delivery. We completed an additional wave of data collection in 2012 as part of PBRN program activities. PBRN networks have used the data and measures for their own analyses, including as a source for constructing a national comparison group used in comparative analyses of practice variation in public health. Several PBRN networks (CA, WA, CT) have fielded the same survey instruments in their own states to allow for focused analyses.

3. Did the program management and/or any of the program's projects encounter internal or external challenges? How were they addressed?

From the program management perspective, one of our most significant administrative challenges has involved moving the program from its originating location at the University of Arkansas to the University of Kentucky during the Fall of 2011, and subsequently combining the program with the RWJF-funded National Coordinating Center for PHSSR starting in Fall 2013. The benefits of undertaking these changes have certainly outweighed the drawbacks, but the changes have required significant attention to retooling and improving key areas of program infrastructure (e.g. staffing, communications, website) while at the same time continuing to advance and expand program operations. We have addressed these challenges by prioritizing needs and then implementing solutions in a phased and sequential fashion so as not to disrupt ongoing program operations. This strategy has required time and patience, but has been largely successful. New key administrative staff (deputy director with communication science expertise Dr. Anna Hoover, and program manager Lizeth Fowler) were recruited and hired in early 2012, followed by expansions and improvements in communication infrastructure during 2012-13, and most recently a major overhaul of website infrastructure beginning in Fall 2013 with the integration of the PHSSR center.

Steady growth of the PBRN program in terms of participating networks and network stakeholders, and in terms of the number and complexity of research projects, has also presented management challenges. We have addressed these challenges through a modest increase in program staffing over time (e.g. additional 0.5 FTE administrative assistant), and through targeted efforts to realize synergies and economies of scale with the co-located PHSSR Center.

The most pervasive challenge faced by our PBRN sites involves engaging sufficient numbers of experienced researchers who collaborate with the networks in crafting competitive proposals for larger-scale research opportunities. Many of our networks have revolved around a small number of research projects, and have not yet generated a critical mass of extramurally funded studies that is sufficient to support a robust infrastructure for network collaboration, research operations, and long-term planning. Consequently, networks continue to rely heavily on the PBRN Coordinating Center for this infrastructure. Similarly, some of our networks include relatively small numbers of practice sites (<25), which provides a "practice laboratory" that is insufficient for generating the statistical power and

degrees of freedom to be competitive for larger-scale research funding opportunities. Our strategy for addressing this challenge is to use a variety of methods for encouraging PBRNs to join together in collaborative consortia for the purposes of positioning for larger-scale and longer-term funded research projects. We have pursued this strategy in part by developing PBRN funding opportunities that encourage or require collaborative research across individual PBRNs, as has been done with the MPROVE and DACS awards and as is planned with the forthcoming DIRECTIVE awards planned for 2014.

Most recently, we have encouraged multi-PBRN research collaboration by directly leading the development of research applications to federal funding sources that involve participation from multiple PBRNs. One of these applications, involving collaboration between several PBRNs and the Prevention Research Center based at the University of Kentucky, appears to have been successful in securing support from the CDC Prevention Research Center program. Several other proposals are now pending, including one with the NIH Institute for Minority Health and Health Disparities, one with CDC's National Center for Injury Prevention and Control, and one with the U.S. Agency for Healthcare Research and Quality. Even if some of these efforts are ultimately not successful in winning funding, the exercise of collaborative proposal development is helpful in building capacity for multi-network research among the PBRNs.

4. *If there were project/site collaborations, were there any challenges or positive results of those relationships?*

PBRNs are inherently collaborative enterprises. Explicit, multi-PBRN research collaborations are occurring through our MPROVE and DACS research initiatives. In both initiatives, multiple networks are collaborating to implement standardized approaches to measurement and analysis, with the goal of pooling data across networks for larger-scale analyses, and/or building in consistencies in analysis that will support valid meta-analyses across networks. Our experience is that successful collaborations of this nature have required intensive scientific leadership and direction from our centralized coordinating center. Our center staff has played a leading role in developing the research protocols, measurement approaches, and even the data collection mechanisms to be used in the collaborative research, but we have done so using an open dialogic process that incorporates ideas and perspectives from the participating PBRN sites in every step of the process. Methodologically, we have found it useful to use formal group process methods in addition to less structured communications to arrive at agreement and consensus across projects on tasks such as measurement selection, using for example iterative Delphi processes among PBRN members. Additionally, we have found it invaluable to include an in-person meeting of the collaborating networks during the first phase of the projects, allowing each participating site to gain a deeper understanding of the projects' collective goals along with the interests and priorities of each individual network.

Successful collaborations are also occurring between individual PBRN networks and other research centers to pursue shared interests in translational research conducted in public health settings. For example, the PBRNs in Colorado, Kentucky, North Carolina, and Missouri have established productive working relationships with the CDC-funded Prevention Research Centers (PRCs) that operate in these same regions. In all four states, PBRNs and PRCs have worked together successfully on collaborative research projects, as we highlighted in a recent review published in the *American Journal of Preventive Medicine*.³⁶ And in all states, the PRCs have incorporated defined roles for their neighboring PBRNs into

the renewal applications that each state submitted to CDC in Fall 2013 for the next round of research center funding. These collaborations have occurred as a result of a sustained effort over several years to make both PRC and PBRN stakeholders aware of the shared interests and productive synergies that could be realized through collaboration, including periodic webinars that we delivered to PRC directors on the work of the PBRNs, and networking at professional conferences that attract both PRC and PBRN participants (e.g. the American College of Preventive Medicine meetings). At the national level, we have been working working closely with CDC officials to identify opportunities for closer collaborative relationships between PBRNs and PRCs, including through a research symposium we are planning for CDC for Spring 2014.

Additionally, successful collaborations between PBRNs and the NIH-funded Clinical and Translational Science Award (CTSA) centers are occurring in some locations. In Ohio, Washington, Missouri, Wisconsin, California, and Kentucky, PBRN participants have been successful in drawing down research funding and other resources from their university-based CTSA center to support translational research projects conducted through the PBRNs. We have pursued these relationships in a parallel fashion to the collaborations formed with PRCs. At the national level, we have worked through the NIH CTSA Consortium, particularly the Community Engagement and Comparative Effectiveness Research Key Function Committees, to make other CTSA-funded universities aware of the work of the PBRNs and their synergies with the translational research missions of the CTSA program, including by giving presentations at the annual CTSA meeting on PBRN research. More locally, we have worked to keep PBRNs apprised of the relevant funding opportunities from CTSA.

5. What have the sites in the national program accomplished and what challenges and shortfalls have they encountered?

Following the PBRN conceptual model described above, each of the PBRNs participating in the program undertake activities to (1) engage public health practitioners and researchers in collaborative exchanges to identify research needs and shared research interests involving public health practice; (2) work collaboratively with practice partners to design and implement research projects with the potential to inform the organization, financing, and/or delivery of public health services; and (3) work collaboratively with practice partners to translate, disseminate, and apply research findings in ways that inform administrative and policy decision-making in public health practice. Every network has experienced both successes and shortfalls in putting this model into practice for specific research opportunities. The following sections provide summaries of the work of 10 representative PBRN networks. These summaries do not provide an exhaustive inventory of all PBRN research projects and products, but rather they illustrate the variety of successes and shortfalls realized in producing new knowledge through research and in promoting the application of this knowledge.

Colorado

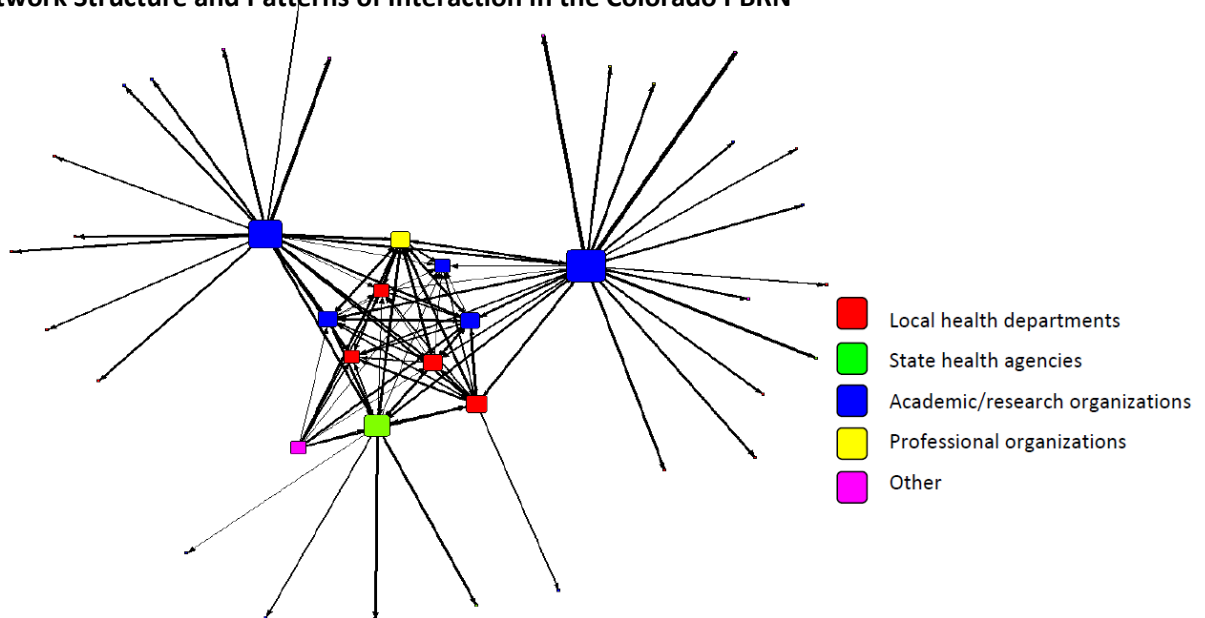
The Colorado Public Health PBRN conducts research on public health organization, decision-making and practice within the diverse rural and urban settings of Colorado. The network is organized by the Colorado Association of Local Public Health Officials and housed with the Public Health Alliance of Colorado, a collaborative of ten public health professional associations within the state. Participating practice agencies include all of the state's local health departments represented by the Colorado

Association of Local Public Health Officials, along with the state health agency. Research partners include faculty from the Colorado School of Public Health, the Rocky Mountain Prevention Research Center, the University of Colorado School of Medicine, and the University of Colorado School of Public Affairs. A diagram of the network's membership and patterns of interaction based on a network analysis is shown below.

The network's initial focus is the study the implementation and impact of a natural experiment involving recently passed state legislation (2008) that modernizes state public health laws and redistributes local public health agency responsibilities and powers. Other research interests involve the use of local health and environmental data for public health planning and decision-making, cross-jurisdictional shared services, public health infrastructure law and public health agency organization and governance. Its RWJF funded research projects have included a developmental award/POC (ID# 65443), RIA (ID# 67323), MPROVE (#69954), QSRF (No ID#), and DACS (#71153) and along with a funded research award from RWJF's Public Health Law Research Program and another project funded through RWJF's PHSSR Annual Solicitation managed by the National Network for Public Health Institutes. Highlights of specific projects include:

- **Tracking Changes in Local Public Health Infrastructure after the Colorado Public Health Act of 2008** (developmental/POC award ID# 65443). This study provided a descriptive look at the impact of the Colorado Public Health Act of 2008 (SB08-194) on a variety of agency and system infrastructure measures including agency jurisdiction, workforce, director qualifications, local board of health structure and funding. It used data from the National Association of County and City Health Officials (NACCHO) Profile of Local Public Health Departments from 2005, 2008 and 2010 as well as annual reports filed by local health departments to the state health department. The findings have been used by the state health agency and other state officials to inform further rule-making and subsequent implementation processes regarding the Act.

Network Structure and Patterns of Interaction in the Colorado PBRN



NOTE: The line thickness indicates frequency of interaction between pairs of organizations (for research purposes). The box size indicates the total volume of interactions that an organization maintains with others. The position of the box within the core or periphery of graph indicates the organization's relative position in mediating relationships between other organizations in the network.

- ***Collaborative Approaches in Chronic Disease Prevention: Factors Affecting Implementation of Evidence-based Practices in Local Public Health Coalitions*** (RIA award ID# 67323). This project examined how local community coalitions find, select and use evidence-based practices (EBPs) for chronic disease and related risk factor prevention, and studies the role of local public health agencies in coalitions and their influence on EBP use and adoption. The project used data from a survey of local public health agency directors and coalition coordinators, a network analysis using PARTNER of eight to ten community coalitions, and interview data collected in a subsample of communities. The results show that agencies play both central and peripheral roles in community coalitions, adapting their activities to the constellation of other stakeholders and resources that are present within communities. The findings indicate ways that public health agencies can strengthen their roles in promoting EBP adoption among coalitions, regardless of their position within the network.
- ***Equity in Competitive Grant-making for Safe Routes to School Projects*** (QSRF award – no ID#). This study examined how communities’ demographic characteristics and organizational resources influenced their ability to apply for and obtain competitive Safe Routes to School (SRTS) grants from state transportation and education agencies. The project explored potential correlates between capacity in a local public health system, including the availability of local data and organizational partnerships, and the development of successful SRTS grant proposals. Findings suggested that state department of transportation policies may hinder equitable distribution of SRTS funds among local communities through funding application procedures that create biases toward communities with a greater capacity and resources to plan projects and write grant proposals. The findings are being used by state and local public health officials to consult with transportation officials on strategies for achieving a more equitable distribution of awards and projects.
- ***Multi-network Practice and Outcome Variation Examination (MPROVE) Study*** (ID# 69954). This project is one of six PBRNs that have collaborated in identifying, collecting, and analyzing a standard set of public health service delivery measures in the three domains of communicable disease control, chronic disease prevention, and environmental health protection. The network used expertise across multiple state and local partners to gather data from existing records and through surveys of public health officials. Data analysis and dissemination activities are still ongoing.
- ***The Influence of Public Health Structure and Governance on the Adoption of Core Services and Outcomes in Local Public Health Agencies in Colorado*** (No ID# - NNPHI project). This project studies the impact of the Colorado Public Health Act of 2008 (SB08-194) specifically on the delivery of core public health services as defined by the law. In October 2011 core public health services, which were called for in the Public Health Act of 2008, were promulgated into rule. The research takes advantage of this natural experiment to measure change over time in service delivery, systems structures and start to explore changes in health outcomes related to the core services. Baseline and follow-up survey data have been collected, and analysis and dissemination activities are still underway.
- ***The Use of Law and Policy in Regional Approaches to Local Public Health Service Delivery*** (No ID# - PHLR project). This project examined whether the Public Health Act of 2008 encourages or discourages the use of regional approaches across local public health jurisdictions. Additionally, through the use of a survey tool and key informant interviews, the project identified what regional

approaches are currently used within Colorado, how they were formed, what legal instruments were used in the development and maintenance of the approaches and what additional resources are needed to maintain the work. The results show that regional approaches were used sporadically across the state prior to implementation of the Act, but the law encouraged more agencies to engage in these arrangements, and prompted greater reliance on formal legal and contractual instruments to support them. Results are being used by state and local officials across the state to facilitate the development of new regional delivery approaches and the expansion and improvement of existing approaches.

- ***Determining the Cost of Core Services Across Colorado Public Health Agencies*** (DACS award #71153) This study will investigate the costs of delivering core public health services as specified in Colorado's statewide public health system reform law. In October 2011 a new set of core public health services were defined and promulgated into state law, specifying the activities that every local public health agency within the state is expected to provide. This research project will measure the variable and fixed estimated costs of delivering a select number of these core public health services in Colorado and to identify services and delivery system characteristics that influence these costs, including economies of scale and scope. The project was initiated in August 2013 and data collection is currently underway.

The Colorado network has experienced marked success with organizing both rigorous and relevant research studies, and rapidly feeding back results and implications to state and local public health decision-makers through its sponsoring organizations at the Colorado Association of Local Public Health Officials, the Colorado Department of Public Health and the Colorado Public Health Alliance (a family of state professional associations). The network has faced challenges in preserving the dedicated time and expertise to publish its research projects in the peer-reviewed literature, but it continues to work on this goal. Numerous publications are in process and under review at this point.

Connecticut

The Connecticut Practice Based Research Network (PBRN), led by the Connecticut Association of Directors of Health, includes the Connecticut Department of Health, local health departments across the state, the Hispanic Health Council, and the academic public health programs of the University of Connecticut, Southern Connecticut State University, and Yale University. The network's initial research interests have focused on organizational and governance issues within local public health systems and their effects on the scope and cost of state-mandated public health services across the state. A diagram of the network's membership and patterns of interaction based on a network analysis is shown below.

