

National Health Security Preparedness Index

Analytic Methodology & Model Design Work Group Meeting



May 16, 2017

NHSPI Program Management Office

University of Kentucky



Agenda

- Release of the 2017 Index
- Data linkage and analysis efforts to stimulate (provoke?) dialogue and discussion about improving health security
 - Analyses to uncover causes and consequences of change in health security



NATIONAL HEALTH SECURITY PREPAREDNESS INDEX

April 25-28
2017

PREPAREDNESS SUMMIT

Atlanta, Georgia
ATLANTA MARRIOTT MARQUIS

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Tackling Inequality in Health Protections Using the National Health Security Preparedness Index

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PREPARED 
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UK
UNIVERSITY OF
KENTUCKY
Center for Public Health
Systems and Services Research

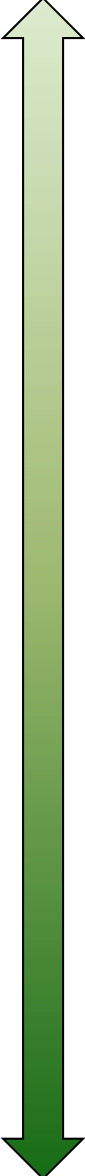
Why a Health Security Index?

**Increase awareness of health security as a
shared responsibility of multiple sectors**

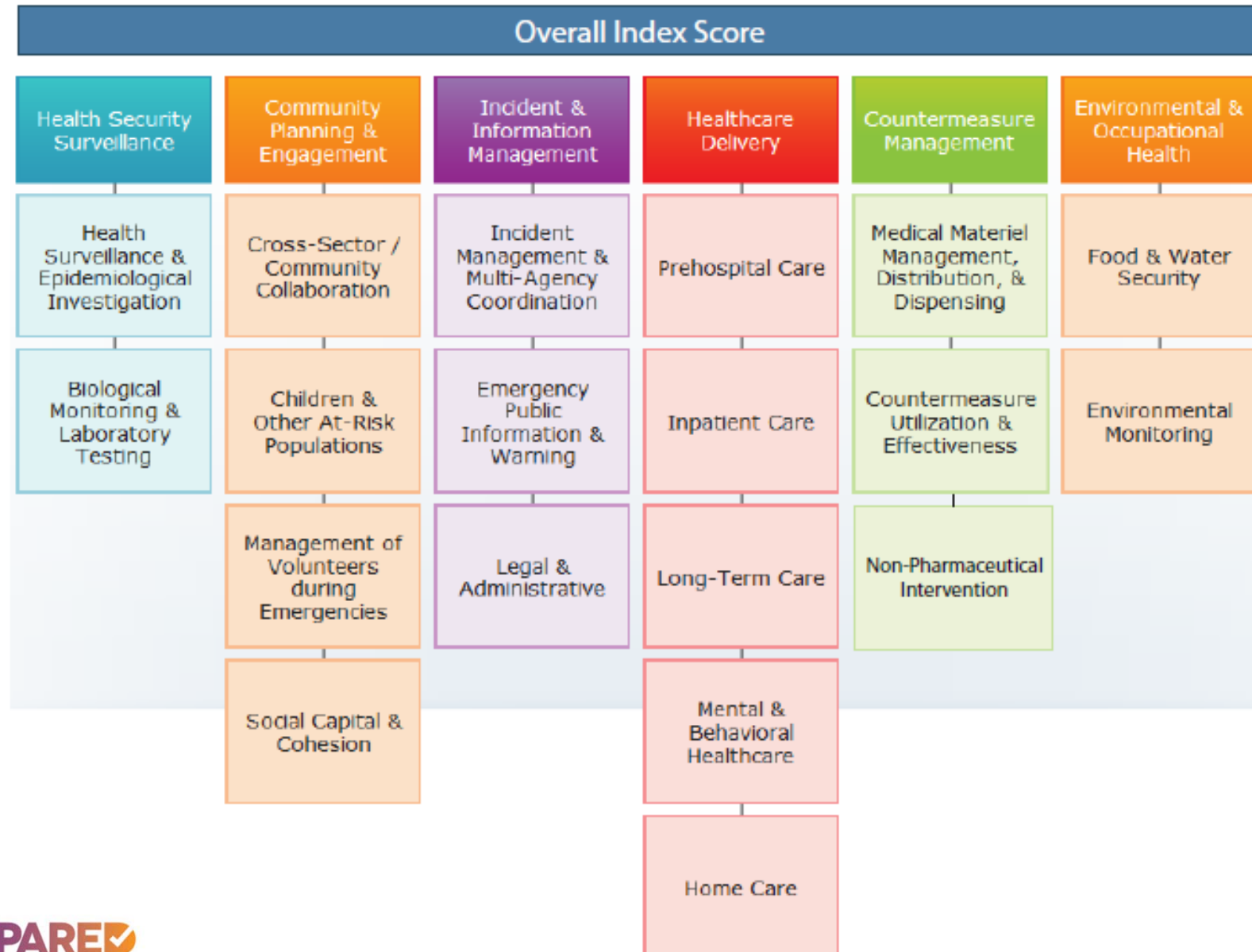
- Identify strengths and vulnerabilities
- Track progress
- Encourage coordination & collaboration
- Facilitate planning & policy development
- Support benchmarking & quality improvement
- Stimulate research & innovation



A Brief History

- 
- 2012**
- **Collaborative Development:** CDC, ASTHO and >25 collaborating organizations
- 12/2013**
- **1st Release:** Initial model structure and results
 - 5 domains and 14 subdomains
 - 128 measures
- 12/2014**
- **2nd Release:** Revised model and results
 - 6 domains and 18 active subdomains
 - Measures: 119 retained + 75 new = 194 measures
- 1/2015**
- **Transition to Robert Wood Johnson Foundation**
 - Validation studies and revision to methodology & measures
- 4/2016**
- **3rd Release:** Revised model and results
 - 6 domains & **19** active subdomains
 - Measures: 65% retained, 12% respecified, 8 new = 135 total
 - Valid comparisons over time + confidence intervals
- 4/2017**
- **4th Release:** Refined model and results
 - Added District of Columbia
 - Measures: 4 dropped, 7 respecified, 8 new = 139 total

What the Index measures



Enhanced Methodology

- 139 individual measures



Weighted
average

- 19 subdomains



Weighted
average

- 6 domains



Weighted
average

- State overall values



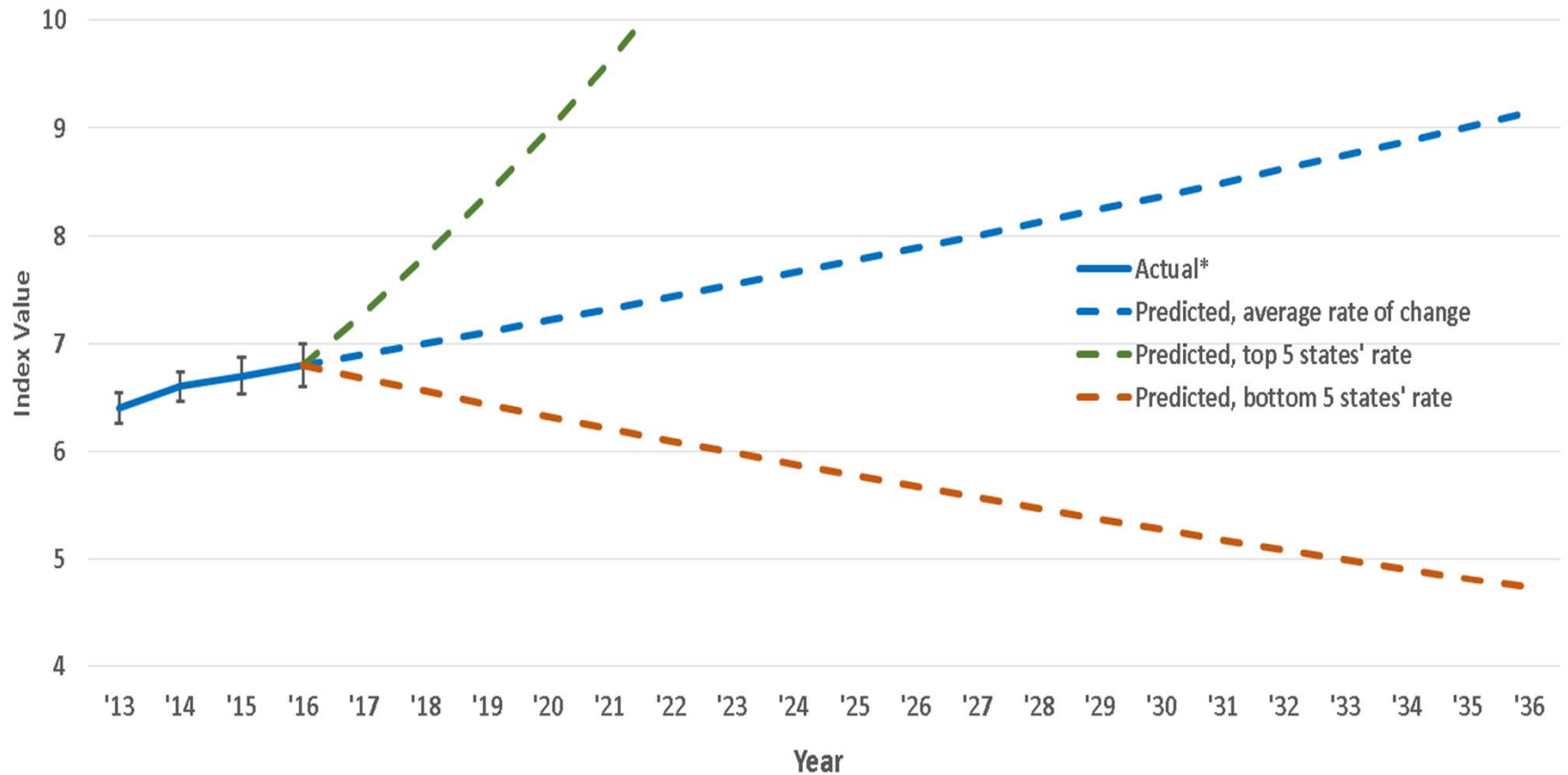
Unweighted
average

- National overall values

- Normalized to 0-10 scale using min-max scaling to preserve distributions
- Imputations based on multivariate longitudinal models
- Empirical weights based on Delphi expert panels
- Bootstrapped confidence intervals reflect sampling and measurement error
- Annual estimates for 2013-2016

