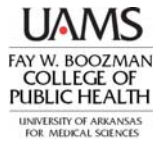


# Practice Variation in Public Health: Using Evidence to Improve Outcomes



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## Questions we will consider

- What is practice-based research in public health?
- What can we learn from studies of practice variation in public health?
- What are PBRNs and how can they help us with what we need to learn?

## Why study public health practice?

“The Committee had hoped to provide specific guidance elaborating on the types and levels of workforce, infrastructure, related resources, and financial investments necessary to ensure the availability of essential public health services to all of the nation’s communities. However, such evidence is limited, and there is no agenda or support for this type of research, despite the critical need for such data to promote and protect the nation’s health.”

—Institute of Medicine, 2003



## Disruptive innovations in the public health system

- Accreditation
- Performance measurement & public reporting
- Economic shocks: recession and stimulus spending
- Implementation of health reform
  - Enhanced coverage for prevention
  - Expanded federal public health investments
  - Expansions in professional and lay workforce
  - Opportunities for enhanced medicine-public health coordination: ACOs, CHCs, CHWs
- Health information technology



**Public Health**  
Prevent. Promote. Protect.

## Missed opportunities in prevention

Less than 50% of the population at risk is reached by:

- Smoking cessation
- Aspirin use
- Influenza vaccination
- Hypertension control
- Nutrition and physical activity programming
- HIV prevention
- Family planning
- Substance abuse prevention
- Interpersonal violence prevention



## What is Public Health Systems Research?

A field of inquiry examining the **organization**, **financing**, and **delivery** of public health services at local, state and national levels, and the **impact** of these activities on population health

## What is Practice-Based Research in Public Health?

- Research that tests effectiveness & impact of public health practices in real-world **public health settings**
- Research designed to address uncertainties and information needs of real-world public health **decision-makers**
- Research that evaluates the implementation and impact of **innovations in practice**
- Research that uses **observations generated through public health practice** to produce new knowledge

## Fundamental empirical questions



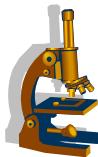
- Which programs, interventions, policies, strategies (**mechanisms**)....
- Work best (**outcomes**)...
- In which institutional & community settings (**contexts**)...
- And why (**causal pathways, active ingredients**)?

Pawson and Tilley 1997

## PHSR's place in the continuum

### Intervention Research

- What works – proof of efficacy
- Controlled trials
- *Guide to Community Preventive Services*



### Services/Systems Research

- How to organize, implement and sustain in the real-world
  - Reach
  - Quality/Effectiveness
  - Cost/Efficiency
  - Equity/Disparities
- Impact on population health



- Comparative effectiveness & efficiency

## How does this relate to CER?

- “Comparative effectiveness research is the generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor disease and improve the delivery of care.”
- The purpose of CER is to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels.”

-National Academy of Sciences  
Institute of Medicine

- **2009 ARRA:** \$1.1B
- **2010 ACA:** \$600M/year



## Patient Protection and Affordable Care Act

### Subtitle D—Support for Prevention and Public Health Innovation

#### SEC. 4301. RESEARCH ON OPTIMIZING THE DELIVERY OF PUBLIC HEALTH SERVICES.

(a) **IN GENERAL.**—The Secretary of Health and Human Services (referred to in this section as the “Secretary”), acting through the Director of the Centers for Disease Control and Prevention, shall provide funding for research in the area of public health services and systems.

