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Harnessing the Power of Public Health Systems for Injury Prevention & Control

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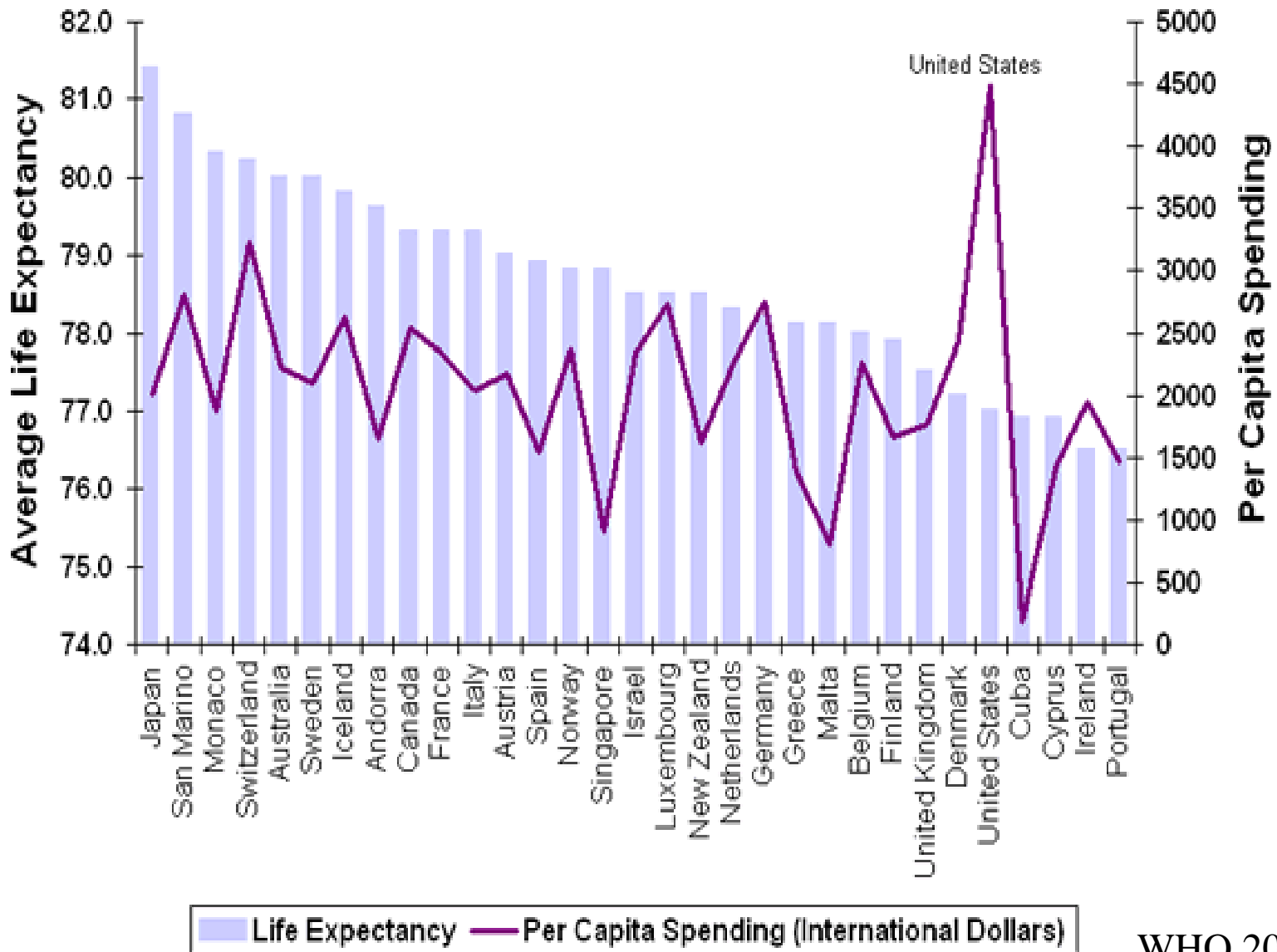
Harnessing the Power of Public Health Systems for Injury Prevention & Control

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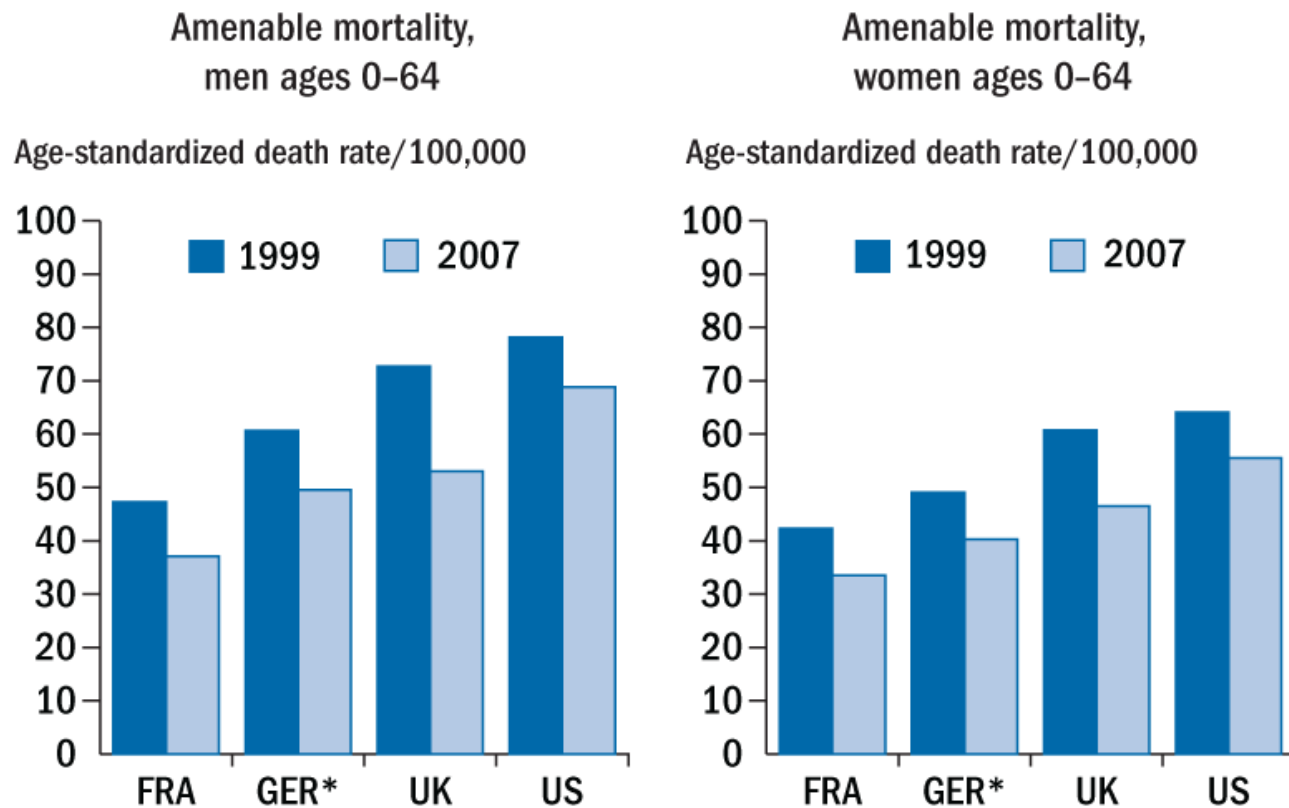


Gaps in health system performance



Falling behind in population health

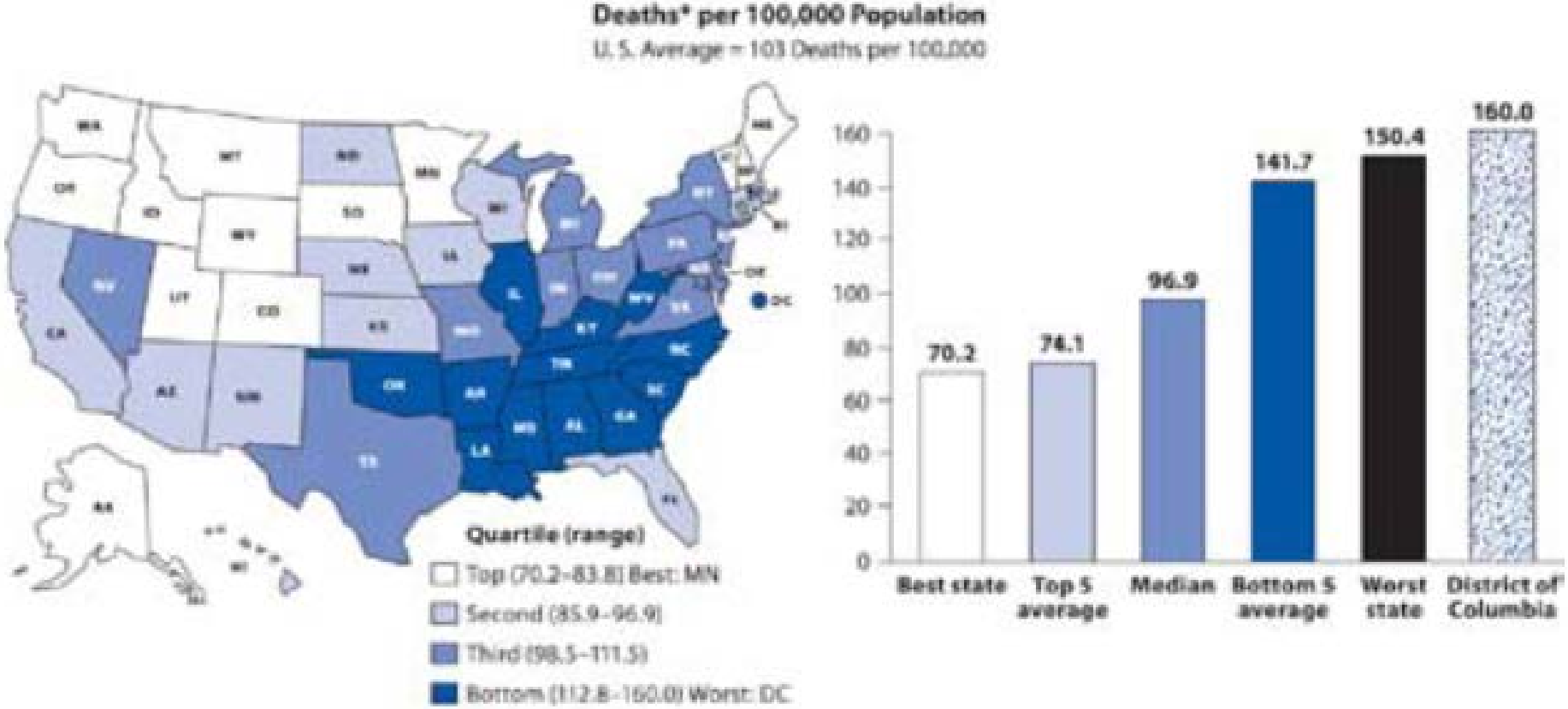
U.S. Men and Women Under Age 65 Have Higher Rates of Potentially Preventable Deaths Slowest Rate of Improvement, 1999–2007



* Data for Germany are 1999 and 2006.

Source: Adapted from E. Nolte and C. M. McKee, "In Amenable Mortality—Deaths Avoidable Through Health Care—Progress in the US Lags That of Three European Countries," *Health Affairs*, published online Aug. 29, 2012.