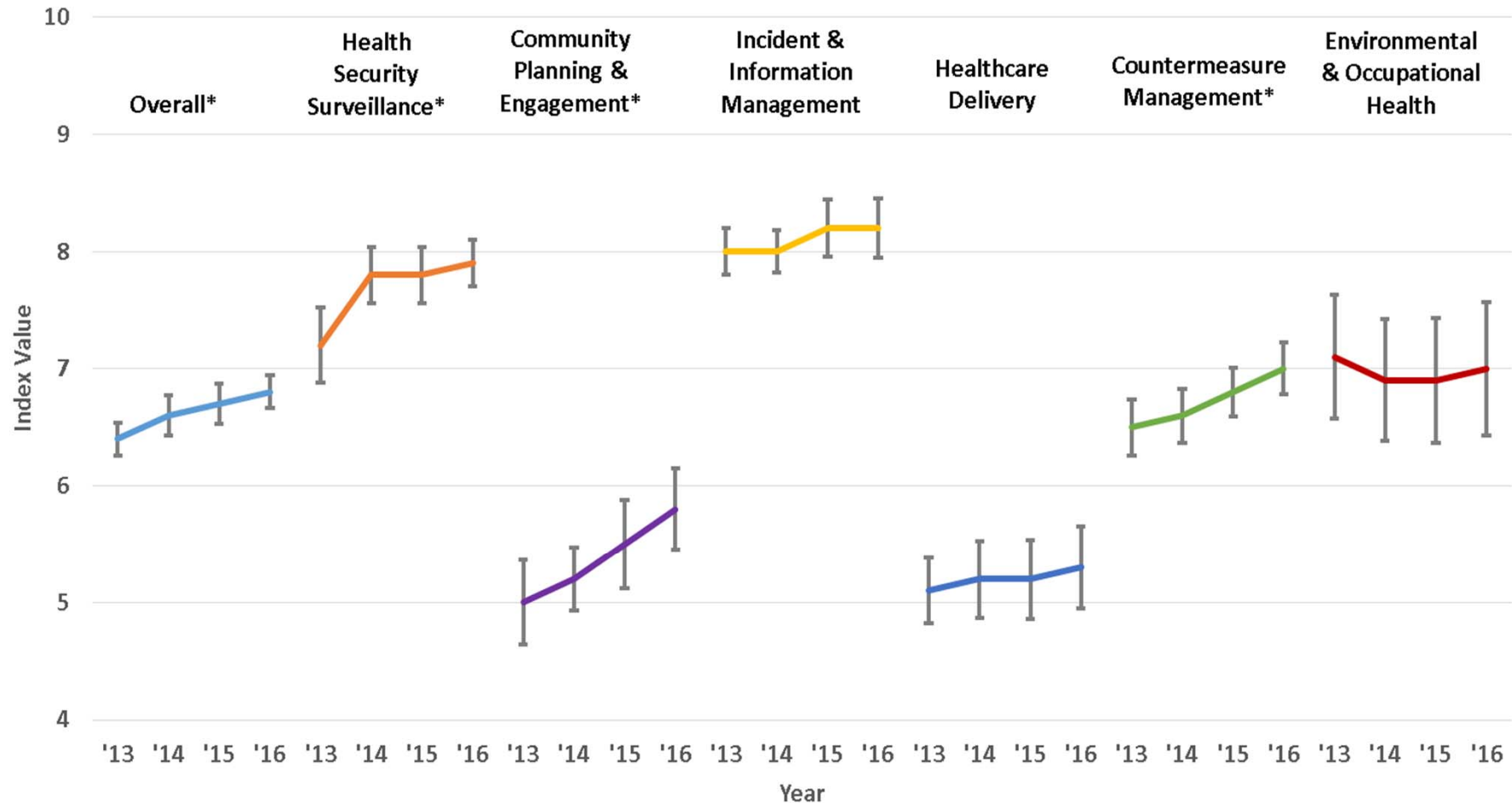
Reliability by Domain	Alpha
Health security surveillance	0.712
Community planning & engagement	0.631
Incident & information management	0.734
Healthcare delivery	0.596
Countermeasure management	0.654
Environmental/occupational health	0.749

Steady but slow progress



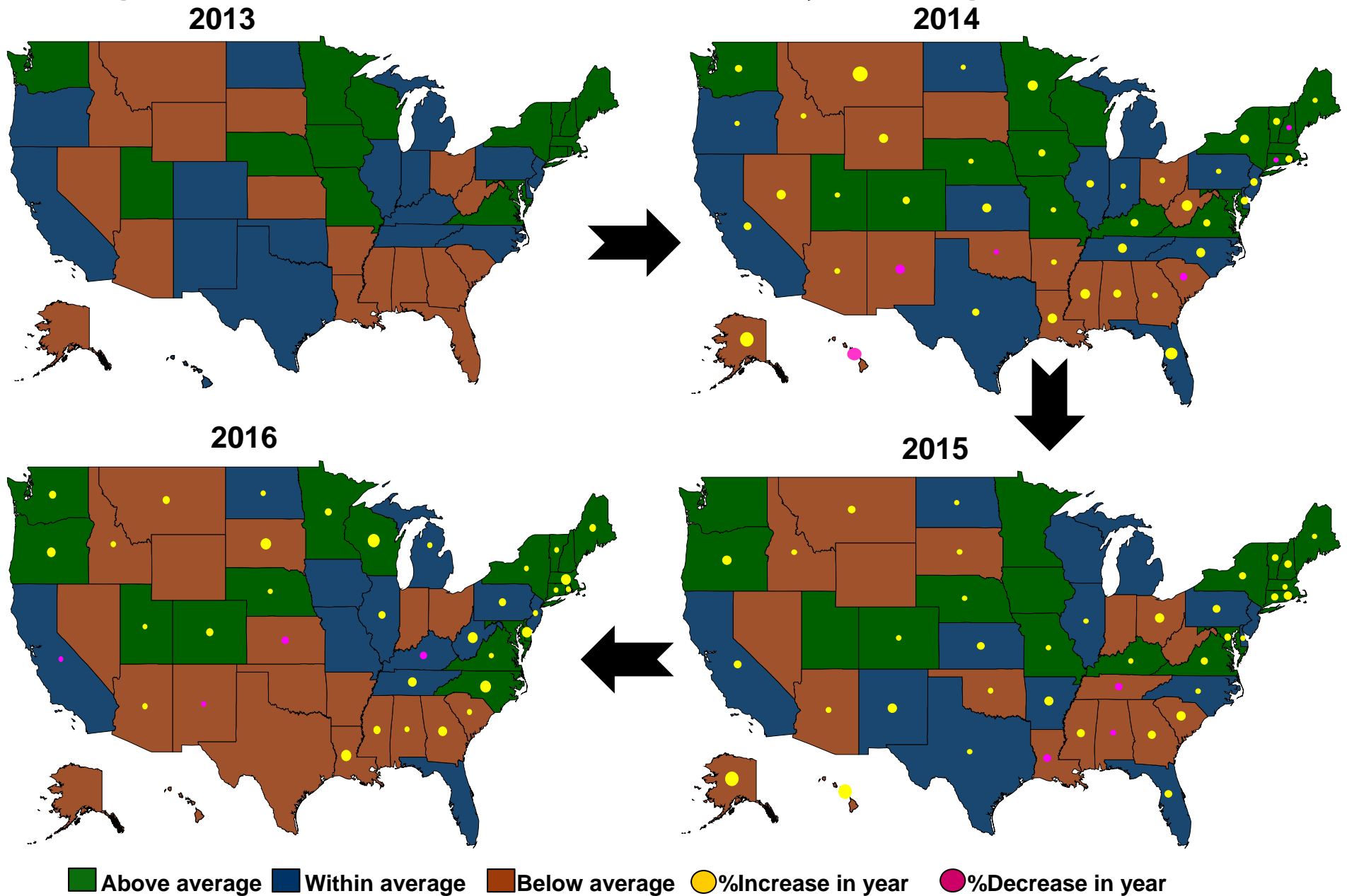
2017 Results

The U.S. improved in most domains during 2013-16, except healthcare delivery and environmental health