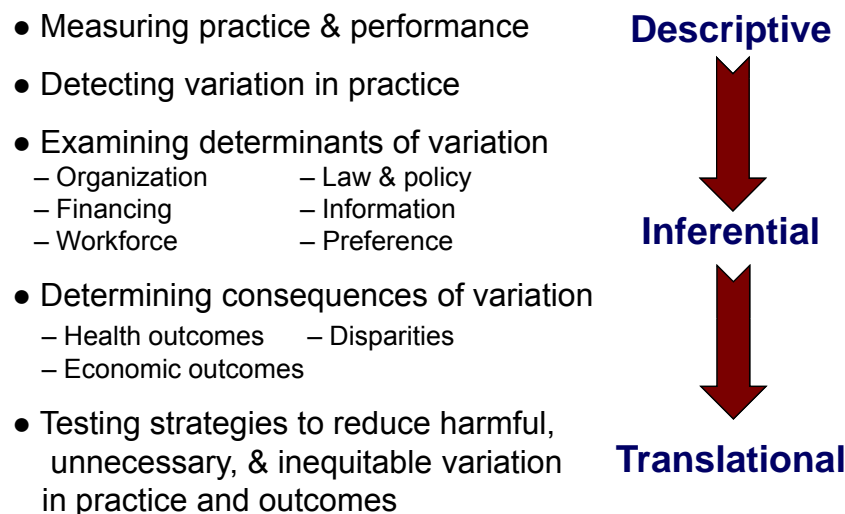
(b) **REQUIREMENTS OF RESEARCH.**—Research supported under this section shall include—

(1) examining evidence-based practices relating to prevention, with a particular focus on high priority areas as identified by the Secretary in the National Prevention Strategy or Healthy People 2020, and including comparing community-based public health interventions in terms of effectiveness and cost;

(2) analyzing the translation of interventions from academic settings to real world settings; and

(3) identifying effective strategies for organizing, financing, or delivering public health services in real world community settings, including comparing State and local health department structures and systems in terms of effectiveness and cost.

## Developmental path for PBR



## Examples: Adoption of evidence-based practices

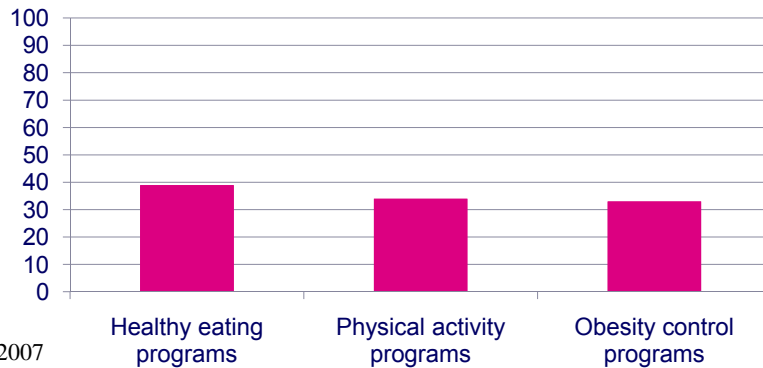


### Missed Opportunities

#### Local Health Departments as Providers of Obesity Prevention Programs for Adolescents

Sandy J. Slater, PhD, Lisa M. Powell, PhD, Frank J. Chaloupka, PhD

#### Percent of local health departments offering evidence-based obesity programs



Slater et al. 2007

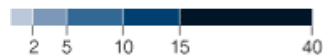
## Examples: Variation in agency practice

### Mixed Results In Tracking Food Scores

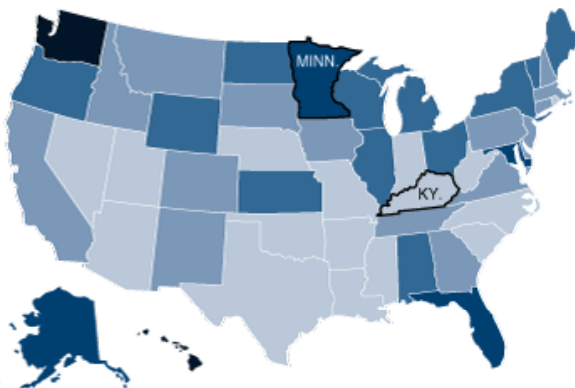
Minnesota health officials investigate all reports of food-borne illness, but officials in many states do not. From 1990 to 2006, Minnesota reported 548 outbreaks, while Kentucky reported 18.

