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Summer August 20, 2013

Strengthening the Science of Public Health Delivery through Services & Systems Research

Glen Mays, *University of Kentucky*



Available at: https://works.bepress.com/glen_mays/108/

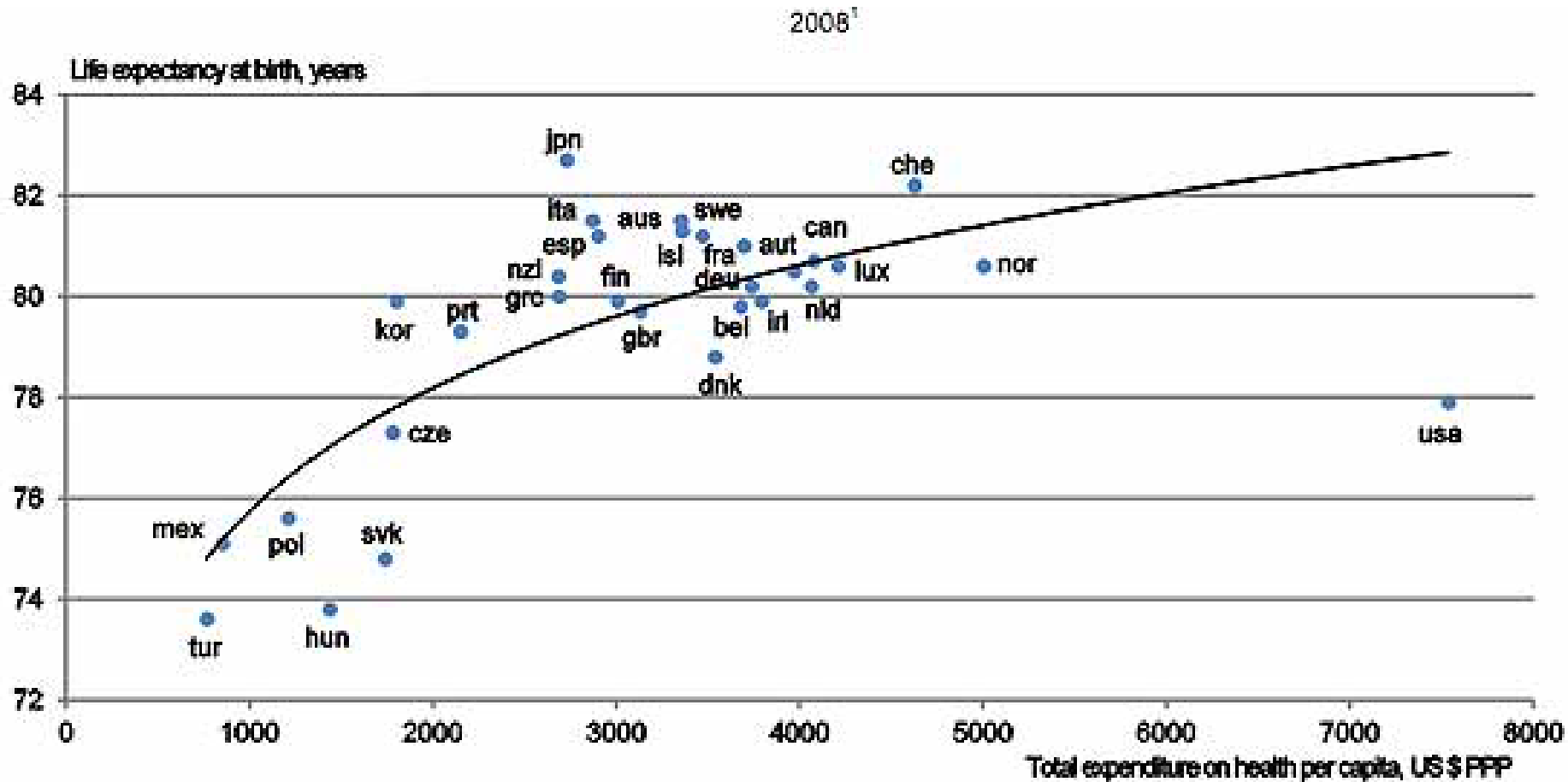
Strengthening the Science of Public Health Delivery through Public Health Services Research

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Senate HELP Committee Staff Briefing • 19 August 2013

Confronting fundamental gaps in health system performance



1. Or latest year available.

Source: OECD Health Data 2010.

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

The public health challenge

- Delivering the right health protections
- For the right people/communities/settings
- At the right time
- At an acceptable financial, economic, and social cost



The public health challenge

Expanding toolbox of research-tested strategies

- Disease & injury prevention interventions
- Screening and early detection
- Vaccination & communicable disease control
- Health information and education campaigns
- Inspection and licensing
- Policy, law and regulatory enforcement
- Design and engineering approaches



BUT these strategies can be ineffective, intrusive, wasteful and counter-productive if not implemented well

- Targeting/reach
- Fidelity/tailoring
- Volume/intensity
- Timeliness

Meeting the challenge: implementation

- Delivery occurs through complex, variable, loosely connected organizations in the public and private sectors
- Success requires strong implementation support functions
 - Epidemiologic surveillance & investigation
 - Environmental health monitoring and assessment
 - Community health assessment & planning
 - Performance measurement and reporting
 - Coordination mechanisms: schools, worksites, health care, community-based and faith-based settings

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

What the research tells us

- Wide variation exists in public health delivery across U.S. communities
- Variation reveals gaps in effectiveness, timeliness, and efficiency
- Variation in public health delivery has important health and economic consequences
- Feasible solutions exist:
 - Regionalization and service sharing
 - Performance standards and accreditation
 - Workforce development & training
 - New funding and payment models

By the numbers: illustrative research findings

- **68%** – proportion of recommended public health practices delivered in the average U.S. community in 2012
- **5%** – reduction in recommended public health practices delivered in the average U.S. community between 2006-2012
- **64%** – proportion of practices contributed by nongovernmental organizations in 2012 (up from 59% in 2006)
- **2.9%** – proportion of total U.S. health spending in 2011 (\$2.7T) allocated to governmental public health activities (0.5%↓ from 2010)
- **86%** – proportion of governmental public health spending contributed by state and local governments in 2011
- **7%** – reduction in preventable mortality between 1993-2008 attributable a 10% increase in local public health spending
- **89%** – proportion of local public health spending during 1993-2008 offset by lower medical care spending in U.S. communities

Variation in public health practice

Mixed Results In Tracking Food Scores

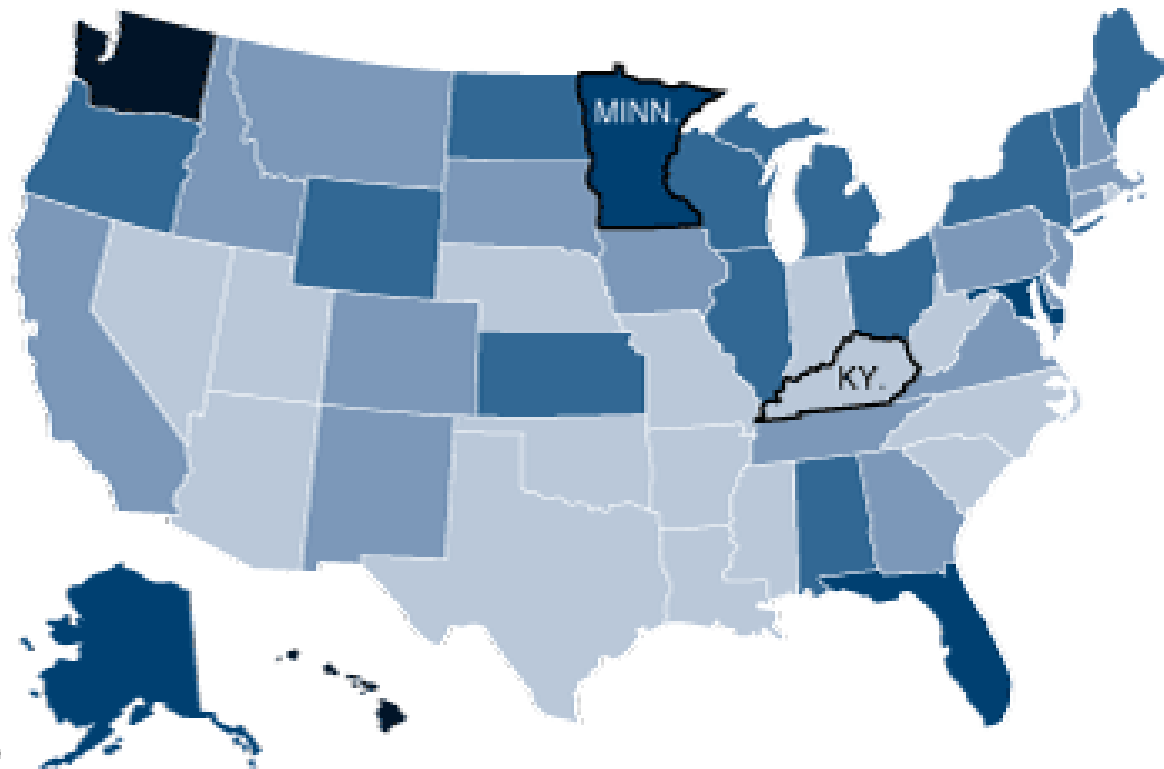
Minnesota health officials investigate all reports of food-borne illness, but officials in many states do not. From 1990 to 2006, Minnesota reported 548 outbreaks, while Kentucky reported 18.

