

Five Years of Measuring Health Security: Steady but Uneven Progress

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Health security requires **collective actions** across many activities and sectors

- Surveillance
- Environmental monitoring
- Laboratory testing
- Communication systems
- Response planning
- Incident management
- Emergency response
- Surge capacity
- Management & distribution of countermeasures
- Continuity of healthcare delivery
- Community engagement
- Workforce protection
- Volunteer management
- Education & training
- Drills & exercises
- Information exchange
- Evacuation & relocation
- Infrastructure resiliency
- Protections for vulnerable populations

Why a Health Security Index?

Track national progress in health security as a **shared responsibility across sectors**

- Raise public awareness
- Identify strengths and vulnerabilities
- Detect gains and losses
- Encourage coordination & collaboration
- Facilitate planning & policy development
- Support benchmarking & quality improvement
- Stimulate research & innovation



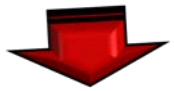
Measurement: National Health Security Index

- 140 individual measures, 59 data sources



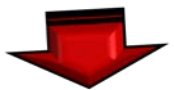
Weighted
average

- 19 subdomains



Weighted
average

- 6 domains



Weighted
average

- State overall values



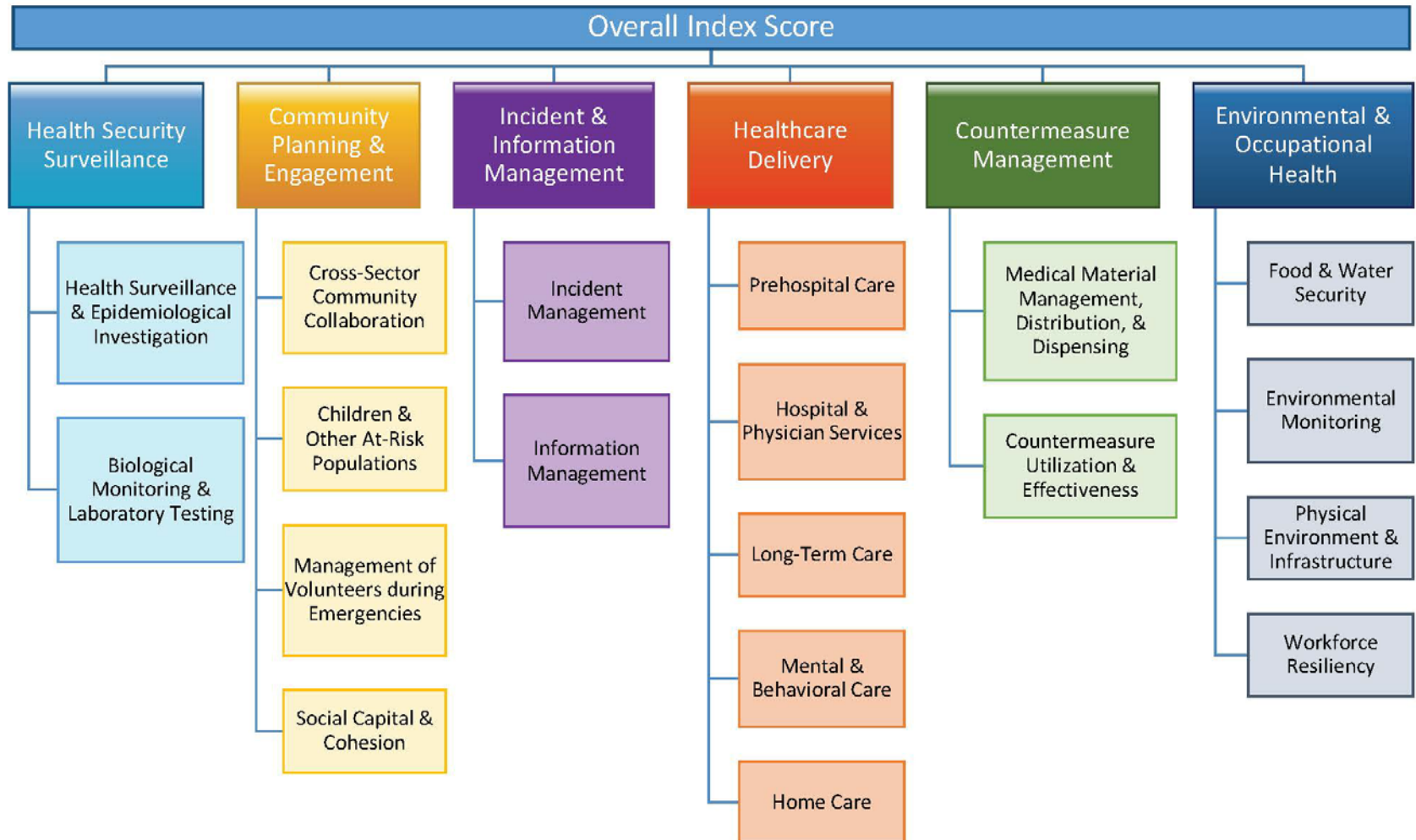
Unweighted
average

- National overall values

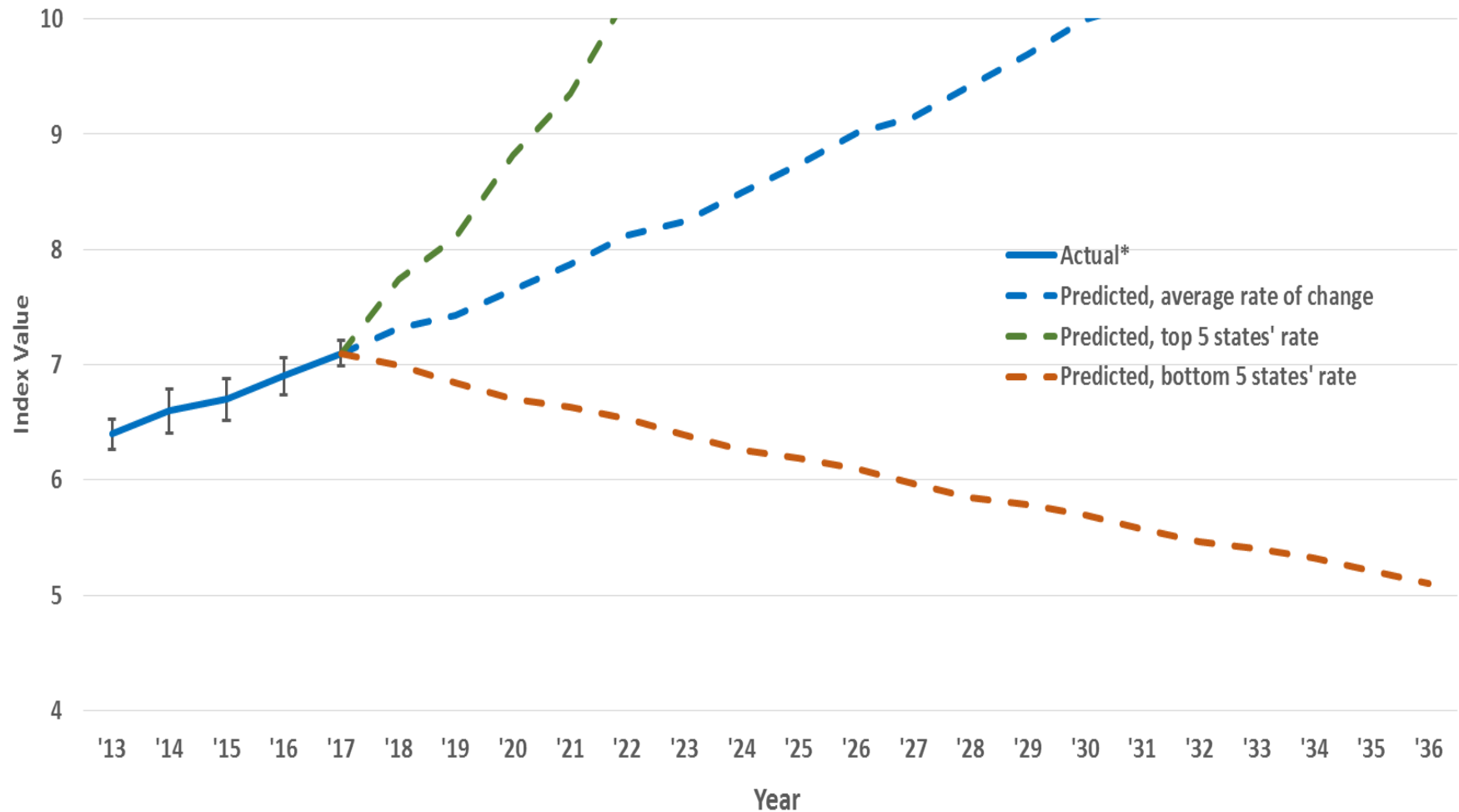
- Normalized to 0-10 scale using min-max scaling to preserve distributions
- Imputations based on multivariate longitudinal models
- Empirical weights based on Delphi expert panels
- Bootstrapped confidence intervals reflect sampling and measurement error
- Annual estimates for 2013-2016

