Public Health Services & Systems Research (PHSSR): Current State of the Field

Glen P. Mays, PhD
Department of Health Policy and Management
Fay W. Boozman College of Public Health
University of Arkansas for Medical Sciences
Overview

◆ Why PHSSR and why now?
◆ What have we learned from PHSSR to date?
◆ What do we need to learn from PHSSR?
◆ Promising directions for the future
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“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 present opportunities for learning

- Accreditation
- Performance measurement & public reporting
- Economic downturn
- Stimulus spending
- Health reform: heightened expectations & accountability
- Health information technology
Missed opportunities in prevention

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

- Smoking cessation programs
- Aspirin use information
- Influenza vaccination
- Hypertension control information
- Nutrition & physical activity interventions
- HIV prevention
- Family planning programs
- Substance abuse prevention
- Interpersonal violence prevention
Fundamental empirical questions

Which programs, interventions, policies, strategies (mechanisms) work best (outcomes) in which institutional & community settings (contexts)

Pawson and Tilley 1997
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.

Mays, Halverson, and Scutchfield. 2003
PHSSR’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
Developmental path for PHSSR

- Measuring practice & performance
- Detecting variation in practice
- Examining determinants of variation
  - Organization
  - Financing
  - Workforce
- Determining consequences of variation
  - Health outcomes
  - Economic outcomes
- Testing strategies to reduce harmful, unnecessary, & inequitable variation in practice and outcomes

Descriptive

Inferential

Translational
Overview

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Polling Question

Do you look to or use Public Health Services and System Research in program development and decision making?

A. Always
B. Frequently
C. Seldom
D. Never
Where are we now?

- Considerable knowledge about public sector organization & practice
- Some knowledge about financing
- Limited knowledge about non-governmental contributions & division of responsibility
- Knowledge about performance variation based primarily on self-assessment
- Limited knowledge about health & economic impact
Descriptive
## Programs And Functions Of U.S. Local Public Health Agencies, 2005

<table>
<thead>
<tr>
<th>Program/function</th>
<th>Performed by agency (%)</th>
<th>Contracted by agency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult immunization</td>
<td>87.5</td>
<td>6.0</td>
</tr>
<tr>
<td>Communicable disease epidemiology</td>
<td>86.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Child immunization</td>
<td>86.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Tuberculosis screening</td>
<td>82.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Food service inspection</td>
<td>74.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Tobacco control</td>
<td>66.6</td>
<td>5.8</td>
</tr>
<tr>
<td>Women, infants, and children (WIC) program</td>
<td>64.0</td>
<td>4.5</td>
</tr>
<tr>
<td>Septic tanks</td>
<td>63.7</td>
<td>2.0</td>
</tr>
<tr>
<td>HIV/AIDS screening</td>
<td>59.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Sexually transmitted disease treatment</td>
<td>57.1</td>
<td>5.7</td>
</tr>
</tbody>
</table>
Adoption of evidence-based practices

Percent of local health departments offering evidence-based obesity programs

- Healthy eating programs
- Physical activity programs
- Obesity control programs

Slater et al. 2007 American Journal of Preventive Medicine
### Variation in agency performance

<table>
<thead>
<tr>
<th>LPHA</th>
<th>Region</th>
<th>Population served</th>
<th>Urban / rural</th>
<th>Mean time unit calls returned (min)</th>
<th>Longest Period before calls returned (min)</th>
<th>Number of calls not returned</th>
<th>Percent “warm transfers”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Midwest</td>
<td>Small</td>
<td>Rural</td>
<td>93</td>
<td>630</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td>2</td>
<td>Midwest</td>
<td>Medium</td>
<td>Rural</td>
<td>51</td>
<td>350</td>
<td>1</td>
<td>57</td>
</tr>
<tr>
<td>3</td>
<td>Midwest</td>
<td>Medium</td>
<td>Urban</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>88</td>
</tr>
<tr>
<td>4</td>
<td>Midwest</td>
<td>Large</td>
<td>Urban</td>
<td>14</td>
<td>30</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>5</td>
<td>Midwest</td>
<td>Large</td>
<td>Urban</td>
<td>10</td>
<td>23</td>
<td>0</td>
<td>39</td>
</tr>
</tbody>
</table>
Inferential
Variation in system performance

Mays et al. 2006

American Journal of Public Health
Variation in System Composition & Structure

Differentiation
- Cluster 1: High
- Cluster 2: High
- Cluster 3: High
- Cluster 4: Mod
- Cluster 5: Mod
- Cluster 6: Low
- Cluster 7: Low