Reported outbreaks of food-related illness

Per 100,000 people, 1990 to 2006



Source: Centers for Disease Control and Prevention



Variation in adoption of evidence-based practices

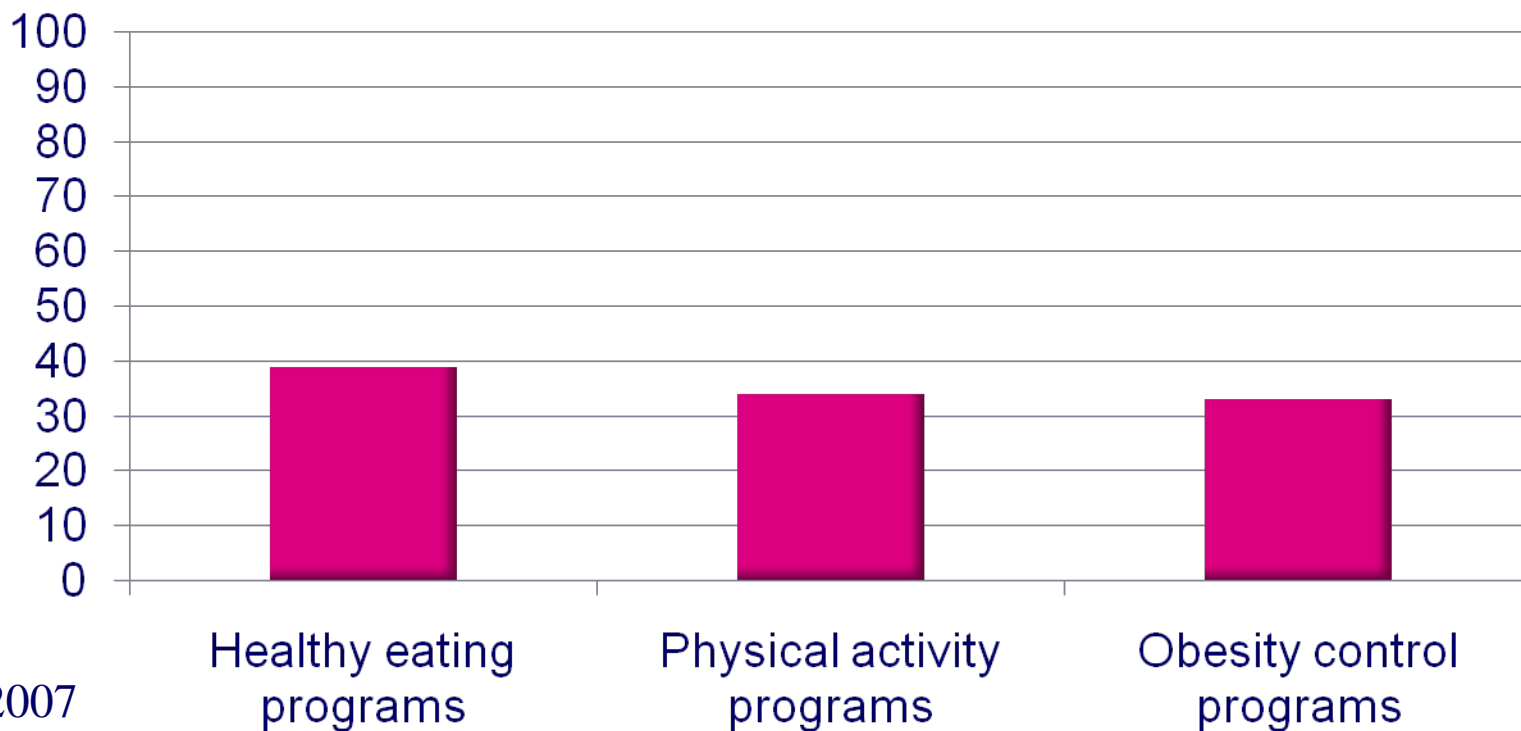


Missed Opportunities

Local Health Departments as Providers of Obesity Prevention Programs for Adolescents

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

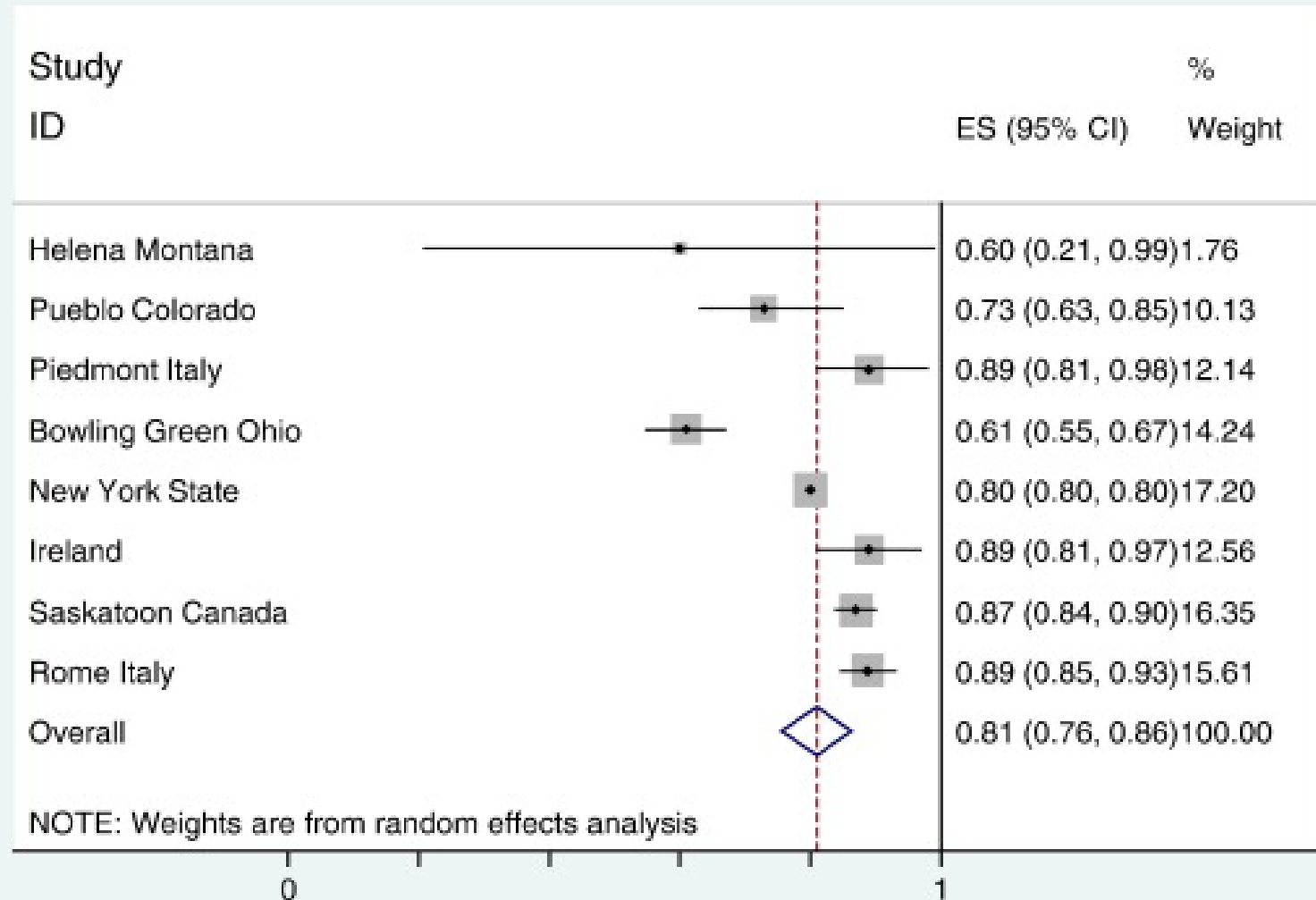
Percent of local health departments offering evidence-based obesity programs