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

Index measurement domains & subdomains

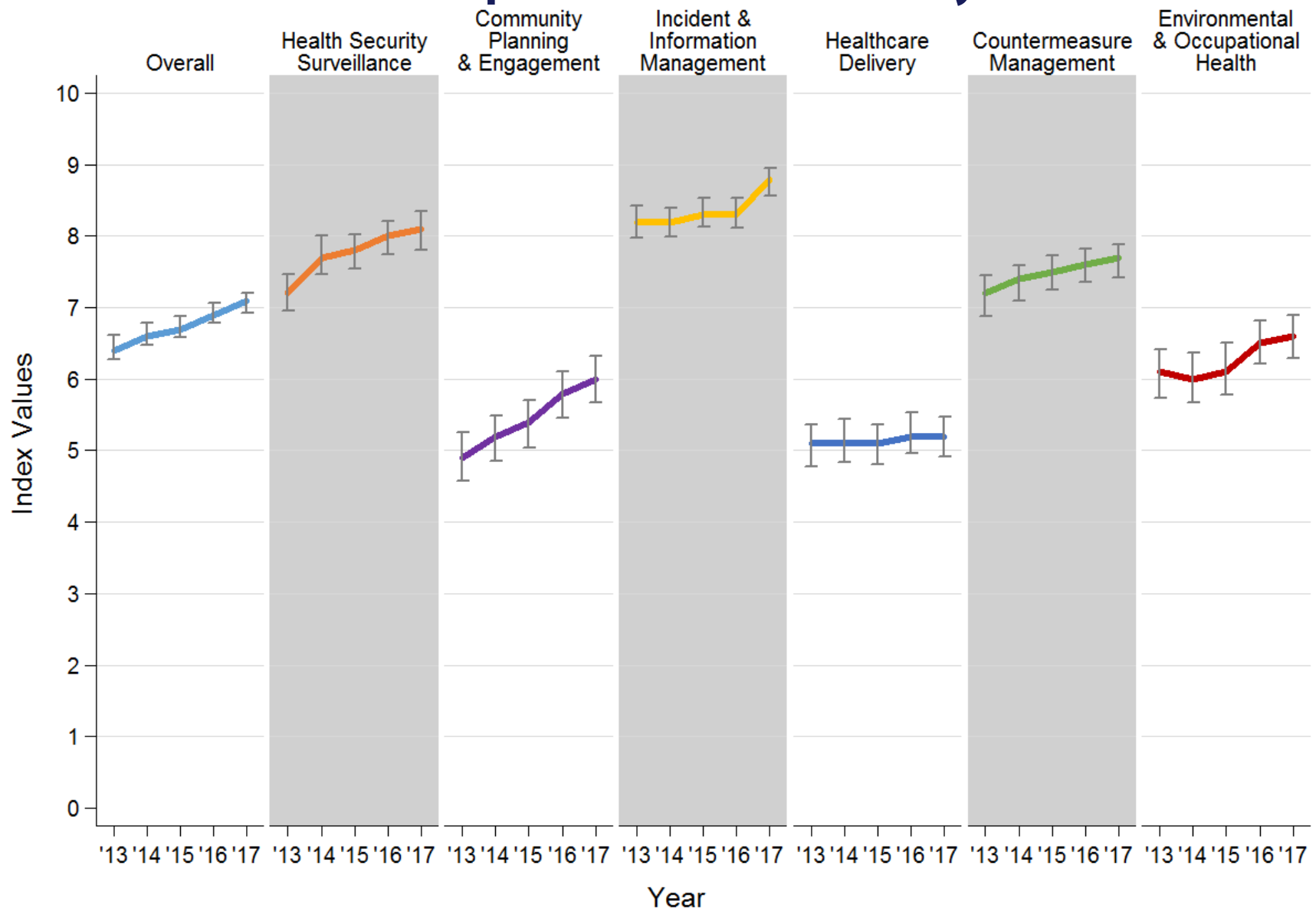


Steady progress, uneven pace



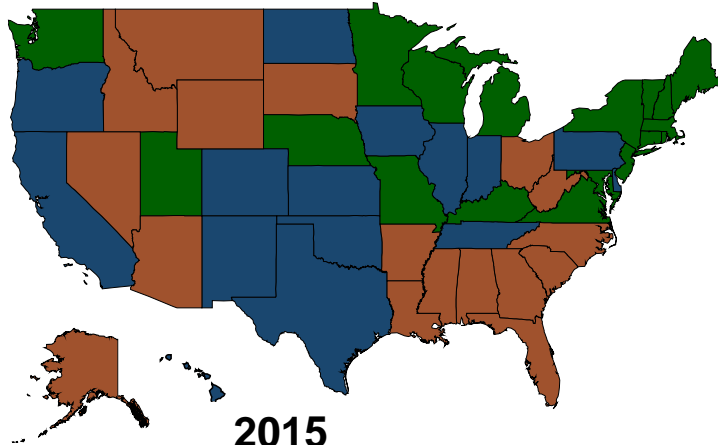
*statistically significant change

The U.S. improved in most domains during 2013-17, except healthcare delivery