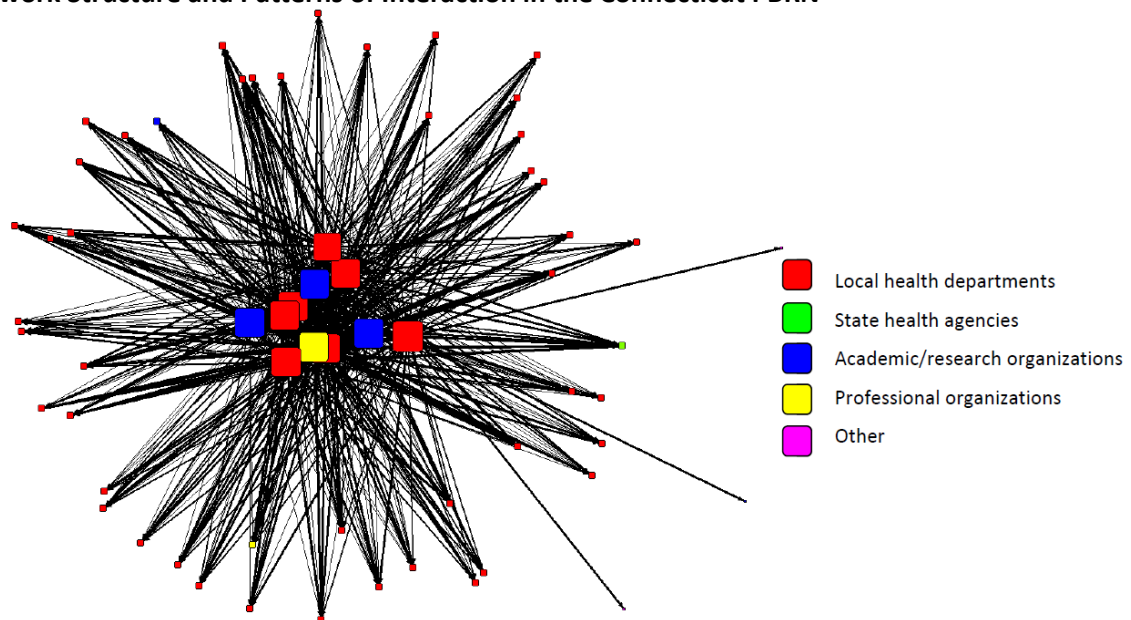
RWJF funded research projects have included a developmental award/POC (ID# 67023), RIA (ID# 68675), RACE (#68675), QSRF (No ID#), and DACS (#71133). Highlights of these projects include:

- ***Examining Relationships between Local Health Department (LHD) Revenues and Services*** (POC ID# 67023). This project explored: (1) how revenue sources and levels varied across Connecticut local health departments and over time before and after the economic recession; (2) how single-municipality agencies and multi-municipality district agencies compared in their revenue sources and levels, controlling for rural/urban distinctions and population characteristics; and (3) whether differences in revenue patterns explain differences in the services provided by local health

departments. The study found that district agencies receive significantly higher per-capita revenue than their counterparts, in part because of their greater discretionary authority to retain fee revenue to support agency operations rather than contribute it to municipal general funds. Overall, agencies experienced only minor reductions in total revenue and few reductions in service during the recession, due to a range of adjustments made to fee levels, revenue sources, staffing patterns and hours, and administrative expenses.

- Local Responses to State Public Health Funding Reductions** (Quick Strike Award, no ID#). This project examined the impact of a 2008 state policy change that reduced state funding for Connecticut local health departments that serve jurisdictions with fewer than 50,000 residents. Specifically, this study examined the impact of the policy change on (1) the range of local public health programs and services delivered, and (2) local government participation in multi-municipality district departments of health. The results document that local health department revenues per capita declined after policy implementation, with larger reductions experienced by agencies operating below the 50,000 population threshold. Small agencies did not report more or larger reductions in service delivery following the funding cut compared to larger agencies, but they did report growth in activities to explore participation in district agencies and to share services and resources with other small agencies.

Network Structure and Patterns of Interaction in the Connecticut PBRN



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- Use of a Health Equity Index by Local Health Departments** (RACE award ID# 68675). This study adapted an existing methodology for constructing community-level index measures of health equity using Census data and other secondary sources, and made customized reports available to local health departments via a web-based portal. Investigators then examined the use of the index by local health departments across the state for community health assessment, planning, and policy development activities. The study found that departments serving economically disadvantaged

communities and racially and ethnically diverse populations were more likely than their counterparts to access and use the index. Utilization was also greater among agencies governed by a board of health, agencies with longer-serving administrators, and agencies with higher proportions of MPH-level staff. Findings suggest that a combination of factors need to be addressed in supporting agencies to undertake work on health equity and disparities issues in their communities, including issue awareness and interest among leaders and staff, engagement of governance and leadership structures, and workforce training and skills.

- ***Measuring Quality in Local Public Health Emergency Preparedness: the H1N1 Experience*** (RIA award ID# 68675). This project developed and validated measures of the quality the local public health response to the 2009-10 H1N1 pandemic influenza outbreak, examined changes in the quality of response different stages of the epidemic, and investigated factors that contributed to differential quality of response to H1N1 across local agencies in the state. The study found that during the early-outbreak period prior to vaccine availability, local public health responses varied widely across a set of activities focused primarily on surveillance, communication and information dissemination. During the post-vaccine period, agencies that performed more highly on measures vaccine clinic implementation and coordination with medical providers achieved higher overall levels of vaccination coverage. Findings suggest a need for decision supports and practice guidelines that can assist local public health agencies in selecting optimal response options during the course of an emergency, and adapting these responses as conditions and resources change.
- ***Efficiency and Cost-Effectiveness of Local Environmental Health Inspection Services*** (DACS award #71133). This project launched in August 2013 will analyze causes and consequences of variation in the costs of implementing four core environmental health services carried out by local health departments in Connecticut: food protection inspections, public water well inspections, sewage disposal inspections, and lead poisoning prevention. Using a combination of administrative and survey data sources, the study will document variation in the costs of delivering these services across local jurisdictions within the state, test for economies of scale and scope in delivery, and explore relationships between cost and quality of delivery. Findings are expected to identify opportunities for improving the efficiency and effectiveness of delivering essential environmental services, such as through shared-service arrangements.

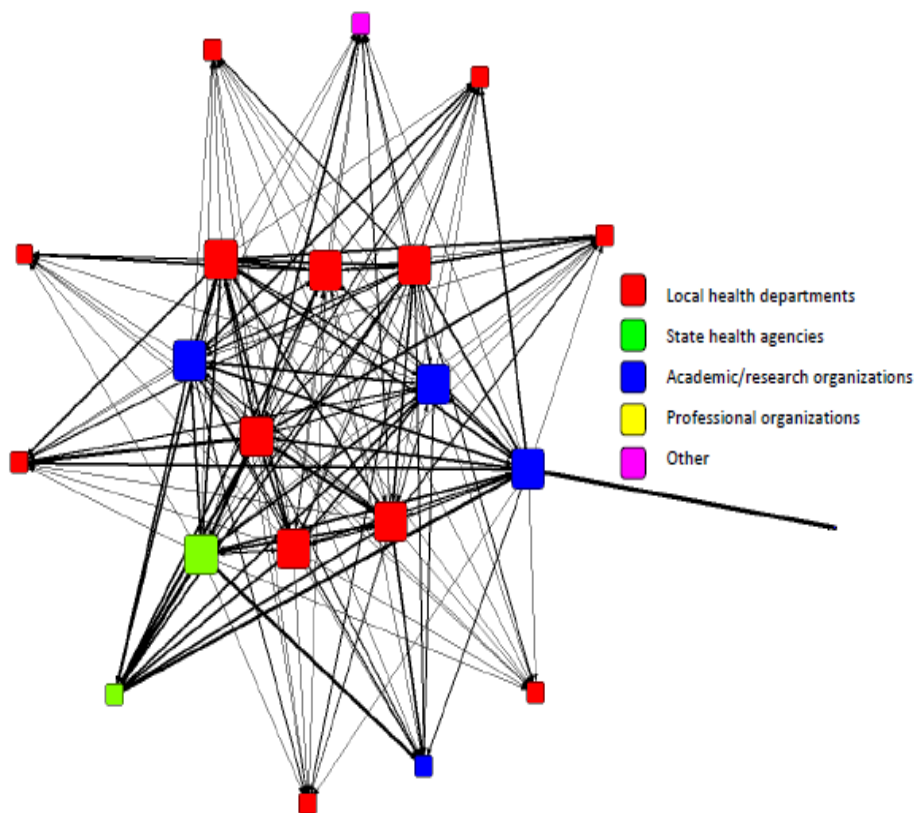
Florida

Two separate PBRNs operate in the states of Florida and Georgia, which are related through a common academic leader and, increasingly, through shared research interests and opportunities for comparative cross-state studies. The Florida PBRN, led by the Duval County Health Department, includes participation by all 67 county health departments through the Florida Association of County Health Officers, the Florida Department of Health, the Florida Public Health Institute, and a consortium of university partners representing the major public health colleges throughout the state including the University of Florida, the University of Florida-Jacksonville, Florida State University, and the University of South Florida. A diagram of the network's membership and patterns of interaction based on a network analysis is shown below.

RWJF funded research projects have included a developmental award/POC (ID# 67016), two QSRF awards (No ID#), MPROVE (ID# 69955) and DACS (#71129). Highlights of these projects include:

- **Local Public Health Funding Streams and Capacity for Essential Services** (ID# 67016): The network's initial research project examined the effects of public health funding streams within Florida on local health department capacities to perform cross-cutting (non-categorical) activities aligned with the U.S. Department of Health and Human Services' Essential Public Health Services framework. The study found that agencies relied primarily on discretionary state and local revenues to support essential public health services, which varied widely and have decreased in most agencies over time. Medicaid revenues appeared to strengthen the capacity for performing some services, but most categorical revenue streams were uncorrelated with these services. This project resulted in numerous presentations at national public health and health research conferences in 2011 and a manuscript published in the *Journal of Public Health Management and Practice*.

Network Structure and Patterns of Interaction in the Florida PBRN



NOTE: The line thickness indicates frequency of interaction between pairs of organizations (for research purposes). The box size indicates the total volume of interactions that an organization maintains with others. The position of the box within the core or periphery of graph indicates the organization's relative position in mediating relationships between other organizations in the network.

- **Regional Variation in Local Public Health Response to H1N1 Influenza** (Quick Strike Award, no ID#): The network's first Quick Strike award was used to examine regional variation in local public health department response to the 2009 H1N1 influenza outbreak. The findings revealed wide variation in strategies used to communicate with health professionals and the general public, particularly in the early stages of the outbreak prior to vaccine availability, but much less variation in surveillance,

vaccine distribution, and mitigation activities later in the outbreak. The study identified strategies for improving communication and information sharing processes between public health and health care providers during large-scale outbreaks. Findings were published in the *Northeast Florida Medicine Journal* and presented at several state and regional meetings.

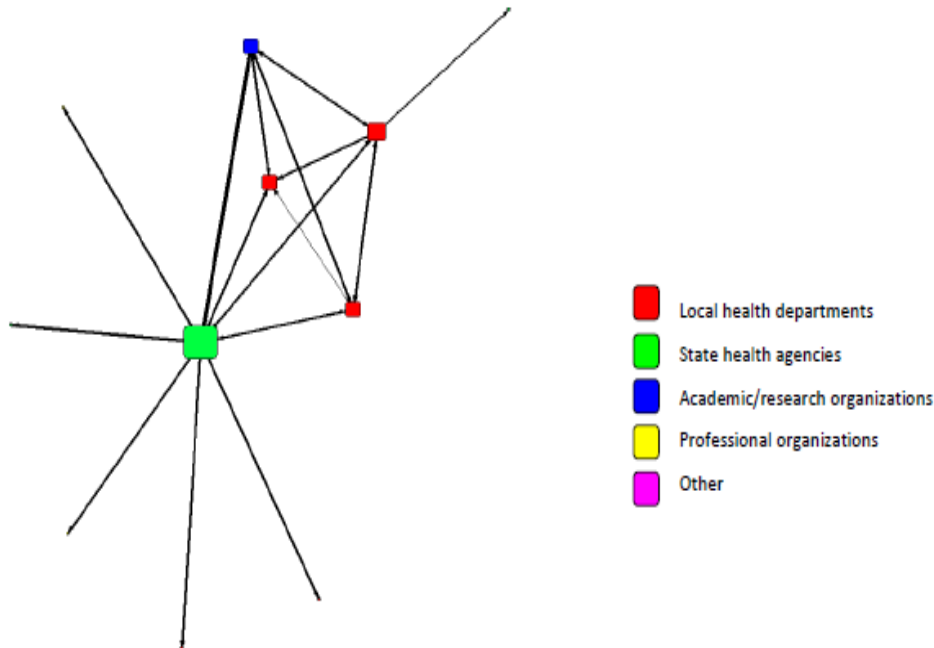
- ***Use of County Health Rankings among Florida Health Departments*** (Quick Strike Award, no ID#): A second Quick Strike award supported an analysis of local health department responses to the public release of County Health Rankings data, and the use of these reports by local agencies and communities across the state. A statewide survey of local agencies revealed substantial use of the Rankings by Florida's health departments, particularly as applied to community health assessments, staff education, and in efforts to secure funding. The study found significant increases in agency use of the Rankings between 2010-11 to build broad multisectoral community involvement in health initiatives. However, media engagement with the Rankings appears to have decreased over that time period. The study identified strategies that agencies can use to enhance the Rankings as a tool for community organizing around public health issues and communicating the multifactorial nature of health. Findings were published in *Frontiers in PHSSR*.
- ***Multi-network Practice and Outcome Variation Examination (MPROVE) Study*** (ID# 69955). This project is one of six PBRNs that have collaborated in identifying, collecting, and analyzing a standard set of public health service delivery measures in the three domains of communicable disease control, chronic disease prevention, and environmental health protection. The network used expertise across multiple state and local partners to gather data from existing records and through surveys of public health officials. Data analysis and dissemination activities are still ongoing.
- ***Cost Variation in Delivery of Sexually Transmitted Disease Services Across Florida*** (DACS award #71129): This study launched in August 2013 will investigate the costs of delivering sexually transmitted disease (STD) screening and treatment services across Florida's local health departments, identify factors that drive variation in costs across local settings, and explore relationships between costs and quality in service delivery. The study links administrative and surveillance data on sexually transmitted disease (STD) screening and treatment services delivered by all of Florida's 67 county-based health departments. Findings will identify pathways for improving the efficiency and quality of STD service delivery, and provide a foundation for investigating cost-effectiveness and value.

Georgia

The Georgia Public Health PBRN was initially organized in part through the work of leaders from the Florida PBRN and Duval County (FL) Health Department, who began working with Georgia Southern University on shared interests in practice-based research activities. The shared history of the Florida and Georgia networks, together with their geographic proximity, has led to interests in comparative research projects that span the two very different state public health systems. Georgia started as an affiliate network through a collaboration of regional health districts and their respective county health departments in the southern half of the state, together with Georgia Southern University's Jiann Ping Hsu College of Public Health including the Center for Rural Health and the Office of Public Health Practice. The network also includes the Georgia Department of Public Health and the Georgia State Office of Rural Health in addition to non-government organizations with major public health practice missions, including the Georgia Public Health Association. Since its inception in 2011, the network has begun to take on statewide research and development activities by recruiting other participating

districts across the state. A diagram of the network's initial regional membership and patterns of interaction based on a network analysis is shown below.

Network Structure and Patterns of Interaction in the Georgia PBRN



RWJF funded research projects have included a RACE award (ID# 69493) and two QSRF awards (No ID#), along with participation in the Florida PBRN's DACS award (#71129). Additionally, the network has received funded awards for accreditation technical assistance from the Health Care Georgia Foundation, a funded contract from the Georgia Department of Public Health to conduct accreditation readiness assessments with five Health Districts in Georgia, and several professional services contracts from the National Association for County and City Health Officials (NACCHO) to conduct analyses using national NACCHO Profile data on local health departments. Highlights of these projects include:

- **Regional Health Districts as Quality Improvement Collaboratives for Local Public Health Agencies (RACE Award ID# 69493):** This study examined the extent to which Georgia's multi-county health districts can function as quality improvement collaboratives (QICs) by supporting QI implementation and peer learning across the multiple county health departments that comprise each district. The study compared a QIC strategy of using districts as the locus of QI activities with a "standard practice" strategy of organizing QI activities individually at the county health department level. The results indicated that district-level QIC processes resulted in more comprehensive and robust QI activities compared to county-level QI activities. The study suggests that regional multijurisdictional district structures offer considerable benefits for organizing and implementing QI activities in local public health settings. Results were published in the *Journal of Public Health Management and Practice* and presented at state and national professional meetings.³³
- **Building Capacity to Support and Study QI in Local Public Health Systems (Quick Strike Award no ID#):** This quick strike study was used to develop and pilot a rapid-cycle method of measuring and comparing QI projects that are implemented through Georgia's regional health district structures. A

mixed-method approach was used to classify and compare QI projects undertaken in 4 regional districts. Using a combination of existing administrative and surveillance data, staff surveys, and direct observation methods, the project was able to document variation in QI objectives, decision-making processes, improvement methods, and results. The study provides a methodological platform for identifying the characteristics of QI projects and their settings that facilitate and inhibit success. Results were disseminated through a series of papers in the journal *Frontiers in PHSSR* along with presentations at state and national professional meetings.