#### Reported outbreaks of food-related illness

Per 100,000 people, 1990 to 2006



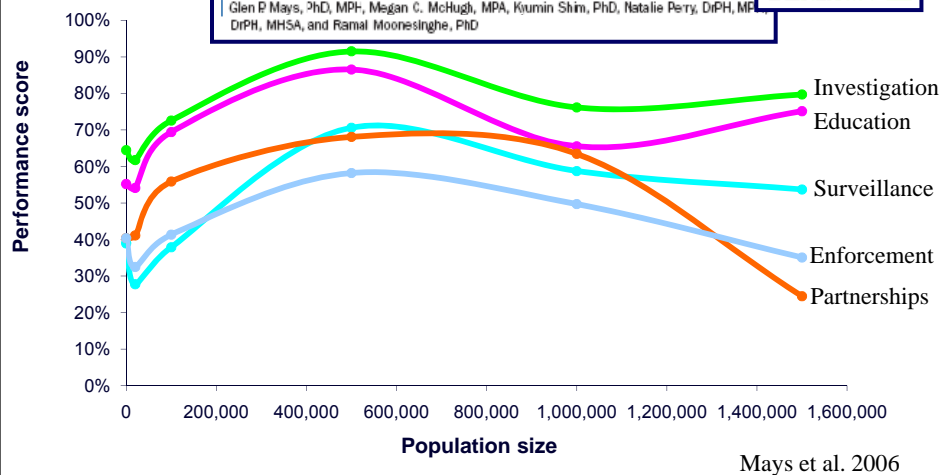
Source: Centers for Disease Control and Prevention



## Examples: Variation in system performance

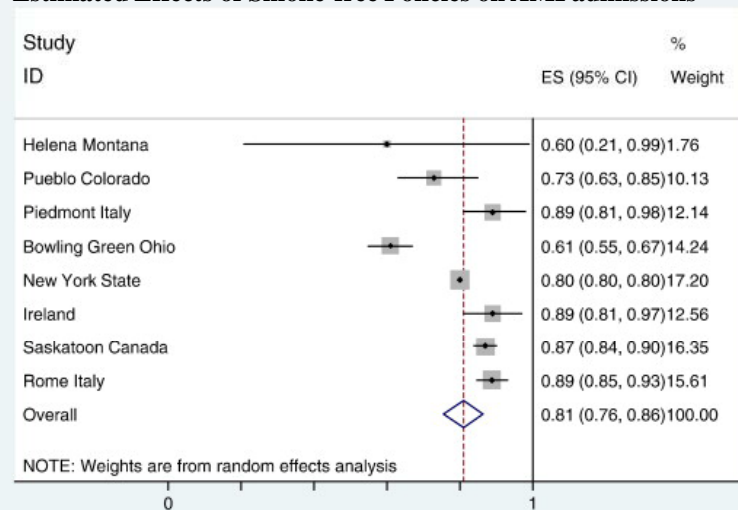
### Institutional and Economic Determinants of Public Health System Performance

Glen P Mays, PhD, MPH, Megan C. McHugh, MPA, Kyumin Shim, PhD, Natalie Perry, DrPH, MEd, DrPH, MHSA, and Ramai Moonesinghe, PhD



## Examples: Variation in program effectiveness

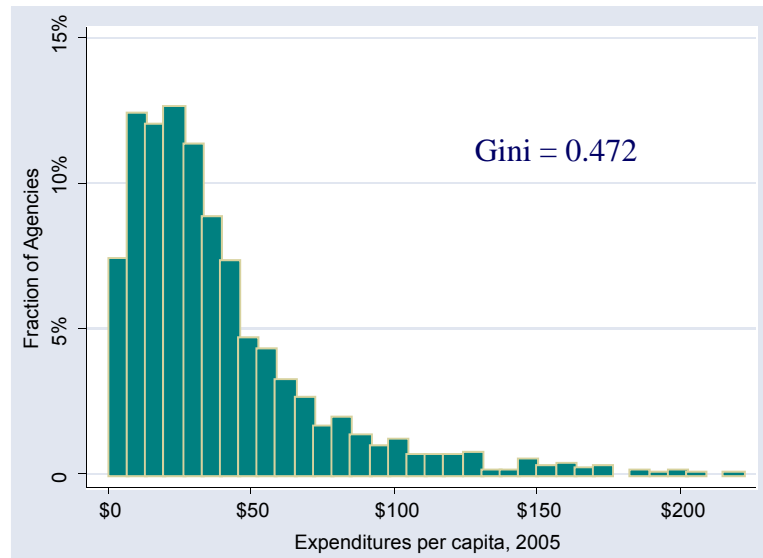
### Estimated Effects of Smoke-free Policies on AMI admissions



