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# Public Health Practice-Based Research Networks: Creating the Evidence to Transform Practice
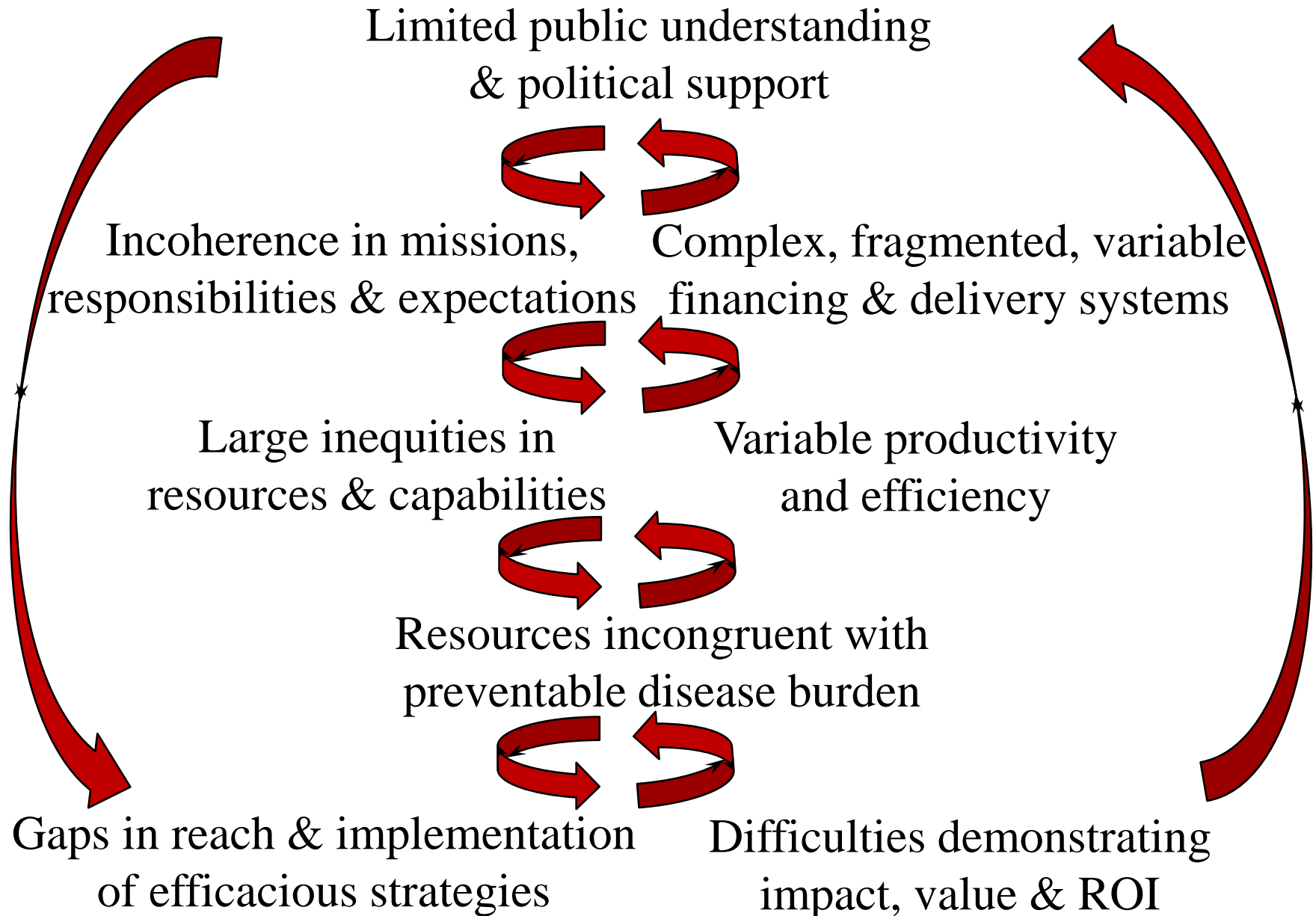
Glen Mays, *University of Kentucky*