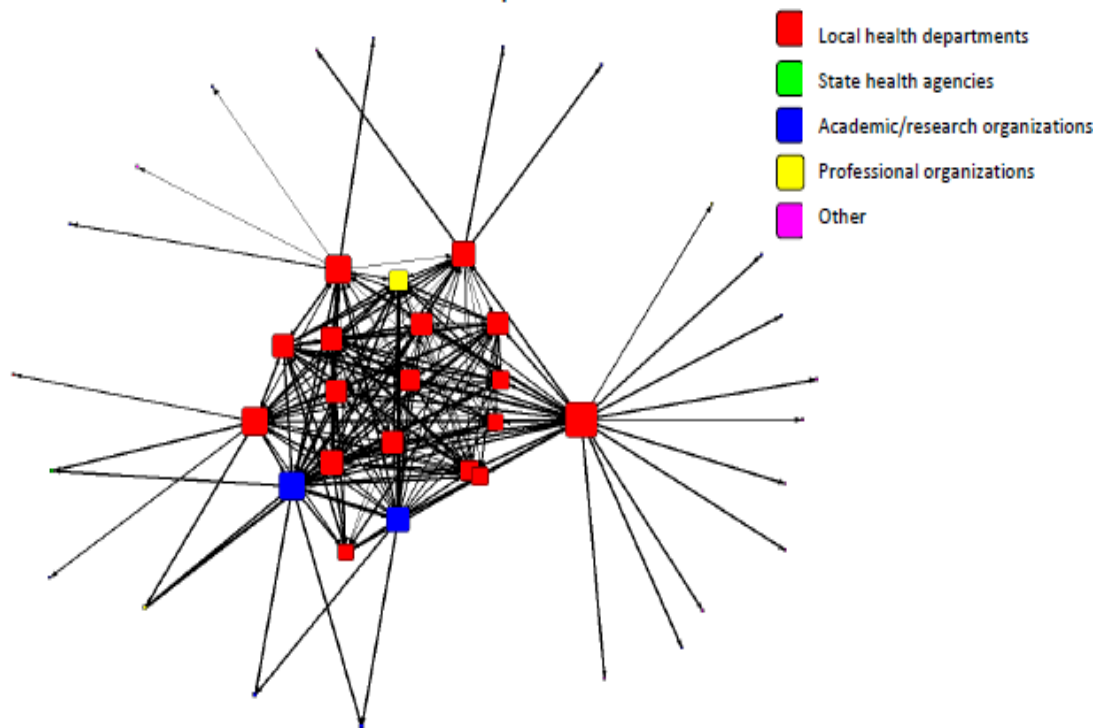
- ***Readiness and Intention to Seek Accreditation among Local Health Departments (non-RWJF funding, no ID#)***: PBRN investigators conducted a series of analyses focused on readiness and intention to seek accreditation among local public health agencies, using national data on local health departments from the NACCHO Profile Survey combined with local observations collected from health districts in Georgia. The results identified agency characteristics that appear to facilitate the completion of prerequisites for the public health agency accreditation process, including the community health assessment, health improvement plan, and agency strategic plan. Facilitating characteristics included decentralized or shared local governance structures, federal and state funding sources, and dedicated epidemiologist staff within the agency. The study also examined the correspondence between completion of accreditation prerequisites and agency intention to seek accreditation, finding an unexpected negative association. These results suggest that early adopters of accreditation are likely to include agencies working to address gaps in their infrastructure and capabilities. The results have been published in the journal *Frontiers in PHSSR* and presented at state and national meetings.
- ***Cost Variation in Delivery of Sexually Transmitted Disease Services Across Florida*** (DACS award #71129 to Florida PBRN): This study launched in August 2013 will investigate the costs of delivering sexually transmitted disease (STD) screening and treatment services across Florida's and Georgia's local health departments, identify factors that drive variation in costs across local settings, and explore relationships between costs and quality in service delivery. As part of this study, the Georgia PBRN will compile administrative and surveillance data on sexually transmitted disease (STD) screening and treatment services delivered in Georgia's regional public health districts in order to support comparisons with Florida's 67 county-based health departments. Findings will explore the cost differences between regional and county-based delivery system structures, and identify pathways for improving the efficiency of STD service delivery.

Kentucky

The Kentucky Public Health Research Network (KPHReN) conducts research focusing on public health partnerships, strategies to reduce health disparities, and the roles of leadership in public health practice improvement. Administered initially by the Kentucky Public Health Association and now led by staff in the Kentucky Department of Public Health, the network also includes 17 local public health jurisdictions and their community partners, a state primary care research network (the Kentucky Ambulatory Network), the Kentucky Health Department Association, and research partners at the University of Kentucky Colleges of Medicine and Public Health. KPHReN has been active in research in the areas of emergency preparedness, evidence-based public health practices, quality improvement, and health disparities. KPHReN has active partnerships with other PBRNs including primary care, physical rehabilitation, and oral health networks. Other interests of KPHReN include evaluating the impact of partnerships between public health and primary care providers in Kentucky, collaborative practices to

reduce health disparities, and the impact of leadership development initiatives on public health practice. A diagram of the network's initial regional membership and patterns of interaction based on a network analysis is shown below.

Network Structure and Patterns of Interaction in the Kentucky PBRN



NOTE: The line thickness indicates frequency of interaction between pairs of organizations (for research purposes). The box size indicates the total volume of interactions that an organization maintains with others. The position of the box within the core or periphery of graph indicates the organization's relative position in mediating relationships between other organizations in the network.

RWJF funded research projects have included developmental award (ID# 65437), RIA award (ID# 67322), RACE award (ID# 69494) and a QSRF award (No ID#). Highlights of these projects include:

- **Local Public Health Perceptions of the Feasibility and Appropriateness of Draft Accreditation Standards (developmental/POC award ID# 65437):** This study conducted a deliberative group vetting process with local and state public health members of the PBRN to document perceptions about the feasibility and appropriateness of draft accreditation standards developed for the voluntary national public health agency accreditation program developed by the Public Health Accreditation Board (PHAB). Pre-vetting and post-vetting surveys of participants revealed significant improvements in knowledge and understanding of the accreditation standards following deliberation, along with relatively uniform positive ratings of the appropriateness of the standards for state and local public health settings. The results, which were published in the *Journal of Public Health Management and Practice* and presented at state and national public health meetings, helped to validate the first generation of standards and measures that are now a part of the PHAB accreditation process.³⁷

- ***Local Public Health Variation in Response to the H1N1 Influenza Outbreak (QSRF award, no ID):*** As one of the first two Quick Strike studies funded in the PBRN Program, this project examined variation in the content and timing of activities undertaken by local public health agencies during the first three months of the 2009 H1N1 influenza outbreak, focusing on communication, surveillance, and mitigation activities prior to vaccine availability. The study documented wide variation in both the content and timing of activities, particularly regarding communication strategies with physicians, pharmacists, and other health professionals. The study revealed strategies for improving local communication during public health emergencies. Results were published in the *Journal of Public Health Management and Practice* and presented at state and national public health meetings.³⁸

- ***Effects of a Public Health Quality Improvement Process on Evidence-Based Diabetes Self-Management (RIA award ID# 67322):*** The Kentucky PBRN used a quasi-experimental study to test the effectiveness of a QI program implemented by local health department staff to facilitate the delivery of an evidence-based diabetes self-management program in community settings. Results showed that the program increased overall participation in diabetes self-management by 14%, and increased completion rates among diabetics who entered the program by more than 100%. The findings demonstrate that local public health agencies can serve as effective vehicles for extending the reach and quality of evidence-based chronic disease prevention programs, particularly when QI principles are used as part of implementation.³⁴

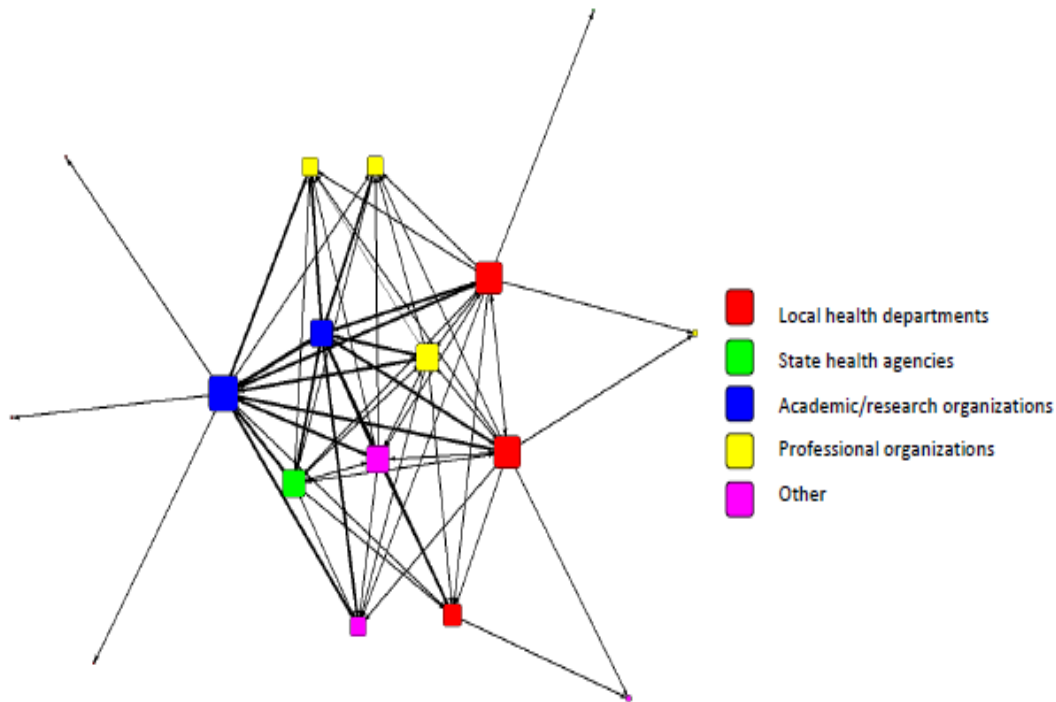
- ***Effectiveness of Cultural Competency Training Program Among Local Public Health Staff: A Pragmatic Randomized Trial (RACE award ID# 69494):*** Making use of a baseline survey of local health department staff regarding knowledge and skills related to culturally competent practices, this study randomly assigned staff in half of the state's local health departments to receive an online cultural competency training program based on the federal government's Culturally and Linguistically Appropriate Standards (CLAS), followed by a post-intervention survey of knowledge and skills fielded with staff in both the intervention and control group health departments. Data collection was completed in December 2013 and final analyses are underway, and control group department staff received access to the training program following final within-trial data collection. Results will be used by both state and local health departments to improve the design and implementation of programs to improve cultural competency among public health workers in the state.

Massachusetts

The Massachusetts Public Health Practice-based Research Network (PBRN) formed with an initial research focus on examining the implementation and impact regionalization strategies on public health service delivery and outcomes. The network is organized by the practice arm of the Boston University School of Public Health in collaboration with the nonprofit Institute for Community Health, and includes representatives from the state Department of Public Health, eight local health departments (LHDs) participating in the state's Regionalization Work Group, and representatives from several public health associations representing public health officials and board members within the state. The network's initial studies take advantage of a natural experiment created by the state's effort to develop a regionalized organizational structure from its current 351 separate public health jurisdictions. A diagram

of the network's initial regional membership and patterns of interaction based on a network analysis is shown below.

Network Structure and Patterns of Interaction in the Massachusetts PBRN



RWJF funded research projects have included a developmental award (ID# 65435) and a RIA award (ID# 67319). Highlights of these projects include:

- ***Design and Implementation Alternatives for Public Health Regionalization Models (Developmental/POC project ID# 65435):*** Through this small-scale proof of concept study, the PBRN conducted a descriptive analysis of the alternative approaches that Massachusetts local government officials and community stakeholders have developed for the design and implementation of multi-jurisdictional models for public health service delivery as part of the state's Massachusetts Public Health Regionalization Project. The study examined key elements of the regionalization approaches under development across the state, including the types of services included, geographic boundaries, intergovernmental and organizational structures, legal frameworks and authorities, governance structures and processes, and financial models. The strengths and limitations of alternative models as perceived by key governmental and community stakeholders were analyzed as part of the study, including logistical, political, economic, and institutional considerations. Findings from the study were used to inform the development of decision tools and guidelines included in the [Massachusetts Public Health Regionalization Toolkit](#) developed by Boston University and the Massachusetts Department of Public Health as part of the state's Public Health Regionalization Workgroup. These findings have also been used to shape key policy and operational [reports and recommendations](#) made by the Workgroup and the state health agency, including the design of Massachusetts' Regionalization Incentive Program that has been implemented as part of the CDC-funded National Public Health Improvement Initiative (NPHII). These findings have also been disseminated widely through presentations at state and national meetings.

- **Local Variation in the Implementation of Evidence-Based Practices for Communicable Disease Control (RIA project ID# 67319):** In this study, the network examined the causes and consequences of local variation in the use of evidence-based practices for communicable disease control across the state of Massachusetts, with a focus on foodborne illness prevention and control practices. The network fielded a survey of all 351 local public health agencies and boards within the state, collecting data on communicable disease practices, local public health infrastructure, and cross-cutting capabilities in delivering essential public health services. The study found that small and low-resource public health agencies exhibited low and highly variable rates of adherence to evidence-based and guideline-recommended communicable disease practices, suggesting possible roles for regionalization and shared-service arrangements in boosting performance. Agencies that performed well in cross-cutting essential services also tended to perform well in adherence to evidence-based communicable disease practices. Knowledge of governing board responsibilities among local elected officials emerged as a strong independent predictor of performance in cross-cutting essential services. Findings have been disseminated through an article in the *Journal of Public Health Management and Practice* and presentations at both state and national professional meetings, and additional analyses and dissemination activities are ongoing.³⁹

Minnesota

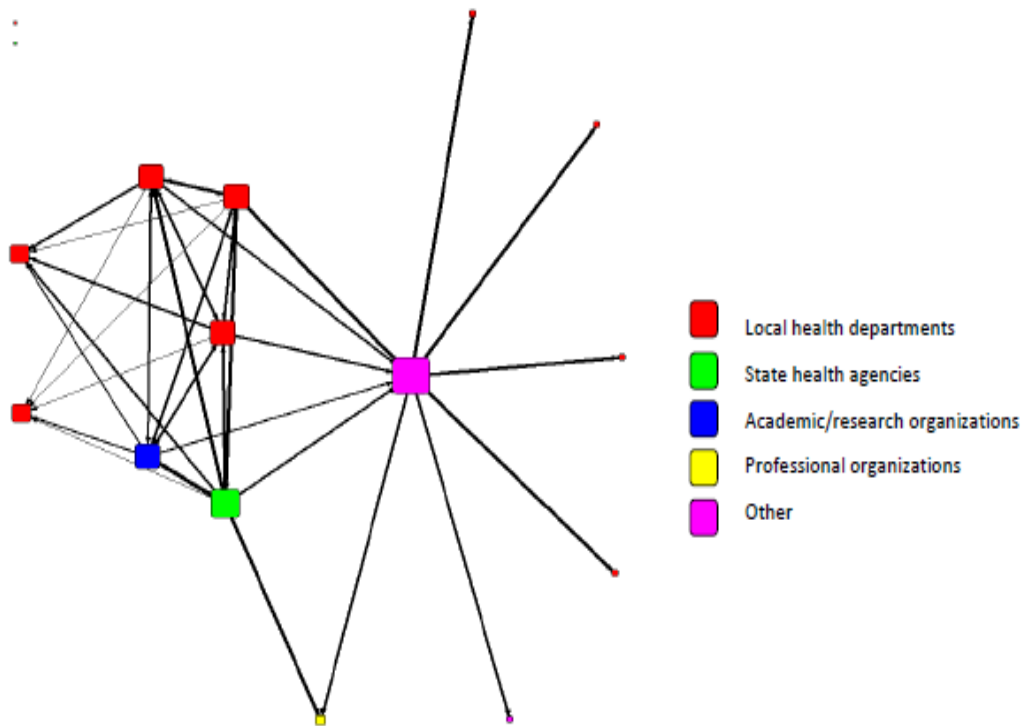
The Minnesota Public Health PBRN, organized by the Minnesota Department of Health, includes partners at the Local Public Health Association of Minnesota, the State Community Health Services Advisory Committee, the University of Minnesota School of Public Health, and the local health departments serving the 87 counties and 4 cities across the state. The network's initial research interests focused on the organizational structures, legal authorities and operational environments of local public health agencies, and the effects of this variation on the quality of public health services. Over time the network has extended this focus to support research on the implementation and impact of quality improvement (QI) processes in public health settings. A diagram of the network's initial membership and patterns of interaction based on a network analysis is shown below.