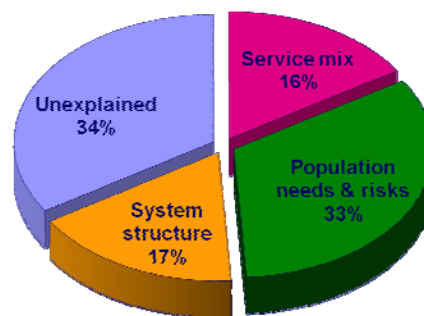
Glantz 2008



## Example: variation in local public health agency spending



## Drivers of geographic variation in public health spending



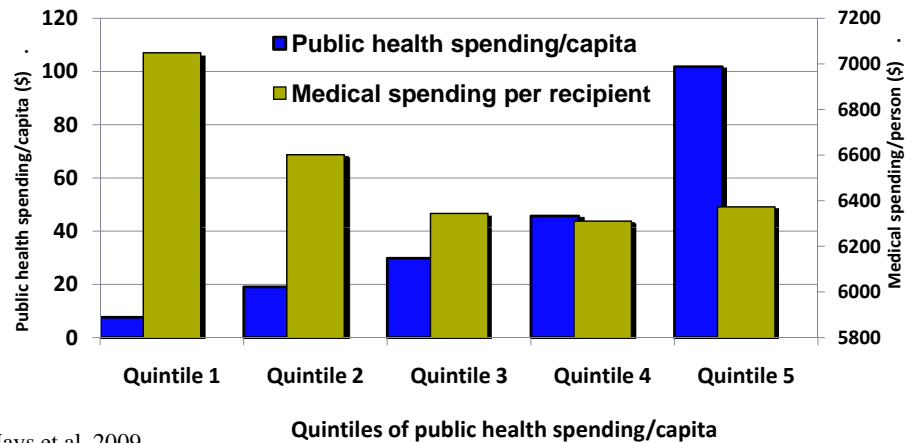
- Delivery system size & structure
- Service mix
- Population needs and risks
- Efficiency & uncertainty

Mays et al. 2009

## Examples: variation in resource use

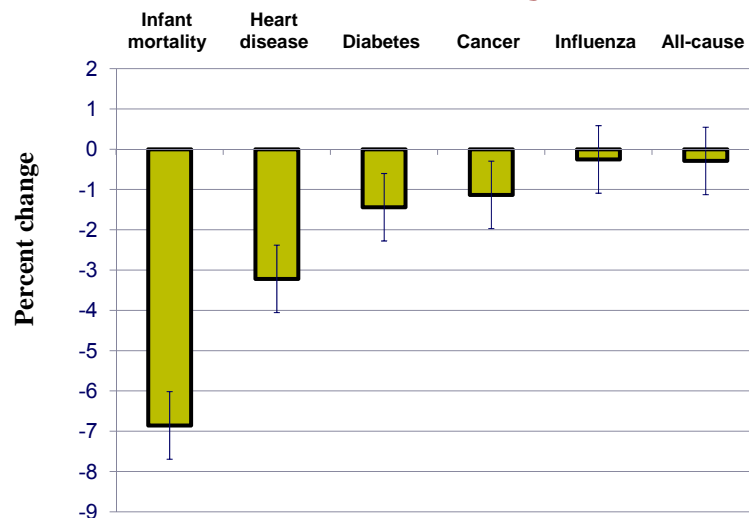


“Local public health spending varies by a factor of 13 between the top 20% and bottom 20% of communities, even after adjusting for differences in demographics, SES, and service mix.”