# Public Health Practice-Based Research Networks:
# Creating Evidence for Practice

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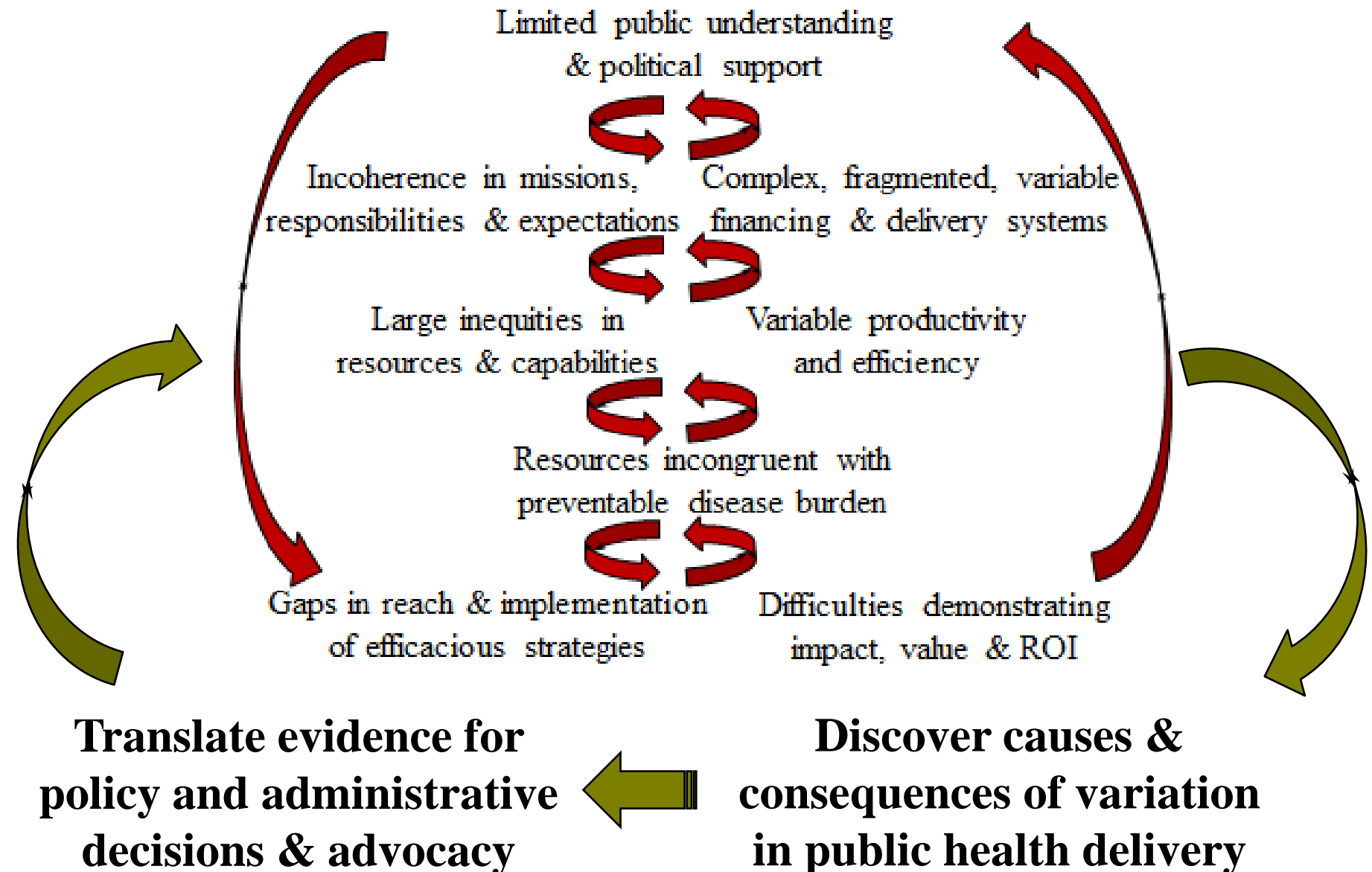UNIVERSITY OF
KENTUCKY
Center for Public Health
Systems and Services Research

PUBLIC HEALTH
Practice-Based Research Networks
National Coordinating Center

National
Coordinating
Center for
PHSSR

# Vicious cycles in public health delivery

Limited public understanding
& political support

Incoherence in missions,
responsibilities & expectations

Complex, fragmented, variable
financing & delivery systems

Large inequities in
resources & capabilities

Variable productivity
and efficiency

Resources incongruent with
preventable disease burden

Gaps in reach & implementation
of efficacious strategies

Difficulties demonstrating
impact, value & ROI

# Vicious cycles to learning systems



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**Translate evidence for policy and administrative decisions & advocacy**