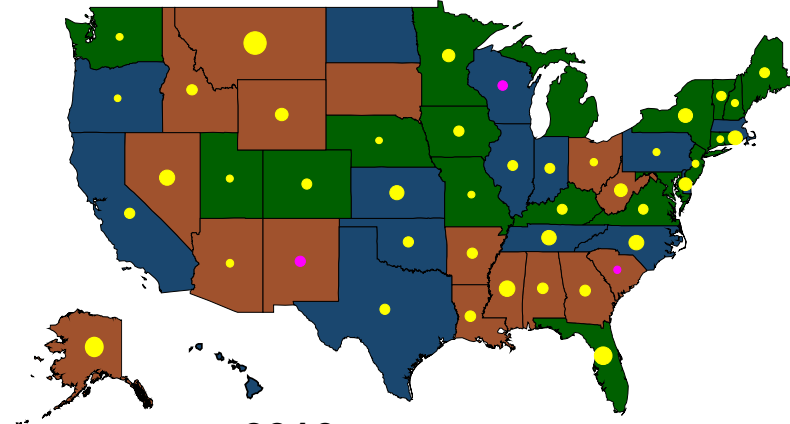


Geographic differences in health security are large and growing

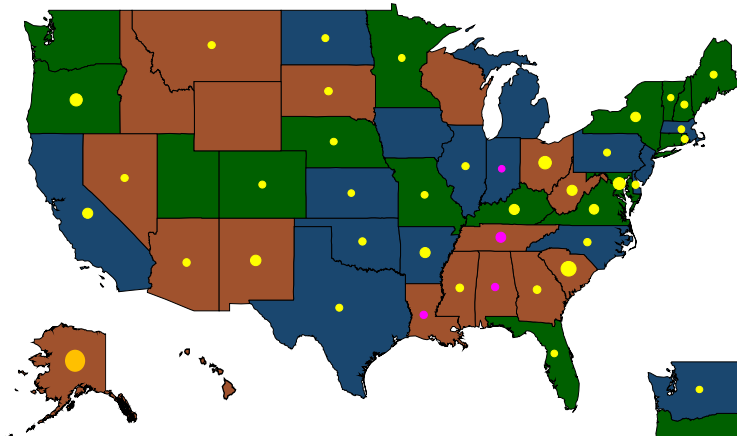
2013



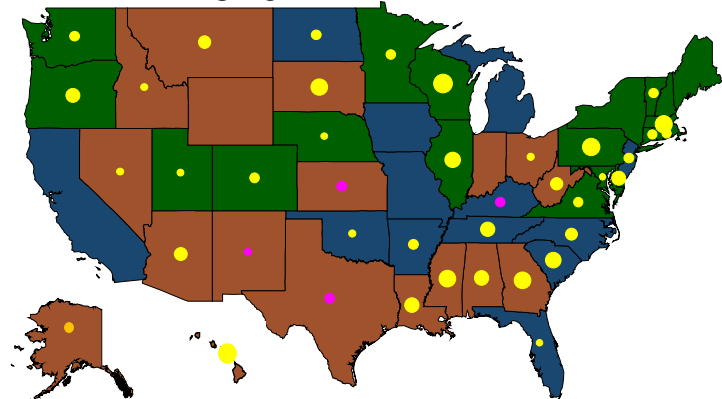
2014



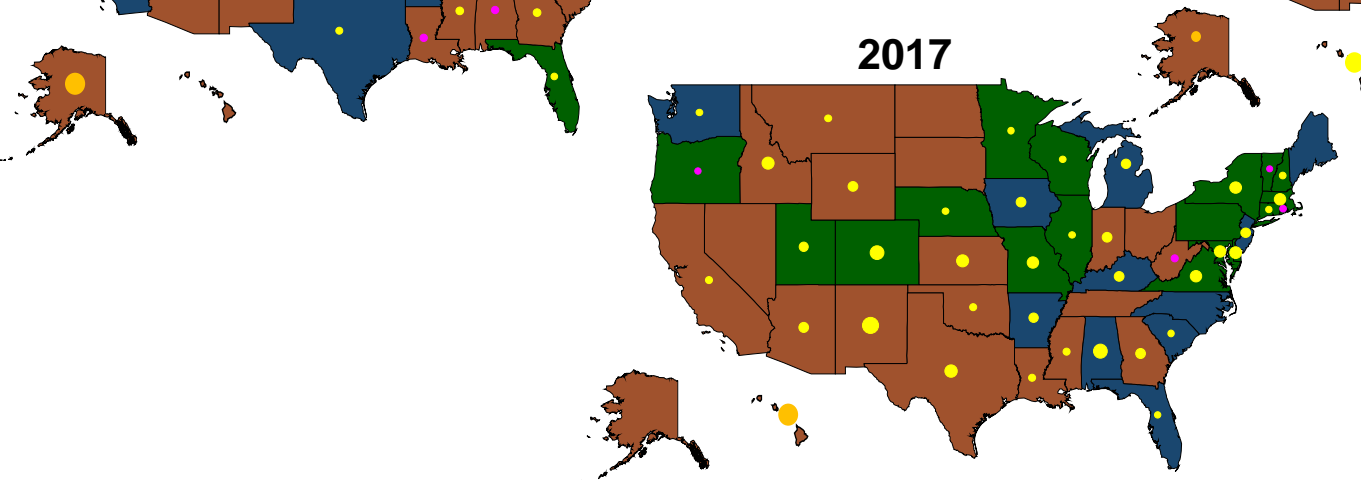
2015



2016