RWJF funded research projects have included developmental award (ID# 67018), RIA award (ID# 68674), RACE award (ID# 69495), MPROVE award (ID# 69956) and a QSRF award (No ID#). Highlights of these projects include:

- **Measuring the Discretionary Authority of Local Public Health Officials (Developmental/POC award ID# 67018):** This exploratory study examined the degree of discretionary decision-making authority that Minnesota's local health department administrators exercise over policy development and budgetary issues. Using a statewide survey of officials, the study found that about 71% of officials held 6 key authorities regarding budget development and interaction with local elected officials. About one in five officials lacked the authority to initiate communication with local elected officials, and one in seven lacked the authority to modify their agency budget. Officials in free-standing public health agencies were more likely to hold these authorities than were officials in combined health and human services agencies. The results suggest legal and policy strategies for strengthening local public health agency roles in local policy and resource decisions. Results from this study were published in the *Journal of Public Health Management and Practice* and disseminated through presentations at state and national professional meetings.³²

- **Tax Levy Financing for Local Public Health (Developmental/POC award ID# 67018):** Another exploratory study conducted by the network examined trends in the use of local tax levy financing to support public health activities across Minnesota’s local health departments. The results revealed that local health departments experienced growth in the absolute amount of revenues they received from tax levy financing during the period 2006-2010, which spanned the economic downturn. However, tax levy funds as a share of total public health funds declined over this period, a trend that was attributed in part to the growing share of tax levy revenue devoted to other public expenditures outside of the public health domain. The results suggest that local tax revenues may not be a persistently stable source for funding local public health agencies over longer periods of time, calling attention to the need for funding diversification. Findings were published in the *American Journal of Preventive Medicine*, *Frontiers in PHHSR*, and disseminated through presentations at state and national professional meetings.⁴⁰

Network Structure and Patterns of Interaction in the Minnesota PBRN



- **Local Health Department Characteristics Associated with Adoption of Obesity and Tobacco Prevention Strategies (RIA award ID# 68674):** This study examined implementation of a new state program that provided funds to local public health agencies to support adoption of evidence-based policy and environmental change strategies for obesity and tobacco prevention. Using data gleaned from grant reports and an agency survey, the study applied a standard method for categorizing and coding the implementation of these strategies by local health departments and their community partners across the state of Minnesota. Results showed that overall about 30% of agencies exceeded expectations in implementing recommended obesity and tobacco strategies, with another 55% meeting expectations and 15% falling below expectations. One of the strongest predictors of implementation success was the public health agency’s level of experience with quality

improvement (QI) processes and methods. The findings suggest that by developing broad QI skills and experiences, public health agencies may be better positioned to adopt, adapt and implement new public health strategies in ways that are consistent with evidence-based guidelines. The study's findings have been disseminated through a publication in the journal *Frontiers in PHSSR* and presentations at both state and national meetings.

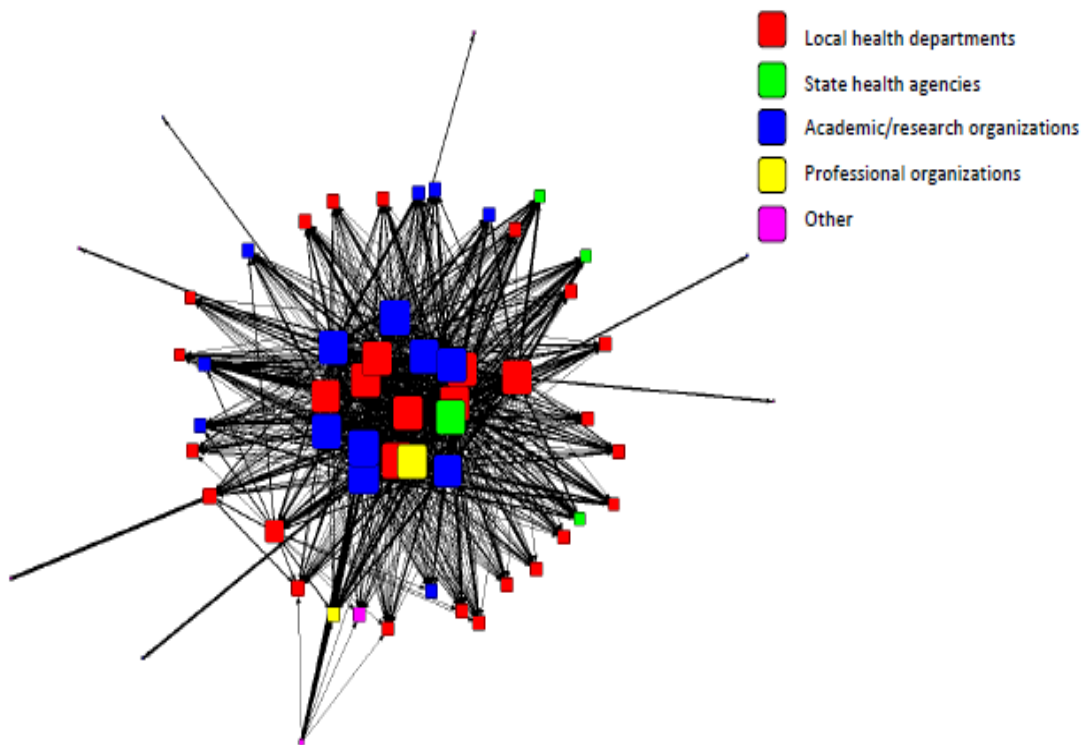
- **Local Health Department Strategies to Promote Health Equity (RACE project ID# 69495):** This supplemental research project of the network was used to field a survey of the state's local health departments in order to inventory and compare the strategies currently being used to identify and reduce health inequities within their jurisdictions. The results showed that while every agency had designated health equity activities in place, wide variation existed in how agencies defined, measured, targeted, and intervened on inequities. Results were used by the state health department to develop standardized definitions, measures, target populations, and intervention strategies for use by local agencies to enhance their health equity programming. Results have been disseminated through presentations at state and national professional meetings, and publications are forthcoming.
- **Multi-network Practice and Outcome Variation Examination (MPROVE) Study (ID# 69956).** This project is one of six PBRNs that have collaborated in identifying, collecting, and analyzing a standard set of public health service delivery measures in the three domains of communicable disease control, chronic disease prevention, and environmental health protection. The network used expertise across multiple state and local partners to gather data from existing records and through surveys of public health officials. Data analysis and dissemination activities are still ongoing; however, the Minnesota Department of Health has already incorporated the standardized MPROVE measures into the state's annual activity and performance reporting process for all local health departments.
- **Developing a Taxonomy for the Science of Improvement in Public Health (Quick Strike Award, no ID#):** In this study the network used information extracted from 51 individual quality improvement (QI) projects implemented in public health settings in Minnesota and through a national collaborative in order to develop an empirical taxonomy of QI projects and their effects. The results showed that, despite national guidelines and recommendations, only 53% of the projects used an established QI model, and 40% used a process control methodology. The findings suggest strategies for enhancing the design and implementation of QI projects, and provide a foundation for the systematic study of QI outcomes and impact. Results were published in the *Journal of Public Health Management and Practice* and disseminated through presentations at state and national meetings. Moreover, the taxonomy has been used to inform the QI technical assistance and support activities of the RWJF-funded Community of Practice in Public Health Quality Improvement program, as well as the design of RWJF's Public Health Quality Improvement Exchange web-based resource.⁴¹

Ohio

The Ohio Practice Based Research Network (PBRN), known as the Ohio Research Association for Public Health Improvement, began with a diverse group of local health departments in nine counties that are affiliated with the state's six university-based graduate public health programs, along with the Ohio Department of Health. Case Western Reserve University's public health program serves as the

organizing hub for the network. Over time the network has expanded to include participation of additional local health departments across the state through the Association of Ohio Health Commissioners. The network has pursued a broad range of research topics driven by the interests of its members, including studies of food safety investigation practices, clean indoor air law enforcement, consolidation of local health departments, and cost estimation for foundational public health capabilities. A diagram of the network's initial membership and patterns of interaction based on a network analysis is shown below.

Network Structure and Patterns of Interaction in the Ohio PBRN



RWJF funded research projects have included developmental award (ID# 67015), RIA award (ID# 68673), RACE award (ID# 69497), DACS award (ID# 71157) and three QSRF awards (No ID#). Highlights of these projects include:

- **Direct Observation of Local Public Health Practice (Project IDs 67015, 68673, and 69497):** Through a staged sequence of increasingly sophisticated studies, the Ohio network has pioneered the development of direct-observation methods for the study of practice variation in local public health settings. The method uses trained observers to accompany practicing public health professionals and collect standardized observations on the content and timing of their work activities, thereby enabling studies of appropriateness, quality, and efficiency in public health delivery. All three of the studies to date have focused on practices for the prevention and control of foodborne illness outbreaks in retail food establishments. A small-scale proof of concept study was used to develop, pilot and validate the direct-observation method (ID# 67015), a larger-scale RIA award was used to collect direct-observation data from a diverse collection of local practice settings across the state to determine the magnitude and nature of practice variation (ID# 68673), and a supplemental RACE award was used to analyze direct-observation data in combination with community socioeconomic and demographic

data to test for inequities in adherence to recommended public health practices for food safety (ID# 69497). Preliminary results from these studies have been disseminated widely through presentations and state and national professional meetings, and publications are forthcoming.

- ***Variation in the Local Enforcement of a Statewide Clean Indoor Air Law (Quick Strike no ID#):*** Following passage of a statewide clean indoor air law that delegated primary responsibilities for implementing and financing enforcement activities to local health departments in Ohio, this Quick Strike study examined local efforts to comply with the law. The study found that three-quarters of agencies enforced the law through complaint investigations and inspections, but more two-thirds of these agencies were at risk of reducing their enforcement activities because they relied exclusively on local collection of fines and fees, resulting in lost revenue from unpaid violation assessments. Communities with the highest violations faced the largest financial vulnerabilities to diminished enforcement. The findings indicated the need for more sustainable funding models for implementation of state tobacco control policies in order to reduce geographic disparities in tobacco control enforcement. The study was published in the journal *Public Health Reports* and disseminated widely through presentations at state and national professional meetings.³¹
- ***Causes and Consequences of Consolidation among Local Health Departments (Quick Strike no ID#):*** This study compiled retrospective data on Ohio local health departments that consolidated or remained independent since 2001 in order to identify precipitating factors as well as economic and operational consequences. The study found that 20 agency consolidations over this period generated a 13% reduction in local public health agencies across the state, with 82% of these consolidations undertaken in pursuit of cost containment goals and 65% also aiming to achieve improvements in service delivery. Comparing consolidating to non-consolidating agencies over this time period, the consolidations were associated with a statistically significant, 13% reduction in agency expenditures per capita on average. There was no evidence that consolidations shifted costs from city to county governments. The findings, which reveal circumstances where consolidations can be beneficial, have been disseminated through presentations at state and national meetings and through technical assistance activities developed for the RWJF-funded Center for Sharing Public Health Services. Publications from the research are forthcoming.
- ***Estimating the Costs of Ohio's Minimum Package of Public Health Services (Quick Strike award no ID#):*** This study tested a methodology for estimating the costs of delivering a "minimum package" of public health activities and cross-cutting capabilities that a statewide public health reform panel has recommended to be delivered by all of Ohio's local health departments. Using a gross costing method with data from the annual financial reports submitted by Ohio's local health departments, the study found that the per capita costs required to deliver the minimum package varied significantly with an agency's resident population size, socioeconomic status, racial/ethnic composition, and scope of other services offered by the agency. The findings from this study are being used by Ohio state and local policy officials to develop funding models, and by the RWJF-funded Public Health Leadership Forum to develop cost estimation methodologies and financing strategies for a national package of public health services and capabilities.
- ***Cost Variation in Delivery of Environmental Health and Nuisance Abatement Services in Ohio (DACS award #71157):*** This study launched in August 2013 will investigate the costs of delivering environmental health protection services related to foodborne outbreak prevention and control among local health departments in Ohio, identify factors that drive variation in costs across local settings,

and explore relationships between costs and quality in service delivery. A second part of this study will examine cost variation in the performance of nuisance abatement activities among local health departments across the state. Results will be used to identify opportunities for efficiency in public health service delivery, and to build a foundation for producing estimates of cost-effectiveness and value of public health services.

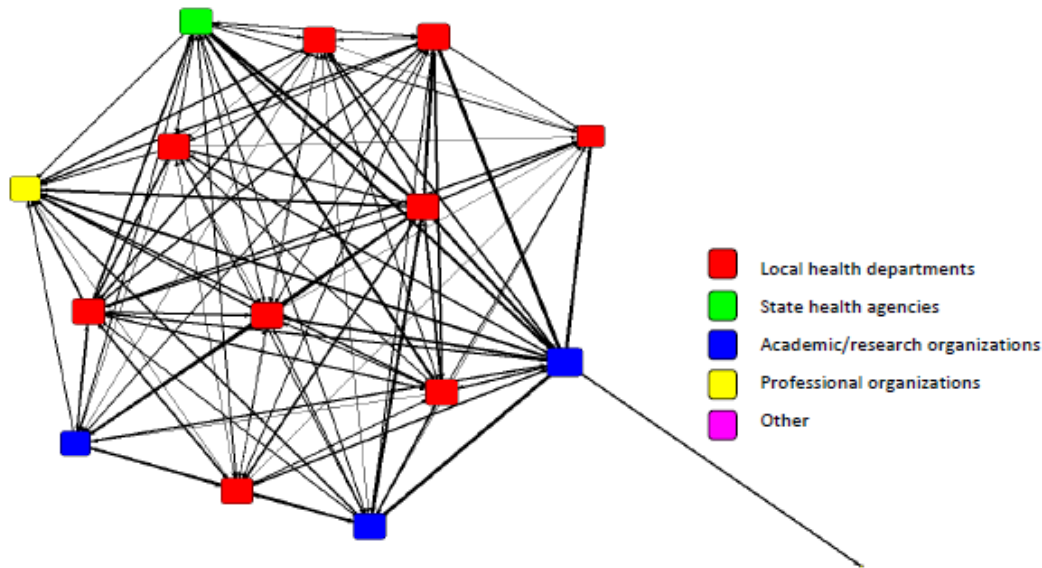
Washington

The Washington Public Health Practice-Based Research Network (PBRN) is led by the Public Health-Seattle & King County health department, and includes the local health departments serving the nine largest jurisdictions within the state, along with the Washington State Department of Health, the Washington State Association of Local Public Health Officials, and research partners at University of Washington School of Public Health and Community Medicine and School of Nursing. The network focuses on cross-jurisdictional public health practice issues relevant to front-line public health service delivery. To date, the network has completed four studies, and has three additional projects underway. Current priorities include proactive dissemination of research results to public health practitioners, using research findings to inform policy changes within the public health system in Washington, and increasing capacity within the network for additional studies. Long-term research interests include projects that focus on public health financing, quality improvement processes, health disparities, workforce competency, and community health assessment. To this end, members of the Washington PBRN led by Dr. Betty Bekemeier at the University of Washington are working with the Public Health PBRN Program to build a research-quality compendium of data on public health program activity from multiple PBRN states that can support comparative studies—the Public Health Activities and Services Tracking (PHAST) study. PHAST has received support from RWJF’s Public Health Nurse Faculty Scholars Program (Dr. Bekemeier, PI) as well as from the Public Health PBRN Program’s Quick Strike award program. A diagram of the network’s initial membership and patterns of interaction based on a network analysis is shown below.

RWJF funded research projects have included a developmental award (ID# 65431), RIA award (ID# 67321), RACE award (ID# 69498), MPROVE award (ID# 69953), DACS award (ID# 71132) and three QSRF awards (No ID#). Highlights of these projects include:

- ***Variation in Local Public Health Practices for Communicable Disease Control (Developmental/POC Study ID# 65431)***: Washington’s proof-of-concept investigation of local health department practices for communicable disease investigation collected data from the state’s 9 largest local public health agencies using a survey with standardized vignettes designed to elicit information on how agencies respond to specific communicable disease cases. The results showed that rates of adherence to evidence based guidelines for rabies post-exposure prophylaxis varied by a factor of 2 between regions of the state, and that adherence to evidence-based guidelines for management of close contacts of pertussis cases varied nearly seven-fold between the regions. The results indicate that wide practice variation in local public health settings leads to unequal protection from communicable disease threats in Washington. In response to the results, the state health agency has taken steps to reduce unwarranted variation in practice by developing and disseminating standardized protocols for communicable disease control to health departments across the state. Results were published in the *Journal of Public Health Management and Practice* and presented at multiple state and national professional meetings.³⁰

Network Structure and Patterns of Interaction in the Washington PBRN



NOTE: The line thickness indicates frequency of interaction between pairs of organizations (for research purposes). The box size indicates the total volume of interactions that an organization maintains with others. The position of the box within the core or periphery of graph indicates the organization's relative position in mediating relationships between other organizations in the network.

- ***Economic Shocks and Evidence-Based Public Health Decision-making (RIA award #67321):*** This mixed-method study investigated the strategies that Washington's local public health officials used to make resource allocation decisions during the Great Recession of 2008-09 when budget and staffing cutbacks became necessary across the state. Through a survey of local health officials and semi-structured interviews, the study explored the ways in which data and evidence were used as part of decisions on where and how to reduce resources, and examined both barriers and facilitators for evidence-based decision-making during economic shocks. The results indicated that officials made decisions about resource reductions primarily using knowledge of legal mandates required by state or local law, and considered evidence about the health and economic impact of service reductions only episodically as secondary factors in resource allocation. Public health officials indicated that most funding mechanisms allowed for very little discretion how agencies use funds, thereby precluding the greater use of evidence in resource allocation decisions. These findings have been used to inform Washington's policy development efforts to design more flexible funding mechanisms that support cross-cutting foundational public health services across the state. Findings from the study have been published in the *American Journal of Preventive Medicine* and presented at numerous state and national professional conferences.⁴²
- ***Economic Shocks and Disparities in Public Health Resources and Services (RACE award #69498):*** As a follow-on study to the network's RIA award, this RACE award allowed the network to explore geographic variation in local public health agency budget reductions and service delivery reductions across the state of Washington during the 2008-09 economic downturn. The study found evidence of inequities in both the incidence and severity of budget and service reductions, such that communities with higher racial/ethnic minority composition and lower socioeconomic status experienced larger reductions in public health resources. The findings suggested a need for public health financing policies and funding formulae that can help low-income and minority communities maintain essential

public health protections during periods of economic distress. Findings from the study have been presented at state and national professional conferences, and publications are forthcoming.