**Discover causes & consequences of variation in public health delivery**

# What is Public Health Services & 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

# Policy Imperatives

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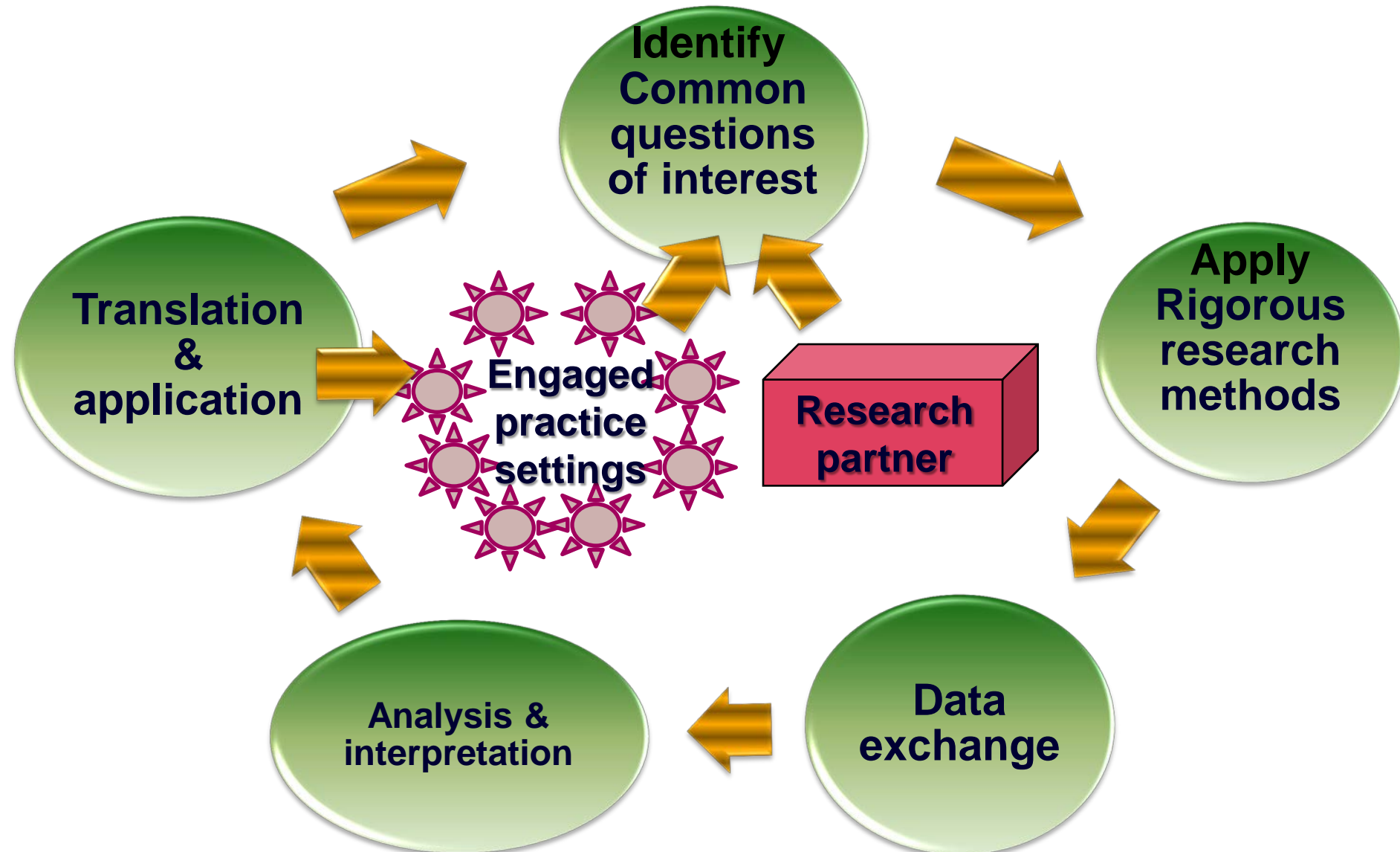
(2) analyzing the translation of interventions from academic settings to real world settings; and

(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.

**Patient Protection and Affordable Care Act of 2010.**

# 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

# The Logic of Public Health PBRNs



- Identify Common questions of interest
- Apply Rigorous research methods
- Data exchange
- Analysis & interpretation
- Translation & application
- Engaged practice settings
- Research partner

# Diffusion of Public Health PBRNs



Legend:
- First cohort (December 2008 start-up)
- Second cohort (January 2010 start-up)
- Affiliate/Emerging PBRNs (2011-13)