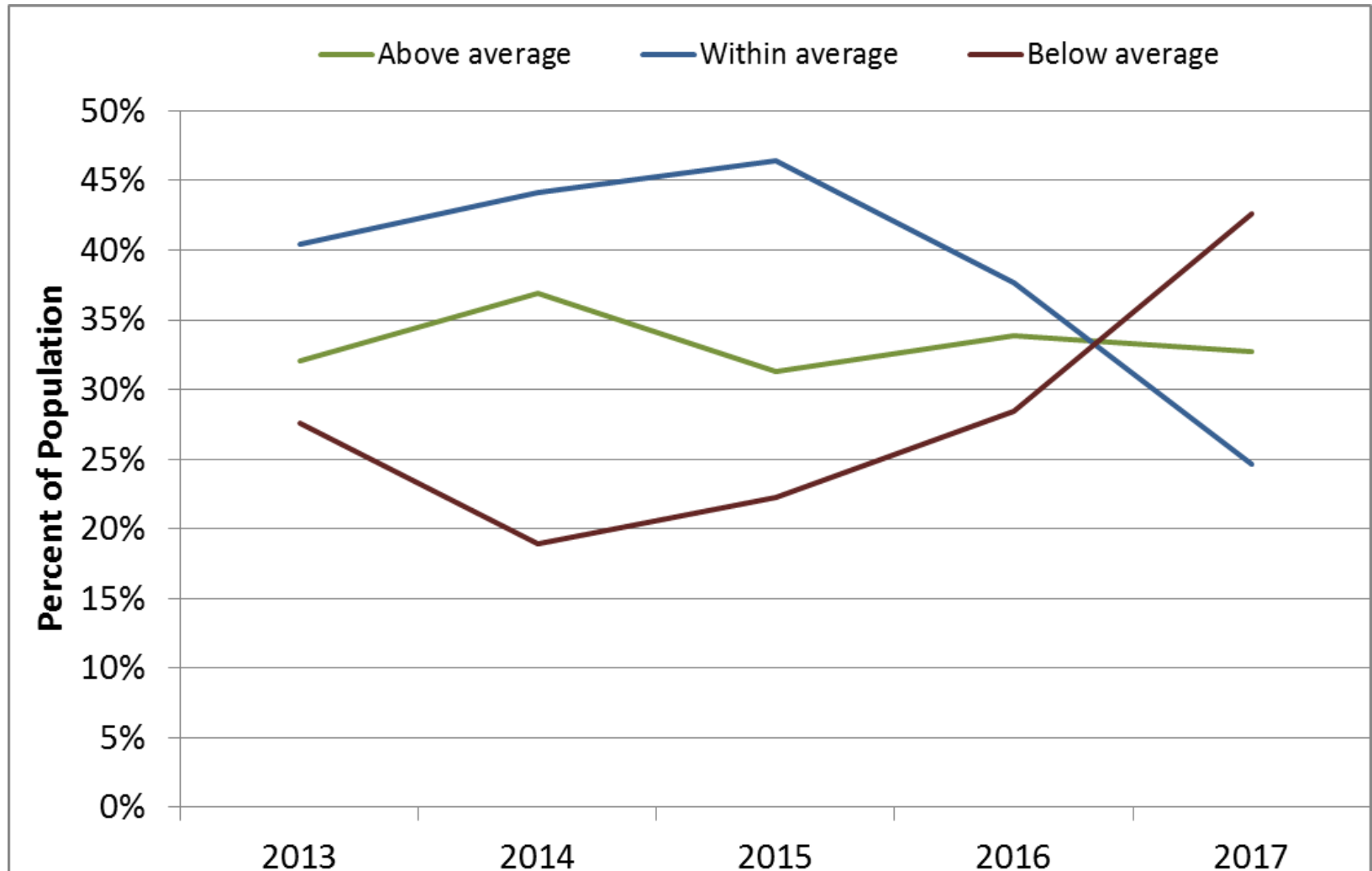


2017

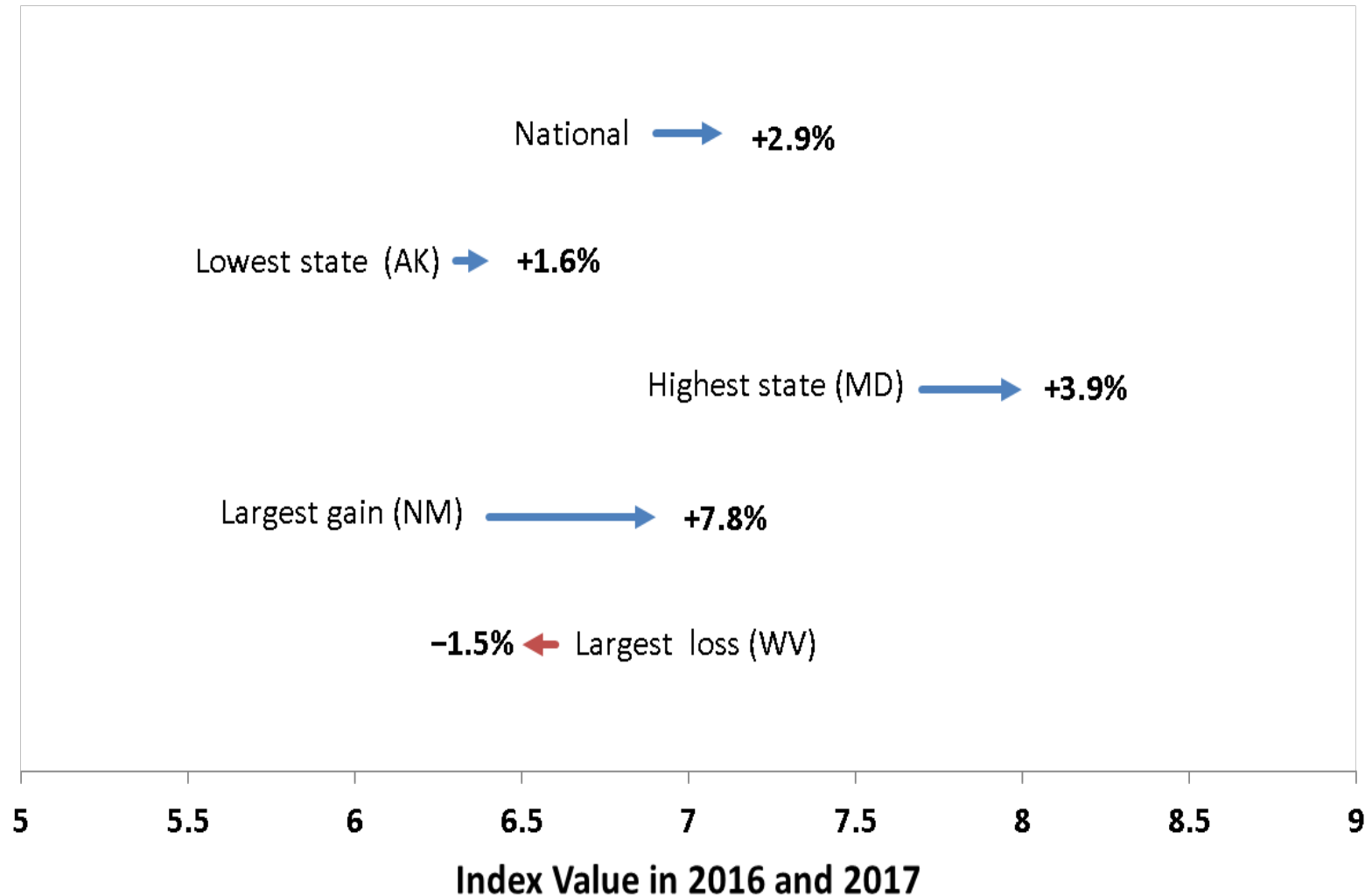


- % increase from prior year
- % decrease from prior year
- Above national average
- Within national average
- Below national average

A growing share of US residents live in regions with below-average health security