Slater et al. 2007

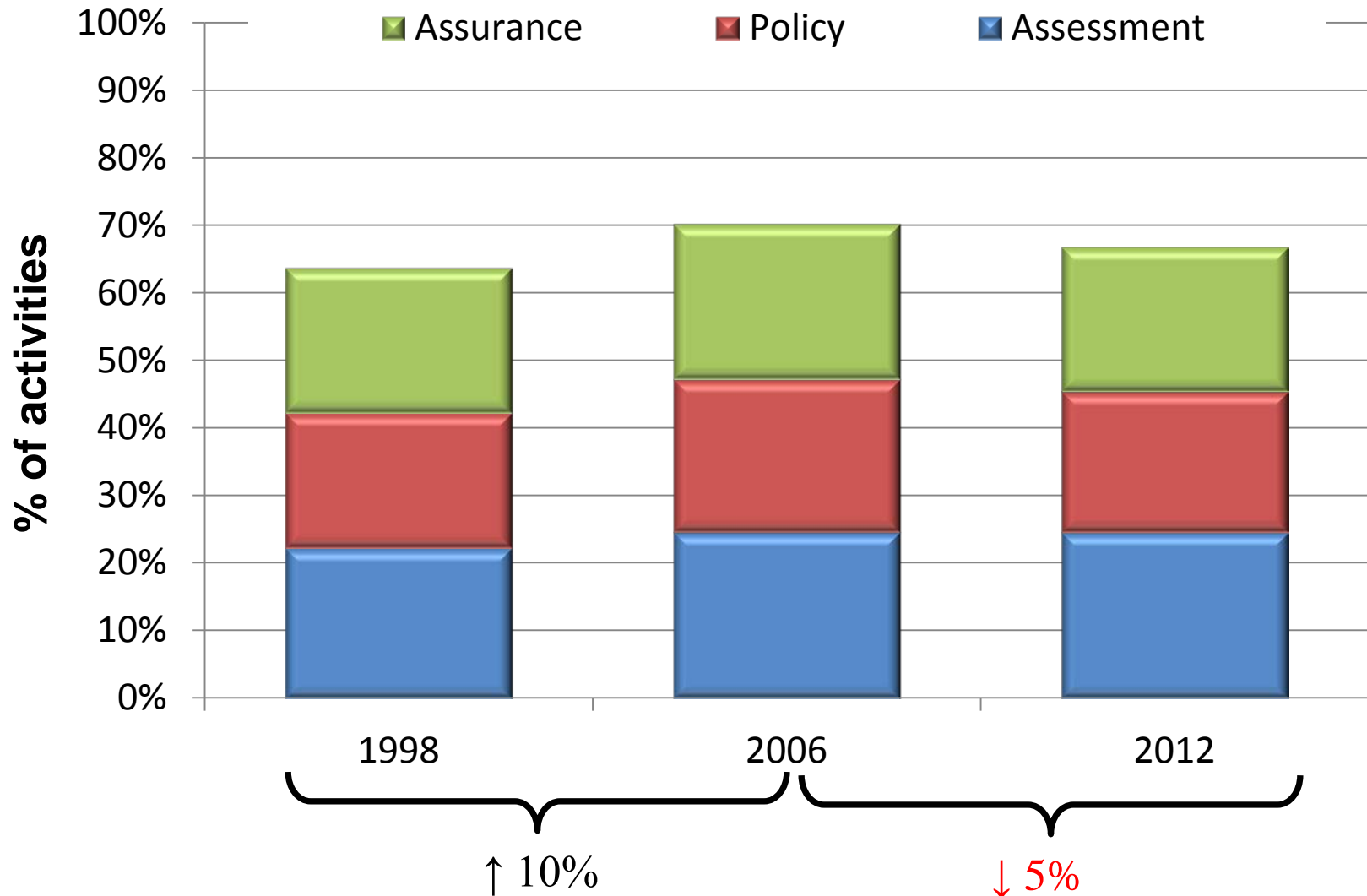
Variation in effects of public health interventions