Inequities in population health



Source: Commonwealth Fund 2012

Preventable disease burden and national health spending

>75% of national health spending is attributable to conditions that are largely preventable

- Cardiovascular disease
- Diabetes
- Lung diseases
- Cancer
- Injuries
- Vaccine-preventable diseases and sexually transmitted infections

<5% of national health spending is allocated to public health and prevention

Preventable disease burden and national health spending

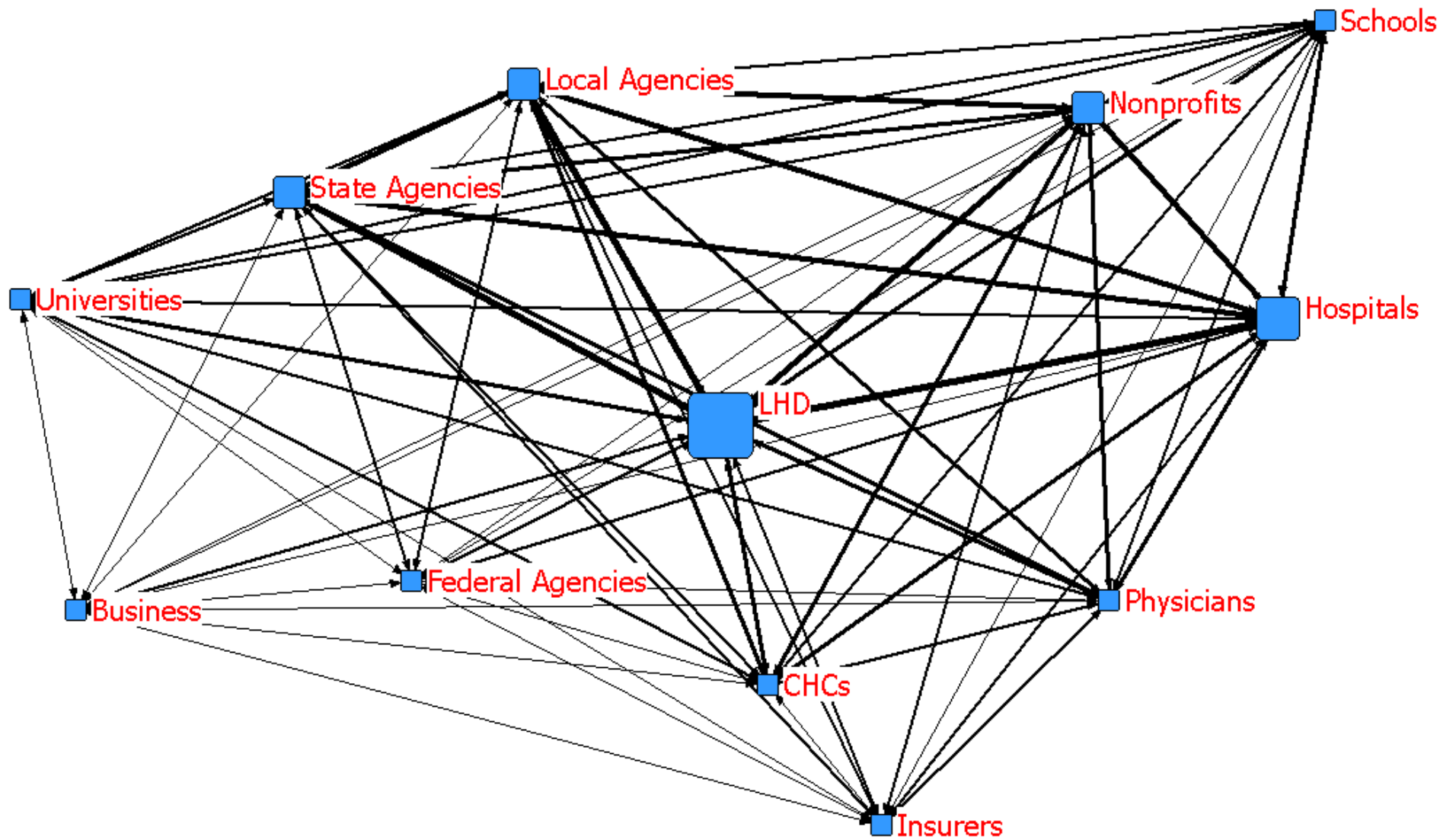
\$406 Billion annually in medical costs and lost productivity due to injury

\$102 Million annually spent on state injury and violence prevention programs

Challenges in public health delivery

- Resources ≠ preventable disease burden
- Complex, fragmented, variable delivery systems
- Large inequities in resources & capacity
- Variable productivity and efficiency
- Gaps in evidence base for public health delivery
- Inability to demonstrate value/return on investment

Public health delivery systems



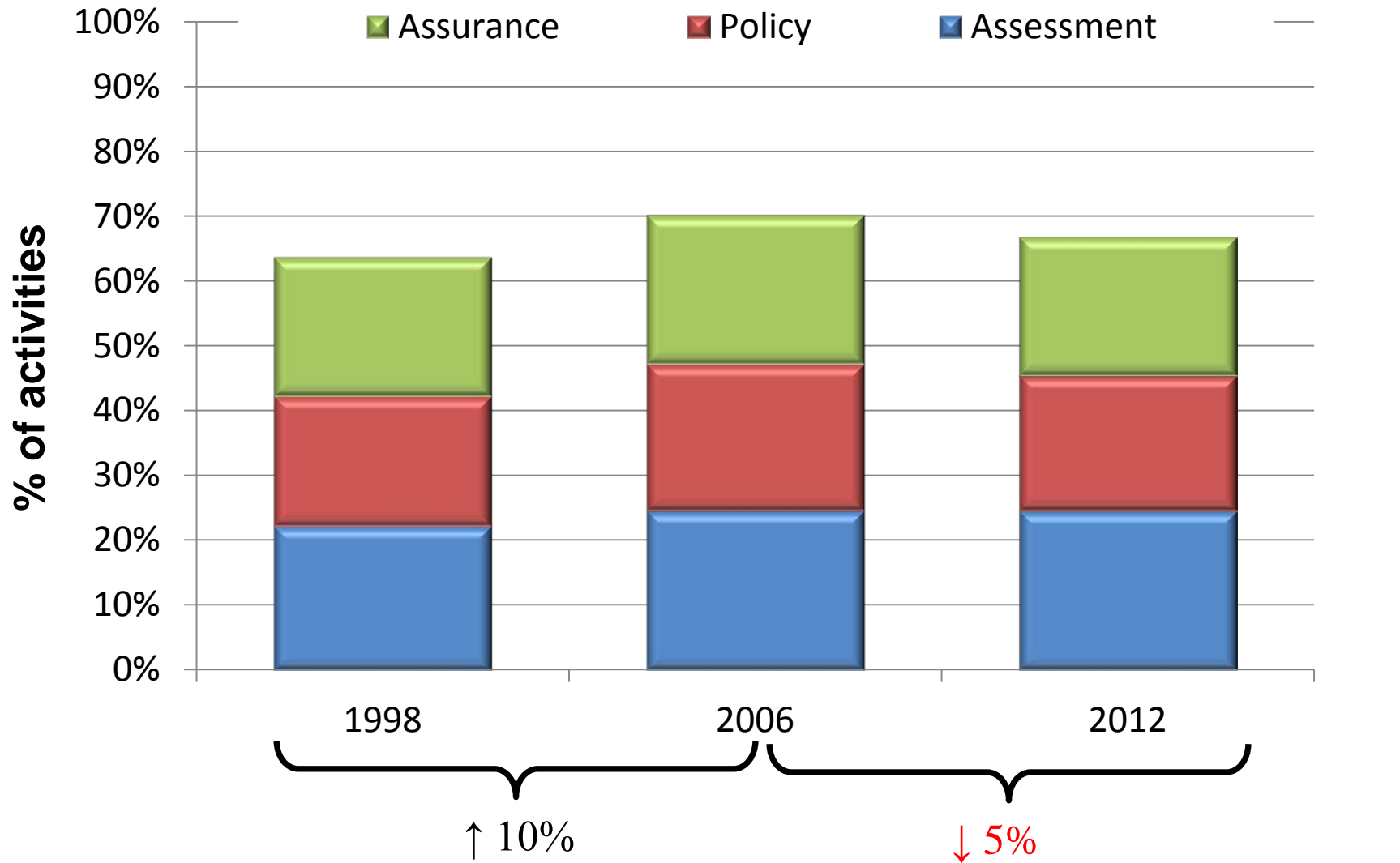
National Longitudinal Survey of Public Health Systems, 2012

Complexity in public health delivery



Variation in Public Health Delivery

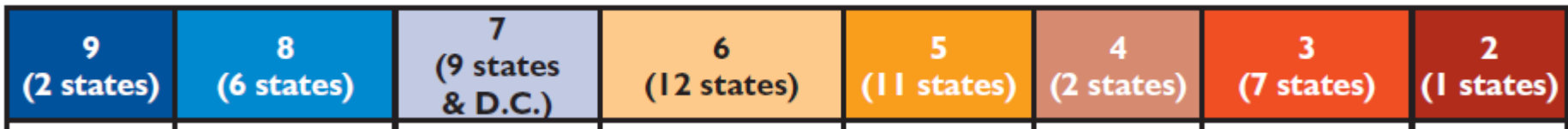
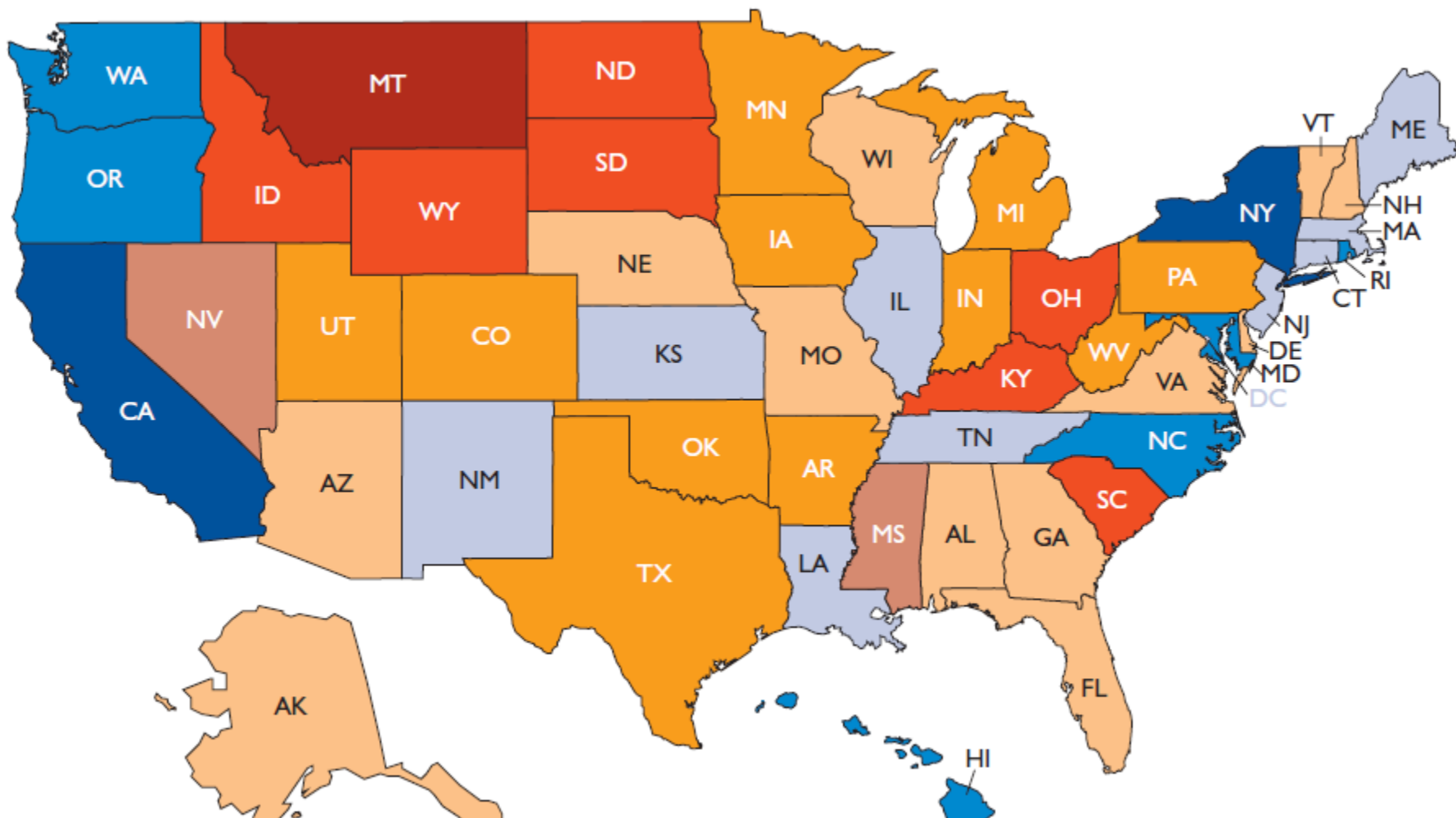
Delivery of recommended public health activities



National Longitudinal Survey of Public Health Systems 2010; 2012

Variation in Public Health Delivery

Injury Prevention Indicator Map



Why study public health delivery?

“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



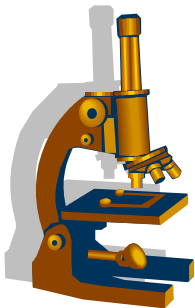
Public health services & systems research

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

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
 - Enforcement/Compliance
 - Quality/Effectiveness
 - Cost/Efficiency
 - Equity/Disparities
- Impact on population health
- Comparative effectiveness & efficiency

PHSSR and policy relevance

Subtitle D—Support for Prevention and Public Health Innovation

Patient Protection and Affordable Care Act of 2010

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—

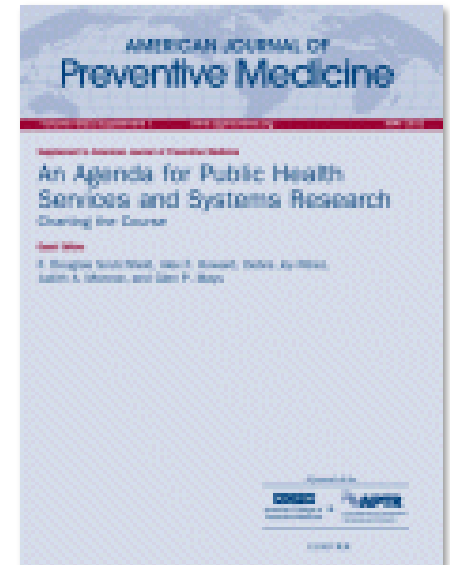
(1) examining evidence-based practices relating to prevention, with a particular focus on high priority areas as identified by the Secretary in the National Prevention Strategy or Healthy People 2020, and including comparing community-based public health interventions in terms of effectiveness and cost;

(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.