Gains in health security far surpassed losses

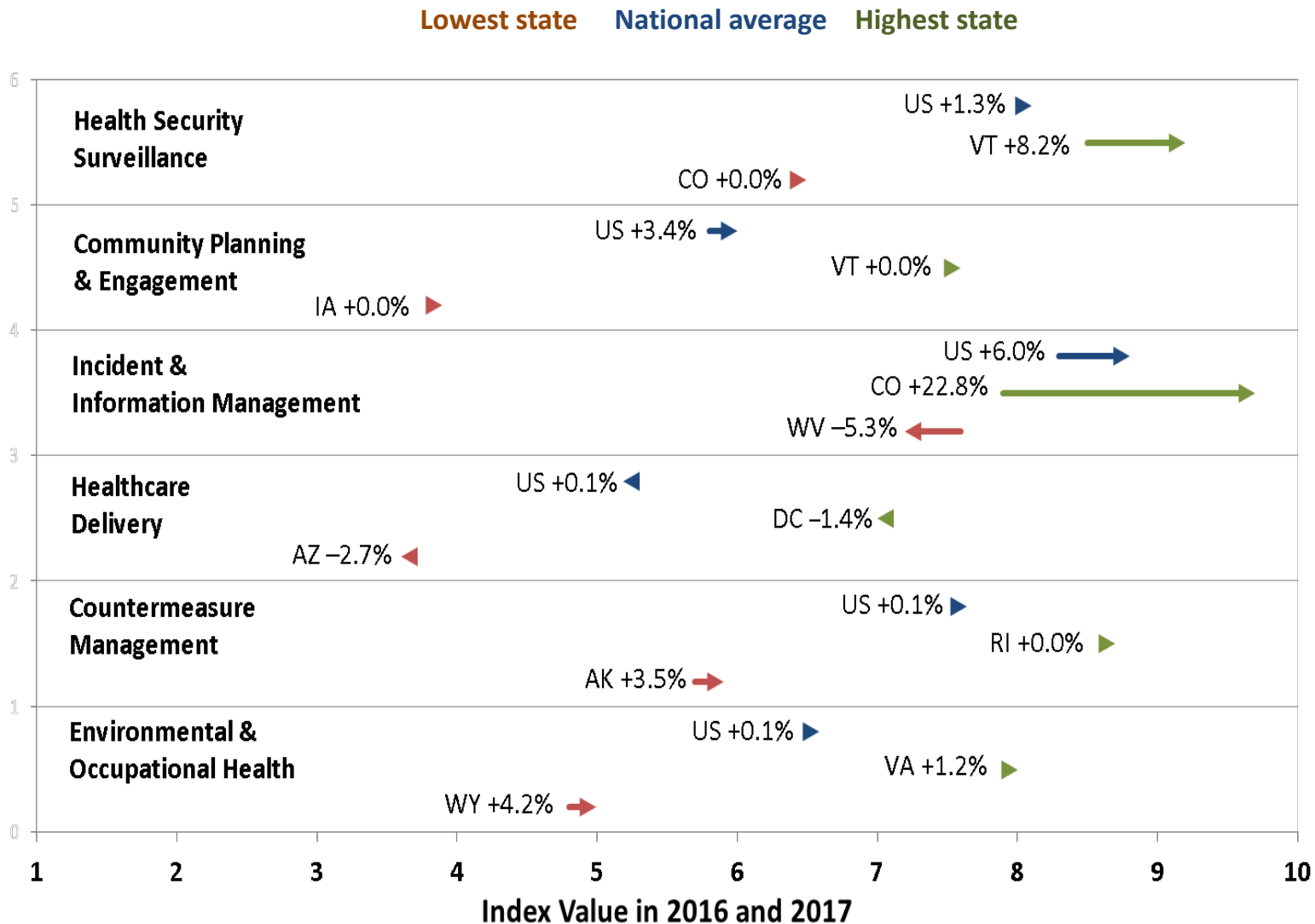


Improvements occurred across the U.S., but 12 states were steady or lost ground