Estimated Effects of Smoke-free Policies on AMI admissions

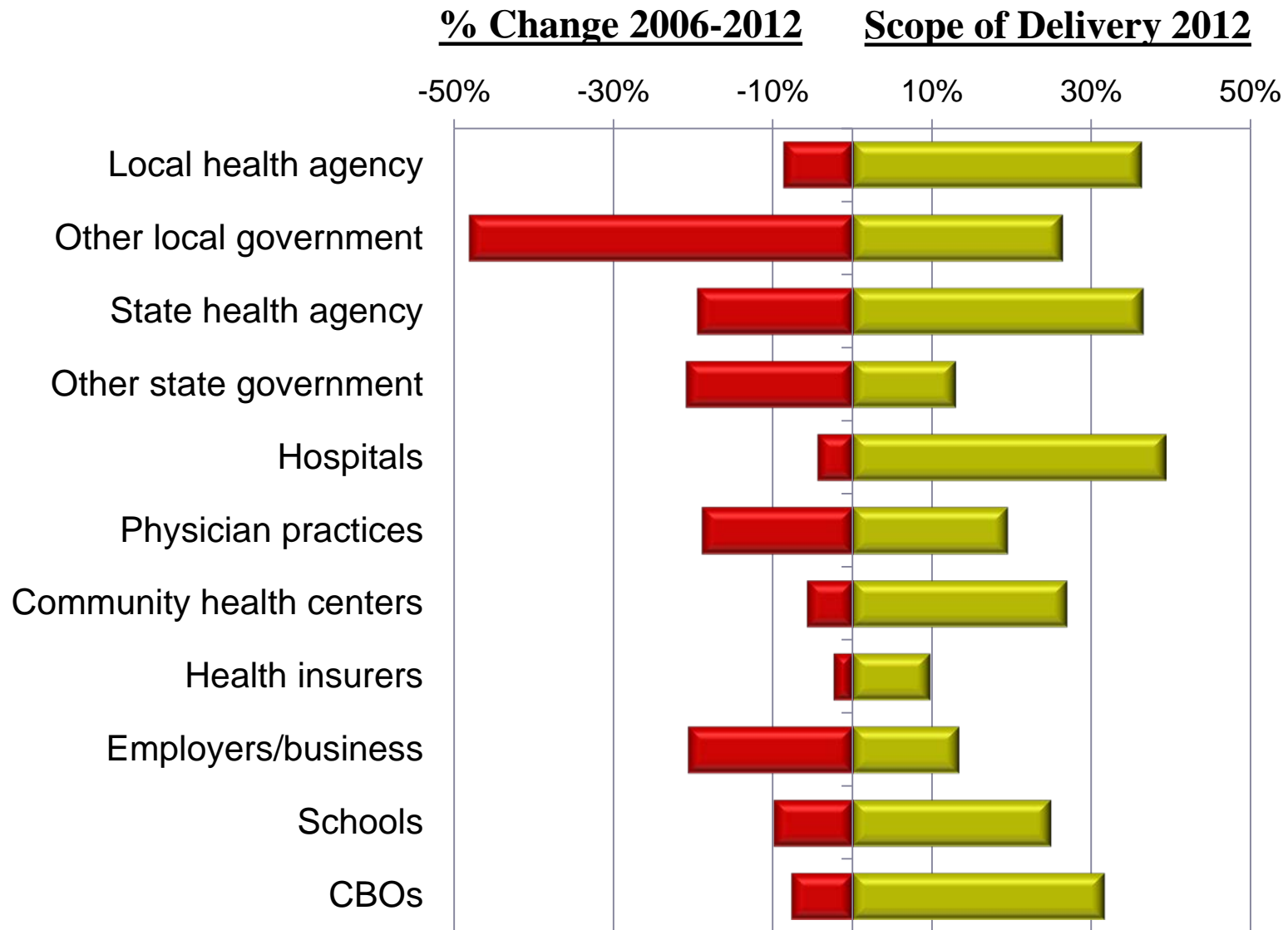


Changes in public health delivery over time

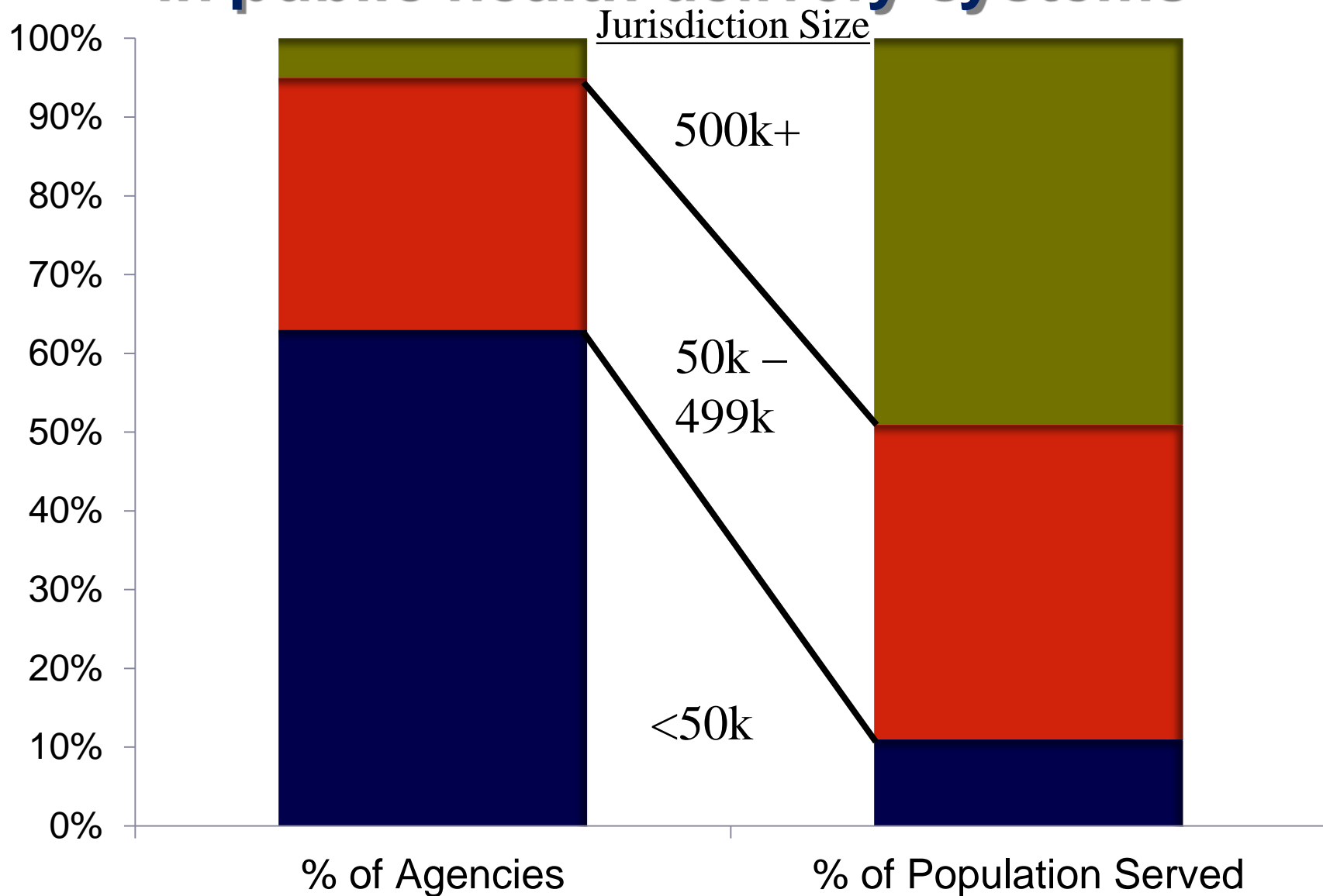
Delivery of recommended public health activities