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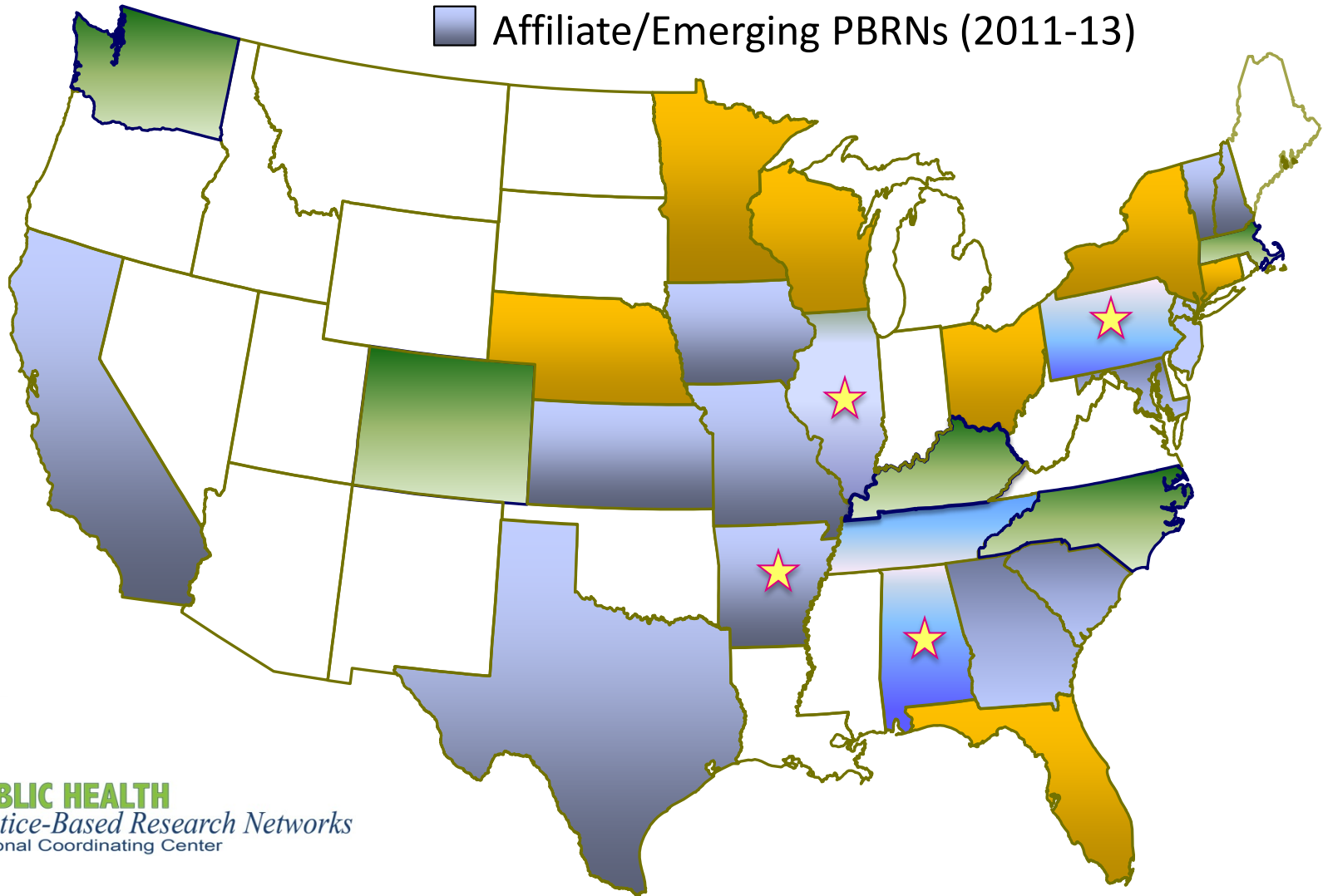
# Examples: Studying PBRNs as Mechanisms
## Types of Public Health PBRN Participants
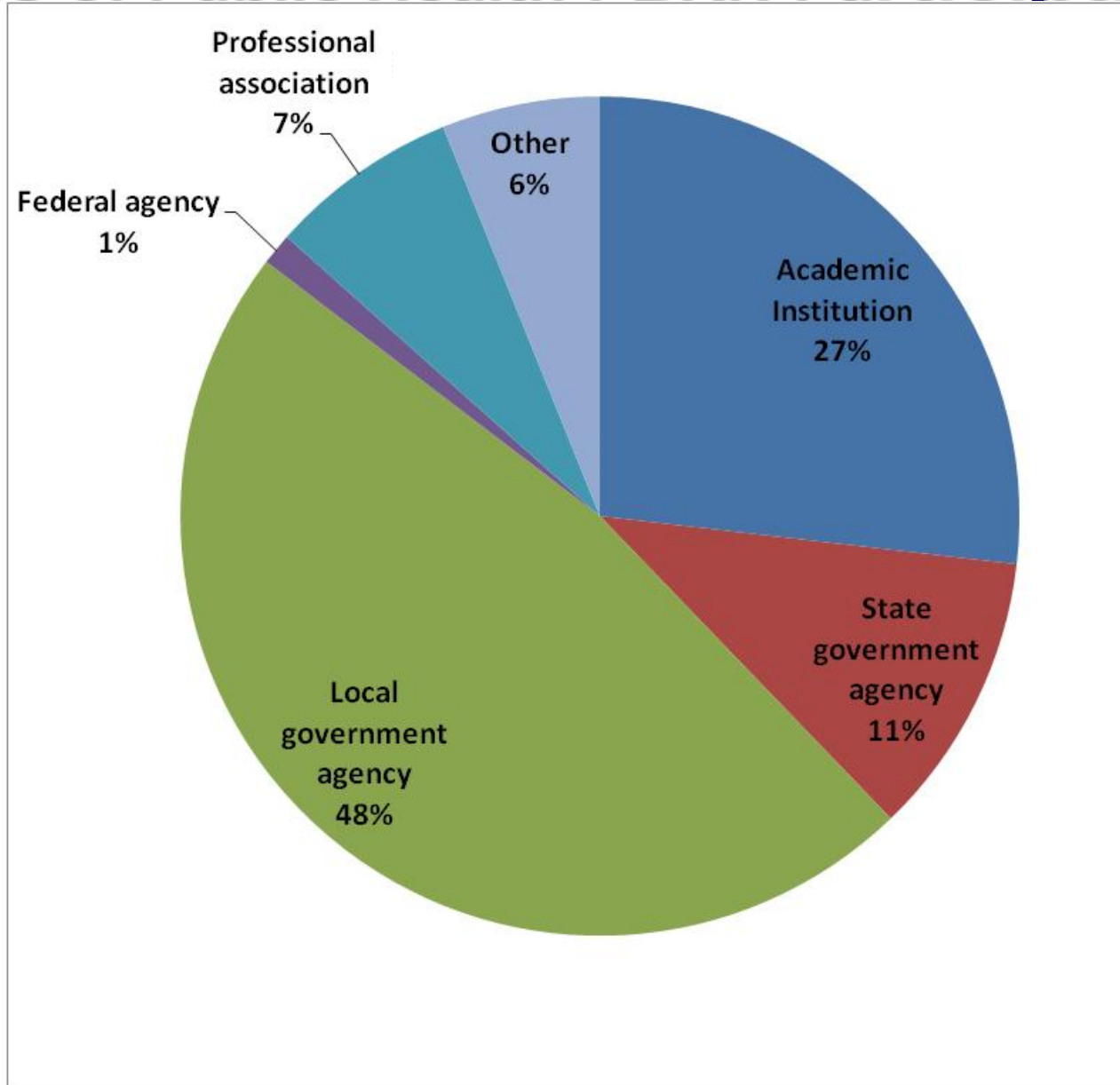
# Examples: Studying PBRNs as Mechanisms
## Roles played by participants in PBRN activities
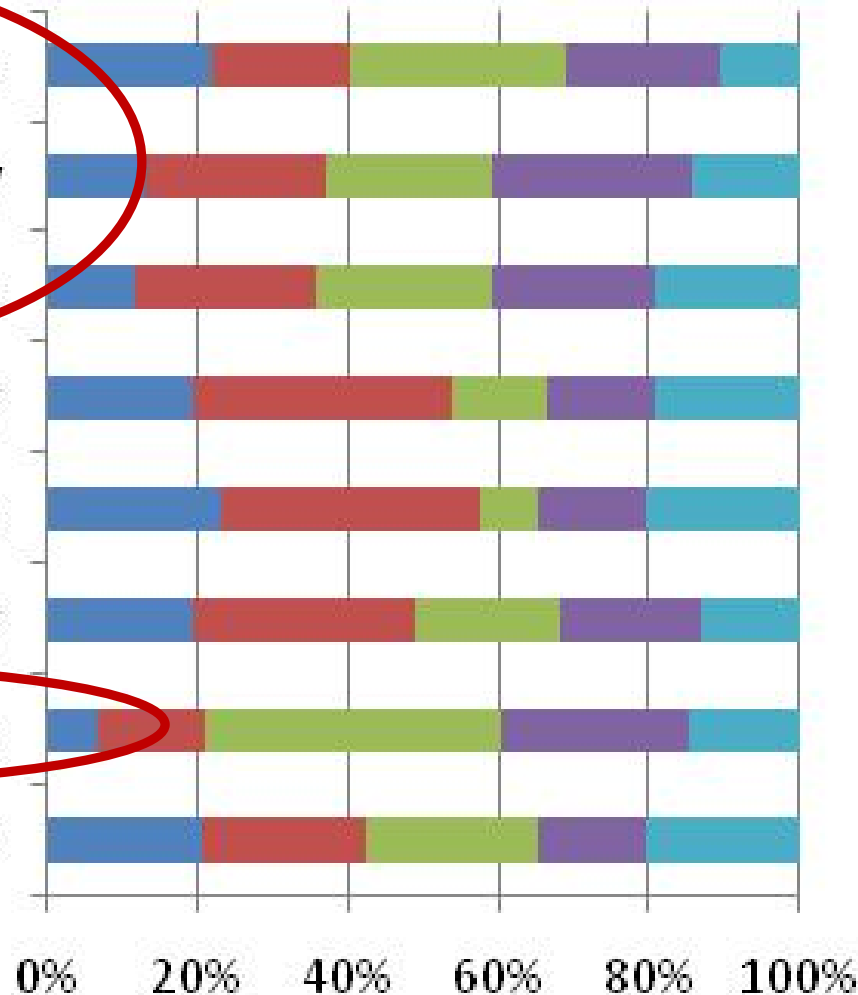
# Examples: Studying PBRNs as Mechanisms