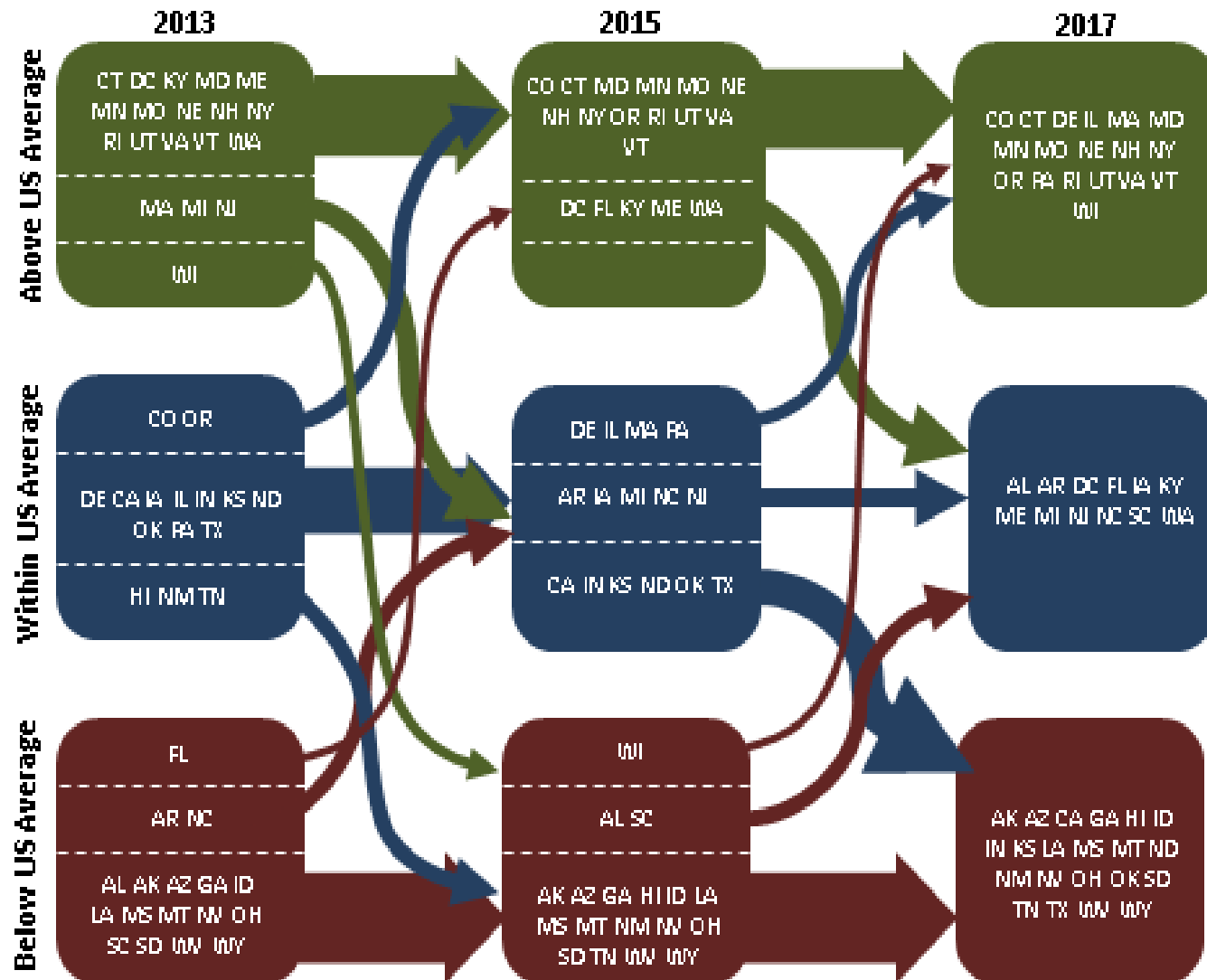
Below national average Within national average Above national average



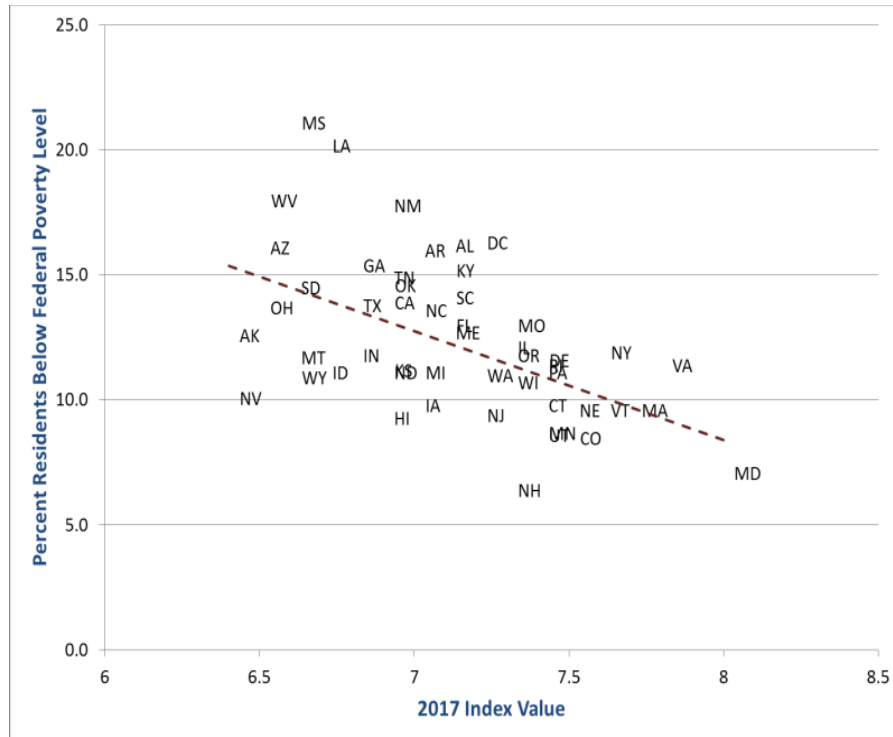
Changes in health security varied widely by domain