Mays et al. 2009

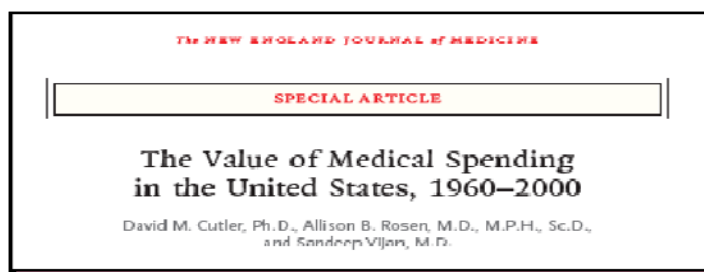
## Examining value: reductions in preventable mortality attributable to public health spending



Hierarchical logistic regression estimates with instrumental variables to correct for selection and unmeasured confounding

## The value of spending: cost of gaining an additional year of life

<u>Source</u>	<u>Cost per Life-Year Gained</u>
Medical care spending, 1990-2000 (Cutler et al. NEJM, 2006)	\$36,300
Public health spending, 1993-2005	\$12,200-\$25,600



## Moving the field forward

We need research that penetrates and elucidates the “black box” of public health agencies and systems



## Next Steps: Getting serious about quality measurement

- ✦ **Detailed** measures of structures and processes
- ✦ Theoretical and empirical linkages to **outcomes**
- ✦ **Objective** and verifiable evidence of action (beyond self-assessment)



**Develop and test a modest starter set of measures**

## Next Steps: Defining Quality in Public Health Practice

- ✦ **Quality defined:** “the degree to which services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (IOM 2001)
- ✦ **Appropriateness:** Does the public health agency and/or system act based on objectively measured health needs and risk profiles of the population served? What is the degree of concordance between a community’s documented health needs/risks and the scope of public health activities performed by the public health agency or the system as a whole?

### **Next Steps: Defining Quality in Public Health Practice**

- **Effectiveness/Fidelity:** Does the public health agency and/or system implement its activities based on available scientific knowledge and fidelity to evidence-based guidelines? To what extent are programs and services concordant with evidence-based guidelines and professional consensus standards?
- **Reach:** To what extent do public health activities reach the intended target populations who could benefit from these activities? To what extent are activities implemented at a sufficient scale and targeted appropriately to the population groups most at risk?

### **Next Steps: Defining Quality in Public Health Practice**

- **Timeliness:** Are public health activities implemented at the appropriate points in time to maximize health protection and minimize the risk of disease transmission or injury?
- **Community Centeredness/Engagement:** To what extent are relevant stakeholders engaged in planning, priority-setting, selection, and implementation of public health activities undertaken by the public health agency and/or system? To what extent are public health activities tailored appropriately to at-risk population groups based on the groups' values, preferences, needs, knowledge, skills, and resources?

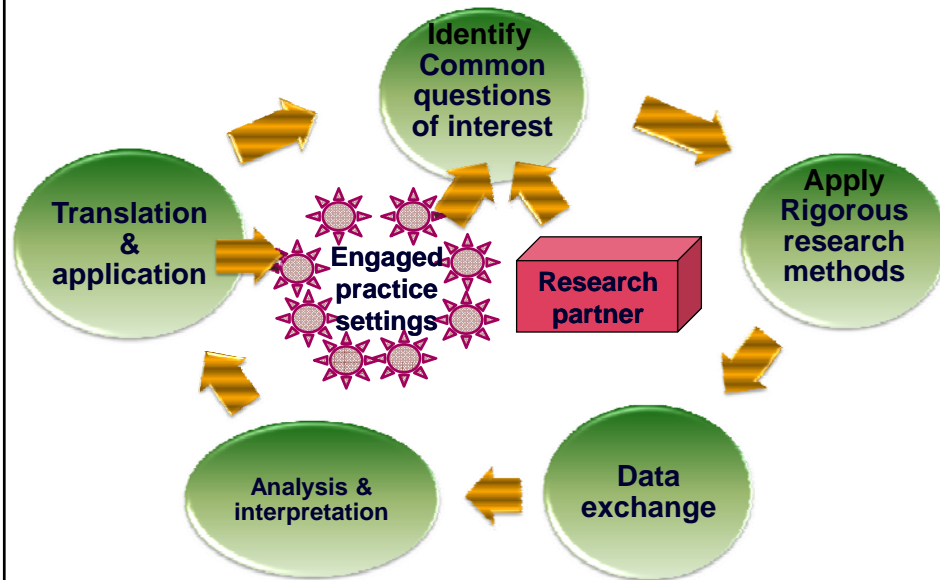
## Next Steps: Defining Quality in Public Health Practice