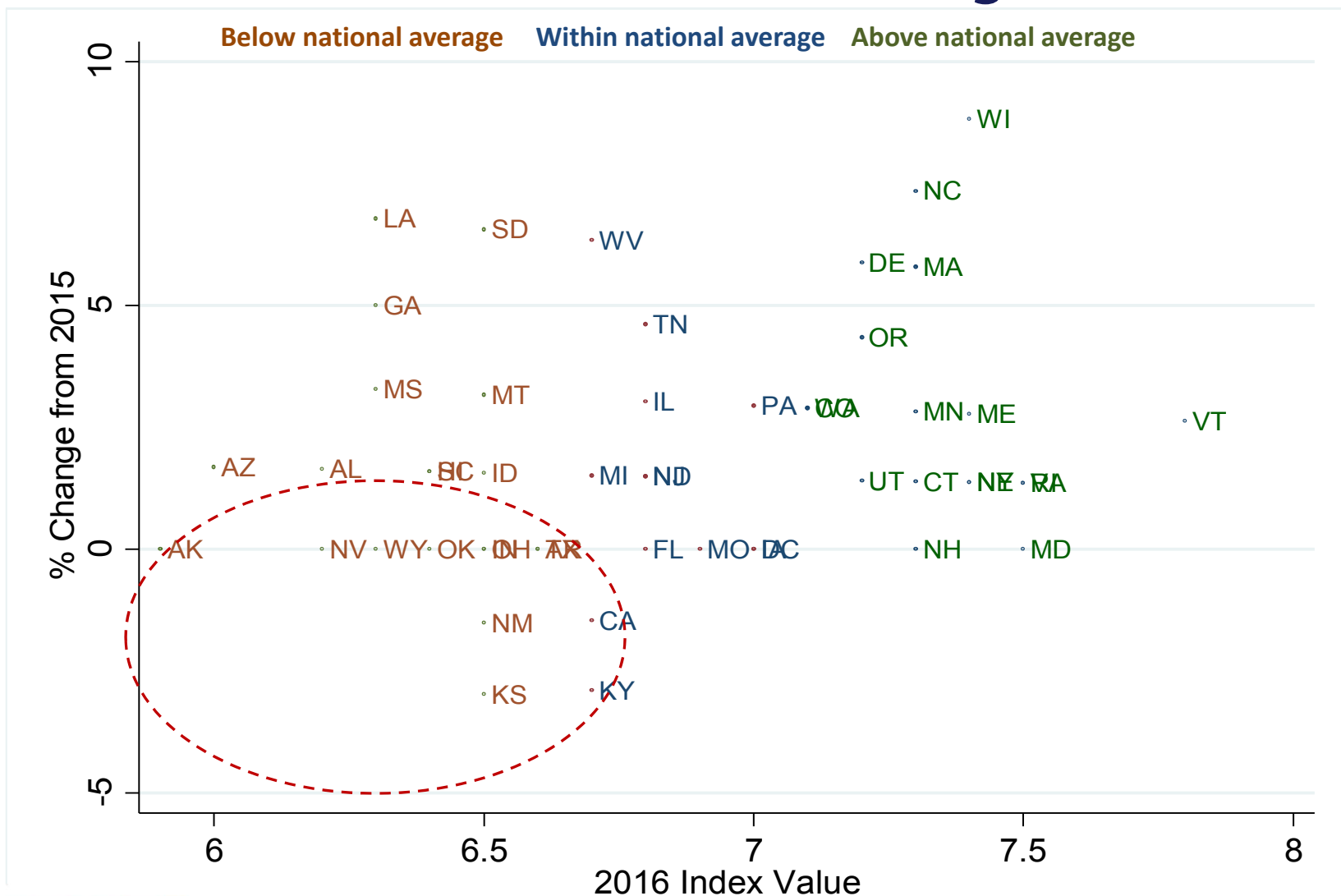
2017 Results

Geographic disparities in health security are large and persistent



2017 Results

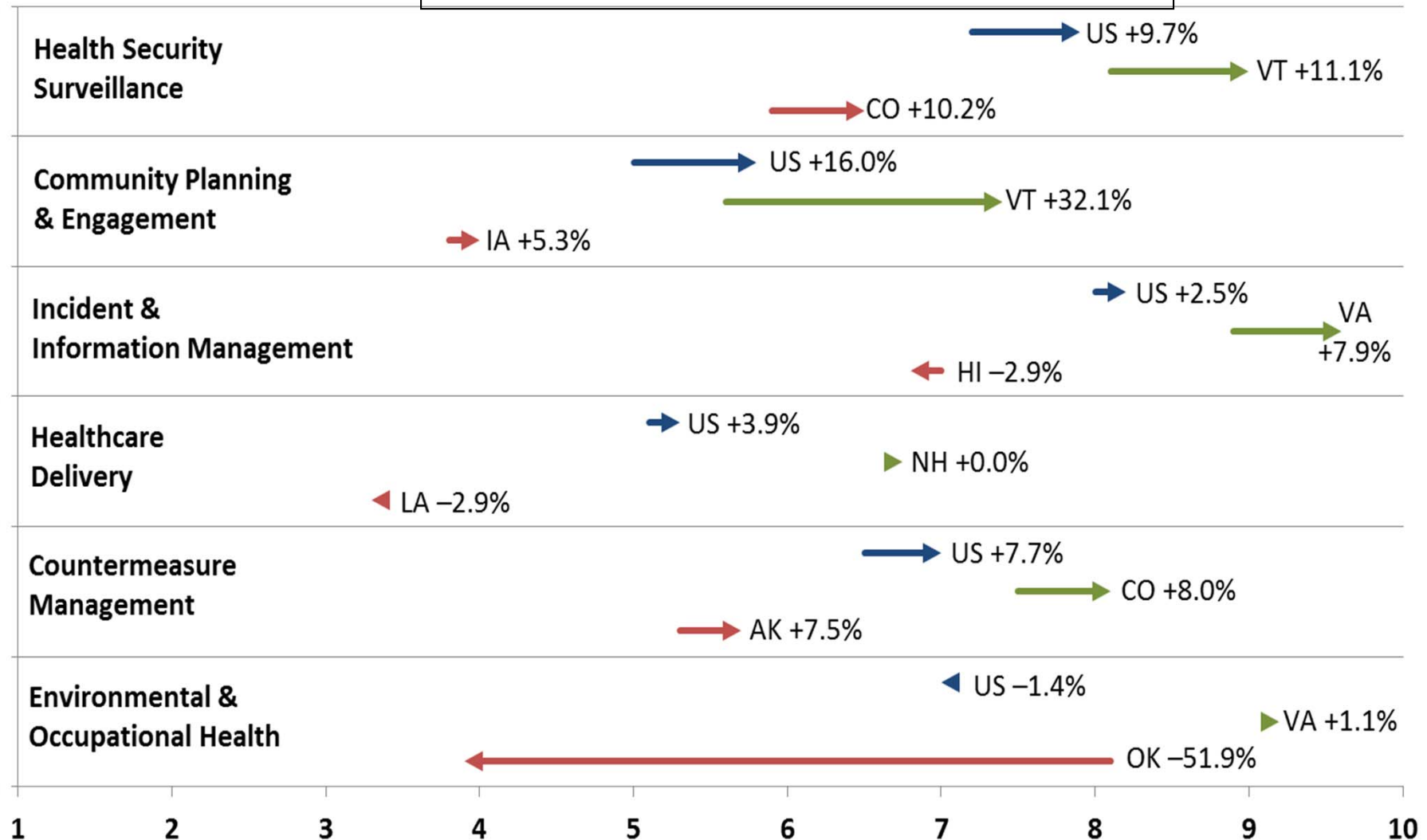
Improvements occurred across the U.S., but 12 states trailed or lost ground