## Expected benefits of PBRN participation

# Examples: Studying PBRNs as Mechanisms

- Baseline network analysis with 5 cohort I PBRNs to examine *network structures* for evidence production and translation
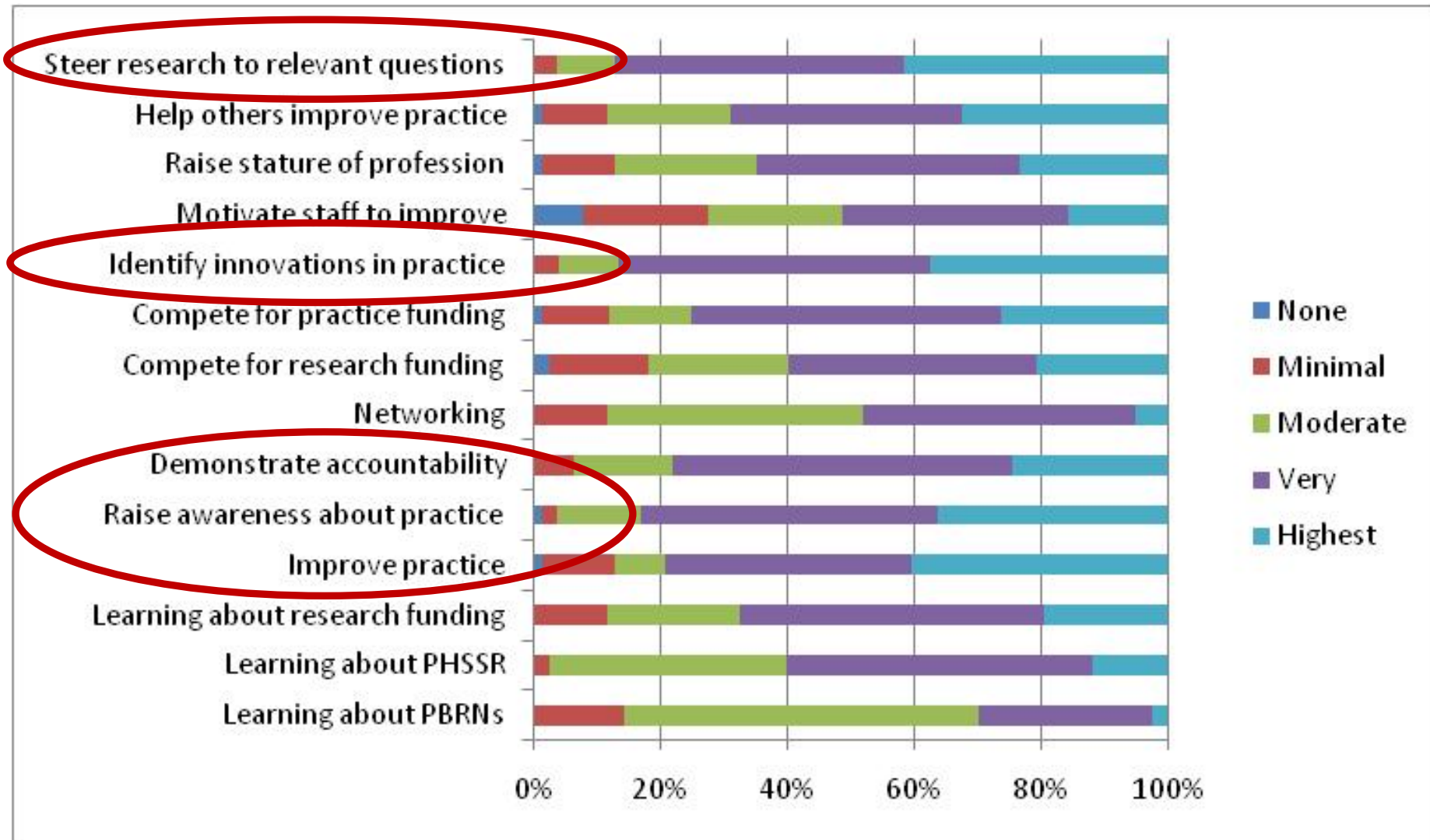
# Examples: Studying PBRNs as Mechanisms