State transitions health security levels are common & bidirectional

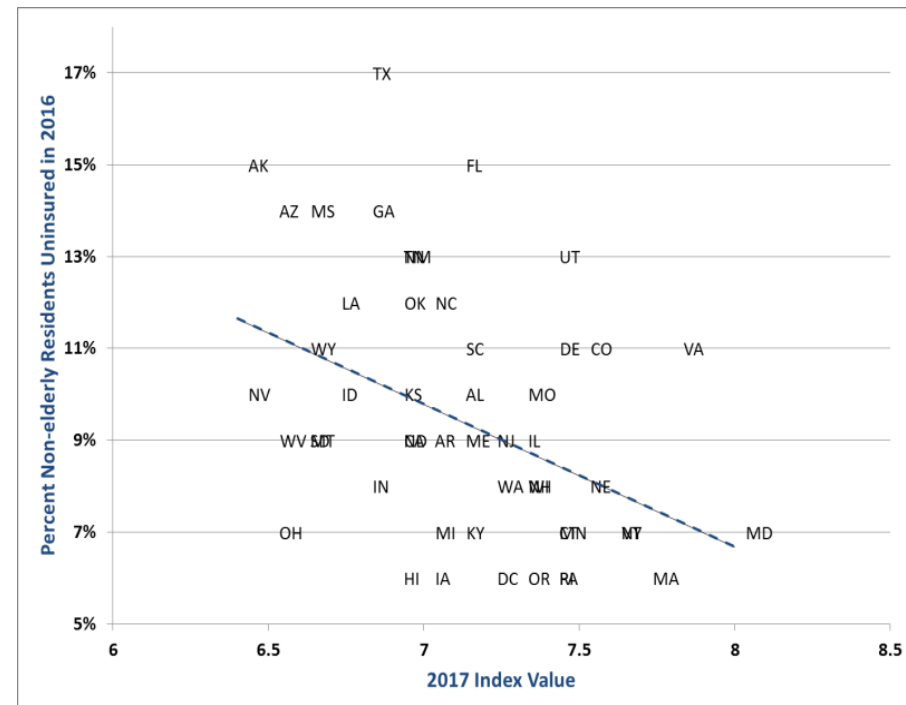


Health security tracks closely with social & economic determinants of health

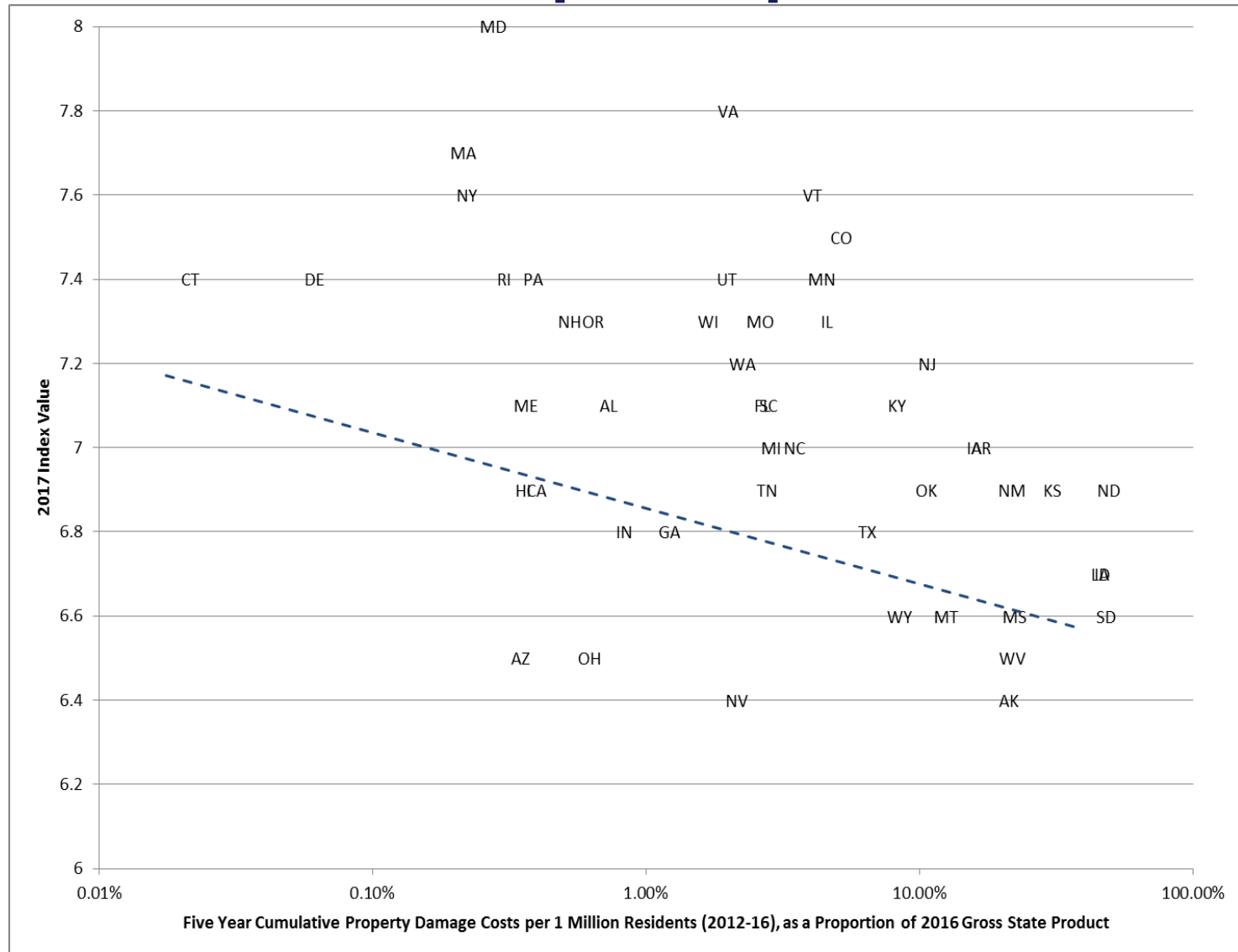


← Percent of population below federal poverty threshold