Organizations engaged in local public health delivery

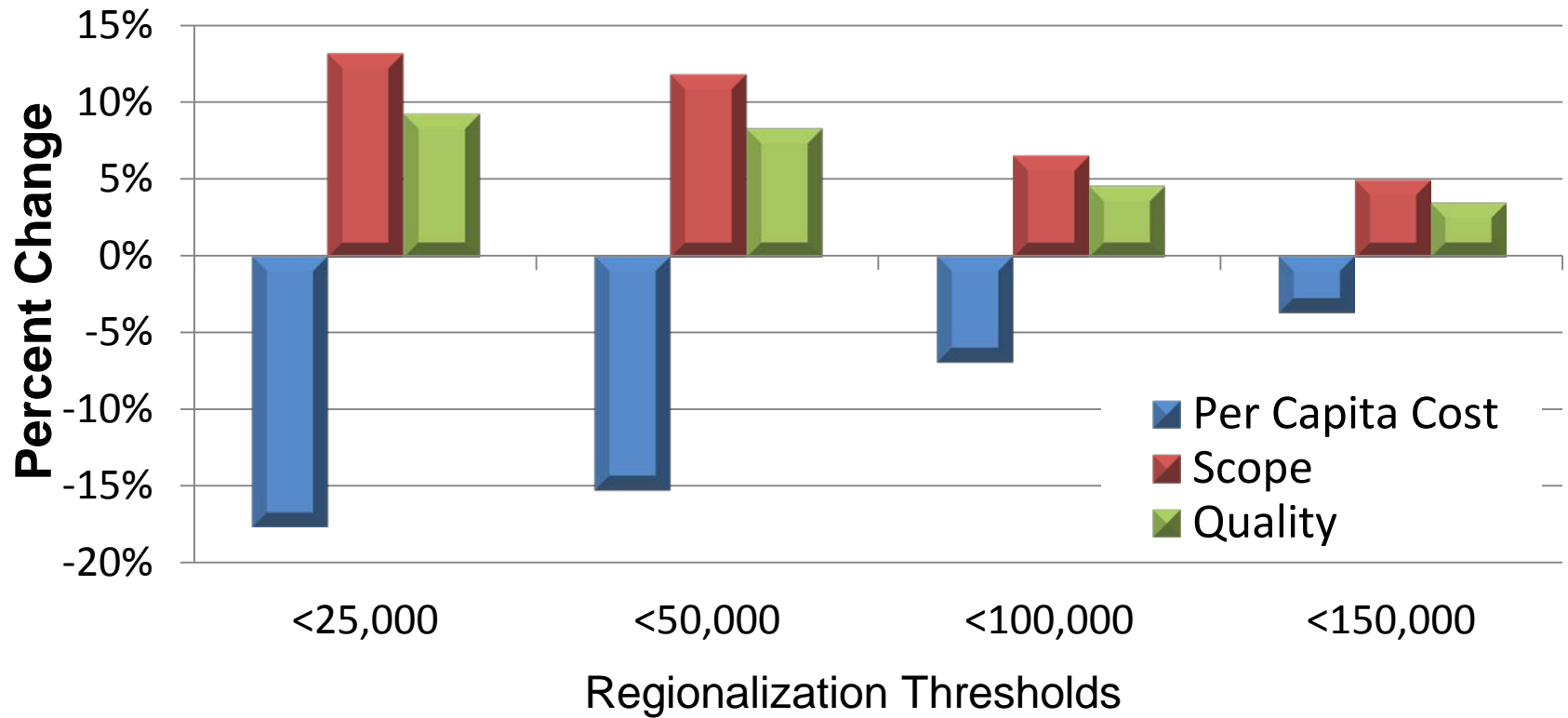


Economies of scale and scope in public health delivery systems



Source: 2010 NACCHO National Profile of Local Health Departments Survey

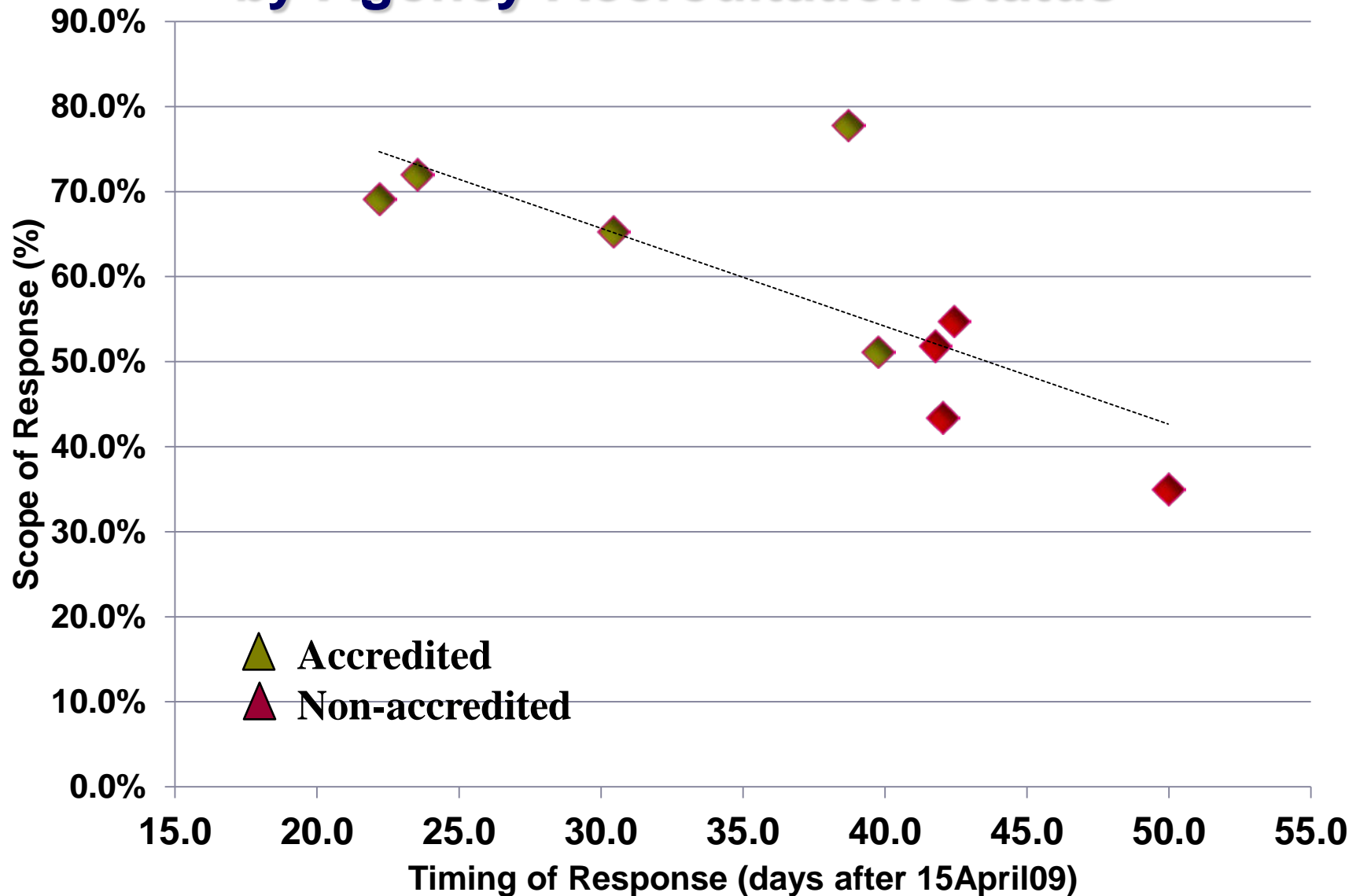
Effects of regionalization strategies



Regionalization strategies under study

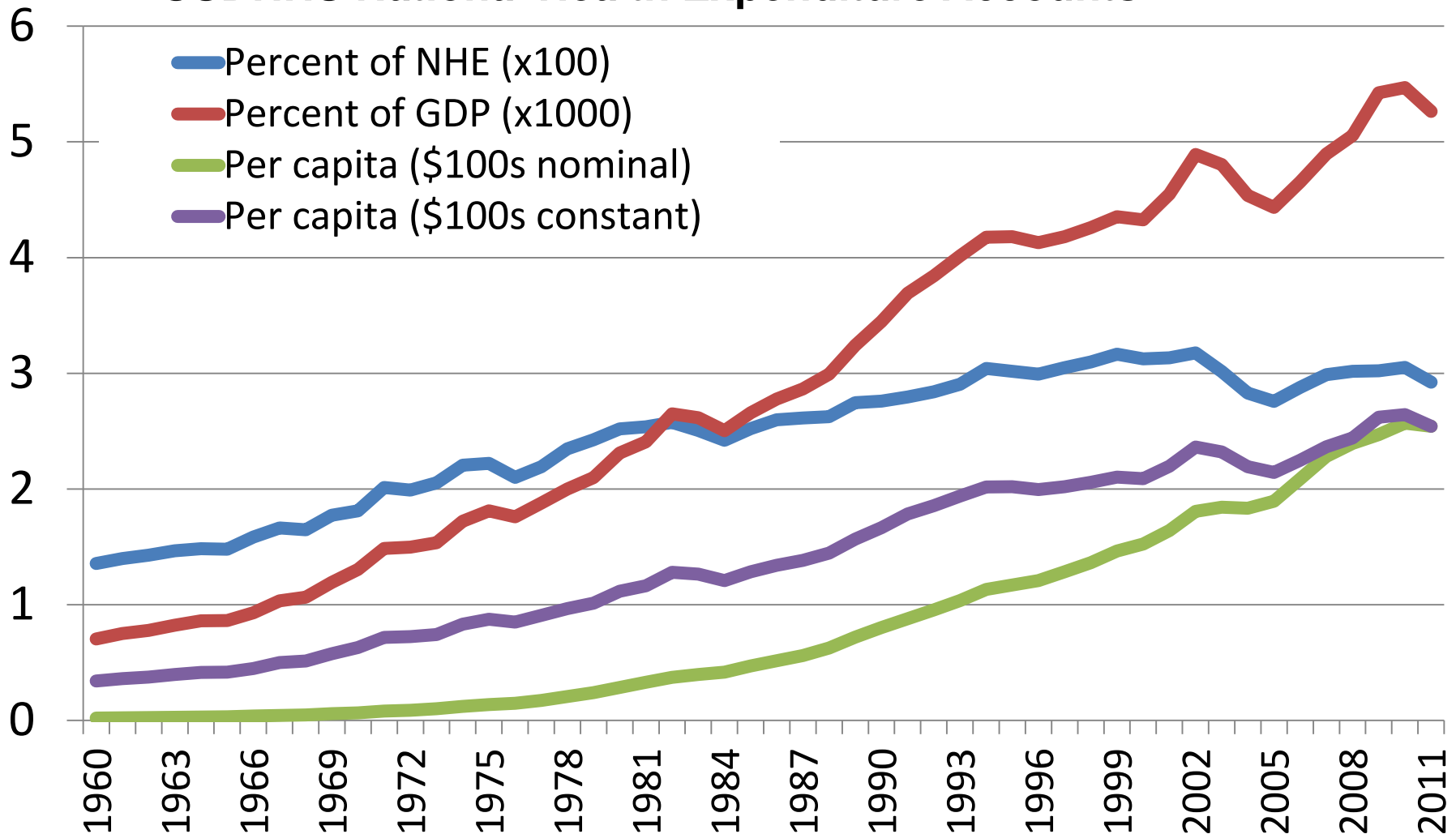
- Agency consolidation (Ohio)
- Regional districts (MA, NE, GA)
- Cross-jurisdictional service-sharing (WI, MN)