2017 Results

Changes vary widely across states and domains

Lowest State | US Average | Highest State



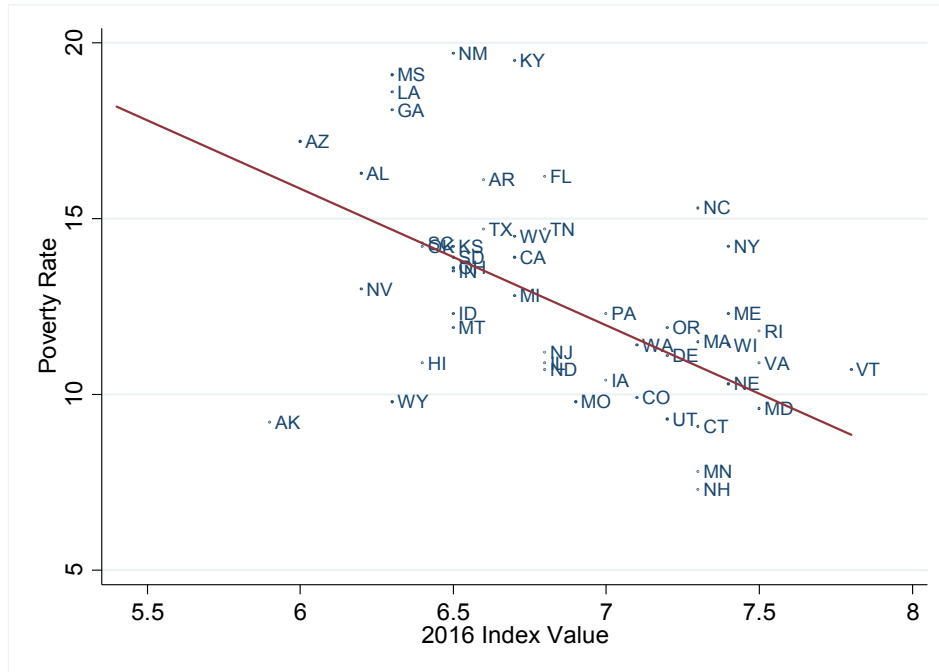
Index Values in 2013 and 2016



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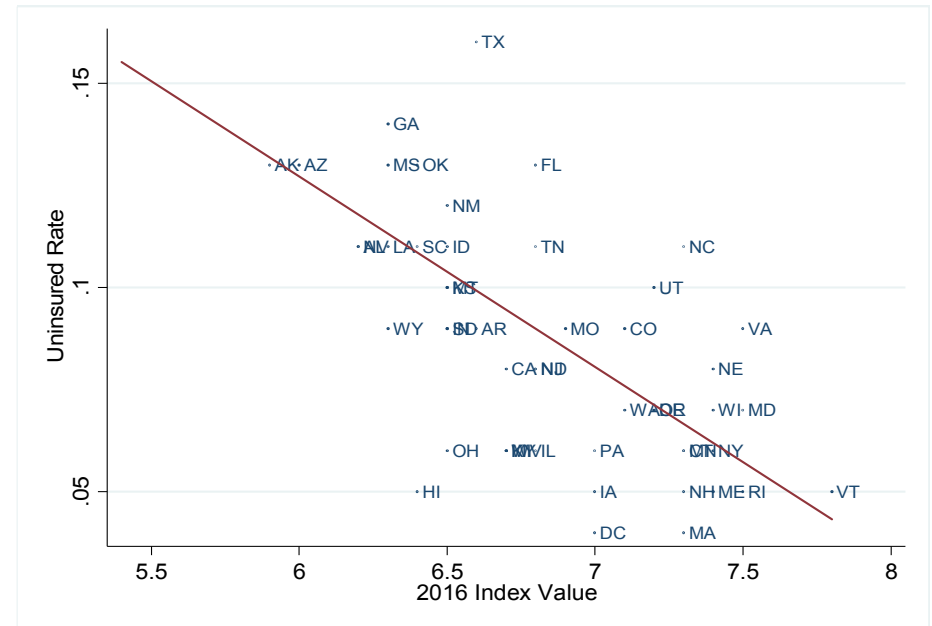
2017 Results

Health security tracks closely with social & economic determinants of health



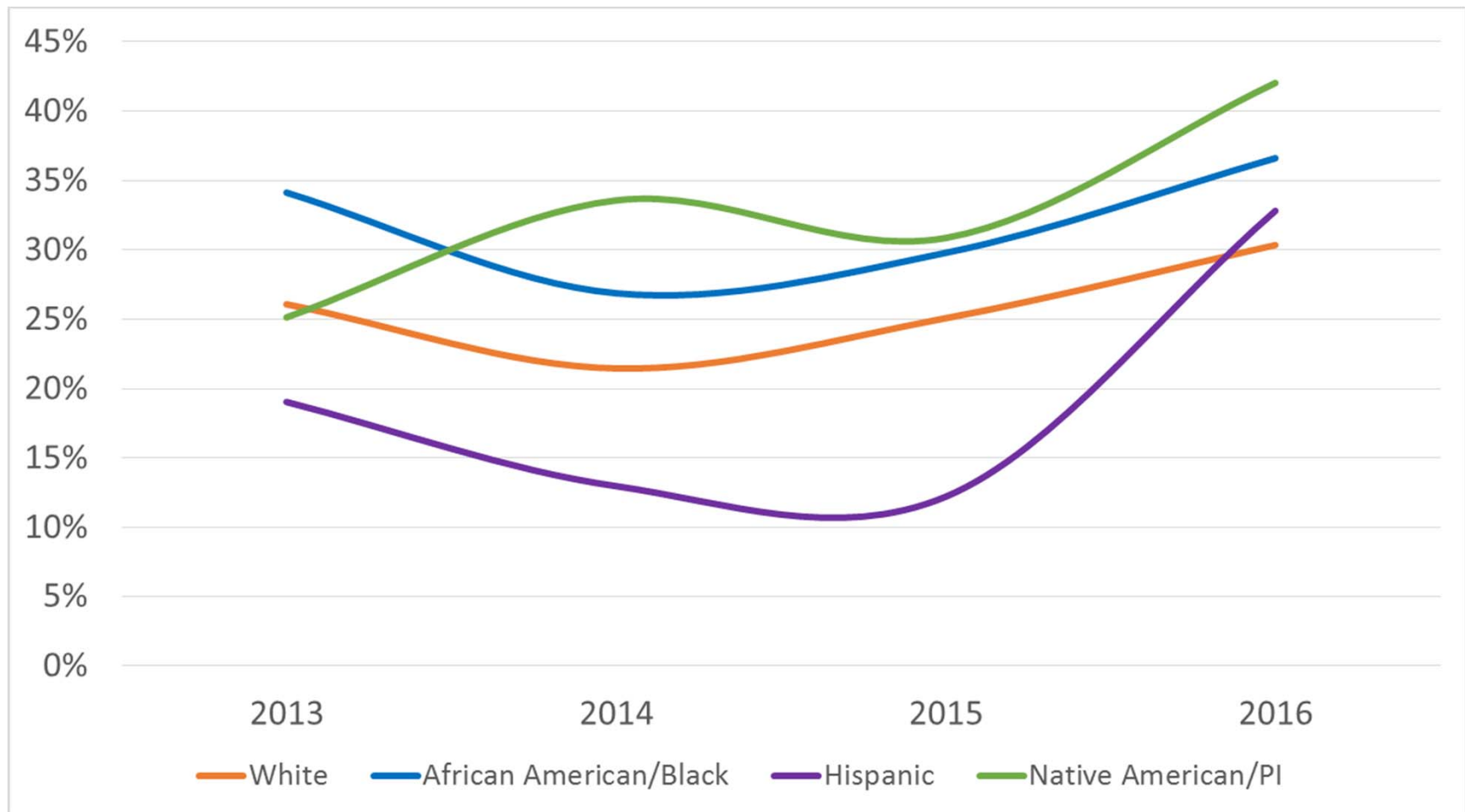
← Percent of population below federal poverty threshold

Percent of population with health insurance coverage →



Racial and ethnic inequities in health security

**Percent of population residing in a state
with below-average health security**



Relative Risk:

21%*

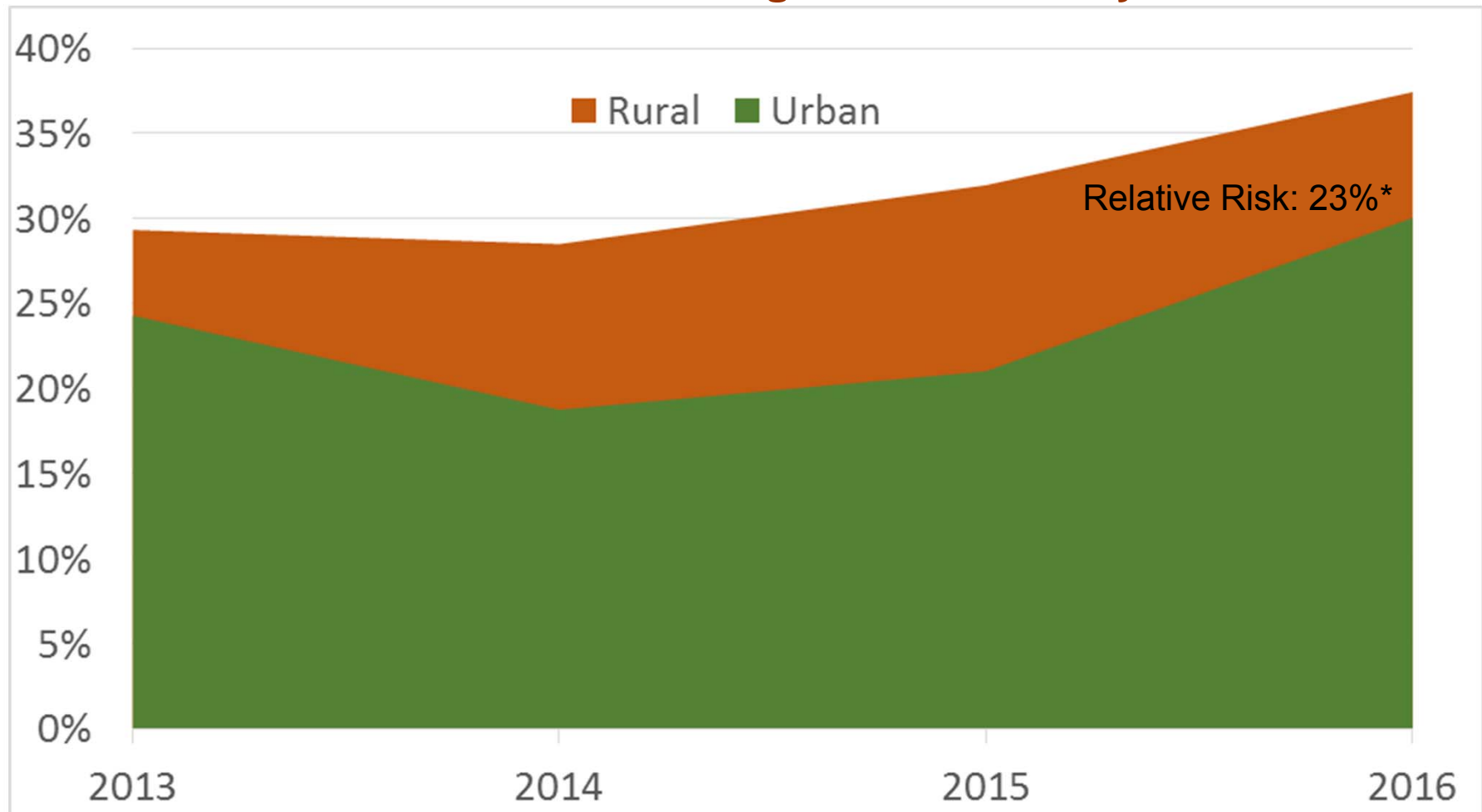
8%

38%*

*statistically significant difference

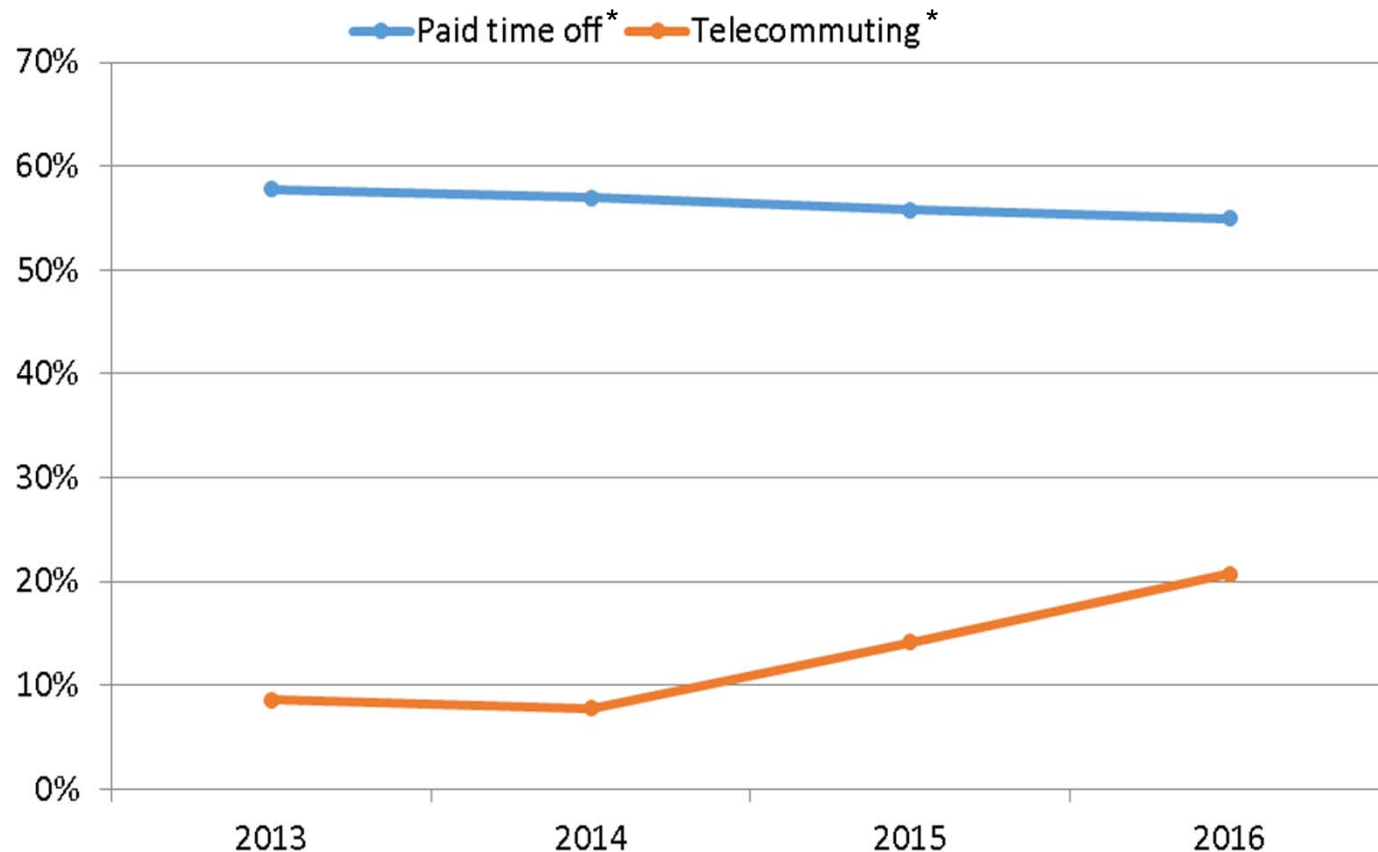
Rural-Urban differences in health security

Percent of population residing in a state
with below-average health security



Underlying drivers: occupational

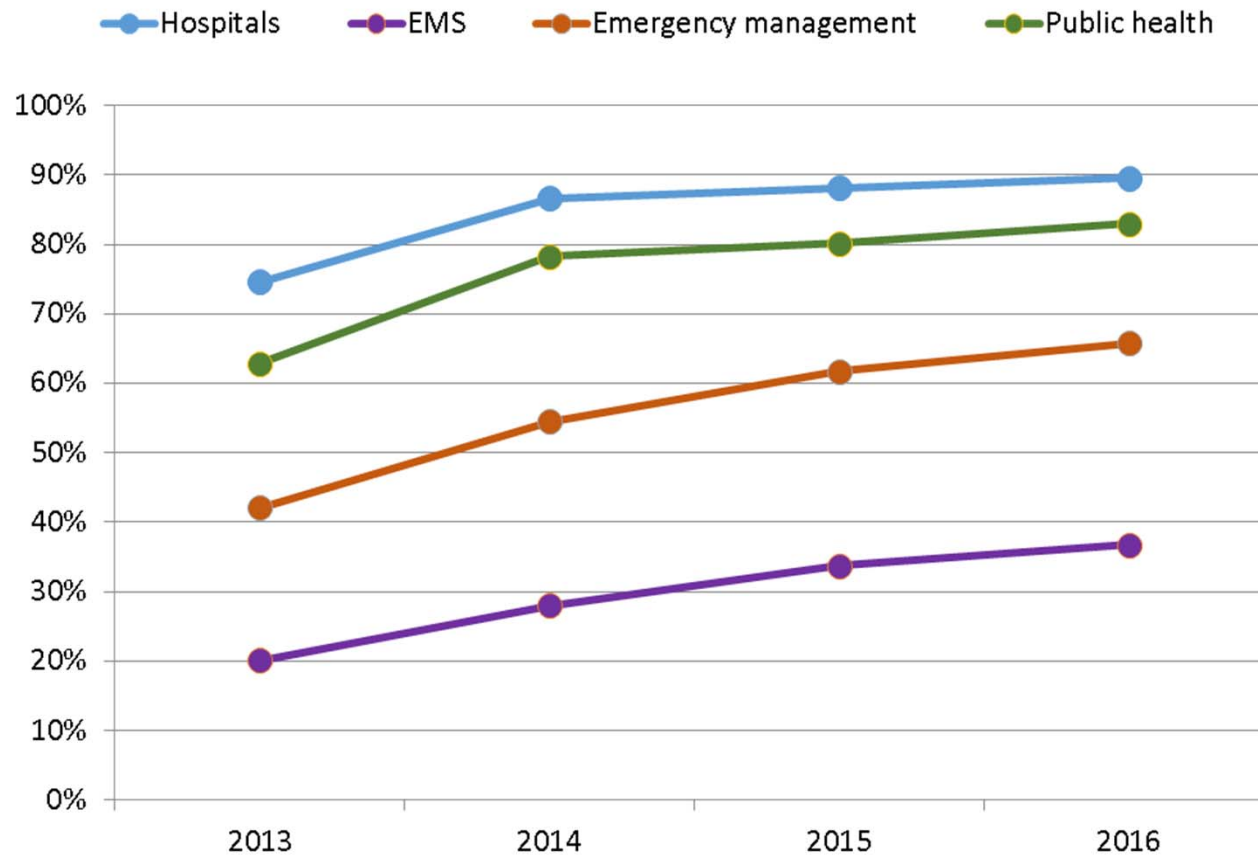
Percent of workers with paid sick leave and telecommuting opportunities