A national research agenda to improve public health delivery systems

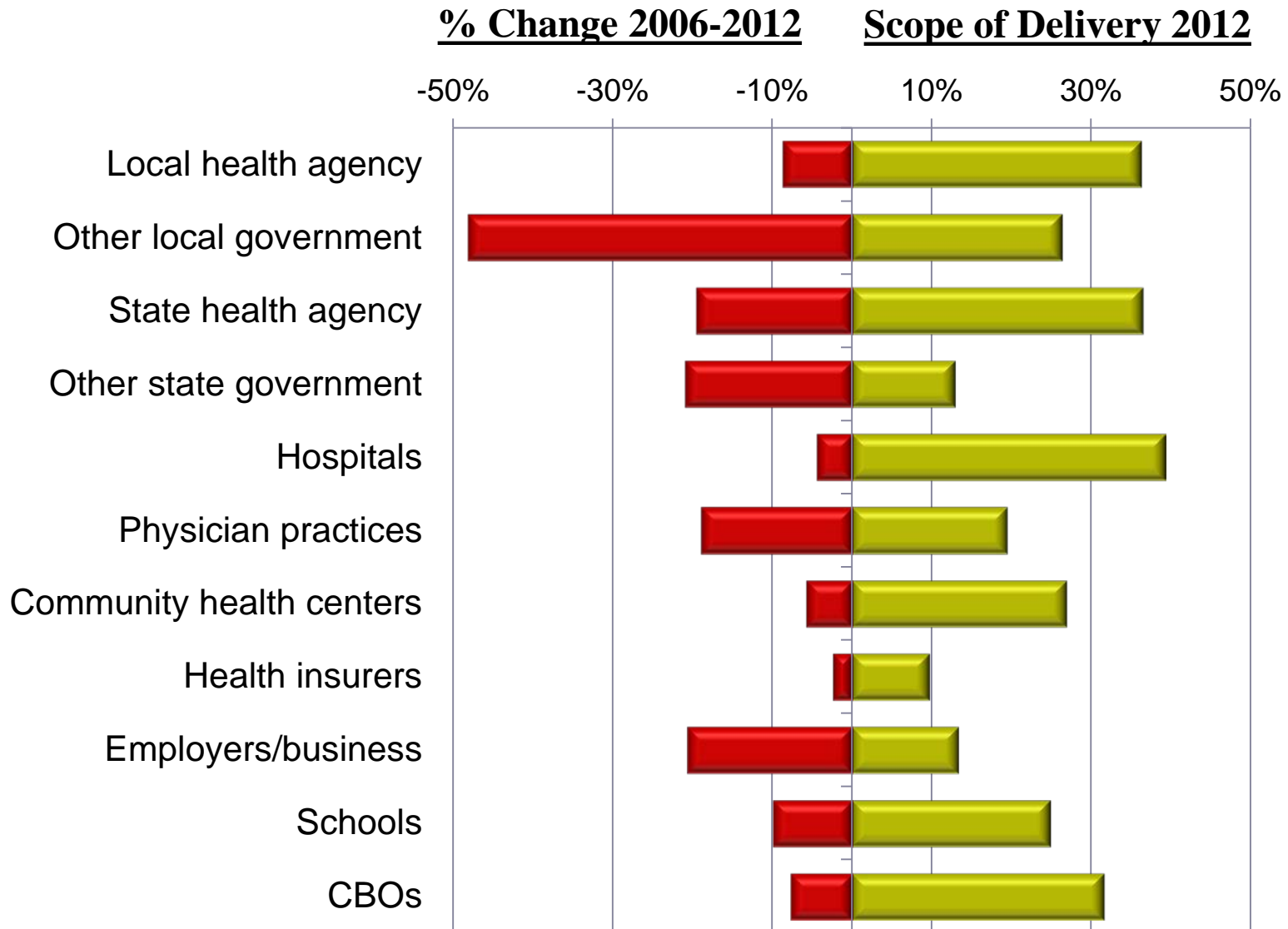
- Public health system organization and structure
- Public health financing and economics
- Public health workforce
- Public health information and technology
- Cross-cutting elements
 - Quality
 - Law and policy
 - Equity and disparities
 - Metrics and data
 - Analytic methods



Emerging evidence: organization and structure

- Who contributes to public health delivery?
- How are roles and responsibilities divided?
- How and why do delivery systems vary and change over time?
- How do system structures affect public health delivery and outcomes?

Organizations engaged in local public health delivery



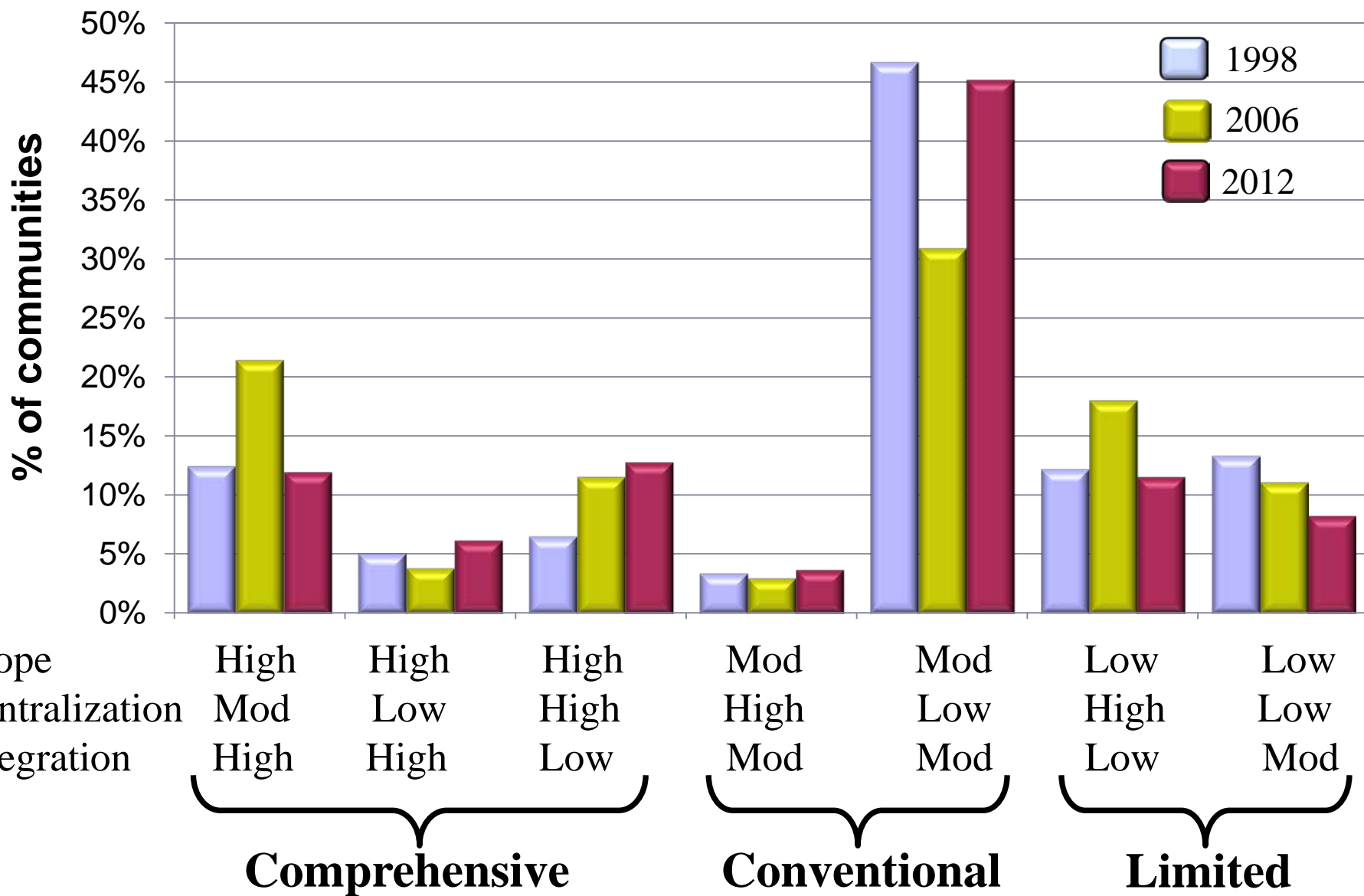
**Private and voluntary organizations
contributed more than**

64%

**of the public health activities performed
in the average U.S. community in 2012.**

Mays GP et al. National Longitudinal Survey of Public Health Systems, 2013.

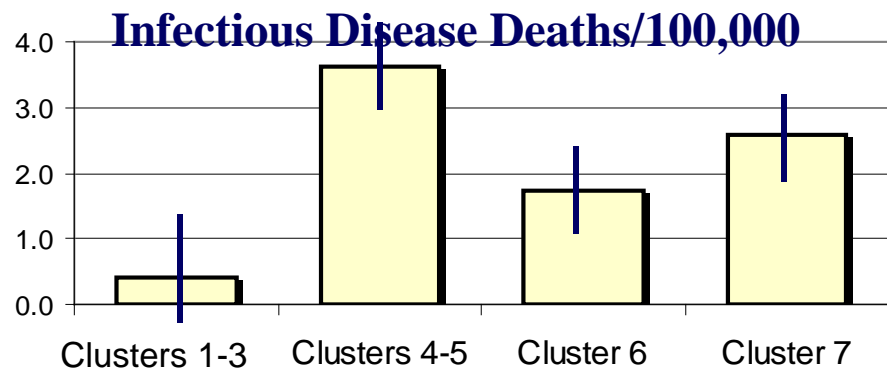
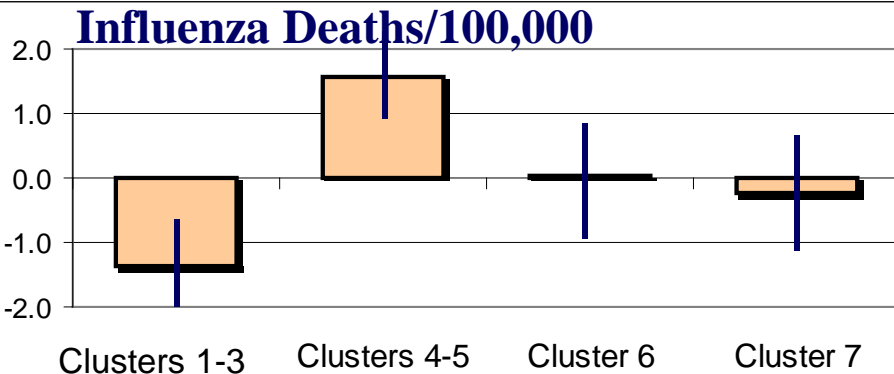
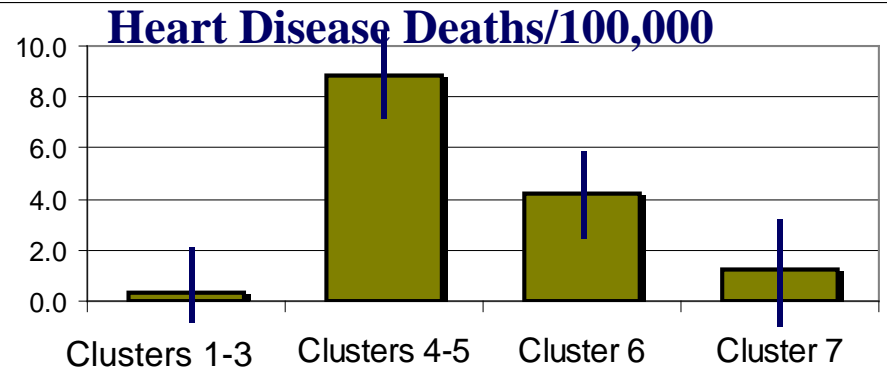
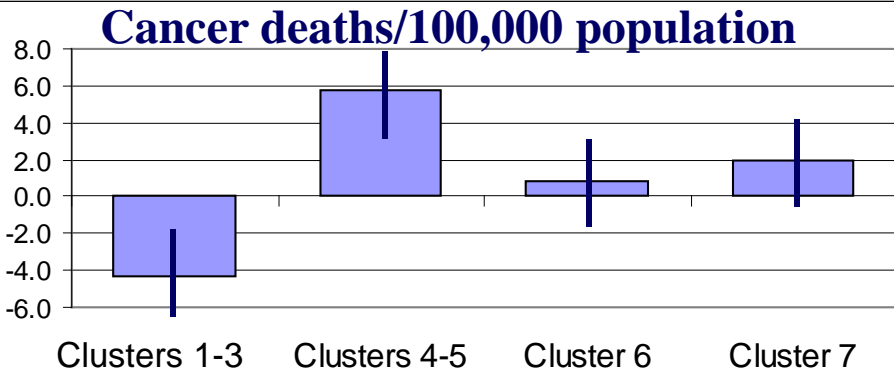
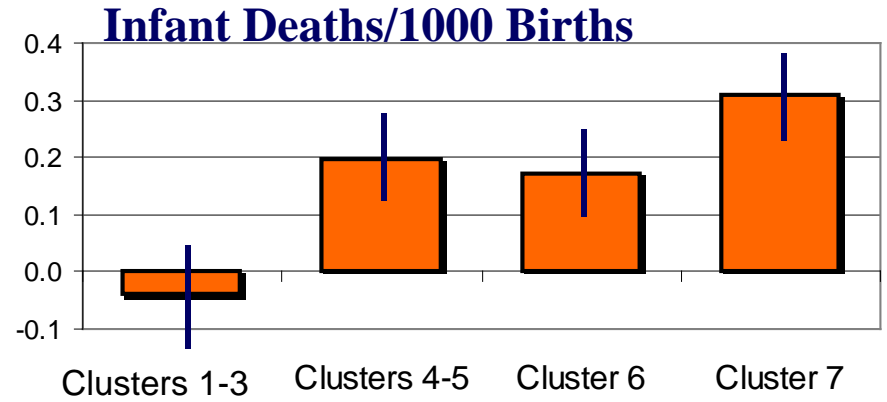
A typology of public health delivery systems