Scope and Timing of H1N1 Response Activities: by Agency Accreditation Status



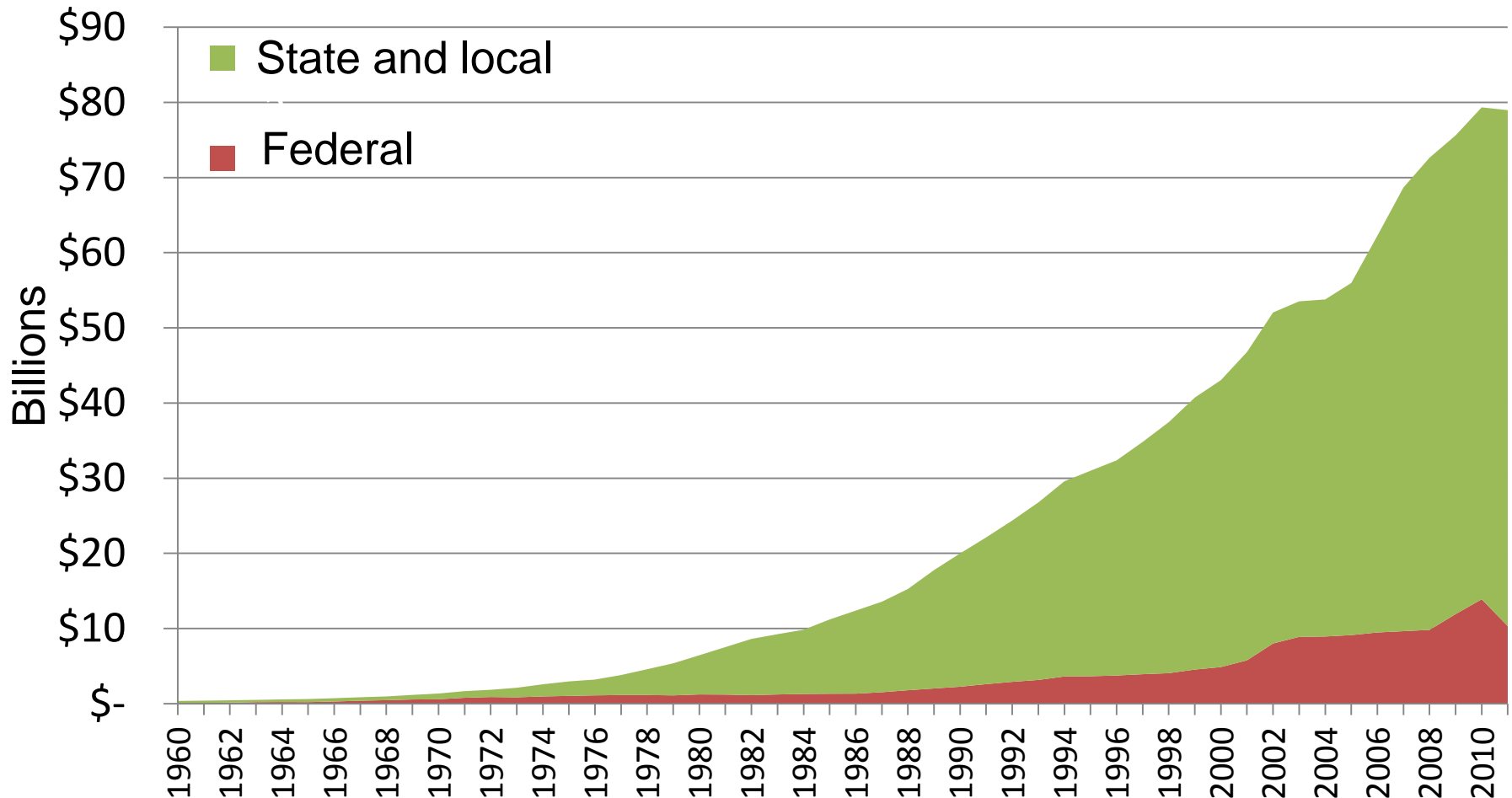
Financing public health activity

Governmental Expenditures for Public Health Activity, USDHHS National Health Expenditure Accounts