*statistically significant change

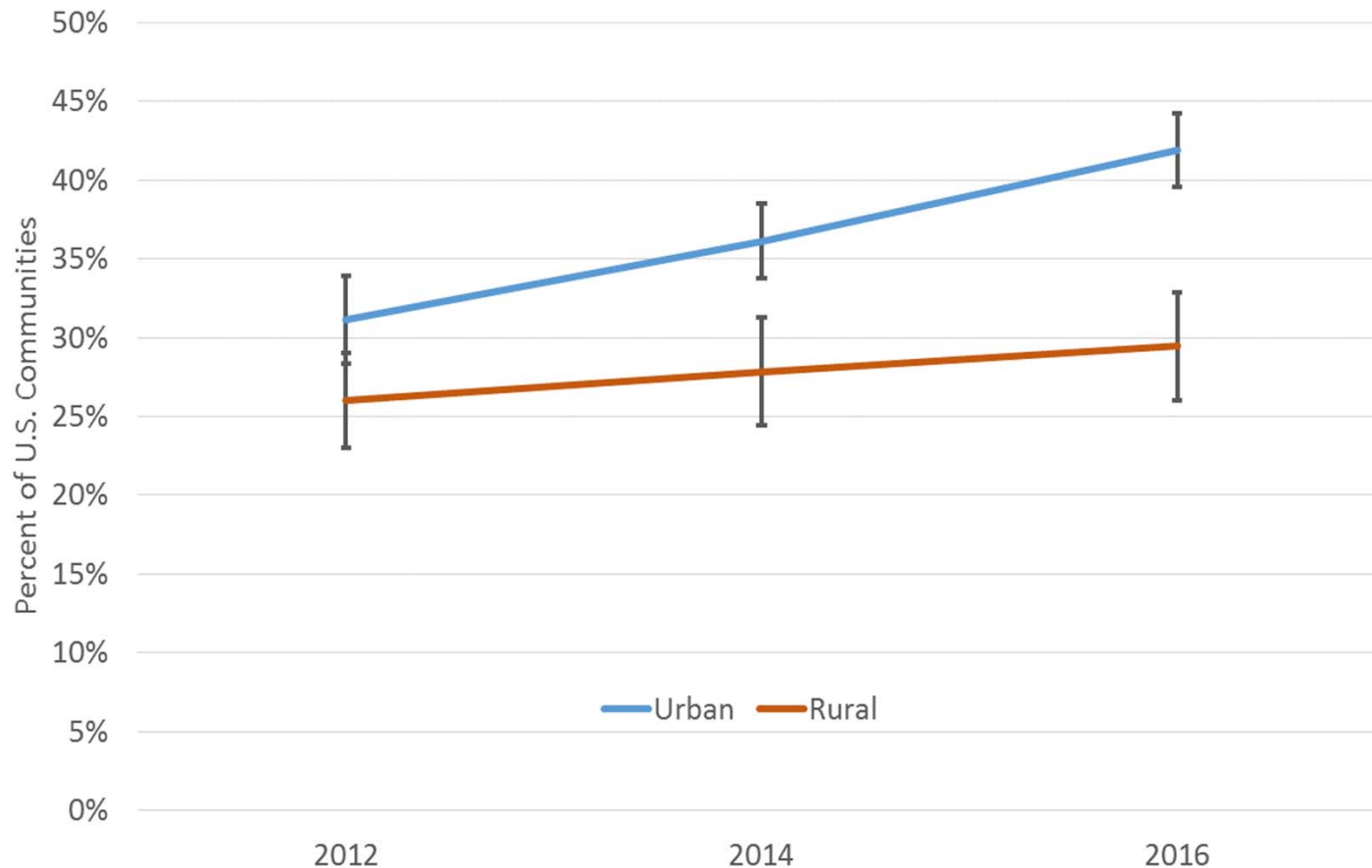
Underlying drivers: organizational

Participation in Healthcare Preparedness Coalitions



Underlying drivers: community and systems

Communities with Strong Multi-Sector Networks (Comprehensive Public Health Systems)



Closing gaps and inequities: Insights from the Index

- Build & connect existing networks and coalitions
- Engage the private sector
- Focus on low-resource states & settings
- Focus on stagnant and declining domains:
healthcare & environmental systems
- Include insurance coverage as a security strategy
- Allow for flexibility in allocation and use of resources

Caveats and cautions

- Imperfect measures & latent constructs
- Missing capabilities
- Timing and accuracy of underlying data sources

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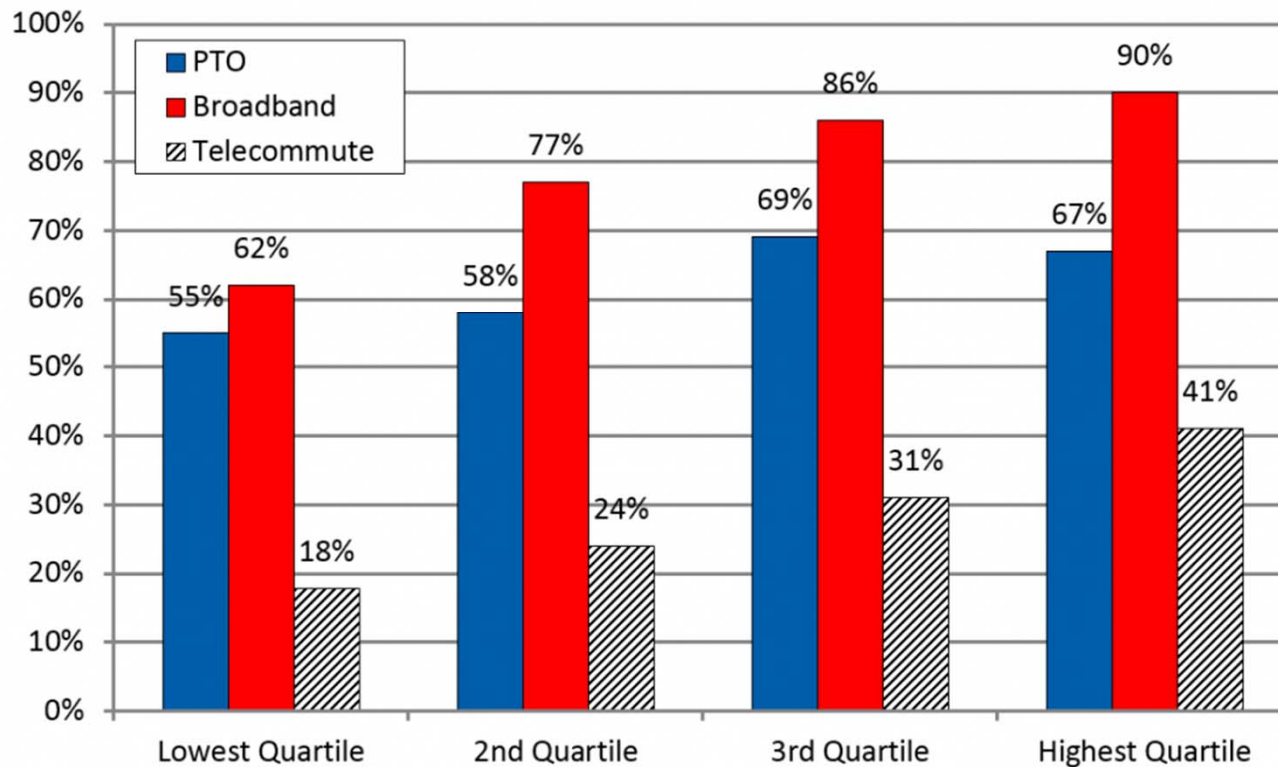
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Workplace Practices & Health Security

- Social distancing policies are efficacious
- Paid time off (PTO), Telecommuting, and broadband
- For prime working-age adults between 25 and 54 years old
 - an estimated 81 percent have broadband access at home
 - approximately 62 percent have some form of PTO
 - about 30 percent can telecommute when they are away from their usual workplace
- Analysis of Census data reveal important equity issues
 - Controlling for income, education, race, residence, age, and gender

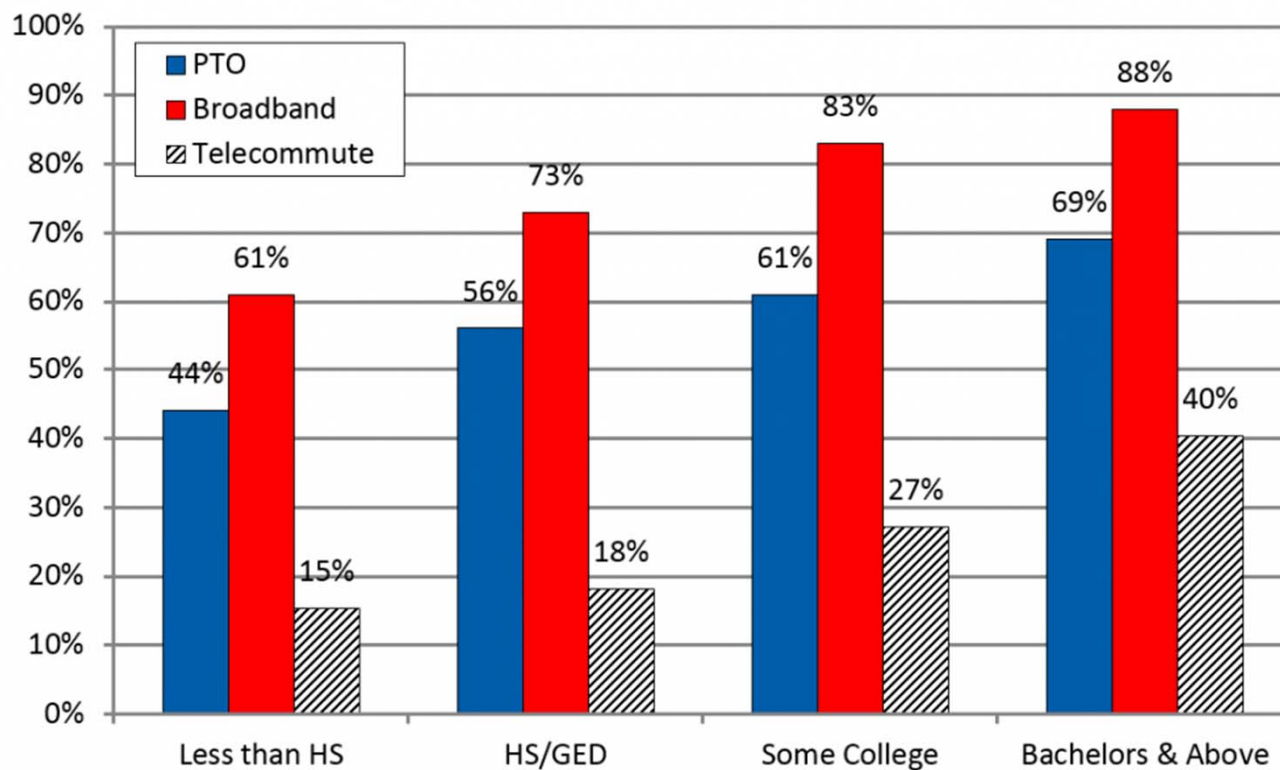
Independent Effect of Income

Figure 1: Estimated Relationship Between Income and Paid Time Off, Broadband at Home, & Telecommuting
(net effect of income, ages 25 to 54 years)