Integration
- Cluster 1: High
- Cluster 2: High
- Cluster 3: Low
- Cluster 4: Mod
- Cluster 5: Mod
- Cluster 6: Low
- Cluster 7: Mod

Centrality
- Cluster 1: Mod
- Cluster 2: Low
- Cluster 3: High
- Cluster 4: High
- Cluster 5: Low
- Cluster 6: High
- Cluster 7: Low

The Milbank Quarterly
Mays et al. 2009
Variation in local public health spending

“Local 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 Health Services Research
Change in local public health spending*

Mortality reductions with changes in public health spending*

*1993–2005

Mays et al. 2010
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Moving the field forward

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

- Policy & legal authority
- Funding
- Human capital
- Population needs & risks

Agencies & Systems

Service delivery

Health & economic outcomes
Dealing with complex systems

**Public Health Agency**
- Scope of services
- Leadership
- Governing structure
- Legal authority
- Staffing levels & mix
- Funding levels & mix
- Intergovernmental relationships

**Population & Environment**
- Perceptions
- Preferences
- Resources
- Needs
- Risks
- Threats

**Public Health System**
- Scale of operations
- Compatibility of missions
- Resources & expertise
- Participation incentives
- Nature & intensity of relationships
- Distribution of effort
- Division of responsibility
- Breadth of organizations
- Scope of activity

**Strategic Decisions**

**Decision Support**
- Accreditation
- Performance measures
- Practice guidelines

**Outputs and Outcomes**
- Reach
- Effectiveness
- Timeliness
- Adherence to EBPs
- Efficiency
- Equity
## Organizational processes

### Group N Within & between group densities

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Adm</th>
<th>Env</th>
<th>Nrsg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration/programs (Adm)</td>
<td>35</td>
<td>0.35</td>
<td>0.08</td>
<td>0.11</td>
</tr>
<tr>
<td>Environmental (Env)</td>
<td>48</td>
<td>0.04</td>
<td>0.30</td>
<td>0.01</td>
</tr>
<tr>
<td>PH nursing (Nrsg)</td>
<td>73</td>
<td>0.14</td>
<td>0.05</td>
<td>0.27</td>
</tr>
</tbody>
</table>

![Network diagram]

Journal of Urban Health

Merrill et al. 2008
Getting serious about quality measurement

- Adoption of and adherence to evidence-based programs and services
- Timeliness of public health response
- Effectiveness of legal powers and practices
- Competencies of the public health workforce

Develop and test starter set of measures
Determining who’s covered

- Reach of public health practices and services to populations at risk
- Consistency of practice across communities
- Program implementation
- Policy enforcement
- Disparities in populations served by effective public health practices

Enhance existing surveillance systems & registries
Comparative effectiveness and cost-effectiveness

- Estimating *value and return on investment* for public health services and systems
- Measuring *efficiency* in public health practice
- Examining effects of alternative *financing mechanisms and incentives*
- Comparing alternative *organizational structures*: regional models, state-local integration, public-private coordination

Demonstrations and natural experiments
Research on practice improvement

- Effectiveness of quality improvement processes and collaboratives
- Performance measurement & reporting
- Accreditation and standards development
- Incentives and pay-for-performance
- Workforce development & new staffing models

Embed research designs within practice initiatives
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Polling Question

Have you or your organization participated in public health systems and services research?

Yes

No
Challenges of practice-based research

- We have limited data and measures about the organization, financing, and delivery of public health services.

- Existing studies often do not focus on issues of primary importance to practice.

- Practice agencies often have only limited roles in the design & conduct of public health studies.

- There are difficulties translating and integrating research findings into practice.
The Logic of Public Health PBRNs

Translation & application

Data exchange

Identify common questions of interest

Engaged practice settings

Research partner

Apply rigorous research methods

Analysis & interpretation

Engaged practice settings

Data exchange

Engaged practice settings
Key elements of a public health PBRN

- State or local agency to serve as lead convener
- Multiple practice settings available for study
- Champion within each practice site
- Research partner with design and analysis expertise
- Regular communication among participants
- Feasible and relevant initial research projects
Robert Wood Johnson Foundation’s Public Health PBRN Program

1st cohort (Dec 2008)
2nd cohort (Dec 2009)
Affiliate networks (2010)
Examples of PBRN 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 and policy communities
- Use research to learn from innovations and changes within public health systems
- Develop measures of practices and outcomes that are relevant and context-specific
- Pay attention to translation