## Network Structures Associated with Perceived Benefits

| Characteristic | Perceived Benefit Rating | |
| --- | --- | --- |
| | Coeff. | S.E. |
| Network density | 0.341 | 0.112** |
| Network centrality | -0.521 | 0.227** |
| History of collaboration | 0.148 | 0.108 |
| Practice orientation | 0.283 | 0.144* |

Estimates from ordered logit model controlling for PBRN random effects    **p<0.05        *p<0.10

# PBRNs and Practice Engagement

**Local Health Departments Engaged in Research Implementation & Translation Activities During Past 12 months**

| Activity | PBRN Agencies Percent/Mean | | National Sample Percent/Mean | | |
|---|---|---|---|---|---|
| Identifying research topics | 94.1% | | 27.5% | | *** |
| Planning/designing studies | 81.6% | | 15.8% | | *** |
| 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 | 84.04 | (27.38) | 30.20 | (31.38) | ** |
| N | 209 | | 505 | | |

# PBRN Research Projects

- *Initial Projects*: Small-scale "proof-of-concept" studies conducted during initial 2 years of network development

- *Research Implementation Awards*: Larger-scale research projects of 18-24 months

- *Quick Strike Research Projects*: Time-sensitive, short-term research projects to study emerging issues in practice

- *Multi-network research projects:* collaborative research involving multiple PBRNs

# Examples: Diabetes prevention in KY

- ***Question of interest:*** How does the public health delivery system influence adoption and implementation of evidence-based self-management strategies for diabetes?

- ***Practice settings:*** 6 health department jurisdictions serving 30 counties

- ***Factors examined:***
  - Adherence to EBPs
  - RE-AIM measures of success
  - Strength of collaboration



- ***Study design:*** pre-post design with QI intervention

# Examples: Obesity prevention practices in CO

- *Question of interest:* How does the public health delivery system influence adoption and implementation of evidence-based strategies to promote healthy eating and active living through the LiveWell Colorado initiative?

- *Practice settings:* 25 local communities in CO

- *Factors examined:*
  - Use of local data
  - Adherence to evidence-based strategies
  - Success strategies measured in RE-AIM
  - Network characteristics associated with success

- *Study design:* observational practice variation study, mixed-method


photo courtesy Pikes Peak Marathon

# Examples: Communicable disease protection in MA

- *Question of interest:* How does the public health delivery system influence adoption and implementation of evidence-based strategies for food safety and infectious disease investigation?

- *Practice settings:* 351 municipalities in MA

- *Factors examined:*
  - Adherence to consensus practices
  - Timeliness of investigation
  - Role of staffing, funding, IT, and partnerships



- *Study design:* observational practice variation study, mixed-method
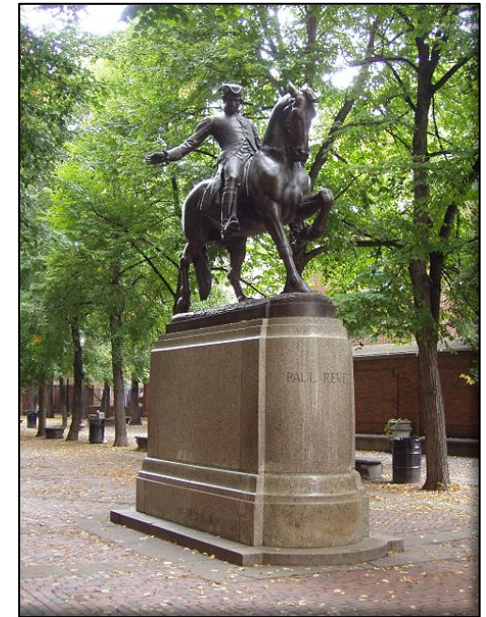
# Two dominant themes in PBRN research: evidence-based management