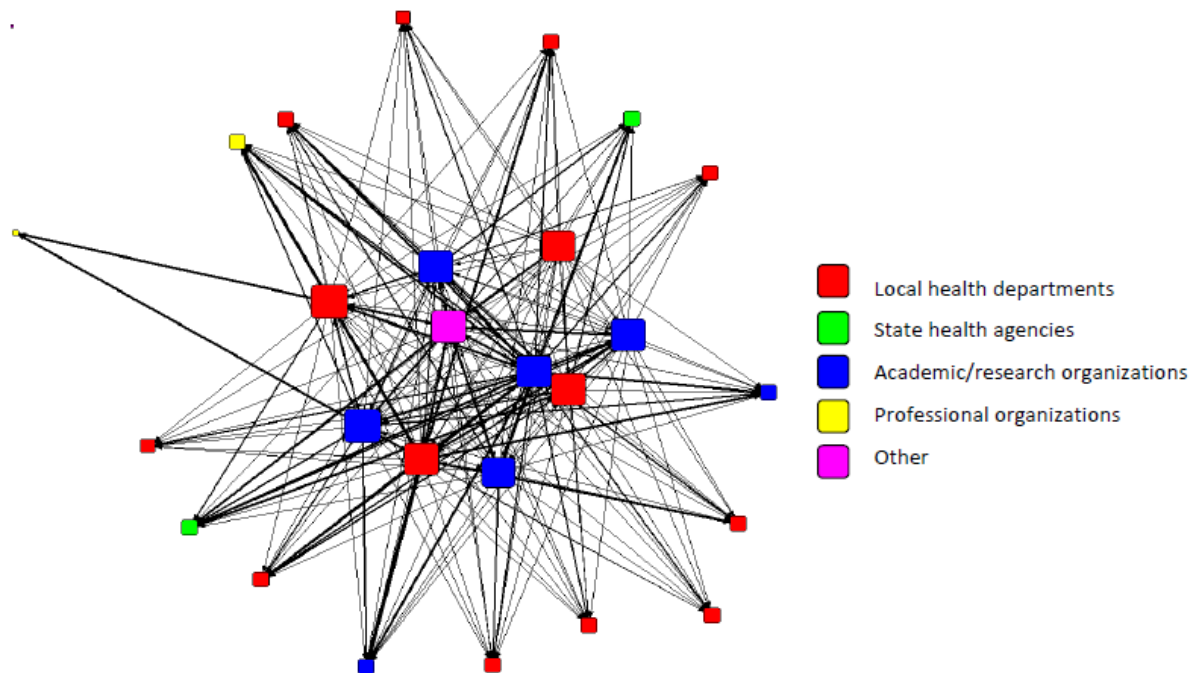
- ***Multi-network Practice and Outcome Variation Examination (MPROVE) Study*** (ID# 69953). This study is one of six PBRN projects that have collaborated in identifying, collecting, and analyzing a standard set of public health service delivery measures in three domains of activity: communicable disease control; chronic disease prevention; and environmental health protection. Collectively, the studies pool data and measures from multiple state and local public health settings in order to examine the causes and consequences of geographic variation in public health delivery, including measures of the volume, intensity, and quality of delivery. The network used expertise across multiple state and local partners to gather data from existing records and through surveys of public health officials. Data analysis and dissemination activities are still ongoing, as are activities to integrate MPROVE measures with the related, multi-state compendium of data sources on public health agency activities known as the Public Health Activities and Services Tracking (PHAST) study.
- ***Cost Variation in Delivery of Foundational Public Health Services in Washington*** (DACS award #71157): This study launched in August 2013 will produce research-quality, statewide estimates of the costs of delivering a set of foundational public health services that have been recommended by a policy development initiative in Washington to be carried out by all public health agencies across the state. The study will estimate costs for each service, identify factors that drive variation in costs across local settings, and explore relationships between costs and quality in service delivery. This study is designed to enhance and extend a preliminary cost estimation project undertaken in Washington in 2013. Results will be used to inform national policy discussions concerning strategies for establishing and financing a “minimum package” of public health services and foundational capabilities, and will build a foundation for producing estimates of cost-effectiveness and value of public health services.
- ***Effects of a Quality Improvement Intervention to Enhance Public Health Workforce Diversity (Quick Strike Award, no ID#)***: This Quick Strike study evaluated a QI intervention implemented in the Seattle-King County Public Health agency to enhance workforce diversity throughout the agency. The project used standard QI tools to analyze the agency’s personnel recruitment, interviewing and hiring processes and to identify adherence to recommended practices for identifying and advancing qualified job candidates from under-represented racial, ethnic, and socioeconomic backgrounds. Using pre and post observations collected through staff surveys and human resources records, the study found that the QI intervention increased adherence to several key practices for recruiting and hiring diverse job candidates. Findings have been used to create a “best practices” manual designed to help institutionalize workforce diversity practices within public health agencies across the state. Longer-term analyses to track the effects of the practices on hiring outcomes are ongoing, as are publications and presentations on the findings.
- ***Development of the Public Health Activities and Services Tracking Study (PHAST) (Quick Strike Awards, no ID#)***: A series of two Quick Strike awards have been used by the Washington PBRN to help incubate and enhance PHAST, a data inventory containing existing measures of public health program delivery contributed by state health agencies across the U.S. to facilitate comparative studies. Initiated with RWJF funding from the Nurse Faculty Scholars Program (PI Betty Bekemeier at University of Washington), the Washington PBRN received two PBRN Quick Strike Awards to support (1) integration of data from agencies in 12 states that participate in the PBRN program into

PHAST; and (2) construction of a web-based data platform that makes PHAST data accessible to participating PBRN investigators to support comparative studies. In December 2012, the University of Washington received a separate two-year RWJF award to support the continued development and application of PHAST. PHAST has resulted in a series of publications in *Frontiers in PHSSSR*, the *Journal of Public Health Management and Practice*, and the *American Journal of Preventive Medicine*, along with presentations at state and national professional meetings.

Wisconsin

The Wisconsin Practice Based Research Network (PBRN), led by the Wisconsin Division of Public Health (WDPH), brings together the state's independent public health institute, the Wisconsin Association of Local Health Departments and Boards, the Wisconsin Public Health Association, and an initial group of 12 local health departments that vary in size, service mix, and geographic location. Academic partners include the University of Wisconsin-Madison School of Nursing and School of Medicine and Public Health. The network's initial research focus has centered on understanding how public health revenues and expenditures have changed in response to the economic downturn, and how these fiscal changes have affected public health service delivery. More recently, the network has begun a line of inquiry examining variation in the content and quality of community health assessments and community health improvement planning activities undertaken by public health agencies and their partners. A diagram of the network's initial membership and patterns of interaction based on a network analysis is shown below.

Network Structure and Patterns of Interaction in the Wisconsin PBRN



NOTE: The line thickness indicates frequency of interaction between pairs of organizations (for research purposes). The box size indicates the total volume of interactions that an organization maintains with others. The position of the box within the core or periphery of graph indicates the organization's relative position in mediating relationships between other organizations in the network.

RWJF funded research projects have included a developmental award (ID# 67014), RIA award (ID# 69867), and two QSRF awards (No ID#). Highlights of these projects include:

- ***Public Health Financial Practices and Outcomes Under Economic Constraints (Developmental/POC Award #67014)***: This initial study of the Wisconsin network examined variations in local public health agency responses to the 2008-09 economic downturn, with specific focus on financial practices and resource allocation decisions. The research documented use of a variety of strategies for preserving program resources, including aggressive pursuit of competitive federal and nongovernmental grant funding, reductions in administrative and overhead expenses, intergovernmental resource-sharing, and public-private partnerships. Findings were shared with public health agencies across the state through PBRN-organized webinars and professional meetings.
- ***Measuring the Quality of Community Health Improvement Planning and Implementation (RIA award # 69867)***: Wisconsin's first large-scale, multi-year research project provides an in-depth investigation of the community health assessment (CHA) and community health improvement planning (CHIP) processes used by local health departments and their community partners across the state. Wisconsin law requires local agencies to complete a CHA and then a CHIP process every three years. Leveraging this requirement, the network developed and validated a method of reviewing and scoring the content and quality of local CHIP processes using a standardized review and extraction protocol applied to CHA and CHIP documents, based on adherence to professional consensus practices identified by the Institute of Medicine and other sources. The network then applied this methodology to the CHA/CHIP documents of all of Wisconsin's 92 local health departments. The study protocol also included steps to examine each CHIP process for evidence of implementation. The resulting data were used to characterize the degree of variation in the content and quality of local CHIPs, and to support a quantitative analysis of the public health system characteristics associated with higher quality CHIPs. Results showed wide variability in both the content and the quality of CHIP processes across the state. Agencies with higher per-capita funding, denser community partnerships, and dedicated epidemiologist staffing produced CHIP processes that were more comprehensive in scope and of higher quality. Findings from the study have been used to produce CHIP guidelines and policy briefs designed to help agencies conduct higher quality CHIP processes. Results have been disseminated through presentations at state and national meetings (including the RWJF-supported Open Forum for Quality Improvement in Public Health), briefings for the Public Health Accreditation Board, and webinars. Additional publications from the research are forthcoming.
- ***A Financial Forecasting Model for Local Public Health Agencies (Quick Strike Award, no ID#)***: In this Quick Strike award, PBRN members worked with faculty at the University of Wisconsin School of Public Affairs to develop a financial forecasting model that can be used to predict future resource flows to local health departments in Wisconsin based on information about state macroeconomic trends, local socio-demographic patterns, and local revenue sources and tax bases. Estimates from the model were then used to identify types of public health agencies and communities that face disproportionately large financial risks and opportunities with implications for service delivery. The study found wide variation in the financial vulnerability of agencies based on their tax bases and demographic mix, with about 6% of agencies projected to experience a greater than 25% reduction in per-capita revenue during 2009-14, another 46% experiencing reductions of less than 25%, and the remaining 48% experiencing revenue increases. The future financial prospects of local health

departments varied considerably based on their jurisdiction's underlying population growth, socioeconomic status, and local tax revenue streams. The project also produced a financial forecasting model that can be used to generate customized estimates for individual agencies. The findings from this study have been used to help local public health agencies around the state develop financial plans and budget estimates during the post-recession period. A web-based version of the forecasting model is under development, and publications based on the model results are forthcoming.

- ***Shared Service- Arrangements Among Wisconsin Local Public Health Agencies (Quick Strike no ID#):*** This Quick Strike study examined the prevalence, structure, and components of shared service arrangements among local public health agencies in Wisconsin. A statewide survey of local and tribal public health agencies captured information on past, current, or planned shared-service arrangements, the programs and services involved, and the legal and organizational structures that support these arrangements. The study found that more than two thirds of agencies had a current or past shared-service arrangement, with emergency preparedness and environmental health programs being the most common programmatic areas involved. Most of these agencies maintained shared-service arrangements for two or more programmatic areas. A variety of structural models are used to support these arrangements, ranging from formal contractual and joint governance structures to informal agreements. The network used findings from the study to assemble a developer's guide for shared-service arrangements that identifies possible strengths and limitations of alternative design features and structural elements. Findings have been presented at state and national meetings as well as through the electronic resources maintained by the Center for Sharing Public Health Services.

6. What lessons did the program's director or key staff members learn from running the program?

An early and persistent lesson from this program is that the demand for practice-relevant and policy-relevant research in public health tends to far exceed the capacity to produce this research at any given point in time, resulting in constant tensions and an imperative to prioritize, plan and balance competing objectives. This imbalance often tempts individual networks and the PBRN program as a whole to take on more research than existing capacity will allow, and when this happens it undermines the ability to successfully complete high quality research and to successfully translate research findings into practice and policy. Over time the program has learned that there is much to be gained from focusing on a limited number research priorities that allow tangible progress to be made over time, and that allow for synergies and joint learning across groups of similar research projects. As the program has developed over time, we have increasingly focused the program's research on topics that strike a balance between practical significance, policy salience, and operational feasibility. This strategy necessarily means that some important questions go unanswered, at least temporarily, but it ensures that the program is able to invest its efforts in the full cycle of knowledge production and knowledge application without shortchanging one or the other of these essential components.

Another important lesson learned over the course of the program has been the value of maintaining a portfolio small and relatively simple research projects in combination with larger and more rigorous studies. The small projects serve several valuable purposes, including: (1) allowing newly developing networks or newly-entering network participants to gain experience with collaborative research development and execution before undertaking more complex tasks; (2) providing a mechanism for networks to pursue time-sensitive and newly emerging research topics that have near-term practical

value even when the longer-term scientific value is uncertain; (3) providing a mechanism for networks to produce preliminary findings and pilot results that can be used to compete for larger and longer-term funding; and (4) allowing networks to attract study collaborators based primarily on scientific and practical interest in the topic rather than drawing in collaborators opportunistically with the promise of large-scale research funding. The Quick Strike award mechanism pioneered by the PBRN Program has served all of these purposes simultaneously. Of course, the scientific value of these small-scale studies, when assessed individually, is frequently limited, which can pose challenges to publication in peer reviewed journals and more generally to communicating results to larger national audiences. Hence the importance of combining small scale studies with mechanisms to support larger scale and more methodologically robust investigations.

A third lesson from our experience in leading the PBRN program is that successful research-practice collaboratives must become proficient in utilizing non-scientific approaches for addressing gaps in knowledge alongside their use of scientific methods and formal research studies. Not all of the information needs and knowledge gaps identified by public health practitioners and policy stakeholders can be (nor should be) addressed through empirical research projects. In some cases, the relevant knowledge can be gained much more rapidly and reliably through experiential processes and information sharing among knowledgeable stakeholders. Even further, sometimes formal methods work beset to elicit this experiential knowledge such as through focus groups, expert panels, or deliberative processes, and in other cases informal and ad hoc information exchange, consultation processes, and learning communities are most effective and efficient. To become successful research-practice collaboratives, PBRNs must become adept at deciding when to pursue **knowledge generation** through research versus when to pursue **knowledge acquisition, compilation and synthesis** through experiential approaches. Part of this skill involves the ability to “parse” the information needs that are articulated by practice and policy collaborators into components that represent research questions vs. experiential questions. PBRNs require leaders and collaborators who are able to do this type of parsing successfully and then help the network pursue the requisite research-based and experience-based approaches to address information needs. Successful PBRNs also capitalize on the synergies that can exist between research projects and experiential learning initiatives, by helping one type of process inform the other.

7. What impact do you think the program has had to date? Who can be contacted a few years from now to follow up on your program?

The PBRN Program’s greatest near-term impact has been to significantly increase the number and variety of public health agencies that participate in designing and implementing research studies about public health practice. Lack of public health agency engagement in studies of and about the U.S. public health system has long been recognized as a barrier to generating larger and faster improvements in public health delivery. By including research as one of its 10 **Essential Public Health Services** in 1994, the U.S. Department of Health and Human Services called further attention to the importance of practice engagement in practice-based research. Yet more than a decade later, data from sources as diverse as NACCHO’s periodic *Profile of Local Health Departments* survey to the CDC’s *National Public Health Performance Standards Program* showed very low levels of governmental public health agency engagement in research – particularly engagement in research about better ways of practicing public health. The PBRN program has had a major impact on this long-standing problem by developing **30**

research networks around the U.S. that collectively engage more than 1500 state and local public health agencies and 46 university-based research centers in applied conducting more than 60 practice-based research studies. As highlighted under Question One above, the public health agencies that participate in PBRN networks are much more likely to engage in research implementation and translation activities than are their counterparts who do not participate in PBRNs.

The PBRN Program has also had an important impact on the larger field of PHSSR by bringing new research questions and new avenues of inquiry into the field based on the needs and interests of stakeholders in public health practice and policy. A frequent criticism of the PHSSR studies conducted during the early years of the PHSSR Interest Group at AcademyHealth (created in 2000), for example, was that too many of the existing studies were driven by the interests of the academic research community and therefore the findings were not immediately applicable and transferrable to real-world practice settings. The PBRN Program has helped to correct this imbalance by creating some of the most visible and actionable new lines of inquiry within the PHSSR field, including research on the use of evidence and evidence-based practices in public health settings (the RIA studies); research on variation in the volume, intensity, and quality of public health programs and services delivered across states and communities (including the MPROVE studies); research on multi-jurisdictional and regional models of public health delivery (through Quick Strike studies); and research on the costs of public health delivery and variation in costs across settings (through Quick Strike and DACS studies). These important areas of inquiry were conceptualized, developed and operationalized with a critical mass of studies through the PBRN Program.