Independent Effect of Education

Figure 2: Estimated Relationship Between Education and Paid Time Off, Broadband at Home, & Telecommuting
(net effect of educational attainment, ages 25 to 54 years)



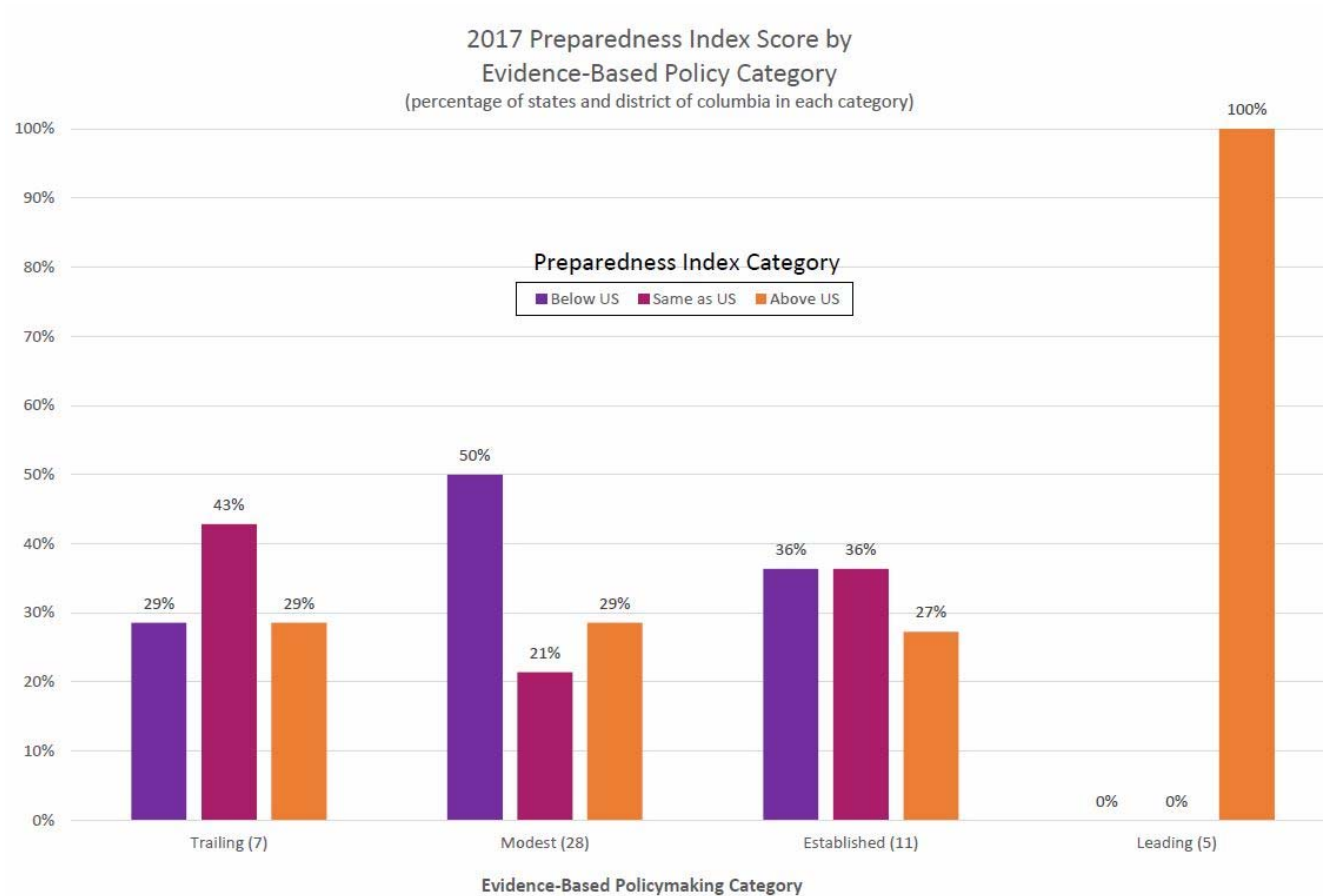
Workplace Practices & Health Security

- This analysis illustrates how the less advantaged can be affected differently by disease outbreaks, disasters, and large-scale emergencies—and how workplace practices can either exacerbate or ameliorate health security.
 - See blog at: <http://nhspi.org/blog/a-potentially-unhealthy-mix-how-workplace-practices-can-either-enhance-or-exacerbate-health-preparedness/>

Evidence-Based Planning & Health Security

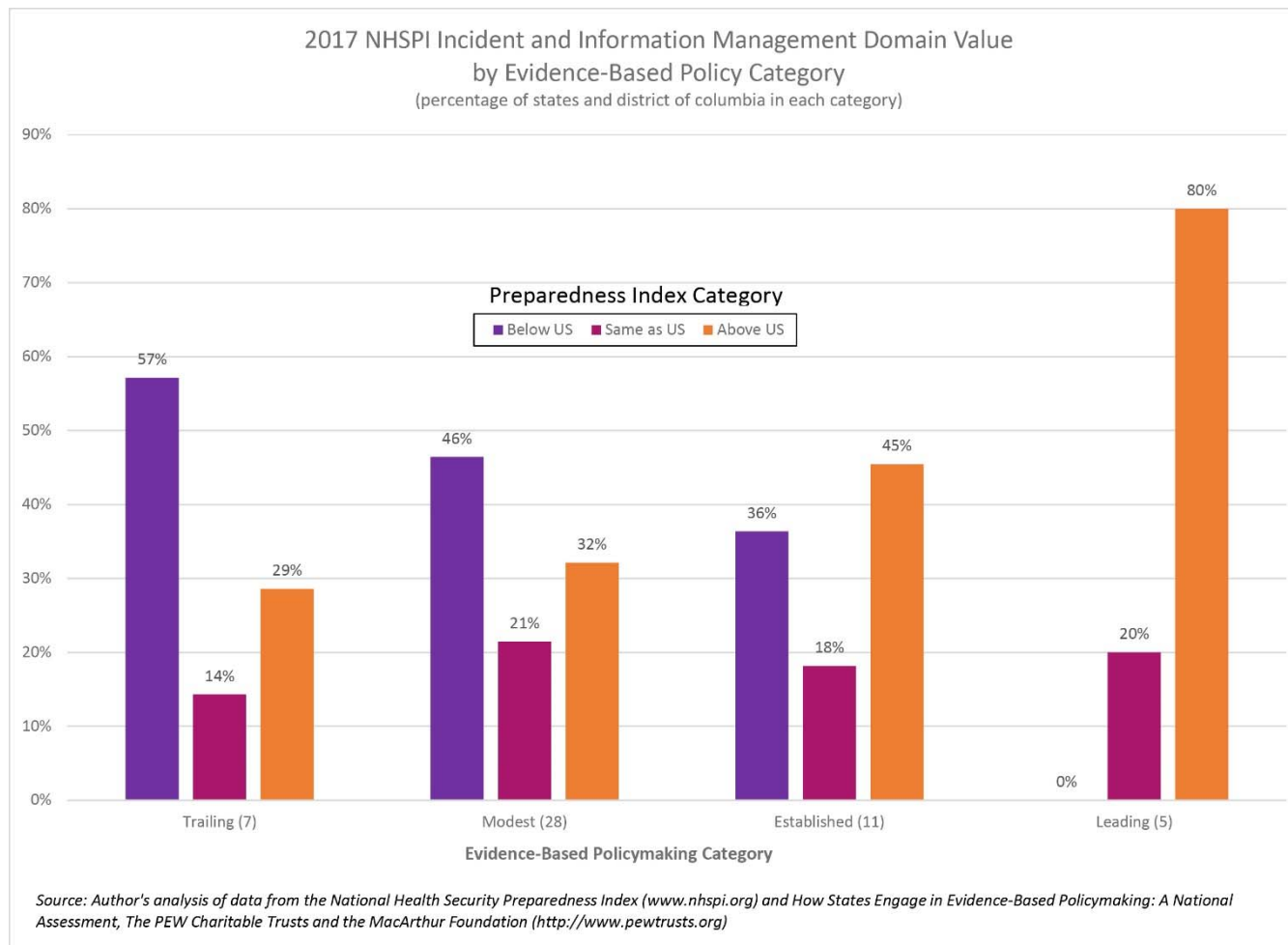
- Planning is integral to the Index
 - By item measure, subdomain, and domain
- What about a wider culture of planning at the state level?
 - January 2017 Pew/MacArthur Foundation Report, “How States Engage in Evidence-Based Policymaking”
 - Assess state-level EBP and categorize states into one of four groups: Trailing (7), Modest (28), Established (11), Leading (5)
- To what extent is a culture of planning related to increased health security?