Source: Mays et al. 2010; 2012

Changes in health associated with delivery system

Percent Changes in Preventable Mortality Rates by System Typology (cluster)



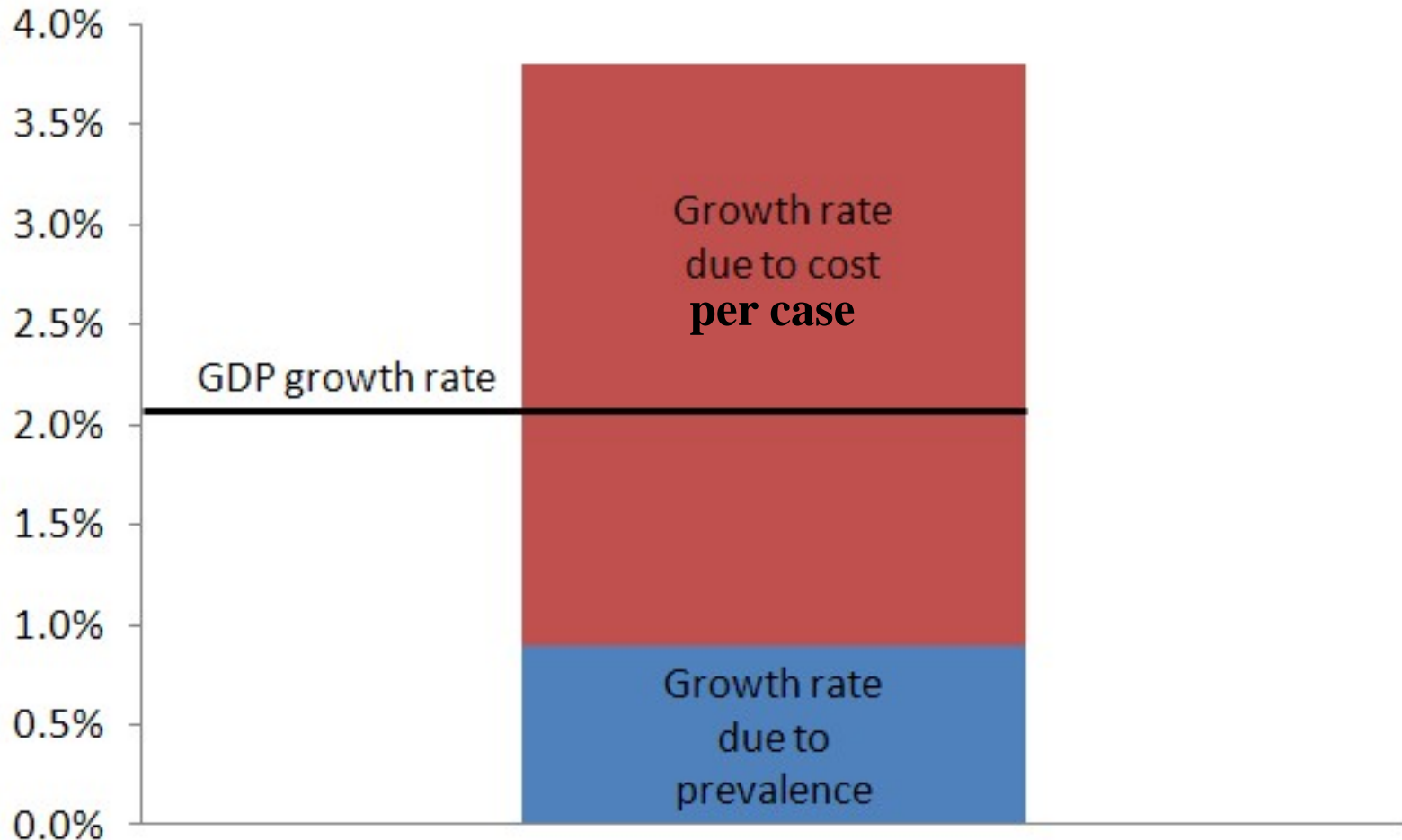
Fixed-effects models control for population size, density, age composition, poverty status, racial composition, and physician supply

Emerging evidence: finance and economics

- How does *public health* spending vary across communities and change over time?
- What are the health effects attributable to changes in public health spending?
- What are the medical cost effects attributable to changes in public health spending?
- What are the opportunities for improving efficiency in public health delivery?

Factors driving growth in medical spending

Health spending growth rate 1996-2006

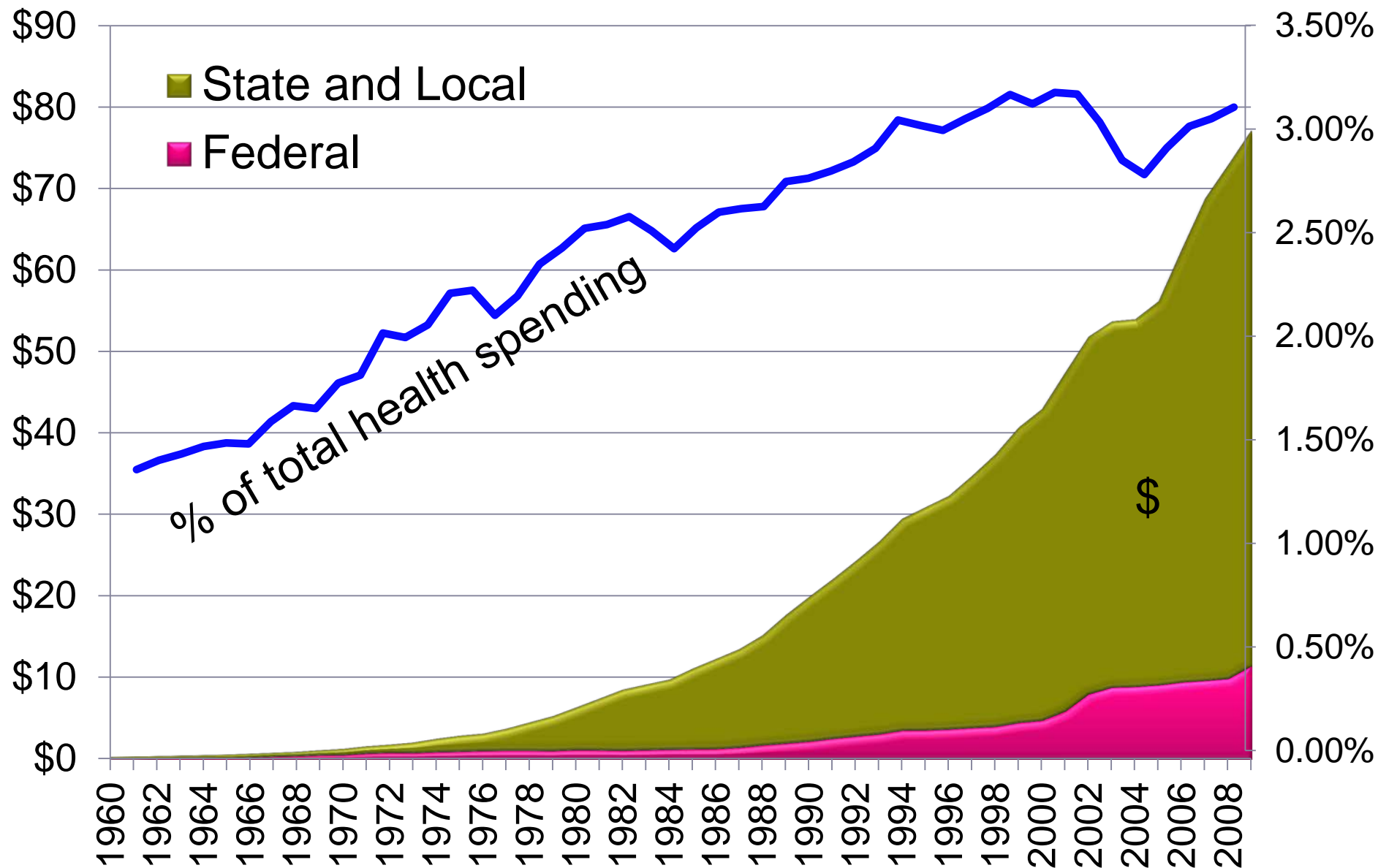


Public health's share of national health spending

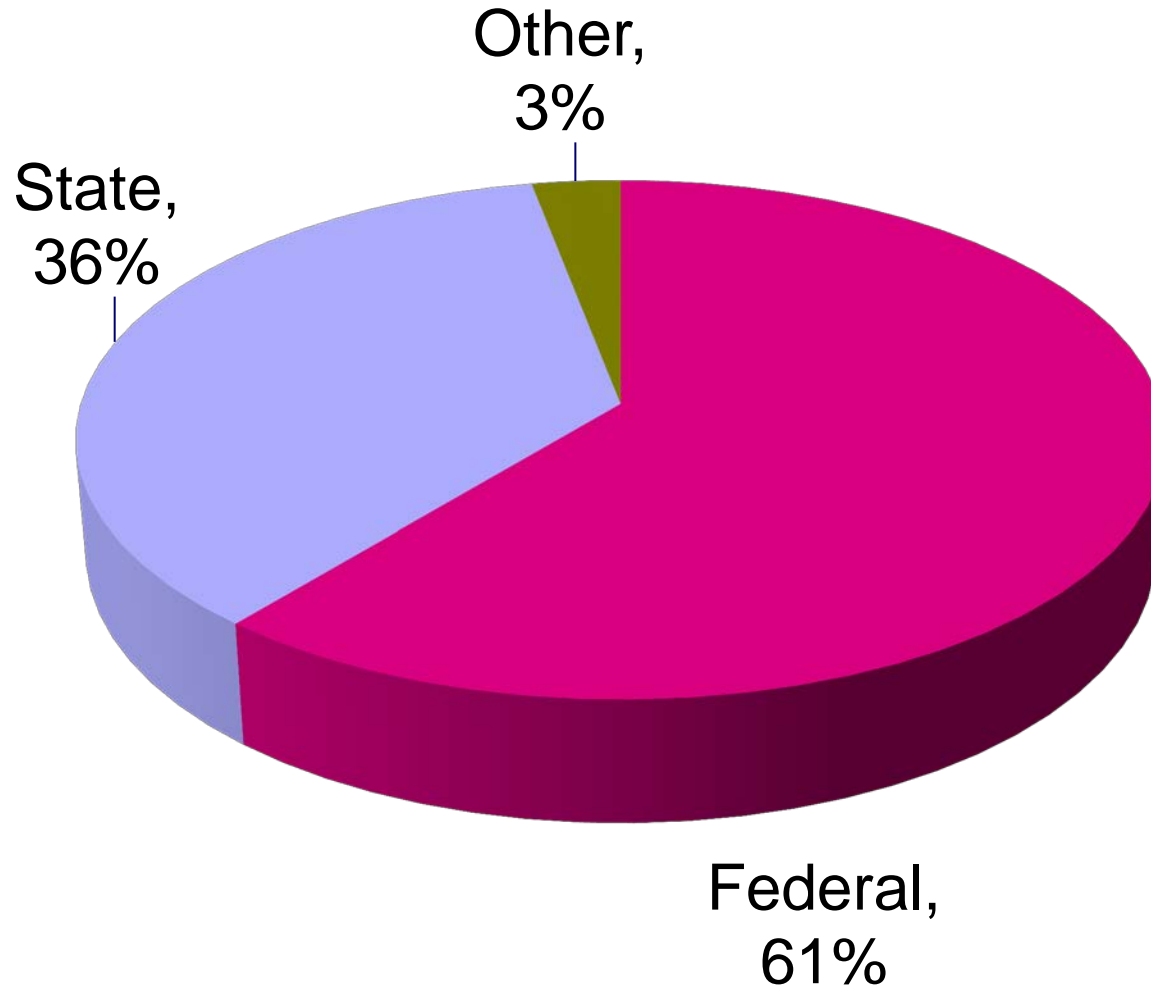
USDHHS National Health Expenditure Accounts