As a third key area of impact, the PBRN Program has helped to stimulate and support use of PHSSR research findings by decision-makers in public health practice and policy. The PBRNs individually have been particularly successful in getting their research findings into the hands of state and local officials, who use them for the ongoing development and improvement of programs, policies, and operating procedures. The PBRN Coordinating Center has had parallel success in getting PBRN research findings into the hands of national policy and practice audiences, such as key HHS officials, OMB, CBO, GAO, and the public health interest groups including APHA, NACCHO, ASTHO, and Trust for America's Health. The impact that these findings have on policy development and implementation is much harder to observe directly and quantify given the complexities of the policy development process. However, the continued and growing interest of these policy stakeholders and intermediaries in receiving briefings and updates on PBRN research findings is a strong signal that findings are being used as part of the policy development work. Periodically we do see tangible evidence of use, such as when the PBRN program has been cited directly in CDC funding announcements and in reports by the Institute of Medicine

For each of these three areas of impact – engaging practitioners, shaping priority avenues of inquiry in PHSSR, and stimulating research application in policy and practice – it will be important to follow up with external stakeholders to track the program's ongoing effects on the field. For the first area, we recommend contacting Bobby Pestronk, Executive Director at NACCHO; Paul Jarris, Executive Director at ASTHO; and Georges Benjamin, Executive Director at APHA. For the second area, we recommend contacting Lisa Simpson, President and CEO at AcademyHealth. For the third area, we recommend contacting Jeff Levy, President at Trust for America's Health.

8. Who served on your final national advisory committee?

Members of the Public Health PBRN National Advisory Committee were:

- Michael Caldwell, M.D., M.P.H., Dutchess County New York Department of Health, *chair*
- Alice Ammerman, Dr.P.H., R.D., University of North Carolina-Chapel Hill
- Ross Brownson, Ph.D., Washington University
- Wayne Giles, M.D., M.S., U.S. Centers for Disease Control and Prevention
- Paul Halverson, Dr.P.H., M.H.S.A., Arkansas Department of Health
- Judith Monroe, M.D., U.S. Centers for Disease Control and Prevention
- Robert Pestronk, M.P.H., National Association for County and City Health Officials
- Donna Petersen, Sc.D., M.H.S., University of South Florida
- Patrick Remington, M.D., M.P.H., University of Wisconsin
- Patricia Sweeney, J.D., M.P.H., R.N., University of Pittsburgh

9. If the program is in its final year, what are the post-program plans?

In Fall of 2013 the PBRN Program formally combined with the RWJF-funded National Coordinating Center for PHSSR to become a single integrated NPO for the Foundation's work in PHSSR. We are currently in discussions with the Foundation about a proposed reauthorization of the combined NPO to continue developing and supporting the PHSSR field. Under this reauthorization, our preliminary plans are to transition from the model of providing dedicated funding and support to PBRNs as we have done during the initial years of PBRN development. Now that a strong cohort of PBRNs is operational around the U.S., we plan to move to a model of integrated funding and support for all of the stakeholders working in the PHSSR field nationally, including PBRNs as well as other networks and individual investigators. One final round of dedicated competitive research funding for the PBRN Program is planned for release in Spring 2014 through a targeted RFP process, which will fund PBRN projects for durations lasting through mid-2016. Beyond that, our plan for the integrated NPO is to support open calls for PHSSR research projects, wherein we will encourage but not require PHSSR investigators to collaborate with PBRNs in designing and conducting studies, recognizing the many advantages that PBRNs bring to this type of inquiry.

10. What have been the program's key publications and national/regional communications activities over the life of the national program? Has the national program met its communications goals?

The PBRN Program has had considerable success in reaching a broad and diverse audience of researchers, practitioners, and policy stakeholders with its publications and communication activities. Some of the program's most important publications and communications milestones, which reflect this breadth and diversity of audience, include:

- Launch of the open-access peer-reviewed journal *Frontiers in Public Health Services and Systems Research* (April 2012) as the official journal of the PBRN program, which has now published 67

articles (a majority of which are based on PBRN research studies) and generated more than 9000 downloads.

- Publication of a special issue of the *Journal of Public Health Management and Practice* (November 2012) featuring PBRN and PHSSR studies, including a key overview article on PBRNs. This issue was released officially at the APHA Annual Meeting in San Francisco and included presentations based on the contributed articles, a meet-the-author session at the publisher's booth, and the launch of a new smartphone App providing electronic access to the journal issue.
- Publication of a theme issue of the *American Journal of Preventive Medicine* (December 2013) featuring PBRN five individual studies along with an overview commentary highlighting opportunities for collaboration between PBRNs and CDC-funded Prevention Research Centers. One of the included manuscripts evaluated the effectiveness of PBRNs in facilitating practitioner engagement in research implementation and translation.
- Plenary speech and panel session featuring PBRN research on evidence-based decision-making at the 2010 *American College of Preventive Medicine Annual Meeting* (San Antonio TX).
- Full research panel session on PBRN findings related to variation in the adoption of evidence-based practice at the 2010 *NIH Conference on Dissemination and Implementation Science* (Bethesda, MD).
- Plenary speech at the 2011 *Annual Meeting of the Association for Schools of Public Health* (Washington, DC).
- Plenary speech and panel session featuring PBRN research at the *2012 American Public Health Association Mid-Year Meeting* (Charlotte, NC). Annual PBRN research presentations at the *American Public Health Association Annual Meeting* 2009-2013.
- Full research panel session on PBRN findings related to public health costs and economic evaluation at the *2012 American Society for Health Economics Biennial Meeting* (Minneapolis, MN).
- Annual research presentations on PBRN research at the *AcademyHealth Annual Research Meeting* and the *AcademyHealth Public Health Systems Research Interest Group Meeting*, 2009-2013.
- Annual research presentations on PBRN research at the *NACCHO Annual Meeting*, 2009-2013.
- Research presentations on PBRN research at the *ASTHO Annual Meeting* 2010, 2012 and at the *ASTHO Meeting for Chief Financial Officers* 2011, 2013.
- Annual research presentations on PBRN research at the *Keeneland Conference on Public Health Services and Systems Research*, 2008-2013.
- Annual panels on PBRN research at the *Open Forum on Quality Improvement in Public Health*, 2010-2013.

- Speech on PBRN Research at 2013 ***CDC Grand Rounds and 20th Anniversary Symposium for the National Center for Injury Prevention and Control*** (Atlanta, GA).
- Plenary speech on PBRN research at the 2013 ***Society for Violence and Injury Research*** (SVIR) (Baltimore MD).
- Plenary speech on PBRN research at the 2014 ***Association for Public Health Laboratories (APHL) Annual Meeting*** (Little Rock, AR).
- Plenary speech on PBRN research at the 2014 ***Society for Behavioral Medicine Annual Meeting*** (Philadelphia, PA).
- Plenary speeches at 14 state public health association annual meetings (APHA Affiliates), 2009-2013.
- Active web-based and electronic communication activities, including 5360 downloads from the [PBRN and PHSSR Research Archive](#) launched in 2012, making this site one of the top 10 most popular sites in both the Public Health (of 7373 sites) and Health Economics (of 97 sites) categories. Similarly, our new blog featuring PBRN research related to the value of public health services, [PublicHealthEconomics.org](#), has already received more than 1000 views since its recent launch at the end of October 2013. Our monthly electronic newsletter and quarterly Research-to-Action podcast series have remained very popular as well.

One key communication goal that is still in progress involves the transition of the PBRN Program website from a model that primarily disseminates information about the program's activities and events (primary for an audience of research producers and PBRN participants), to a model that functions as a clearinghouse for PBRN research results, tools, and products (primarily for external research users). Completing this transition is a key communications priority for the current program year.

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APPENDIX:

SUMMARIES OF PUBLIC HEALTH PBRN RESEARCH PROJECTS

The Robert Wood Johnson Foundation's *Public Health Practice-Based Research Networks Program* supports research on the organization, financing, and delivery of public health services using the infrastructure of practice-based networks (PBRNs). A Public Health PBRN brings multiple public health agencies into collaboration with an academic research partner to design and conduct studies in real-world practice settings. The program supports research through several different mechanisms, including (1) multi-year Research Implementation Awards (RIAs) conducted by established networks; (2) Quick-Strike Research Fund (QSRF) awards that support short-term, time-sensitive studies on emerging issues; (3) supplemental Research Acceleration and Capacity Expansion (RACE) awards designed to expand the scope and enhance the tempo of ongoing research within a PBRN; (4) the Multi-Network Practice and Outcome Variation (MPROVE) studies, which support 6 networks in the collection and analysis of a standard set of public health delivery measures that allow exploration of the causes and consequences of geographic variation in public health delivery; and (5) the Public Health Delivery and Cost Studies (DACs), which use standard economic evaluation methods to estimate the costs of delivering high-value public health services and to examine public health system characteristics that lead to cost variation across settings. The Public Health PBRN National Coordinating Center coordinates the development individual and multi-network studies supported by grants from various sources. This brief provides a summary of major research projects underway and under development within the public health PBRNs.

ROUND I RESEARCH IMPLEMENTATION AWARDS (2010-2012)

Community Partnerships and Evidence-Based Prevention: This study conducted through the Colorado PBRN examines how local public health agencies influence the adoption and use of evidence-based practices in chronic disease prevention through their work with local community coalitions. Survey data are being collected in all 54 county health jurisdictions in the state, and network analysis methods are being used to examine the structure and operation of local community coalitions.

Economic Shocks and Evidence-Based Decision-Making in Public Health: The Washington PBRN is examining local variation in public health agency budget reductions during the 2009-10 economic downturn in Washington and the impact of these reductions on public health decision-making and use of evidence-based practices. An existing statewide survey is being adapted and used to measure evidence-based practice implementation and service delivery at multiple points in time during the economic downturn.

Medicaid MCH Funding and Local Public Health Practice: This study by the North Carolina PBRN investigates the effects of a recent state policy change that eliminated Medicaid funding for evidence-based maternity case management services provided by local public health agencies. The research estimates the policy's impact on the delivery of MCH services and resulting birth outcomes, the “spill over” effects on public health agency core capacity to provide other services, and the adaptations that agencies are implementing to preserve core capacities.

Public Health QI and Evidence-Based Diabetes Prevention: The Kentucky PBRN is testing the ability of local public health agencies to implement quality improvement (QI) strategies as part of a diabetes education and self-management program implemented through regional diabetes centers of excellence across the state. The study is designed to identify factors that influence the adoption and implementation of evidence-based diabetes self-management strategies, and estimate the comparative effectiveness of agency-supported QI strategies in facilitating adoption and implementation.

Local Variation in Food Safety and Infectious Disease Control Practices: This study by the Massachusetts PBRN examines the extent and nature of variation in the use of evidence-based practices (EBPs) for food safety and infectious disease control as implemented by local public health agencies across the state. This study specifically examines the influence of jurisdiction size, performance standards, and regionalization strategies on adoption and use of EBPs.

ROUND II RESEARCH IMPLEMENTATION AWARDS (2011-2013)

Measuring Quality in Local Public Health Emergency Preparedness: the H1N1 Experience: The Connecticut PBRN is developing and testing measures of the quality of local public health emergency response activities using the 2009-10 H1N1 influenza outbreak as a test case. This study's aims are to: (1) develop quality measures specific to the H1N1 context using retrospective data from the 2009-10 outbreak response; (2) test the validity and reliability of these measures; (3) use measures to compare the quality of response across different types of local public health settings across the state; and (4) identify factors that contribute to differential quality of response across local settings.

Measuring the QI Continuum and Correlates in Public Health Settings: The Minnesota PBRN study seeks to identify, measure, and compare characteristics of quality improvement (QI) implementation in local public health settings across the state. The study will develop and validate measures the quality of QI implemented in Minnesota public health agencies (state and local) relative to a conceptualization of “full implementation” or “mature QI” as articulated in the professional literature and consistent with professional knowledge. These measures will then be used in a comparative analysis to examine how institutional and community contextual factors influence the quality of QI implementation in local public health agencies.

Integrated HIV/AIDS and STD Service Delivery in New York: A Natural Experiment: The New York PBRN aims to identify and test valid and reliable measures of quality associated with delivery of HIV/AIDS and STD services by local public health agencies, and then use these measures as part of a natural experiment to evaluate the impact of a statewide initiative to integrate the delivery of these two service lines. This project will assess the impact of the integration process on staff attitudes and job satisfaction, client awareness and utilization of services, and service quality

based on adherence to evidence-based practices. Results of this study will yield validated measures for assessing the quality of HIV and STD service delivery, as well as other efforts to integrate public health service programs.

Prevention, Investigation, and Intervention Related to Foodborne Illness in Ohio: The Ohio PBRN's RIA study investigates the structure, process, and outcomes of public health agency roles in foodborne illness prevention, investigation, and control, utilizing a mixed methods approach. The study will develop, test, and validate a novel, direct observation methodology for measurement. Direct-observation measures will then be used in a comparative analysis of local variation in public health practices for foodborne illness.

Measuring the Quality of Community Health Improvement Planning and Implementation: The Wisconsin PBRN's study develops, tests, and validates an instrument for measuring the quality of community health improvement planning and implementation processes (CHIPP) facilitated by local public health agencies across the state. Moving beyond the mere description of CHIPP components, a valid measurement tool for CHIPP quality will be implemented with local public health agencies across Wisconsin. Measures will be collected and used in a comparative analysis of factors that influence the quality and comprehensiveness of CHIPP practices, and factors that influence the degree of success in moving from assessment to implementation actions.

ROUND I QUICK STRIKE RESEARCH PROJECTS (2009-2010)

Local Variation in H1N1 Response in North Carolina: North Carolina's PBRN conducted a study of local variation in the content and timing of public health activities to contain the H1N1 outbreak during summer and fall of 2009, with a special interest in testing for differences between accredited and non-accredited public health agencies in the state. The study found that accredited agencies performed a broader range of H1N1 response activities, and implemented investigation and incident command activities more rapidly than did non-accredited agencies. Also as part of their quick-strike project, the North Carolina PBRN conducted a population study of local residents' awareness of and intention to receive the H1N1 vaccination, focusing on two communities served by PBRN public health agencies. The study found wide variation in both awareness and intention across subgroups within the population, suggesting opportunities for targeted intervention.

Local Variation in H1N1 Communication and Response in Kentucky: The Kentucky PBRN replicated the study of local variation in H1N1 response developed for North Carolina, and added a new component focusing specifically on communication patterns among local health departments, primary care providers, and community pharmacists. The study uncovered wide variation and large gaps in communication among these three groups of responders, suggesting many opportunities for improved response.

ROUND II QUICK STRIKE RESEARCH PROJECTS (2010-2011)

Financial Constraints, Regionalization Incentives, and Public Health Responses: The State of Connecticut has subsidized local public health services for many years using an annual per-capita grant mechanism. Effective July 1, 2009, the subsidies were eliminated for 49 of Connecticut's 80 local health departments. The cuts were targeted to departments serving populations of 50,000 or less, with the expectation of increasing interest in consolidation and regionalization among small

agencies. The Connecticut PBRN study investigates the effects of the cuts on local public health decision making concerning agency operations and service delivery. Specifically, the study tests whether the funding cuts motivated departments to explore consolidation, change their mix of programs and services, and pursue other funding sources.

Variation in Local Enforcement of State Public Health Policy: When Ohio's smoke-free workplace act went into effect in May 2007, enforcement responsibilities were delegated to local public health agencies without additional state funds to support these new roles. In addition, the punitive fines prescribed in the law were graduated and allowed substantial local public health discretion in both the magnitude and frequency of fines. This study examines the causes and consequences of local variation in public health enforcement of the tobacco law, with particular attention to the effects of the recent economic downturn on public health decision-making regarding enforcement. The study sets the stage for a larger investigation of the consequences of local variation in enforcement with regard to policy impact on exposure to environmental tobacco smoke.

Resource Allocation and Public Health Roles in Safe Routes to Schools: This study by the Colorado PBRN takes advantage of a one-time infusion of federal funds to support local planning and policy development to facilitate safe and active commuting by school children to and from school. The study examines local variation in how these funds were distributed across the state, the role of local public health authorities in influencing resource allocation and decision-making concerning local use of funds, and the consequences of these decisions in terms of development and implementation of local active commuting plans and policies.

Local Information Systems for Studying Public Health Practice and Outcomes: Wisconsin's PBRN uses longitudinal data from an automated, electronic information system to analyze changes in the delivery of community health nursing programs and activities since 1986, and to evaluate prospects for developing similar information systems to track the outputs and outcomes of other public health programs. The study demonstrates how local public health information system can be used to examine associations between the intensity of programmatic activity and resulting behavioral and health outcomes. Findings suggest ways of using automated, electronic information systems in public health settings to strengthen capacity for public health systems and services research.

ROUND III QUICK STRIKE AND QI QUICK STRIKE RESEARCH PROJECTS (2011)

Local Public Health Responses to the County Health Rankings: This study by the Florida PBRN investigates local variation in how public health organizations across Florida's 67 counties respond to and use the County Health Rankings (CHR) data for public health practice and health improvement activities. The study seeks to identify organizational and community-level factors that drive variation in the types of responses taken across communities and in the degree of success in implementing these responses. A by-product of this study is the development and testing of indicators of successful CHR responses that can be used as public health quality measures. This project takes advantage of the time-limited opportunity to study responses soon after release of the second annual wave of ranking data in a diverse population of local public health settings.