- ✦ **Efficiency:** To what extent are public health activities implemented in ways that optimize the use of financial and human resources? To what extent do implementation processes avoid waste and delays in service? To what extent do the benefits of public health activities justify their costs?
- ✦ **Equity:** Are there disparities in the reach of public health activities to different population sub-groups defined by personal characteristics such as race, ethnicity, geography, or socio-economic status? Are there disparities in effectiveness, timeliness, community-centeredness, and/or efficiency?

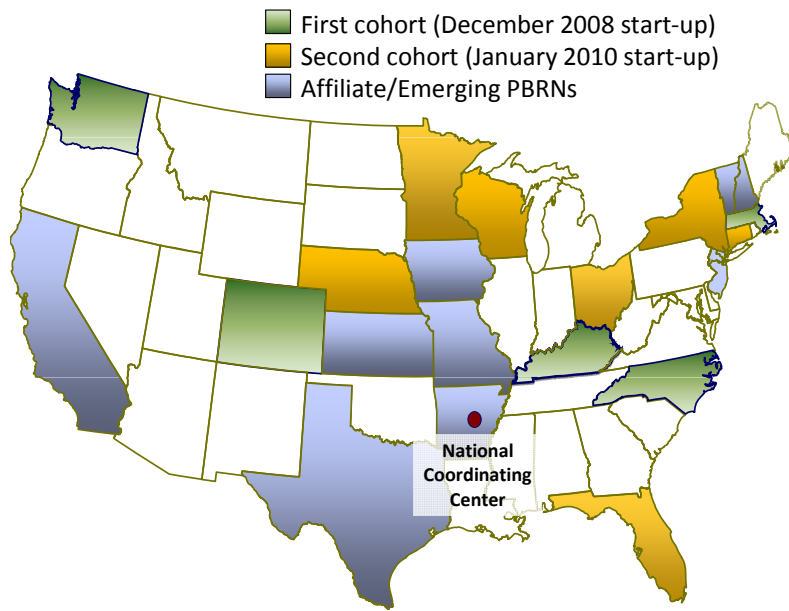
## What are Public Health PBRNs?

A collection of ***public health agencies*** and their ***partner organizations*** engaged in an ongoing collaboration with an ***academic research center*** to conduct rigorous, applied studies of strategies for organizing, financing, and/or delivering public health services in ***real-world community settings***.

## The Logic of Public Health PBRNs



## The Public Health PBRN Program



## Examples of practice-based studies

- ***Comparative case studies***: document processes, identify problems, examine innovations
- ***Large-scale observational studies***: document practice variation across public health settings; identify causes & consequences
- ***Quality improvement studies***: evaluate strategies for improving program operations & outcomes
- ***Policy evaluations and natural experiments***: monitor the effects of key policy and administrative changes

## Getting inside the box

- Engage practice communities
- Develop and test sensitive and specific measures of practice quality
- Foster public sector demonstrations and experiments in public health
- Routinize and standardize data collection on core system attributes and practice measures





## For More Information

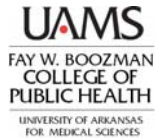


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