\$Billions

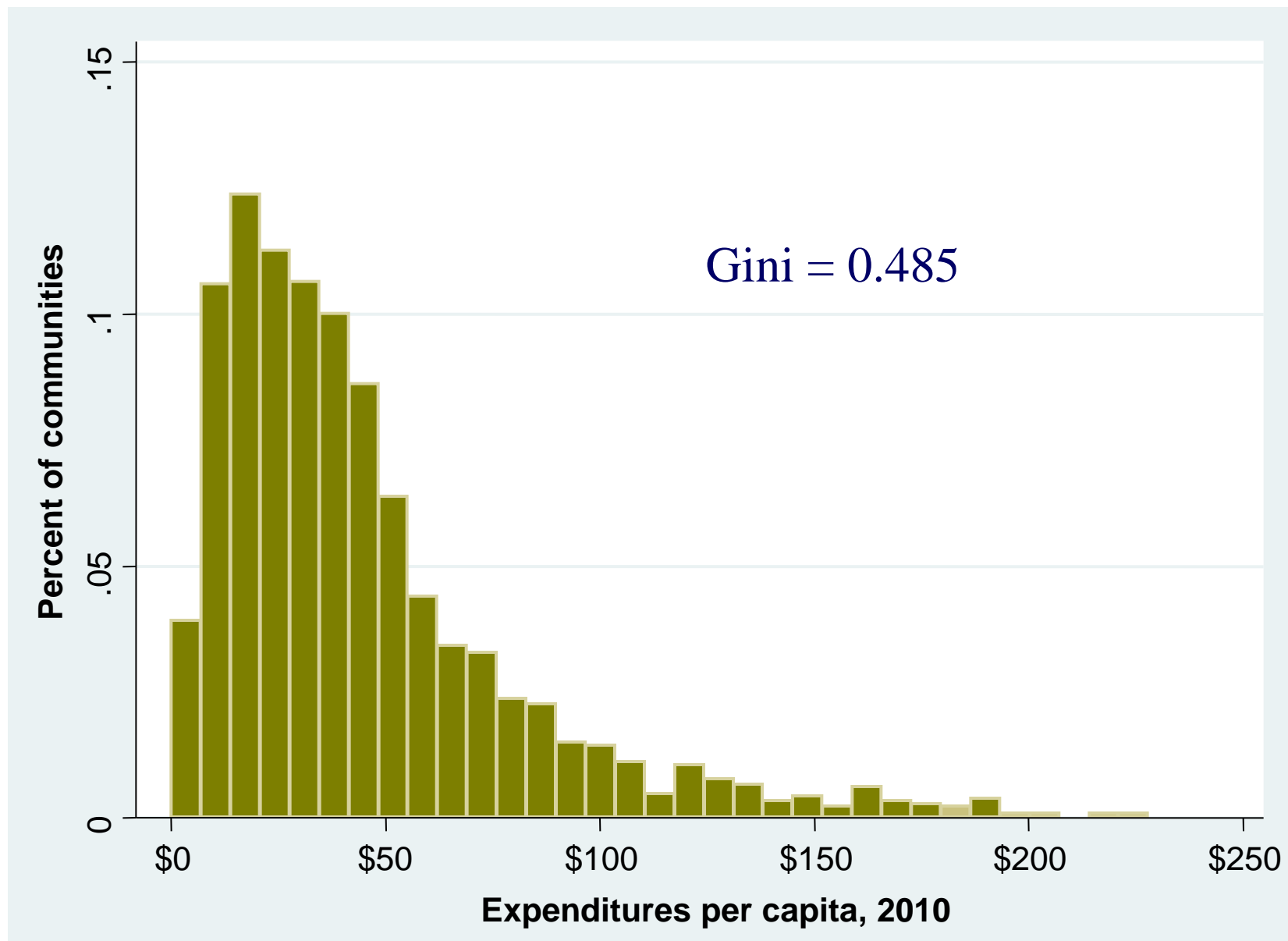
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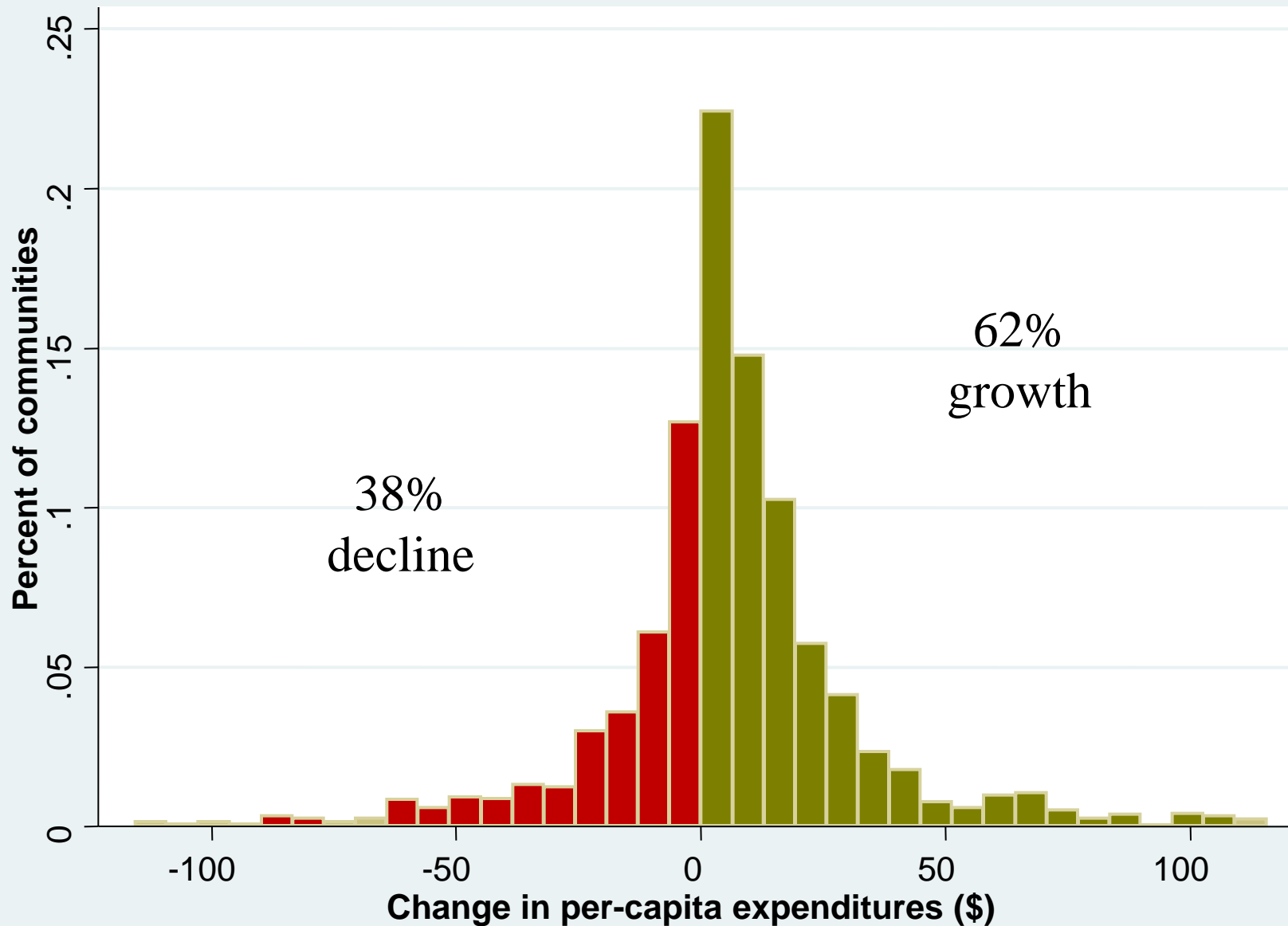
Funding sources for injury prevention



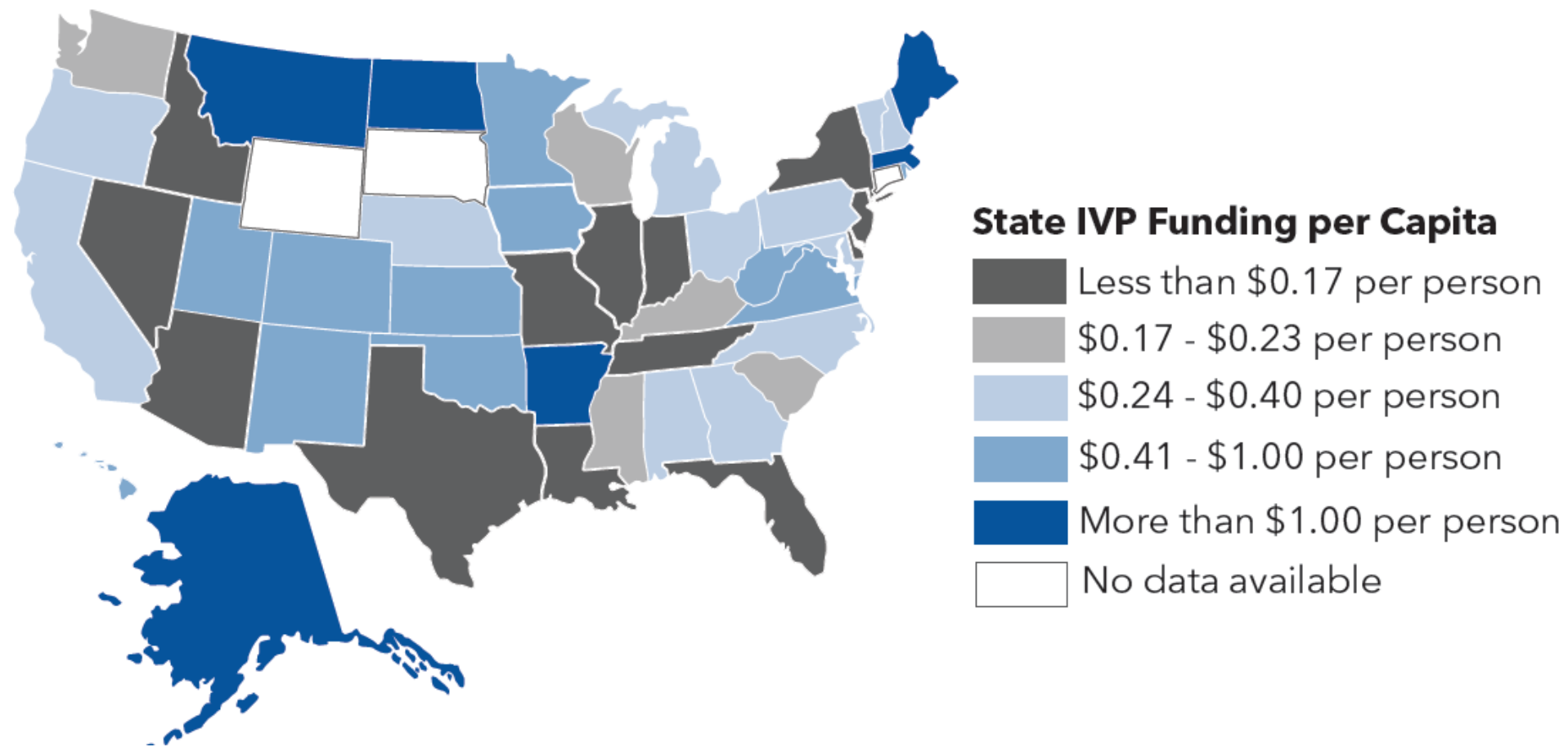
Variation in Local Public Health Spending



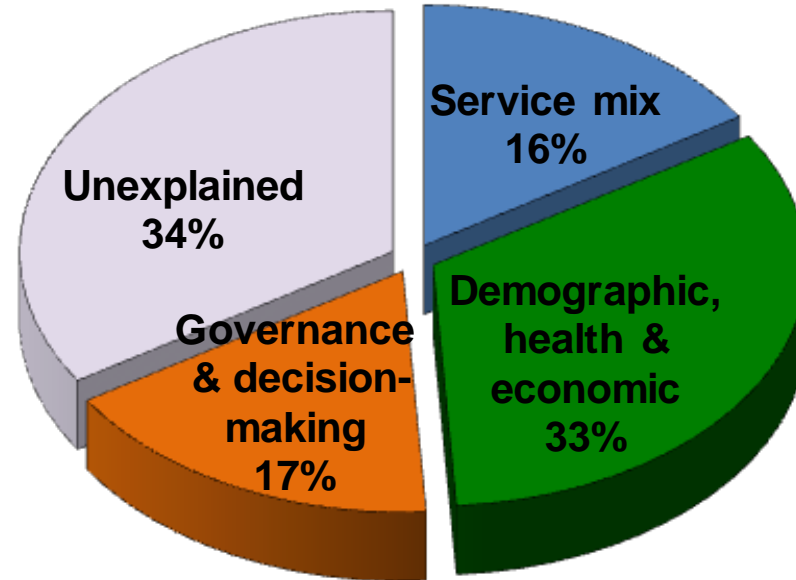
Changes in Local Public Health Spending 1993-2010