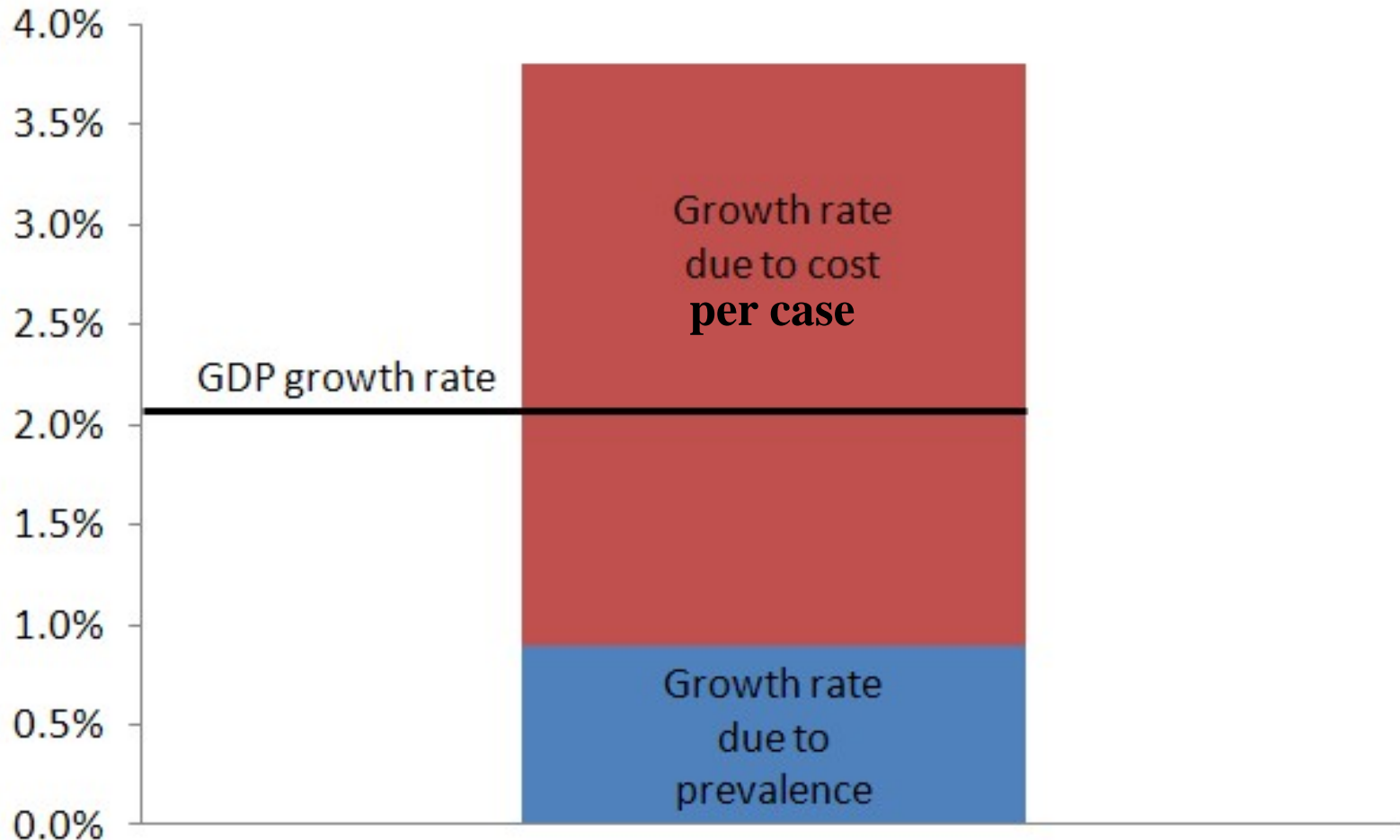
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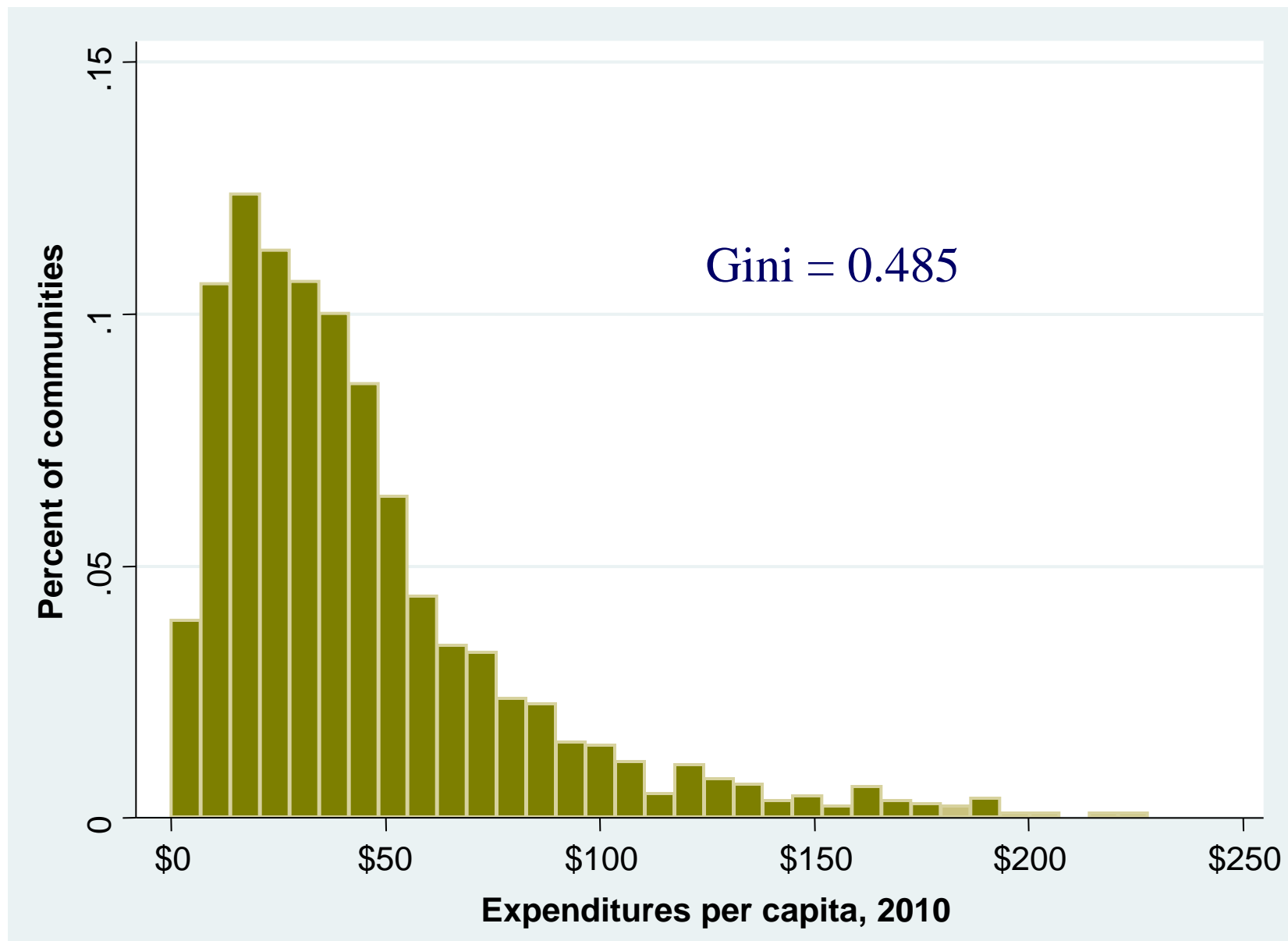