- How best to prioritize and allocate resources in response to *economic shocks*

- What *regionalized service delivery* models produce gains in capacity, efficiency, effectiveness

Source: Congressional Budget Office based on data from the Centers for Medicare and Medicaid Ser

# Examples: Economic Shocks and Decisions

- ***Washington:*** Variation in LHD budget reductions during the 2009-10 economic downturn, and how the reductions have affected service delivery and use of evidence-based practices

- ***North Carolina:*** LHD responses to Medicaid maternity case management funding cut, and impact on service delivery

- ***Connecticut:*** Responses to elimination of state subsidies to small LHDs

- ***Ohio:*** LHD enforcement of smoke-free workplace act (magnitude & frequency) in response to economic downturn

- ***Wisconsin & Florida:*** Changes in LHD spending, funding sources and resource allocation during economic recession

# Examples: Regionalized Service Delivery

- ***Massachusetts:*** Local variation in decision-making and implementation regarding regional delivery models

- ***Nebraska:*** How do organizational design and workforce issues affect implementation of regional health department models

- ***Connecticut:*** How do state-mandated services and funding reductions influence decision-making regarding regional models

- ***Colorado:*** Impact of state public health law reform on regional approaches to service delivery; variation in local legal instruments and approaches to regionalization
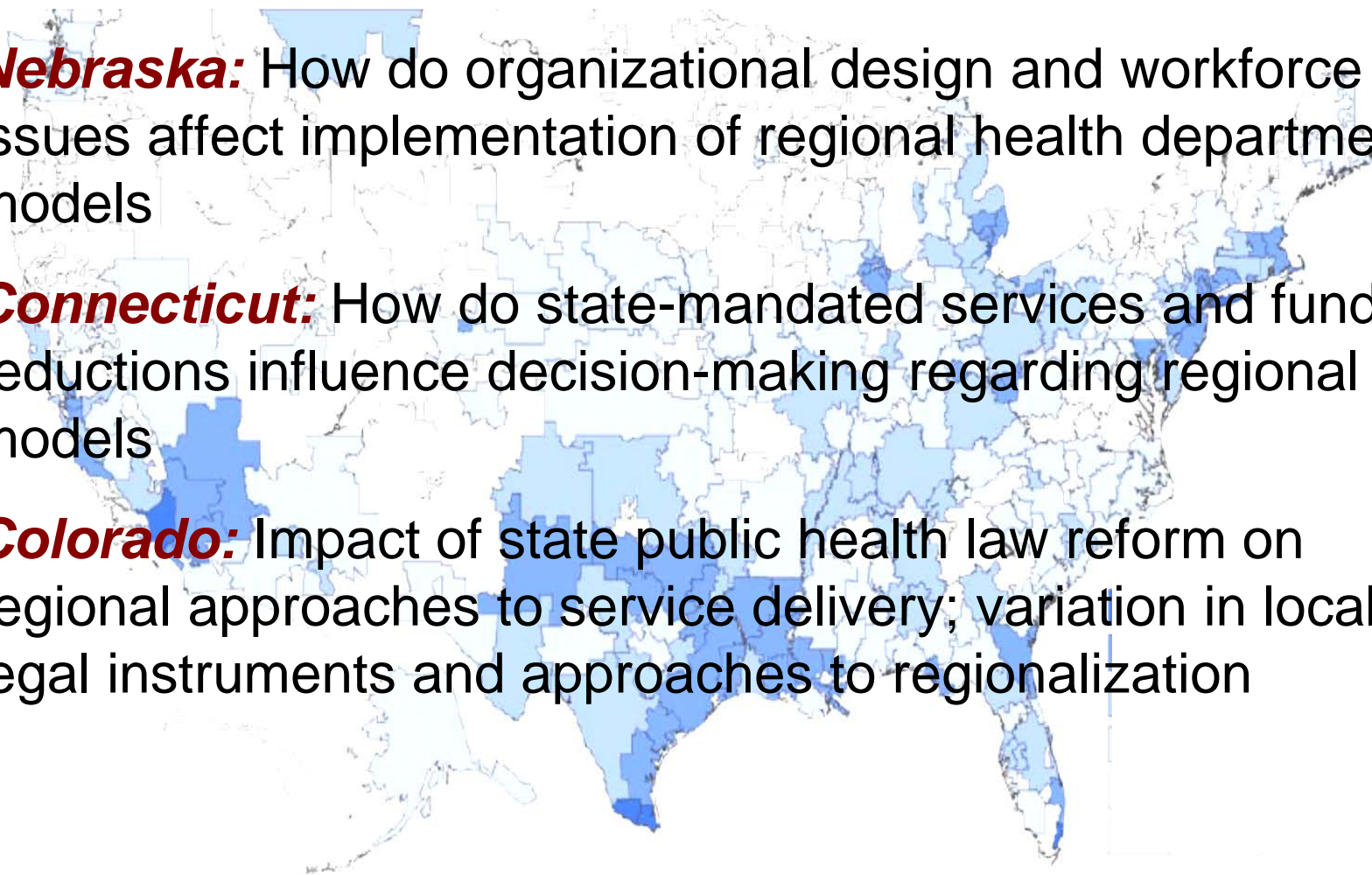
# Multi-Network Practice and Outcome Variation Examination Study (MPROVE)

◆ Identify service delivery measures for selected, high-value public health services

◆ Create a registry of measures collected consistently across local communities

◆ Profile geographic variation in the delivery of selected public health services across local communities