Quality Improvement Collaboratives for Small and Rural Public Health Settings: The affiliate PBRN in Georgia will take advantage of the time-limited opportunity to test the utility of regional quality improvement (QI) strategies in strengthening accreditation readiness and attainment among

small and rural public health jurisdictions. As part of a larger initiative, local public health agencies in a selection of counties are attempting to implement regional public health quality improvement collaboratives (QICs) using the state's multi-county public health districts as the primary organizational structures. This study compares measures of QI implementation and impact among local agencies that do and do not participate in regional QICs, with a specific focus on the ability of small and rural health departments to meet the Public Health Accreditation Board's national accreditation standards for QI activities. A secondary aim of the study is to assess the potential of the newly formed Georgia Public Health PBRN to function as a state-level public health QIC.

Public Health Accreditation and Quality Improvement Philosophy: The new affiliate public health PBRN in Missouri will take advantage of the time-limited opportunity to learn from the nation's only voluntary, state-based accreditation program for public health agencies, and use these lessons to inform the approaching implementation of the Public Health Accreditation Board's national accreditation program. This study uses both state and national data sources to examine local variation in public health agency efforts to adopt and institutionalize quality improvement (QI) practices within their organizations and communities. Using these data sources, investigators are constructing a composite measure of QI philosophy for each local public health agency in Missouri and then comparing this measure across three groups of agencies: (1) agencies that have undergone accreditation; (2) agencies that intend to apply for accreditation within 2 years; and (3) agencies that do not intend to apply for accreditation. Qualitative data collected from key informant interviews with these three groups of agencies are used to explore how the nature and timing of exposure to the voluntary accreditation program influences agency QI practices.

Taxonomy of QI Methods, Techniques and Results in Public Health: This study by the Minnesota PBRN pursues a time-limited opportunity to collect and analyze data on QI projects while these efforts are still being implemented and evaluated by public health agencies. The study's primary aims are to develop a logic model and taxonomy for QI in public health, employing a mixed-methods design in three phases: (1) creation of a database registry of QI projects implemented in public health settings through the Multi-State Learning Collaborative II and the Public Health Collaborative II initiatives, both which were implemented in Minnesota and funded by the Robert Wood Johnson Foundation; (2) development of a preliminary classification system for QI projects reflecting the QI methodologies used, the operations and processes targeted, the contextual features of the institutional and community settings, and the results achieved; (3) validation of the taxonomy through an expert panel review of the conceptual model and key informant interviews with public health leaders who conducted the QI projects; and (4) application of the taxonomy to document the extent and nature of variation in public health QI projects and to identify key determinants of variation.

Quality Improvement Strategies and Regional Public Health Structures: The Nebraska PBRN will take advantage of the unique regional health department structure used in two-thirds of its local public health jurisdictions to mount a comparative study of the implementation and perceived effectiveness of QI activities in regional vs. single-county public health delivery systems. The Nebraska PBRN will partner with Minnesota's PBRN in order to use the QI classification system and taxonomy under development in Minnesota to study QI activities in Nebraska. A coordinated approach to QI classification and data collection will enable cross-state comparisons of data and key findings. This project capitalizes on an opportunity to rapidly produce new information about regional QI models at a time when public health decision-makers across the U.S. are preparing for accreditation and responding to political and economic forces demanding improved accountability, efficiency, and value in public health.

Evaluation of a Quality Improvement Project to Improve Workforce Diversity: This study by the Washington PBRN investigates the effectiveness of a quality improvement (QI) initiative designed to improve racial/ethnic diversity across workforce categories within a large local public health agency. The study examines changes in recruitment and hiring processes and staffing outcomes that occur after implementation of the QI initiative, using retrospective data from human resource records. Findings will be rapidly integrated into staffing practices being implemented in response to the agency's ongoing responses to economy-related fiscal constraints.

PHAST Retrospective Data Compilation and Transformation: This Washington PBRN study is developing and testing measurement and data collection strategies used to support the construction of a multi-state data repository containing of measures of local public health service volume and intensity across participating PBRN states. The data repository will be used as part of the multi-PBRN Public Health Activities and Services Tracking Study (PHAST) to study the causes and consequences of geographic variation and change in public health service delivery.

Forecasting the Impact of the Economic Recession on Public Health Financing: The Wisconsin PBRN is using national and state-specific data sources to develop a fiscal forecasting model that generates predictions of the total revenue available to each Wisconsin local health department over a four year period. The project will develop and validate the model using retrospective data sources, and produce prospective estimates for all local health officials in the state. Findings will be disseminated through a customized report to each agency and an interactive web-based map. The research will assist local officials in anticipating changes in fiscal capacity and adopting strategic responses to maintain core services.

Analyzing Concordance between Position Descriptions and Practice Standards for Public Health Nurses: This study by the Ohio PBRN collects, codes, and analyzes position descriptions for all levels of public health nurses practicing within the state's 125 county health departments in order to determine the extent to which positions are consistent with national competency standards and scope of practice policies. The study profiles geographic variation in the degree of concordance with public health nursing practice standards, and uses multivariate analytic techniques to identify organizational, community, and market-level factors that influence concordance. Findings will be used to develop policy and practice recommendations for enhancing nursing workforce competencies.

ROUND IV QUICK STRIKE RESEARCH PROJECTS (2012-2013)

Current and Planned Shared Service Arrangements Among Wisconsin Local and Tribal Health Departments.. This study by the Wisconsin PBRN describes the prevalence, scope, and scale of shared-service arrangements among local and tribal public health agencies in Washington, and explores factors that have influenced their successes and failures. Data are collected through a statewide survey of local agencies' past, current, and planned involvement in shared-service arrangements, along with reviews of government documents pertaining to these arrangements, and case study interviews with key stakeholders involved in designing and implementing them. Results will support guidance documents and decision tools designed to help public health officials design optimal cross-jurisdictional approaches to public health service delivery.

Effects of Health Information Exchange Systems on Public Health and Primary Care Alignment. The objectives of this study are to examine the readiness of public health practitioners and primary care physicians to adopt and use health information exchange systems currently being implemented in Georgia, and to examine how these systems influence patterns of interaction between public health and health care professionals. Data are collected through surveys of public health officials and primary care physicians across the state, and through key informant interviews in selected case study communities. Findings will identify strategies for using health information exchange systems to coordinate the activities of public health and primary care providers.

Consolidation of Local Public Health Jurisdictions: Financial Implications. This study seeks to examine the financial effects of consolidations among local health departments in Ohio that have occurred over the past decade. The study uses public health expenditure data that are collected annually from all local health departments in the state (before and after consolidation), along with key informant interviews in 12 case study communities. Results will support guidance documents and decision tools designed to help local officials make informed decisions about when and how to pursue consolidation arrangements.

The Cost of Doing Business: Developing a Cost Model for a Minimum Package of Local Public Health Services. This study by the Ohio PBRN estimates the costs required to deliver a “minimum package” of local public health services as defined under recently adopted Ohio state legislation and base on the recent IOM report on public health funding. The study utilizes existing local health department expenditure data collected statewide, and pilots a survey-based method of identifying and allocating costs to programmatic areas adapted from a method widely used for drug treatment centers by SAMHSA. Results will identify feasible and reliable methods for costing public health services that, after further development and testing, can lead to applications in research and policy development on a broad national scale.

RESEARCH ACCELERATION & CAPACITY EXPANSION (RACE) SUPPLEMENTS (2011-2013)

Comparative Effectiveness of State vs. Regional Approaches to QI in Public Health. This study from the Georgia affiliate PBRN examines the impact of a quality improvement collaborative model implemented through Georgia’s regional public health districts on the implementation and effectiveness of local public health QI activities. Building on the methods and results of an ongoing quick-strike project, this study compares QI activities organized through Georgia’s regional public health district structure with QI activities organized through Georgia’s state health department structure. Pre-intervention and post-intervention measures of QI practices and outcomes are collected via surveys of staff from each QI project, supplemented with qualitative data collected through interviews with key informants. Findings will provide practitioners and policy-makers with evidence regarding the organizational structures and implementation processes that are most effective in facilitating successful QI processes in public health.

Variation in Local Public Health Actions to Address Health Inequities. This project of the Minnesota PBRN seeks to investigate the extent to which local health departments in Minnesota engage in activities to reduce health inequities, and to identify the characteristics of local public health systems that facilitate and impede these activities. The project begins by analyzing existing administrative data compiled by the state health agency to identify the characteristics of local health departments that currently collect and report data on health disparities, social determinants of health, or health inequities within their jurisdictions. An electronic survey of all 75 local health

departments in Minnesota captures information on the range of activities that these agencies undertake to address health inequities. These data are linked with existing data sources on local health department finances, expenditures, and governance and decision-making structures in order to identify factors that facilitate and impede activities to address inequities. As a final step, key-informant interviews and focus groups are conducted in a sample of local health departments to provide a more detailed examination of inequity-focused activities.

Utilization and Effectiveness of a Health Equity Index in Mobilizing Local Public Health Action. The Connecticut PBRN is refining and expanding a methodology developed by the Connecticut Association of Directors of Health (CADH) to construct a health equity index that measures social and economic determinants of health at the neighborhood level, and to investigate the use of this index by local public health officials to mobilize multi-sector disparity reduction activities. Specifically, the project refines the measurement and reporting elements of the health equity index in order to reflect changes over time in health determinants and to allow for subgroup analyses based on racial and demographic characteristics. Additionally, the project tracks usage of the index by local public health officials and analyzes factors that facilitate and inhibit use.

Effects of Cultural Competency Training on Local Health Departments: A Randomized Trial. This project through the Kentucky PBRN analyzes variation in the cultural and linguistic competence of local health departments within Kentucky, adapt and test a series of training modules designed to strengthen cultural and linguistic competence among staff, and evaluate the effectiveness of these training models. The study uses existing baseline data from an earlier project that conducted organizational assessments of each department using an instrument designed to measure compliance with the National Standards on Culturally and Linguistically Appropriate Services (CLAS). Competency training models are being adapted from existing modules developed by the Office of Minority Health at the U.S. Department of Health and Human Services and delivered via videoconferences and webinars to random subsample of local health departments. The CLAS survey will be repeated after training completion and used to estimate training program effectiveness using repeated-measures estimation techniques.

Local Health Department Workforce Reductions: Implications for Diversity and Health Disparities. This project by the Washington PBRN seeks to quantify the variation in workforce reductions made by local health departments in Washington state in response to the economic downturn, and to estimate the effects of these reductions on local health department service delivery, workforce diversity, and capacity to address health disparities. The study builds on ongoing research conducted by the Washington PBRN to track changes in funding and service delivery among local health departments across the state, and makes use of a unique data repository constructed for this purpose. A mixed method approach is employed that includes linkage and analysis of existing, secondary data sets and the collection of primary qualitative and quantitative data. The project also allows a new investigator from an under-represented racial background to collaborate with the PBRN in the conduct and translation of the study, which includes mentoring from public health practitioners, knowledge and skill development through courses and active involvement in the PBRN, networking and presenting research findings at national and local meetings focusing on practice-based research, and dissemination of study findings via peer-reviewed publications.

Direct Observation Methods in Local Public Health Settings: Foodborne Outbreak Practices in Ohio. This methodological supplement builds on an ongoing research project by the Ohio PBRN that uses direct observation methods to assess practice variation in food-borne

outbreak (FBO) investigation and response among local health departments in Ohio. Three methodological enhancements are implemented. First, the supplement expands the research focus by adding measures of consumer perceptions of agency actions in prevention, investigation and management of FBO, offering additional perspectives on the validity of direct observation measures. Second, the study links direct observation data with several additional secondary data sources including the Ohio Annual Financial Report (AFR), the Ohio Disease Reporting System (ODRS), census data, restaurant and bar revenues, and County Health Rankings in order to analyze factors that explain variation in observed FBO practices. GIS mapping is used to investigate and illustrate geographic variation in practices, resources and services. Third, the study investigates the project features that benefit or challenge the direct observation research process, using formal interviewing and debriefing methods with student observers and public health practice observees. Findings from this study will suggest approaches for expanding the use of direct observation methods in PBRNs and the larger field of public health research.

Regional Public Health Structures and Readiness for Accreditation and QI. The Nebraska PBRN makes use of the state's recently developed regional public health structure to assess and compare readiness for accreditation among regional health departments and single-county health departments within the state, and to examine the utility of quality improvement (QI) strategies implemented by health departments in preparing for accreditation. The study analyzes self-assessed performance data collected from all local health departments through the state's Local Health Department Standards and Measures tool. Combining these data with the newly released PHAB accreditation standards, the study examines performance variation across agencies and estimates agency readiness for the PHAB accreditation process, with a specific focus on differences in readiness between regional and single-county agencies. Additionally, the study links performance data with newly collected data from an ongoing study of local health department engagement in QI strategies (a PBRN Quick Strike study) to examine the extent to which agencies are implementing QI activities in areas where gaps in performance exist. Site visit interviews in selected regional health department sites explore the relationship between QI implementation and readiness for accreditation in regional health departments. Findings will provide useful insight into the implementation of QI and accreditation initiatives for public health agencies nationwide.

Comparative Effectiveness Research Tools for Examining Public Health Services and Outcomes: This project of the North Carolina PBRN applies new methodological approaches from the field of comparative effectiveness research (CER) to an ongoing study of the impact of a state funding reduction policy on local public health delivery of evidence-based maternity outreach and postpartum services to low-income women and their children. The new methodological approaches augment the existing research by: (1) enhancing the current propensity score matched analysis to provide improved control groups for estimating policy impact, and (2) allowing researchers to better estimate differences in policy impact across a range of vulnerable subgroups of women and children. Findings will illustrate how novel CER methods can be applied to strengthen the evidence produced by studies of public health policies, services, and outcomes.

MULTI-NETWORK PRACTICE AND OUTCOME VARIATION STUDY [MPROVE] (2012-2013)

Six PBRNs were selected through competitive funding opportunity announcement to collaborate in a study that examines geographic variation in the delivery of selected high-value public health services across local public health settings, and explore the determinants and consequences of this variation. The participating funded networks are Colorado, Florida, Minnesota, New Jersey,

Tennessee, and Washington, and an additional network (North Carolina) is participating voluntarily without funding from the program. The networks are collecting data on a common set of service delivery measures that include indicators of service availability, volume, intensity, reach, and quality in the three domains of chronic disease prevention, communicable disease control, and environmental health protection. A Delphi expert panel process was used to select and specify the measures using criteria that gave emphasis to high-value services expected to have large health and/or economic effects if service delivery were improved. Data will be pooled into a common registry and linked with other data sources to support both across-network and within-network analyses of practice variation. Findings will reveal policy and administrative strategies for reducing unwarranted variation in the delivery of high-value services.

PUBLIC HEALTH DELIVERY AND COST STUDIES [DACS] (2013-2014)

Optimizing the Use of HIV/STD Partner Services Strategies in New York State: With CDC policy initiatives emphasizing high-impact HIV/STD prevention activities, public health decision-makers need to understand both the costs of such activities and their relationship to outcomes to ensure optimal allocation of labor and resources. To this end, the New York Public Health Practice-Based Research Network, led by Health Research Inc., is conducting an economic assessment of HIV/STD partner services (PS) delivery by state and local public health agencies. Investigators are measuring variation across two PS strategies: 1) integrated HIV and STD services currently delivered by the state health department's regional offices, and 2) a new strategy that focuses on high-impact HIV prevention delivered by large local health departments. This comparison will reveal how reallocating staff resources to the new, high-impact strategy affects the costs and outcomes of prevention programs at the county and state levels. The project builds on recent research that has identified quality and outcome measures related to HIV/STD PS delivery, continuing the engagement of both academic and practice partners in research designed enhance the relevance, quality, and dissemination of study results. Findings could contribute to better prioritization of staffing resources, increased efficiency in PS program delivery, and a return on investment that includes reduced transmission of HIV/STDs.

Comparative Cost Study of Sexually Transmitted Infections Services in Florida: Through a study focusing on the prevention and control of sexually transmitted infections (STI), the Florida Public Health Practice-Based Research Network, led by the University of Florida, is evaluating unit costs of public health service delivery and examining the cost effects of selected delivery system characteristics, including: (1) the centralization or decentralization of program implementation; (2) the centralization of information technology and human resources systems; (3) economies of scale related to population size of health department jurisdiction; (4) local tax and other revenue support for county health department services; and (5) responsiveness to local community governance. Evidence generated through the study will facilitate informed decision-making, ultimately enhancing both delivery systems for public health services and support efforts toward achieving optimal, equitable health outcomes.

Costs and Cost-drivers of Providing Foundational Public Health Services in Washington State: To support the transformation toward a more efficient and effective public health system, Washington's statewide Foundational Public Health Services Workgroup was tasked with developing a strategy to determine "predictable and appropriate levels of financing." With leadership from the University of Washington, the Washington Public Health Practice-Based Research Network is using this opportunity to leverage the current activities of the state's practice leaders toward identifying

and examining factors that promote and inhibit the provision of this foundational set of public health services and capabilities. This study's aims are three-fold: to estimate and validate the cost per unit of service for selected Foundational Public Health Services for Washington's local health jurisdictions; to determine how organizational and community factors influence the cost of public health system service delivery in the state; and to determine how variation in the cost of Washington's Foundational Public Health Services relates to equity of resource allocation. Among the approaches to determine costs, cost drivers, and other factors associated with programs and capabilities are: 1) cross-sectional resource-based cost estimation, 2) an activity log-based method, and 3) longitudinal modeling to examine factors that influence cost and production. Results will support public health leaders in developing a more efficient and equitable system of public health resource allocation.