Variation in Injury Prevention Spending, 2011

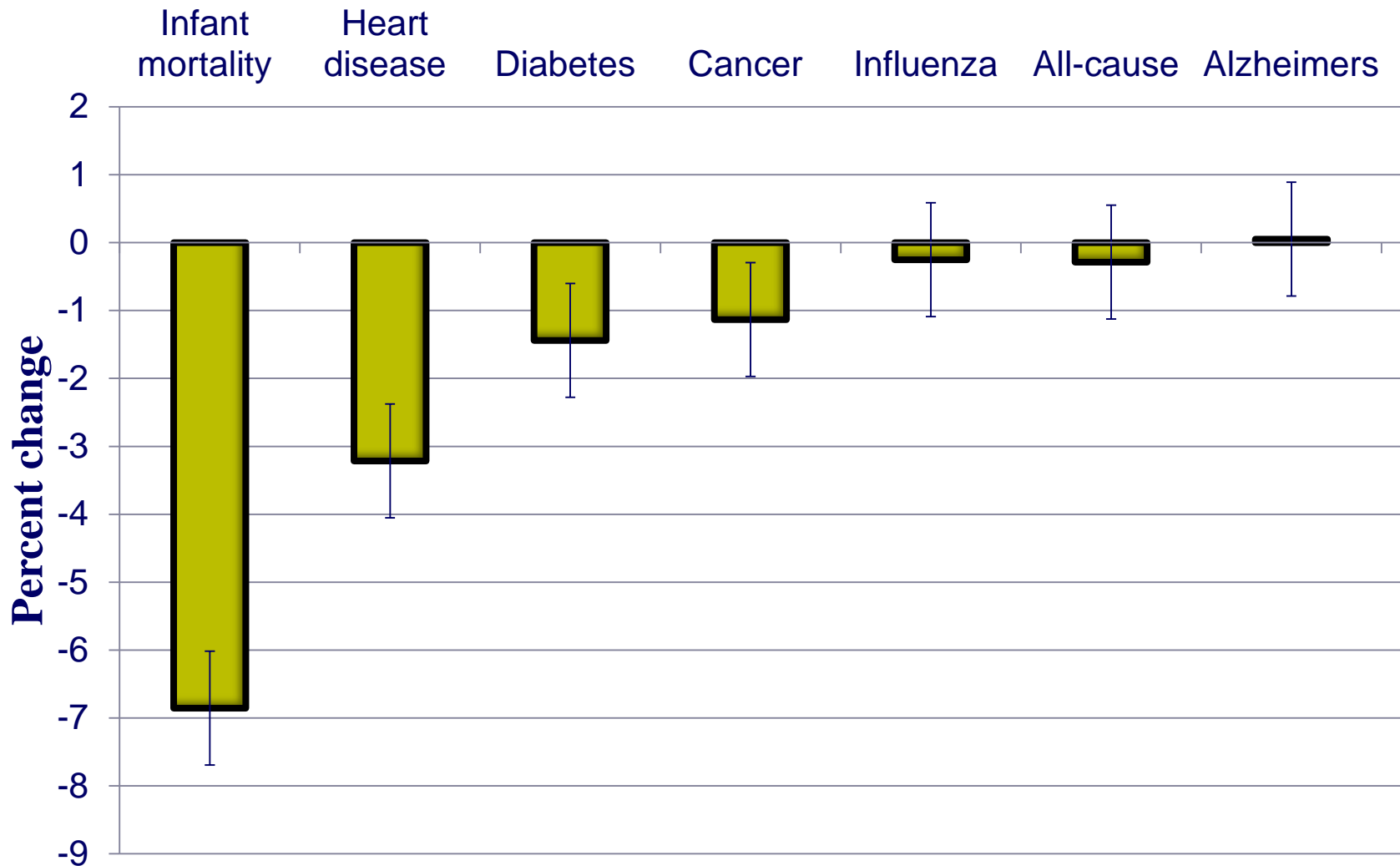


Determinants of Public Health Spending Levels



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

Mortality reductions attributable to local public health spending, 1993-2008



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

Effects of public health spending on medical care spending 1993-2008

Change in Medical Care Spending Per Capita Attributable to 1% Increase in Public Health Spending Per Capita

<u>Model</u>	<u>N</u>	<u>Elasticity</u>	<u>S.E.</u>
One year lag	8532	-0.088	0.013***
Five year lag	6492	-0.112	0.053**
Ten year lag	4387	-0.179	0.112

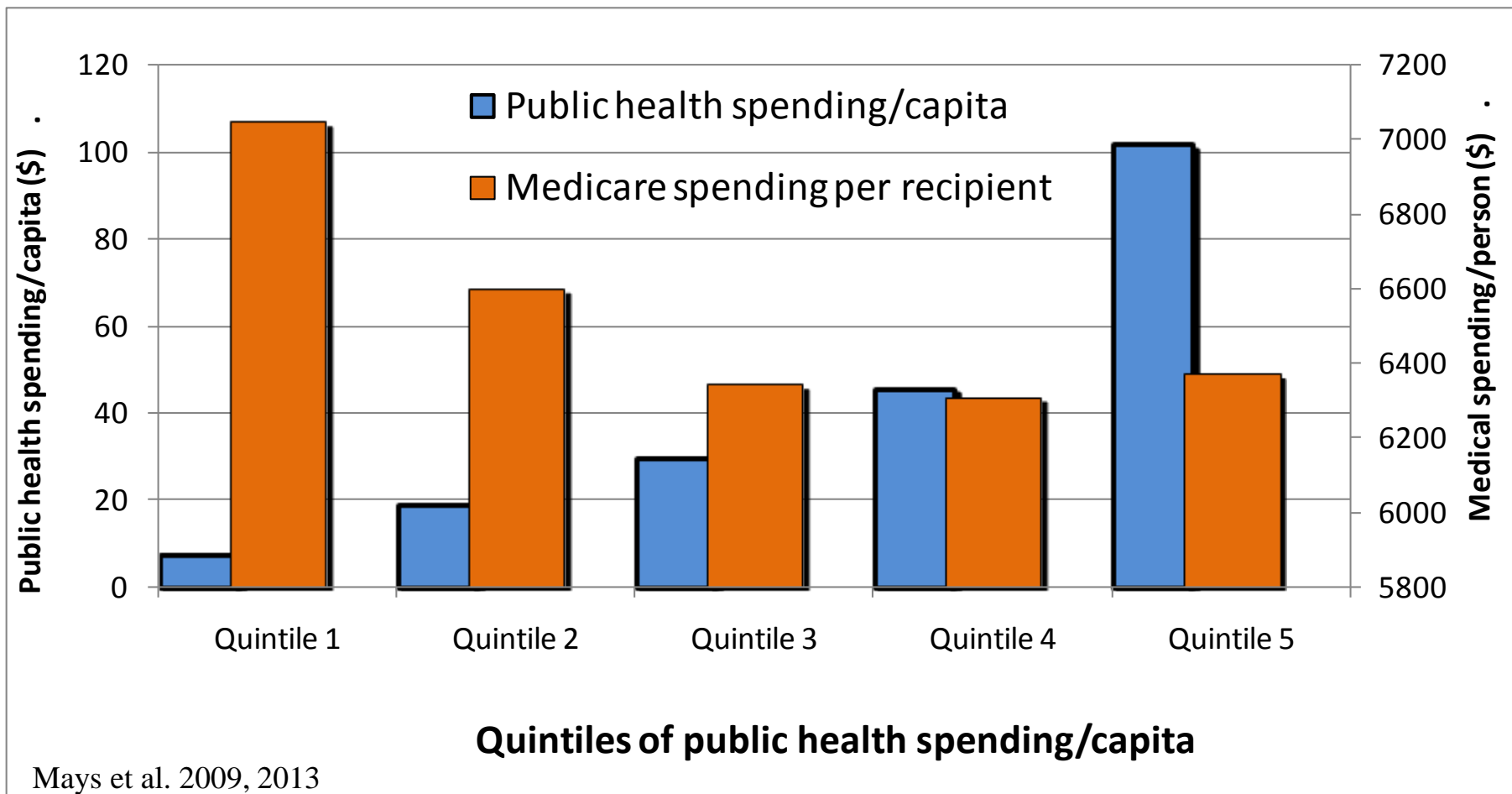
log regression estimates controlling for community-level and state-level characteristics

*p<0.10 **p<0.05 ***p<0.01

Mays et al. 2013

Medical cost offsets attributable to local public health spending, 1993-2008

For every \$10 of public health spending, ≈\$9 are recovered in lower medical care spending over 15 years

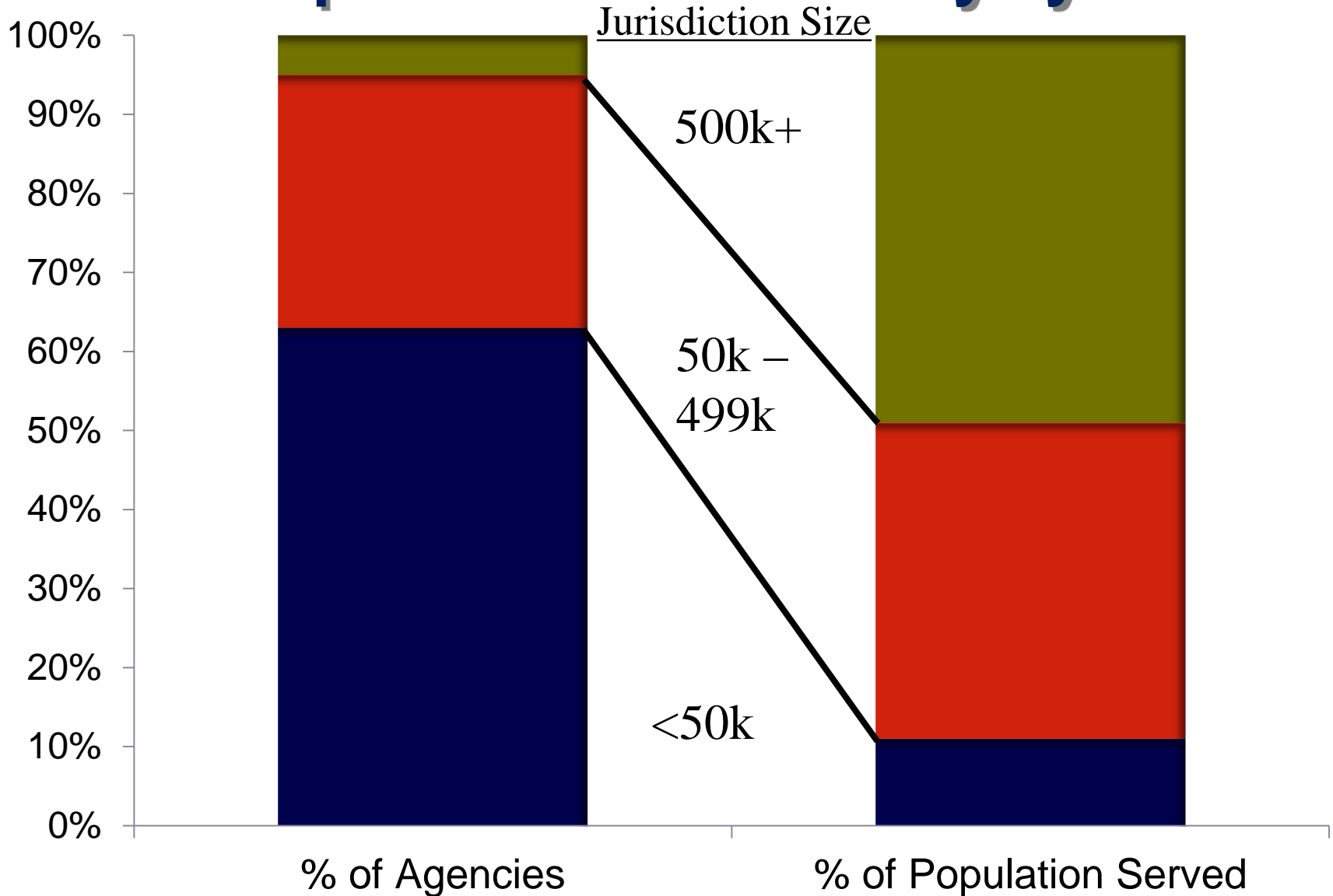


Economies of scale and scope in public health delivery

Gains in effectiveness and efficiency from:

- Delivering programs that reach larger populations
- Pooling resources & expertise across multiple organizations, communities, states
- Realizing synergies across multiple related programs & services

Economies of scale and scope in local public health delivery systems

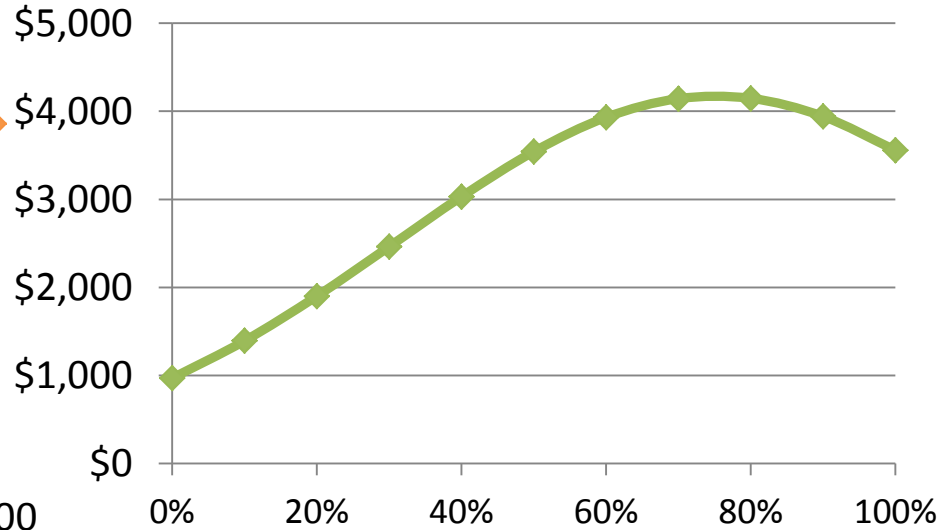
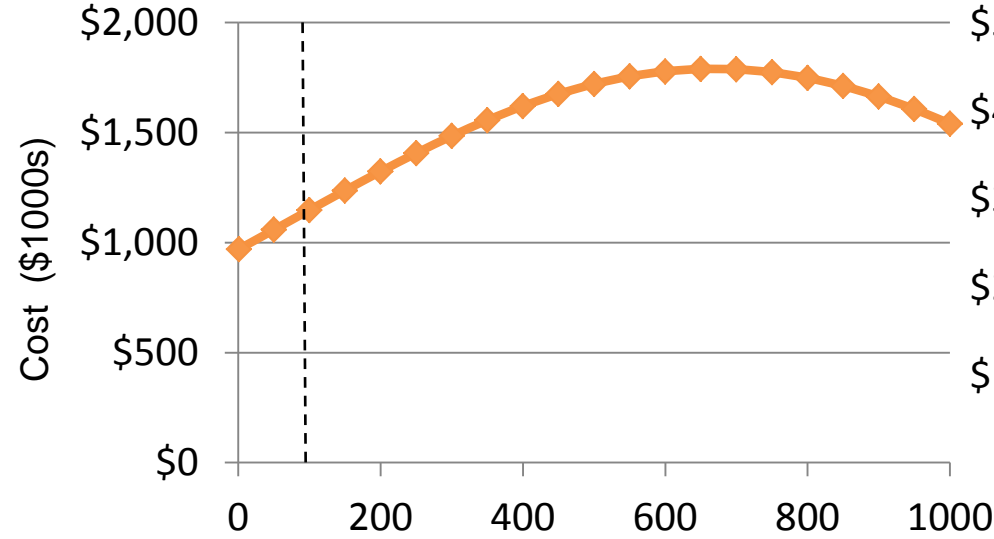


Source: 2010 NACCHO National Profile of Local Health Departments Survey

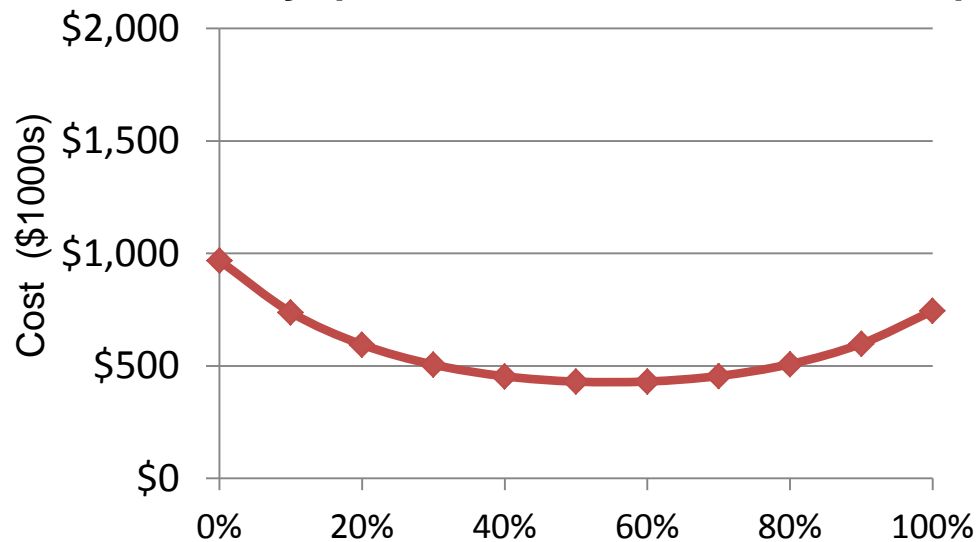
Empirical estimates of scale and scope effects in local public health delivery

Scale (Population in 1000s)

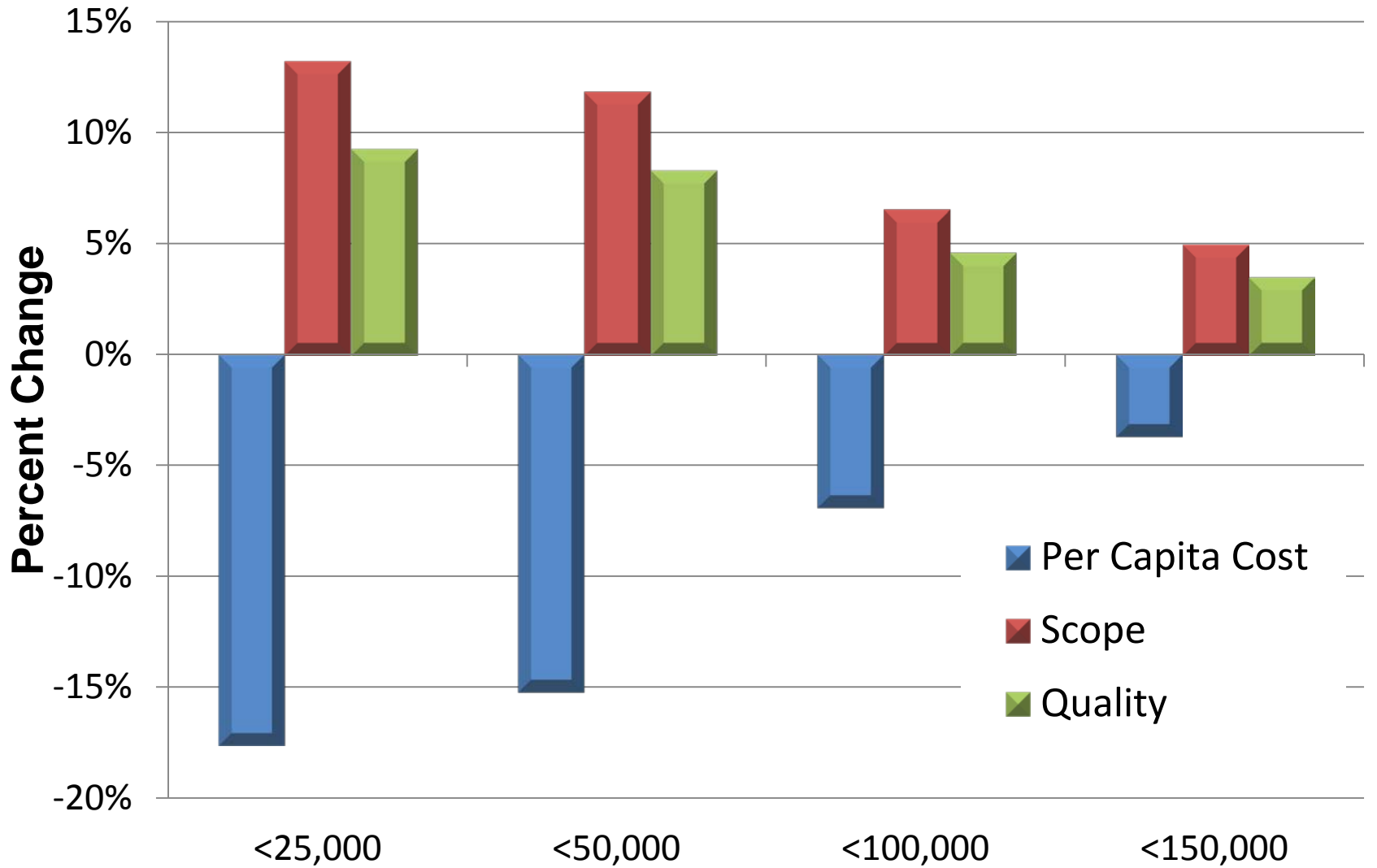
Scope (% of Activities)



Quality (Perceived Effectiveness)