◆ Decompose variation into attributable components:
  – need-sensitive or preference-sensitive factors
  – supply-sensitive factors

◆ Examine associations between service delivery & outcomes

# MPROVE Measurement Dimensions
## Multi-Network Practice and Outcome Variation (MPROVE) Study, 2012-13

**Measures of Interest**

- *Availability/Scope:* specific activities produced

- *Volume/Intensity:* Frequency of producing activity over period of time

- *Capacity:* Labor and capital inputs assigned to an activity

- *Reach:* Proportion of target population reached by activity

- *Quality:* effectiveness, timeliness, equity of activity

- *Efficiency:* resources required to produce given volume of activity

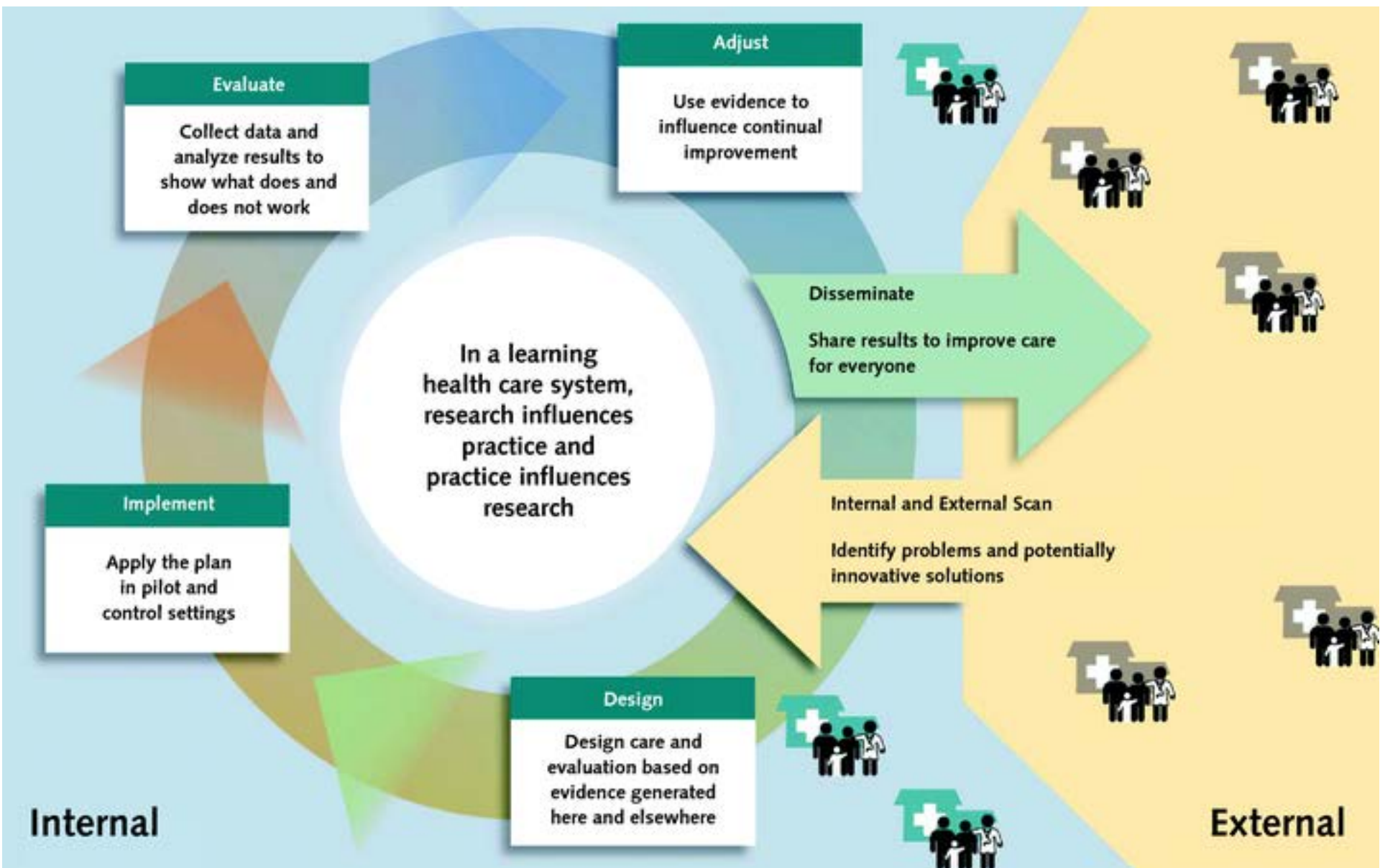# Conclusions: getting inside the box

- Engagement of practice and research partners

- Sensitive and specific measures

- Research designs in real-world settings

- What works best in which settings and why

- Informed public health decisions

- Smarter investments and greater value

# Toward a "rapid-learning system" in public health



**Evaluate**
Collect data and analyze results to show what does and does not work

**Adjust**
Use evidence to influence continual improvement

**Disseminate**
Share results to improve care for everyone

**Internal and External Scan**
Identify problems and potentially innovative solutions

**Implement**
Apply the plan in pilot and control settings

**Design**
Design care and evaluation based on evidence generated here and elsewhere

In a learning health care system, research influences practice and practice influences research

Internal

External

Green SM et al. *Ann Intern Med*. 2012;157(3):207-210

# For More Information

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