Cost Effectiveness, Efficiency and Equity of Inspection Services throughout Connecticut's Local Public Health System: With leadership from the Connecticut Association of Directors of Health, the Connecticut Public Health Practice-Based Research Network is evaluating whether state-mandated environmental services (SMES) are most effectively, efficiently, and equitably delivered by local or regional public health entities, as well as the impact of local health department (LHD) jurisdiction size and population density on SMES delivery. Specifically, the study addresses: (1) the relative cost of providing SMES for LHD serving small vs. larger populations, departments vs. districts, and unionized vs. non-union jurisdictions; (2) the impact of LHD size, organizational structure and receipt of state subsidies on capacity to provide SMES; (3) potential correlations between LHD jurisdiction population size and effectiveness of food service programs that result in differences in per capita cost for these services; (4) the impact of LHD size and organizational structure on the fee structure for food service inspections whether the fee structure presents an equity issue for local food service establishments; (5) the impact of routine local food inspections on establishments and their food service workers; and (6) correlations between inspections, changes in food handling practices, and the retention of these changes. Findings will support evidence-based decision-making related to environmental services provision.

The Influence of Organizational and Community Characteristics on the Cost of Providing Mandated Public Health Services in North Carolina: Recent legislation in North Carolina, enacted largely on the basis of presumed cost savings, expands the ability of local health departments (LHDs) to reorganize governance. Practitioners are concerned that these and other changes to public health law increasingly require service provision without reliable cost estimates. Led by East Carolina University, the North Carolina Public Health Practice-Based Research Network is attempting to address this concern via a three-pronged study that will: (1) estimate and validate the cost per unit of public health service for selected services mandated by North Carolina statute; (2) construct a validated service cost-estimation methodology that can be readily implemented by LHD finance staff; and (3) examine the influence of different delivery system structures on the costs of delivering mandated public health services. Investigators are employing multiple methods to compare cost estimates and to enhance the validity and reliability of the findings. The study will generate an actionable, accessible, and validated methodology for estimating cost of services, thus supporting practitioners in the prioritization of public health activities while also building the evidence base to inform future policies.

Public Health Delivery and Cost Studies in the San Joaquin Valley of California: The implementation of the Affordable Care Act (ACA) necessitates better information on the costs of service delivery. The California Public Health Practice-Based Research Network, led by the Public Health Institute, is addressing this need through research to identify and compare the costs of

delivering three target sets of public health services in four rural Local Health Departments (LHDs) located in the San Joaquin Valley. Investigators are comparing the methods and costs of tuberculosis surveillance and investigation, child immunizations, and community needs assessments across these rural areas to enhance LHD workforce capacity for integrating cost analyses into their operations. Using a resource-based costing approach, the research team is estimating the cost of resources associated with delivering each of the three services, developing a model to explore the robustness of the results, and, where appropriate, identifying the cost-effectiveness of the existing services. Findings will aid LHDs in planning for ACA implementation by providing information on both the cost of delivering services and the resulting outcomes, as well as by increasing capacity within LHDs to sustain this type of analysis.

Determining the Cost of Select Core Services Across Colorado Public Health Agencies: The Colorado Public Health Practice-Based Research Network, led by the Colorado Association of Local Public Health Officials, is working both to estimate the cost of delivering selected core public health services in Colorado and to identify services and delivery characteristics with economies of scale and scope. Using a micro-costing approach to estimate the variable and fixed costs associated with the selected core services, this study is examining the degree to which local public health agency (LPHA) structural differences modify costs. These goals are being accomplished through a four-stage process: (1) selecting specific public health services for evaluation; (2) conducting key informant interviews and a focus group to identify variable and fixed costs; (3) conducting a survey using time logs to estimate variable costs; and (4) performing analyses of cost data to determine the effect of delivery system characteristics on the cost of delivering services. This project is engaging partners using the Colorado PBRN's communications plan, which includes cyclical phases of building awareness, recruitment, and dissemination to ensure targeted communication throughout the project. Study results will help inform decisions by local public health agencies, the state health department, and system level partners, while also building evidence about the utility of core public health services funding nationally.

Understanding Governmental and Non-Governmental Funding and Network Structures in Different Models of Public Health Infrastructure: The New Hampshire Public Health Practice-Based Research Network, led by the University of New Hampshire, is exploring how funding and allocation for tobacco prevention and cessation services relate to connectivity among partner members of local public health systems, as measured using the PARTNER network analytic tool. The study examines four communities with diverse local public health system infrastructures located in geographically and demographically distinct areas, exploring how these infrastructural differences relate to various financial inputs. The research team is identifying variation in funding sources and allocation for tobacco services to make inferences about how financial characteristics might impact connectivity across partners delivering public health services. An improved understanding of the variety of funding sources can help sites better understand their own infrastructures, along with related impacts on collaboration. This work will assist other states in understanding how public health funding affects the way local public health systems with multiple diverse partners function.

Determining the Public Health Costs of Tobacco Prevention and Control: A Comparison of New Jersey Local Health Departments: To better understand the true cost of public health services, the New Jersey Public Health Practice-Based Research Network, with leadership from the Foundation for Healthcare Advancement, is comparing tobacco prevention and control costs across five diverse local health departments (LHDs). Using a standard costing work plan, investigators are determining all relevant activities and their capital versus recurrent costs, both fixed and variable, for tobacco prevention and control, looking specifically at the costs of common

activities and overall costs during the course of a state fiscal year. Thirteen New Jersey LHDs, along with an economic/budget analysis consultant and the research team, constitute the project's advisory group, which is selecting the subject LHDs based on diversity of geography, population, and administrative structure. Study results will add to public health knowledge of the mechanisms through which costs, information, and labor produce health promotion and protection services, programs, and policies, ultimately helping improve quality and efficiency of public health activities and the population health outcomes associated with them.

Measuring the Costs of Implementing QI Initiatives and Examining the Variation in Costs of QI Implementation among LHDs in Nebraska: The growing use of quality improvement (QI) initiatives within local health departments (LHDs) brings with it a need for better understanding the implementation costs associated with QI activities. Led by the University of Nebraska Medical Center, the Nebraska Public Health Practice-Based Research Network is addressing this information need through a project that is measuring and estimating QI implementation costs while also examining cost variation across LHD settings. Using both key informant interviews and surveys, investigators are collecting cost information on four specific LHD QI projects, following the procedures of economic evaluation to conduct the cost estimation and analysis. The resulting cost estimates and related tools will be valuable for LHDs that are considering similar QI activities, ultimately supporting better allocation of limited resources toward suitable initiatives. This study also will provide insights into the examination of scale economies for QI implementation, which will benefit LHDs nationwide.

OTHER ACTIVE PBRN RESEARCH PROJECTS

Public Health Law and Regionalization. The Colorado PBRN has received funding from the RWJF Public Health Law Research Program to conduct a national review of state laws that govern the regionalization of public health service delivery; a legal analysis of the Colorado Public Health Act of 2008 as it impacts regionalization and regional approaches to public health service delivery; a mapping study of regional approaches within Colorado that includes an analysis of related legal instruments; and a qualitative study of the determinants of legal and structural barriers to regional public health service delivery.

Local Public Health Performance in H1N1 Mass Vaccination: The Washington PBRN has conducted a study of local variation in H1N1 mass vaccination planning and implementation within the state during 2009-2010 using funds provided by the state health department through its federal CDC pandemic influenza grant.

Variation and Change in Local Public Health Service Delivery: Bettie Bekemeier of the Washington PBRN has received funding from the Robert Wood Johnson Foundation's Nurse Faculty Scholars Program to support a study of variation and change in the types of services offered by local health departments around the country, and the impact of local and national economic conditions on this service delivery. This two-year study, scheduled to begin in September 2010, will involve multiple PBRNs with coordination from the PBRN National Coordinating Center.

Sustaining Maternal and Child Care Coordination in the Face of Changing Medicaid Policies: Rebecca Wells and the North Carolina PBRN are completing a study funded by HRSA's Maternal and Child Health Research Program that examines the strategies local public health agencies are using to sustain health and social services for pregnant women and young children in

the face of Medicaid reimbursement reductions and restructuring.

PBRN Structures and the Implementation and Translation of Public Health Research. This study led by the PBRN Coordinating Center is conducting a network analysis survey with all participants in 14 public health PBRNs (12 primary networks and 2 affiliate networks) in order to characterize patterns of interaction and the distribution of roles and responsibilities among participating researchers and practitioners. More than 400 organizational participants are represented in the 14 networks, including public health agencies, universities, and community-based organizations. Standard measures of network structure and flow are constructed for each PBRN, using information about the types and frequencies of interaction reported by network participants. Hierarchical ordered logistic regression models are used to estimate how organizational attributes and network structures influence the experiences of PBRN participants with research participation and translation activities. Findings will be used to identify strategies for improving the quality and productivity of research conducted through public health PBRNs.

Public Health Spending and Avoidable Medical Care Use. Glen Mays (National Coordinating Center) and Paul Erwin (University of Tennessee, affiliate PBRN) are collaborating on a longitudinal study of public health spending patterns in local areas and their relationship to avoidable medical care utilization and expenditures. The study builds upon prior research conducted by Mays and Erwin and utilizes both historical and newly available data from NACCHO, ASTHO, the U.S. Census Bureau, and the Dartmouth Atlas of Health Care.

Return-in-Investment Analysis of Public Health Infrastructure Improvements. Glen Mays (National Coordinating Center) is leading a project funded by the U.S. Centers for Disease Control and Prevention and the Association of State and Territorial Health Officials to conduct return-on-investment (ROI) analyses of public health infrastructure improvement initiatives funded through the CDC's National Public Health Improvement Initiative (NPHII) created by the Affordable Care Act. The project is being carried out in collaboration with selected Public Health PBRN members that receive NPHII funding.

National Longitudinal Survey of Public Health Systems. Since 1998, Glen Mays (National Coordinating Center) has followed a nationally representative cohort of U.S. communities to examine the types of public health activities performed within the community, the range of organizations contributing to each activity, and the perceived effectiveness of each activity in addressing community needs. This information, obtained through a validated survey of local public health officials, provides an in-depth view of the structure and function of local public health delivery systems and how these systems evolve over time. Originally conducted with support from the U.S. Centers for Disease Control and Prevention, the National Longitudinal Survey of Public Health Systems (NLSPHS) was fielded for the first time in 1998, with a follow-up survey conducted in 2006 as part of a Robert Wood Johnson Foundation-funded project to develop an evidence-based typology of local public health delivery systems. Each wave of the survey has been linked with data on local health departments collected from the prior year's National Profile of Local Health Departments survey conducted by the National Association of County and City Health Officials (NACCHO), allowing for an in-depth view of how local health departments relate to the multi-organizational delivery systems in which they operate. These data, linked with still other data sources on community demographic, health, and economic characteristics, have supported a wide array of studies regarding the organization, financing, and delivery of public health services and provided considerable insight into policy and administrative mechanisms for improving the practice of public health. Public health PBRNs in Connecticut, Wisconsin, and California have used the

survey instrument and its data for more targeted studies. A third wave of the NLSPHS is now being conducted by the Public Health Practice-Based Research Networks Program in collaboration with the National Coordinating Center for Public Health Services and Systems Research at the University of Kentucky.

PBRN RESEARCH PROJECTS IN DEVELOPMENT

Appalachian Research Collaborative for Health Equity Solutions (ARCHES): This program, submitted to the NIH National Center for Minority Health and Health Disparities and coordinated by the University of Kentucky's Public Health PBRN Coordinating Center, will develop a transdisciplinary research center focused on developing, testing, and replicating multi-level policy solutions that reduce disparities in health risk behaviors and prevention practices among residents of the Appalachian region. Populations residing in Kentucky and the surrounding Appalachian region experience among the nation's highest rates of tobacco use, obesity, preventable hospitalizations, and premature deaths due to cancer and other preventable chronic conditions. A convergence of economic and social conditions, cultural influences, environmental exposures, health system constraints, and public policy choices contribute to these problems and make them resistant to change. The proposed center brings accomplished scientists from the disciplines of epidemiology, behavioral science, clinical medicine, economics, health services research and health policy together with public health practice-based research networks (PBRNs) that include state and local government agencies, primary care providers, and community-based organizations serving communities across the Appalachian region in Kentucky, Ohio, and West Virginia. The Center will allow diverse teams of scientists, health professionals, and public officials to collaborate in the design, implementation, and translation of comparative effectiveness studies that test policy initiatives for reducing high-priority health disparities across the region. Initial research projects of the center will examine the impact of community-level policies to promote cervical cancer screening among rural Appalachian women, workplace policies to discourage tobacco use and limit occupational exposure to environmental tobacco smoke, and state and local public finance policies to support the work of public health agencies in prevention and health protection programs. Studies will examine both the health and economic effects of these policies in the Appalachian region in order to provide policy guidance for sustainability and replication strategies. A pilot grant program will support the development and preliminary testing of innovative policy strategies to address risk factors for obesity, substance abuse, and partner violence in Appalachia. A research core will support the collection and analysis of survey data for the purposes policy development, implementation, and evaluation, along with the novel use of secondary data from cancer surveillance systems, electronic health records, health insurance claims, and public program administrative records. The Center will build upon a constellation of existing, highly successful regional research initiatives including Kentucky Rural Cancer Prevention Research Center, the Public Health PBRN Program, the Kentucky Center for Clinical and Translational Research, and the Appalachian Translational Research Network, along with several ongoing NIMHD-funded research projects in the region.

Public Health Spending, Preventable Outcomes, and Medical Care Use: This study, submitted to the Agency for Healthcare Research and Quality (AHRQ) and coordinated by the University of Kentucky's Public Health PBRN Coordinating Center, will estimate the effects of federal, state and local public health spending patterns on the implementation of evidence-based prevention programs in communities, and on the resulting health risks, costs, and health outcomes experienced by community residents. The study focuses on residents of the Central Appalachia

region, who experience among the nation's highest rates of tobacco use, obesity, preventable hospitalizations, and premature deaths due to cancer and other preventable chronic conditions. The study will give special attention to spending effects on the implementation of tobacco prevention, nutrition, and physical activity programs as well as the implementation of strategies to facilitate access to primary care. A two-part research design will be employed that includes (1) a longitudinal analysis of how spending patterns influence program implementation, risks, and outcomes using a quasi-experimental, difference-in-difference design; and (2) an interorganizational network analysis that explores how spending patterns shapes governmental and nongovernmental contributions to public health program implementation. The study will focus on the 592 counties located in the six Central Appalachian states of Kentucky, North Carolina, Ohio, Tennessee, Virginia, and West Virginia, compared with the 622 counties located in a six-state comparison group outside the Appalachian region. Public Health Practice-Based Research Networks (PBRNs) operating in each of these states will be actively engaged in the design, implementation, and translation of the study.

Public Health System Capacity and the Implementation of Prescription Drug Overdose Prevention Strategies Across Appalachia: The Appalachian region has experienced some of the nation's highest and fastest-growing rates of non-medical use of prescription drugs, as well as injuries and deaths due to prescription drug overdose. Differences in public health system resources and capacity, policy and program design, and implementation intensity are likely to precipitate differences in the effectiveness and efficiency of prescription drug overdose prevention (PDOP) strategies in reducing prescription drug injury burden. Inequities in public health protection result from these differences. Unfortunately, very little empirical injury research to date has focused on factors that facilitate and inhibit PDOP implementation and impact. Ongoing economic and policy shocks—such as those precipitated by recessionary changes in state and local government budgets, coal industry contraction, Affordable Care Act implementation, and federal budget sequestration—have triggered heterogeneous changes in state and local PDOP financing and implementation across the Appalachian region, creating “natural experiments” for analyzing the causes and consequences of change in PDOP strategies. The proposed project will support a quasi-experimental, comparative study of public health system capacity and PDOP spending and implementation across the 13 states that straddle the Appalachian region, in order to elucidate the determinants and the health and economic consequences of geographic variation in PDOP strategies. The study, proposed to the National Center for Injury Prevention and Control at CDC by the University of Kentucky as part of an Injury Control Research Center application, will use relationships with public health practice-based research networks (PBRNs) operating across the region to collect detailed measures of PDOP financing and implementation at both state and local levels, and to compile existing data on public health system capacity and prescription drug injury burden in these same areas. Data will be used to estimate the impact of PDOP implementation and enforcement intensity on nonmedical prescription drug utilization, emergency department admissions, hospitalizations and deaths within the region using quasi-experimental, instrumental-variables estimation with longitudinal, hierarchical models.

CDC Prevention Research Centers: The U.S. Centers for Disease Control and Prevention (CDC) is in the process of evaluating competing proposals for the reauthorization of its network of Prevention Research Centers across the nation. Public Health PBRNs are proposed to play key roles as research partners and research translation mechanisms in four of the PRC applications: Kentucky (University of Kentucky), Ohio (Case Western Reserve University), Colorado (University of Colorado), and Washington (University of Washington). Additionally, the Public Health PBRN Program is proposed to serve on the steering committee for the PRC applications in Kentucky and Colorado.