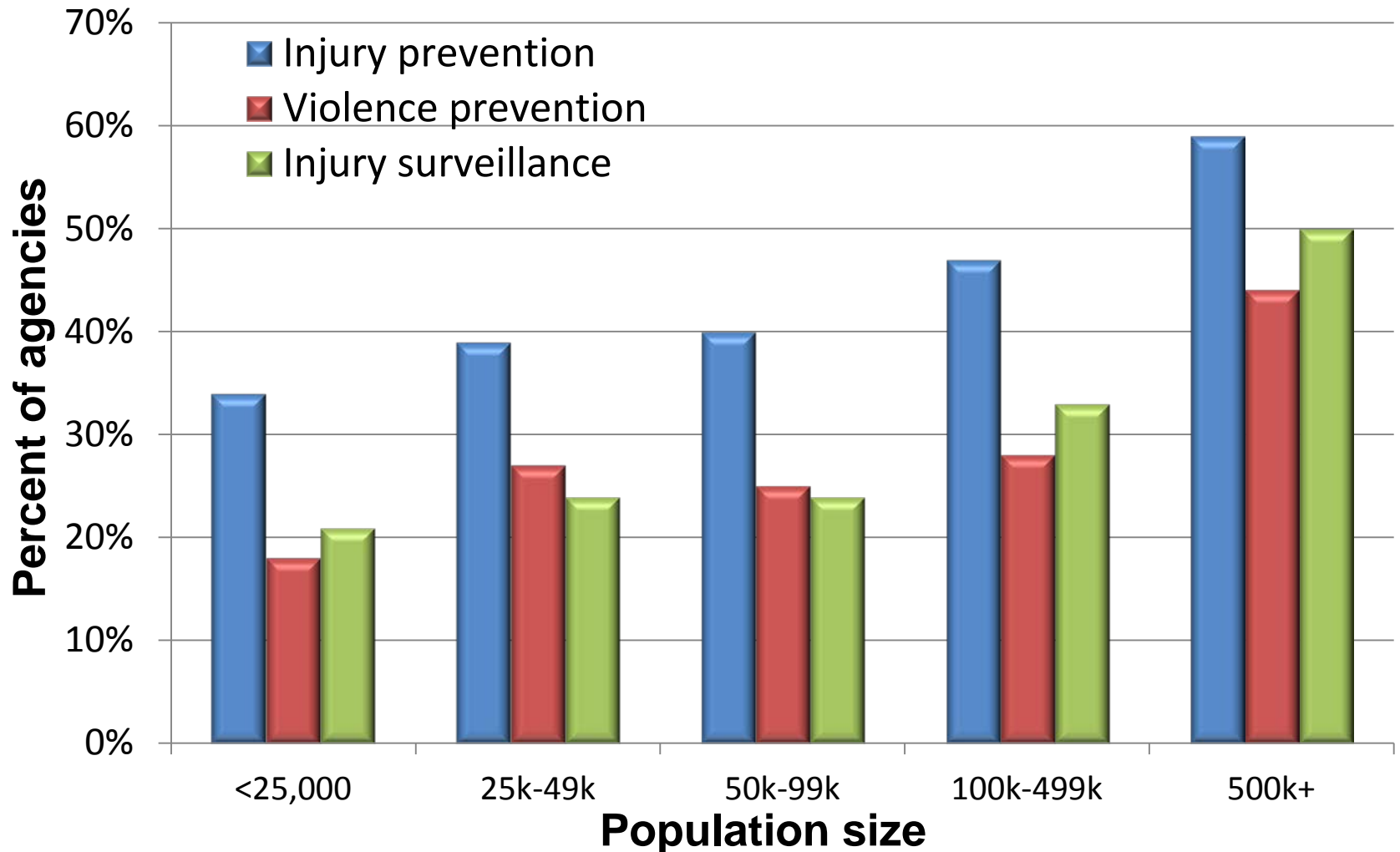


Simulated Effects of Regionalization

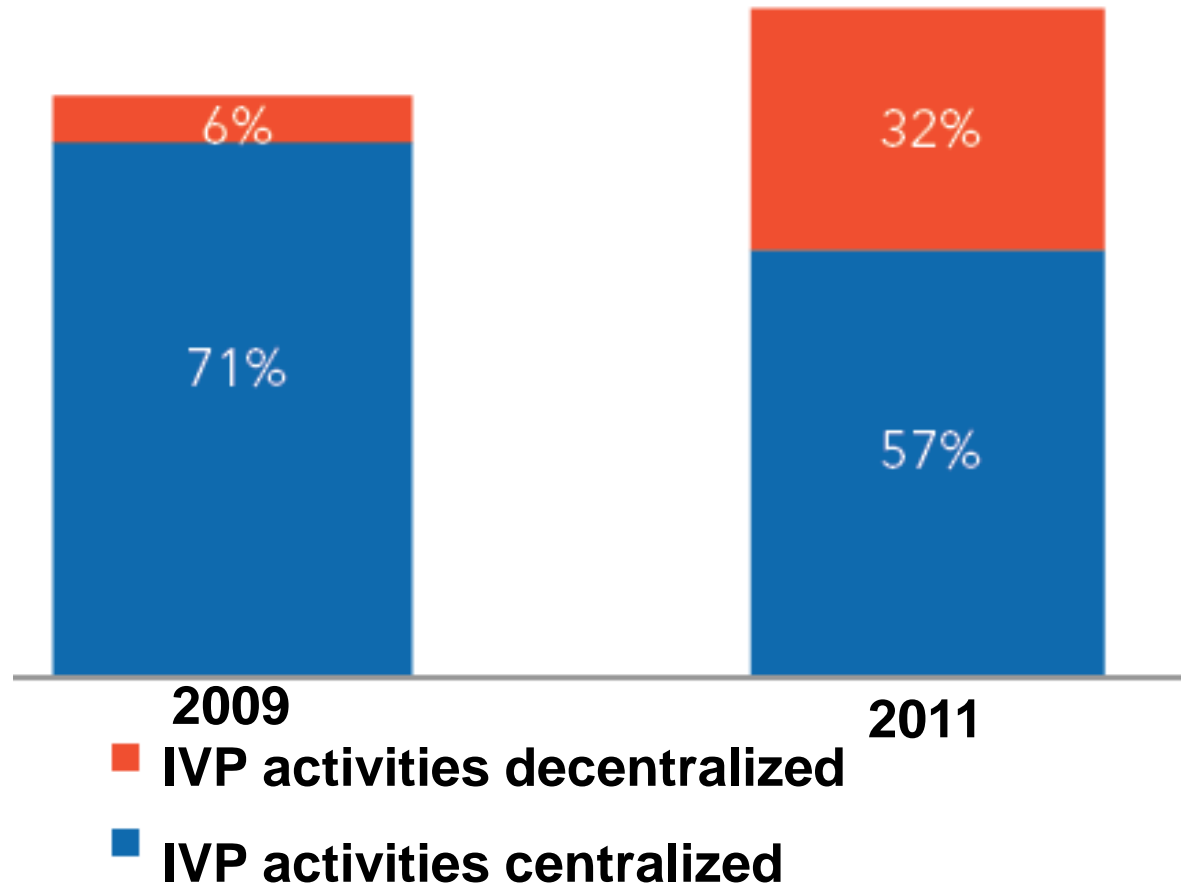


Regionalization Thresholds Source: Mays et al. 2012

Scale effects in delivery of local injury prevention programs



Scale and scope issues in state injury prevention: centralization



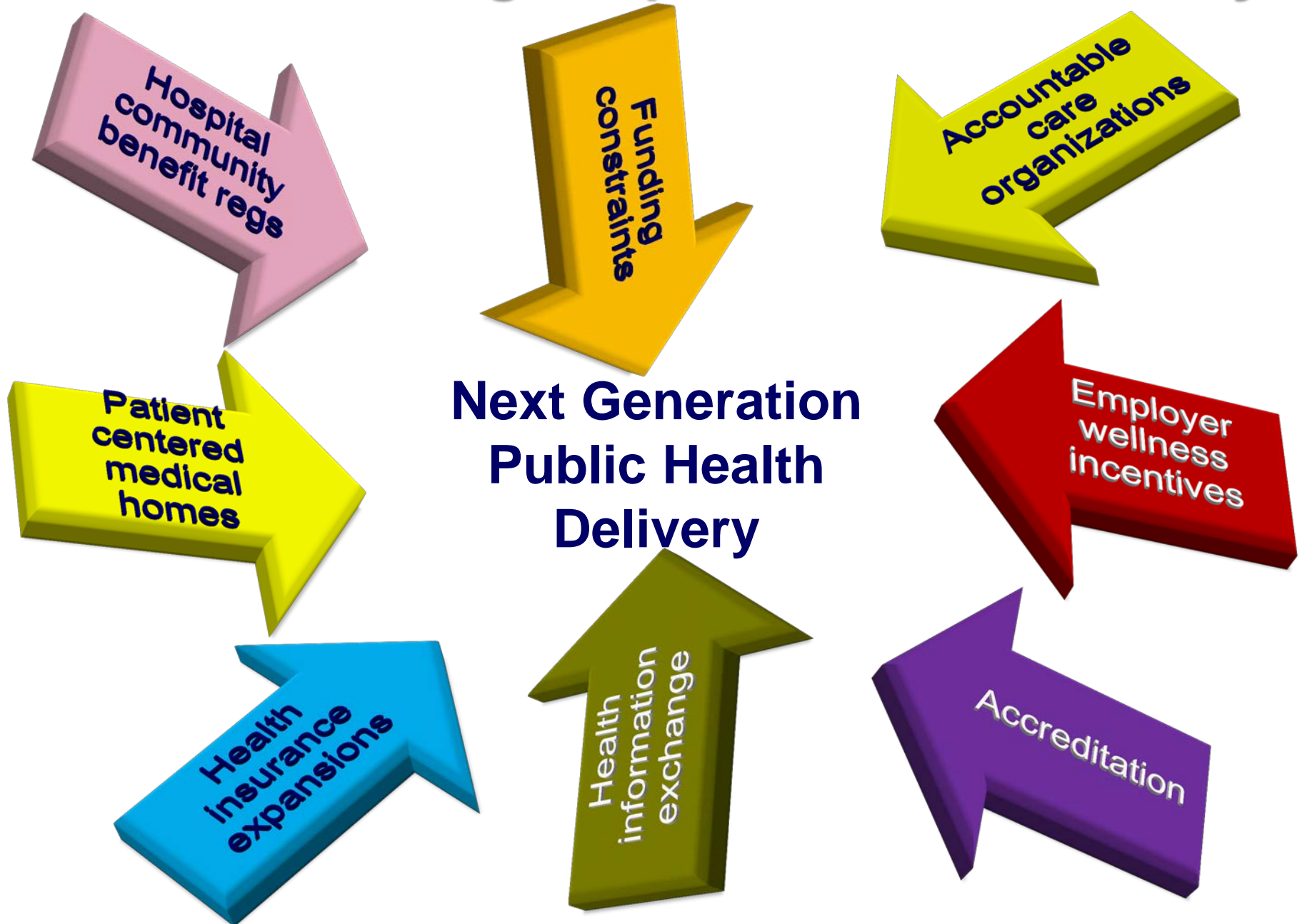
2012 Institute of Medicine Recommendations

- ◆ Double current federal spending on public health
- ◆ Allow greater flexibility in how states and localities use federal public health funds
- ◆ Identify components and costs of a minimum package of public health services
- ◆ Implement national chart of accounts for tracking spending & funds flow
- ◆ Expand research on costs and effects of public health delivery



Institute of Medicine. For the Public's Health: Investing in a Healthier Future. Washington, DC: National Academies Press; 2012.

Forces of change in public health delivery



Harvesting the power of public health systems: Toward “rapid-learning systems”



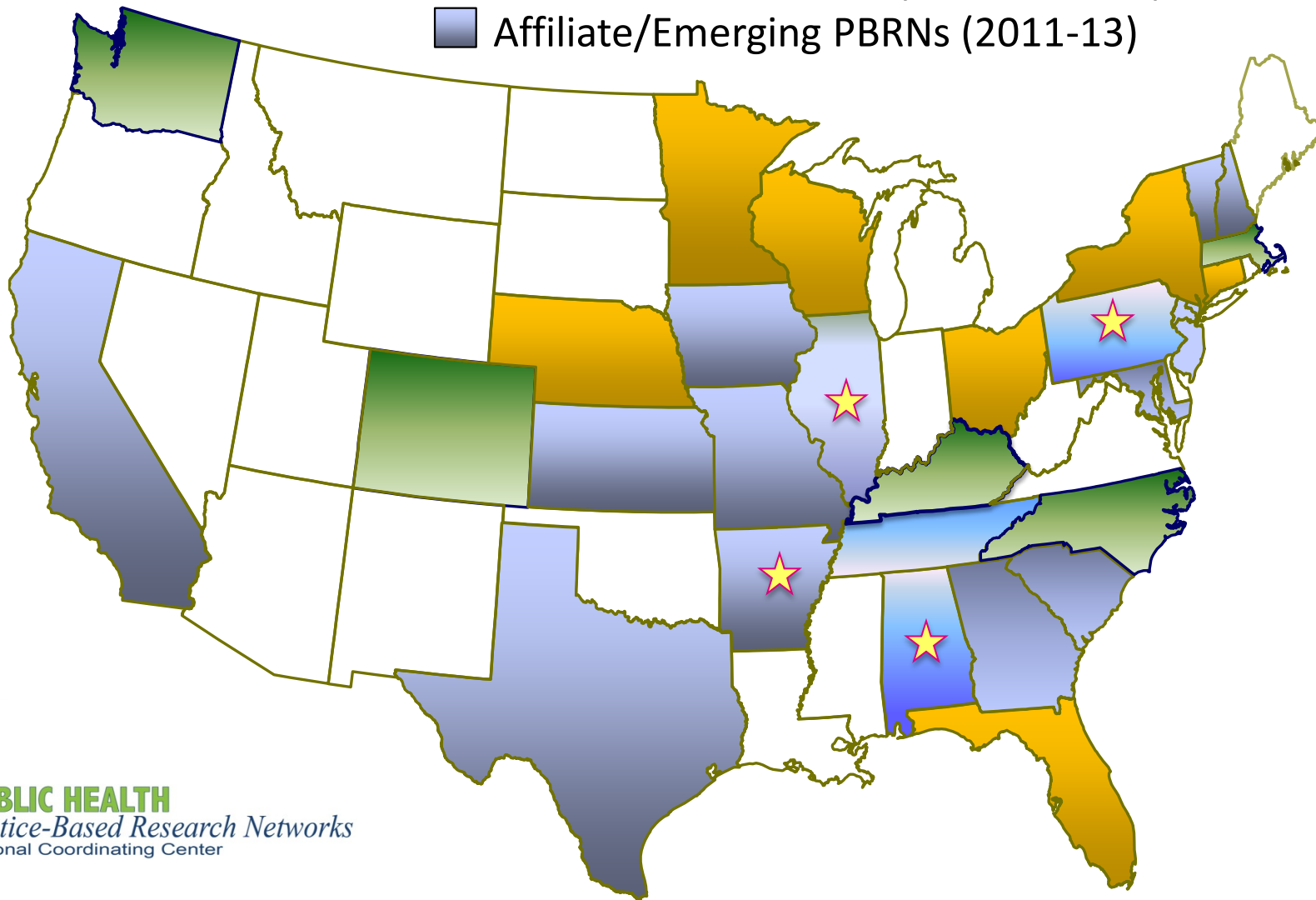
Can Practice-Based Research Networks Help?

- Practice partners to help identify the most pressing questions to answer
- Multiple practice settings for analysis and comparison
- Research partners to help design studies that balance rigor, relevance, feasibility
- Collaborative interpretation of results
- Translating results to timely practice and policy actions



Public Health Practice-Based Research Networks (PBRNs)

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



PBRNs and Delivery System Change

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

<u>Activity</u>	<u>PBRN Agencies</u>		<u>National Sample</u>		
	<u>Percent</u>	<u>Mean</u>	<u>Percent</u>	<u>Mean</u>	
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		

Moving delivery systems forward

- Public health delivery systems are engines for injury prevention & control
- Compelling opportunities for improving capacity, effectiveness, & efficiency
- Growing urgency to demonstrate value and ROI
- Imperatives to achieve **equity** in public health protection
- Connecting research and practice is key

For More Information



Supported by The Robert Wood Johnson Foundation

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