Factors driving growth in medical spending

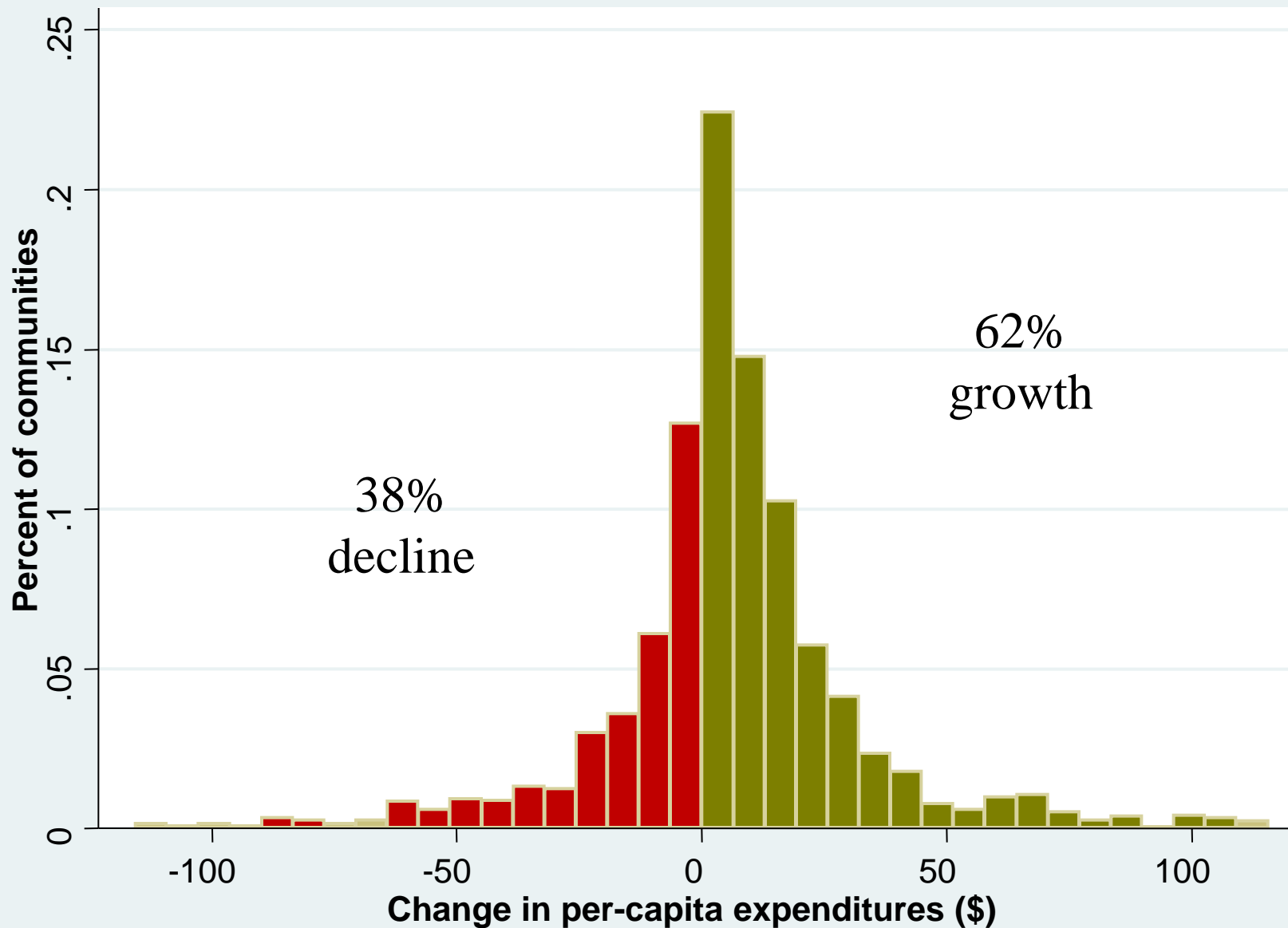
Health spending growth rate 1996-2006



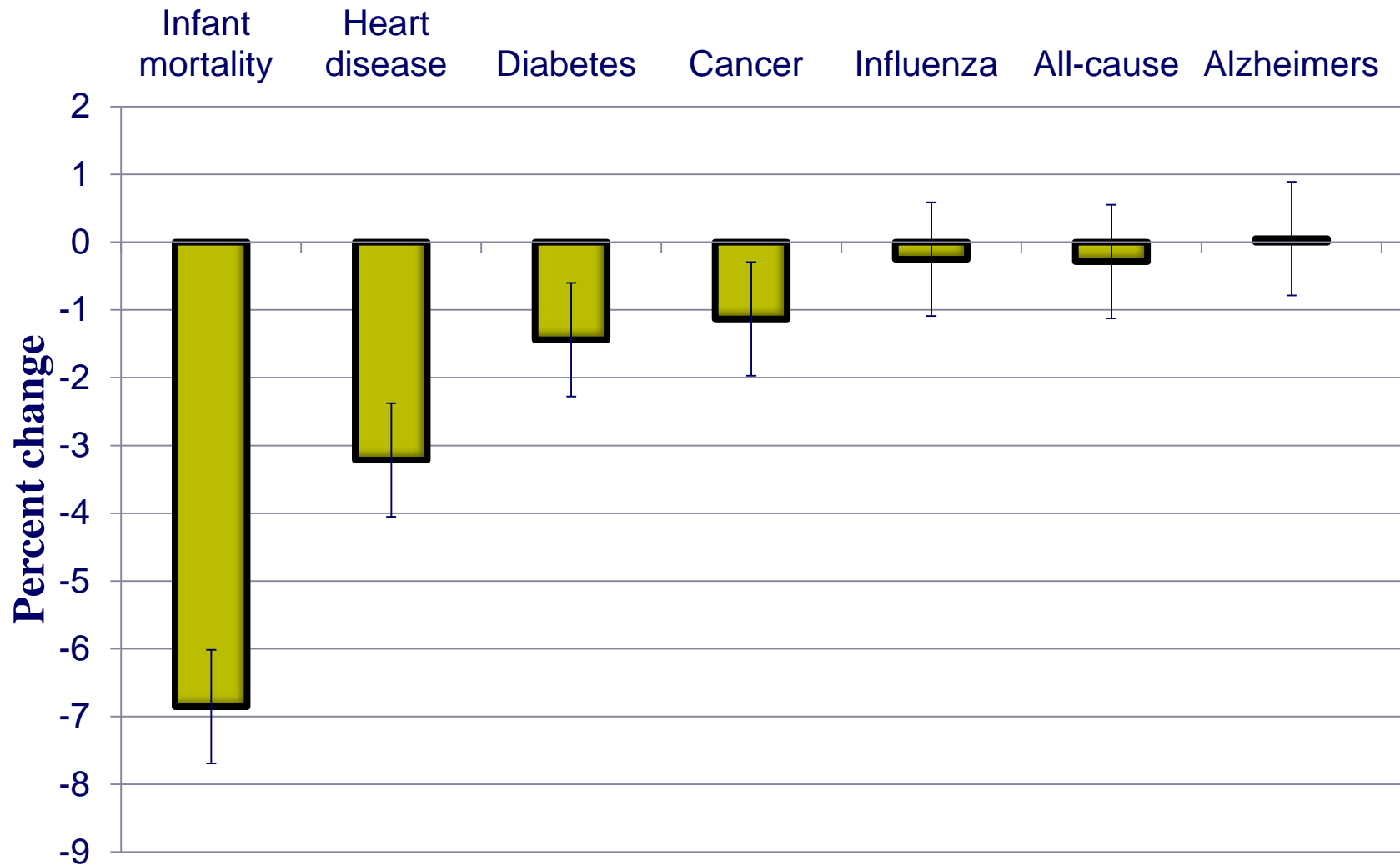
Variation in Local Public Health Spending



Changes in Local Public Health Spending 1993-2010



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

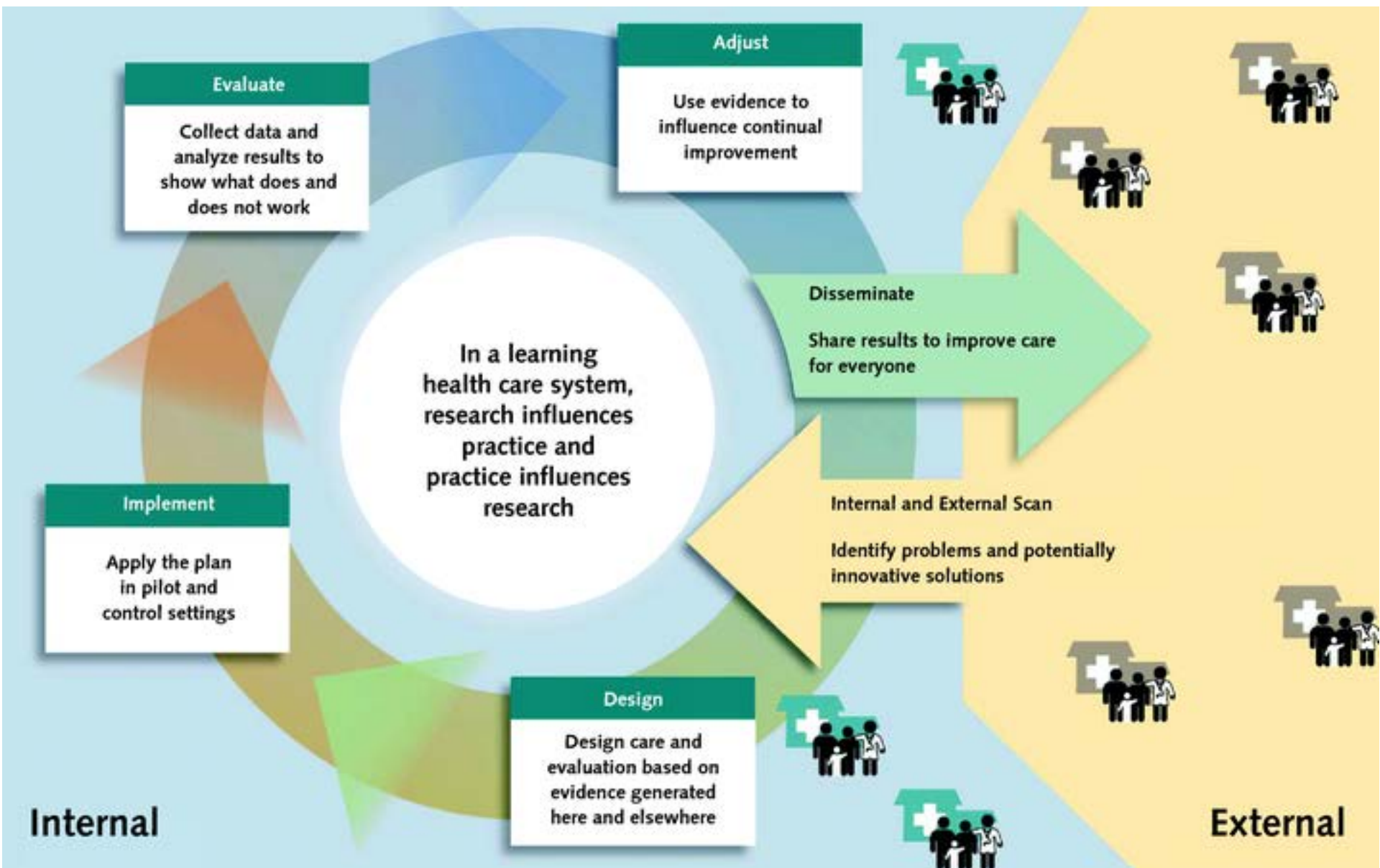
Mays et al. forthcoming

Estimated value of public health spending

- ◆ 10% increase in public health spending in average community:

Public health cost	\$594,291	
Medical cost offset	-\$515,114	(Medicare only)
LY gained	148	
Net cost/LY	\$534	

Conclusions: Toward a rapid-learning system



For More Information



Supported by The Robert Wood Johnson Foundation

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