2017 Index Overall

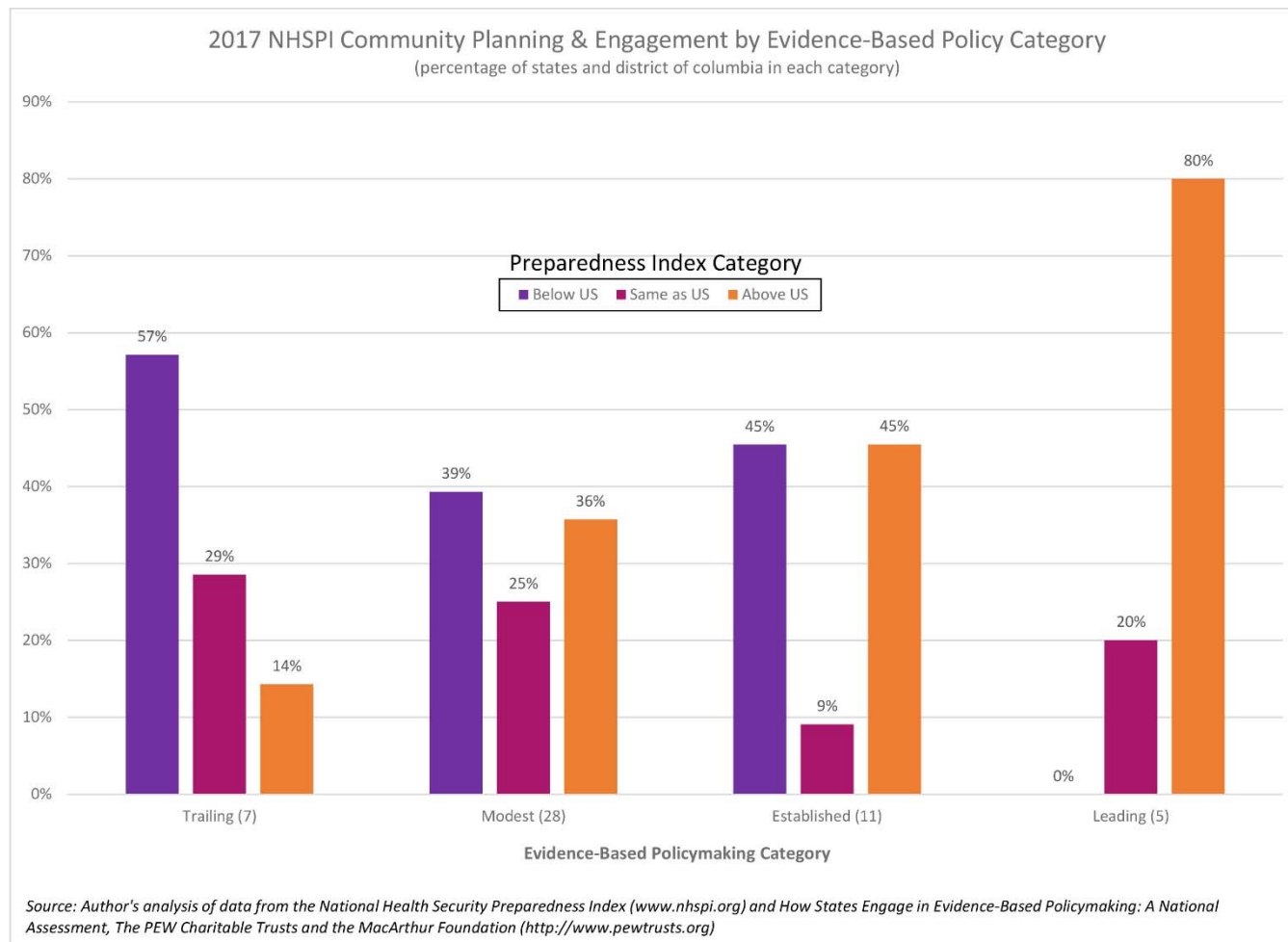


Source: Author's analysis of data from the National Health Security Preparedness Index (www.nhspi.org) and How States Engage in Evidence-Based Policymaking: A National Assessment, The PEW Charitable Trusts and the MacArthur Foundation (<http://www.pewtrusts.org>)

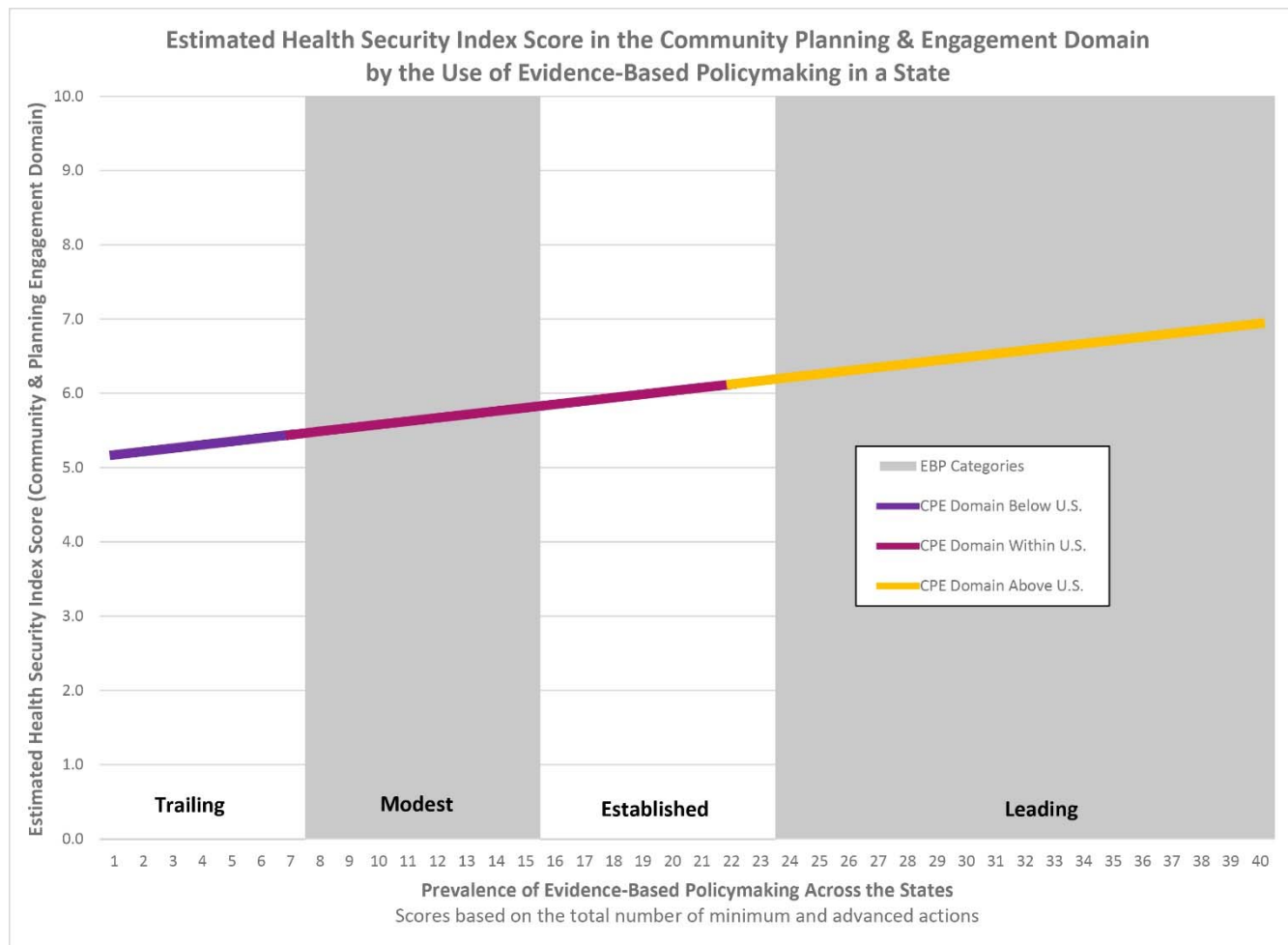
Incident & Information Management Domain



Community Planning & Engagement Domain



Community Planning & Engagement Domain



Evidence-Based Planning & Health Security

- The independent effect of EBP on Community Planning and Engagement is substantively and statistically significant
 - $CPE = f(EBP, PCIncome, \text{Long-term Financial Obligations})$
 - More EBP = Higher CPE
- Building support for evidence-based policymaking (source: Pew & MacArthur)
 - Facilitating dialogue
 - Creating strong data infrastructure
 - Building analytical and technical capacity

For More Information



National Program Office

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Systems for Action

National Coordinating Center

Systems and Services Research to Build a Culture of Health