Percent of population without health insurance coverage →

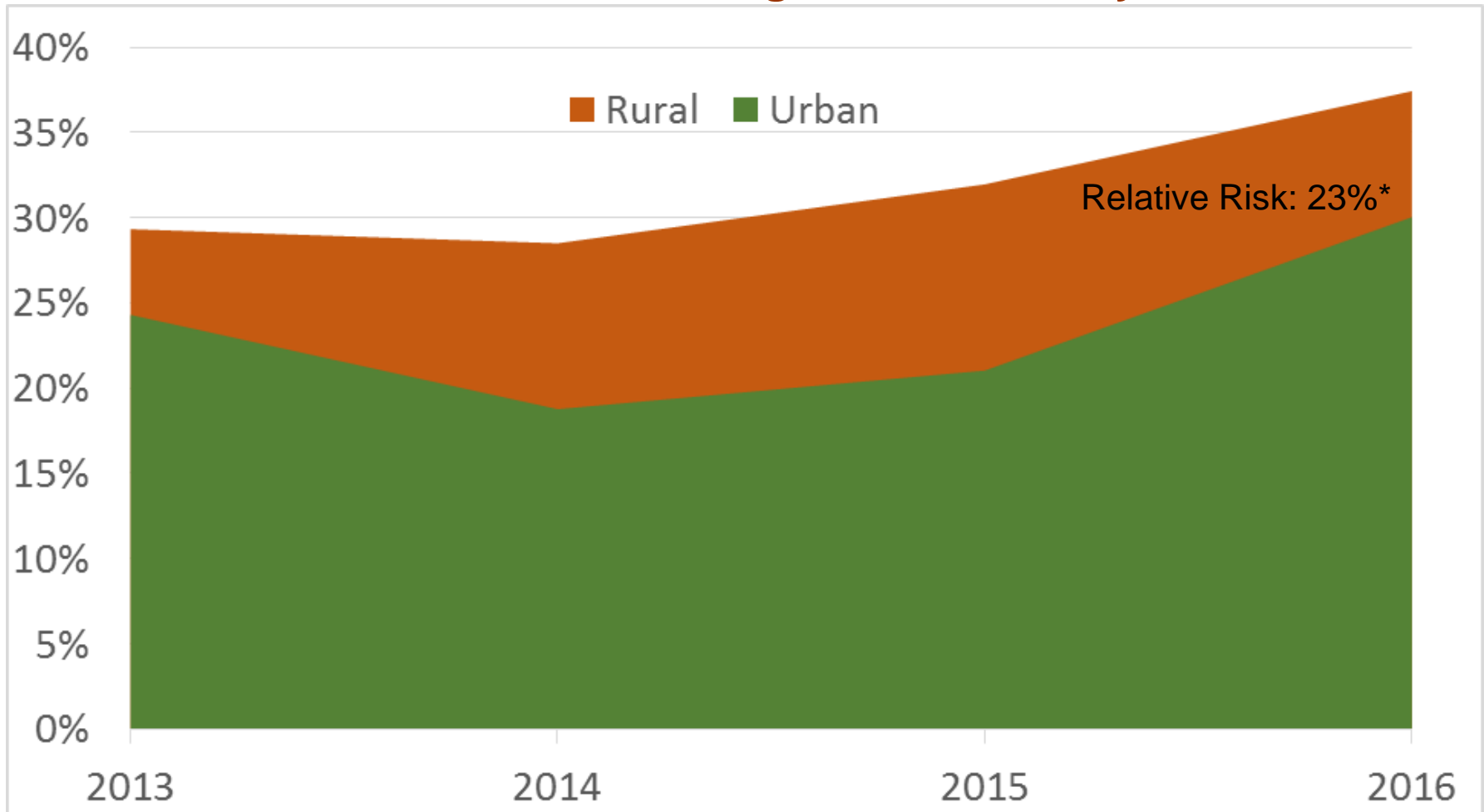


Health security levels vary inversely with the economic impact of past disasters



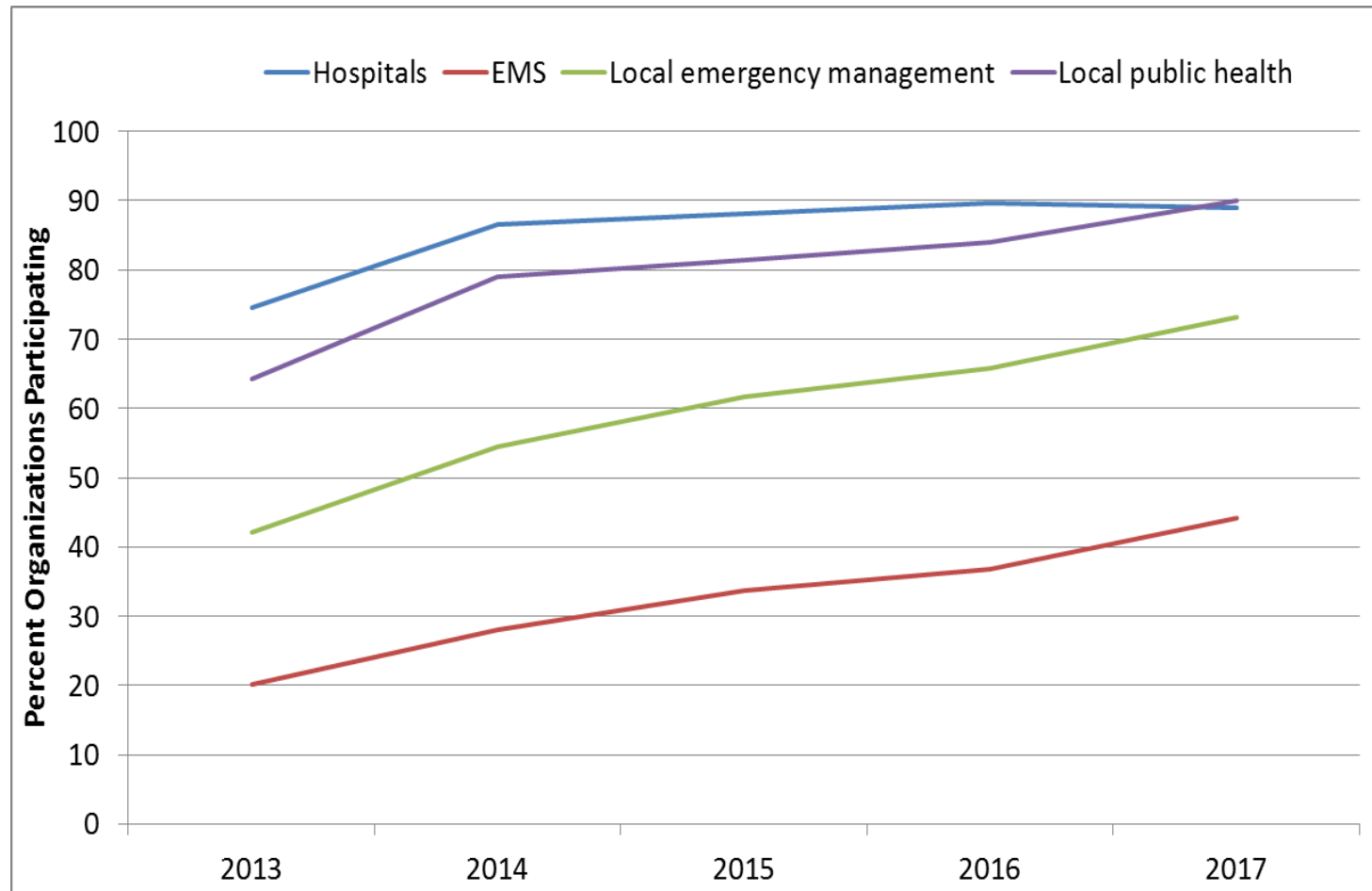
Rural-Urban differences in health security

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



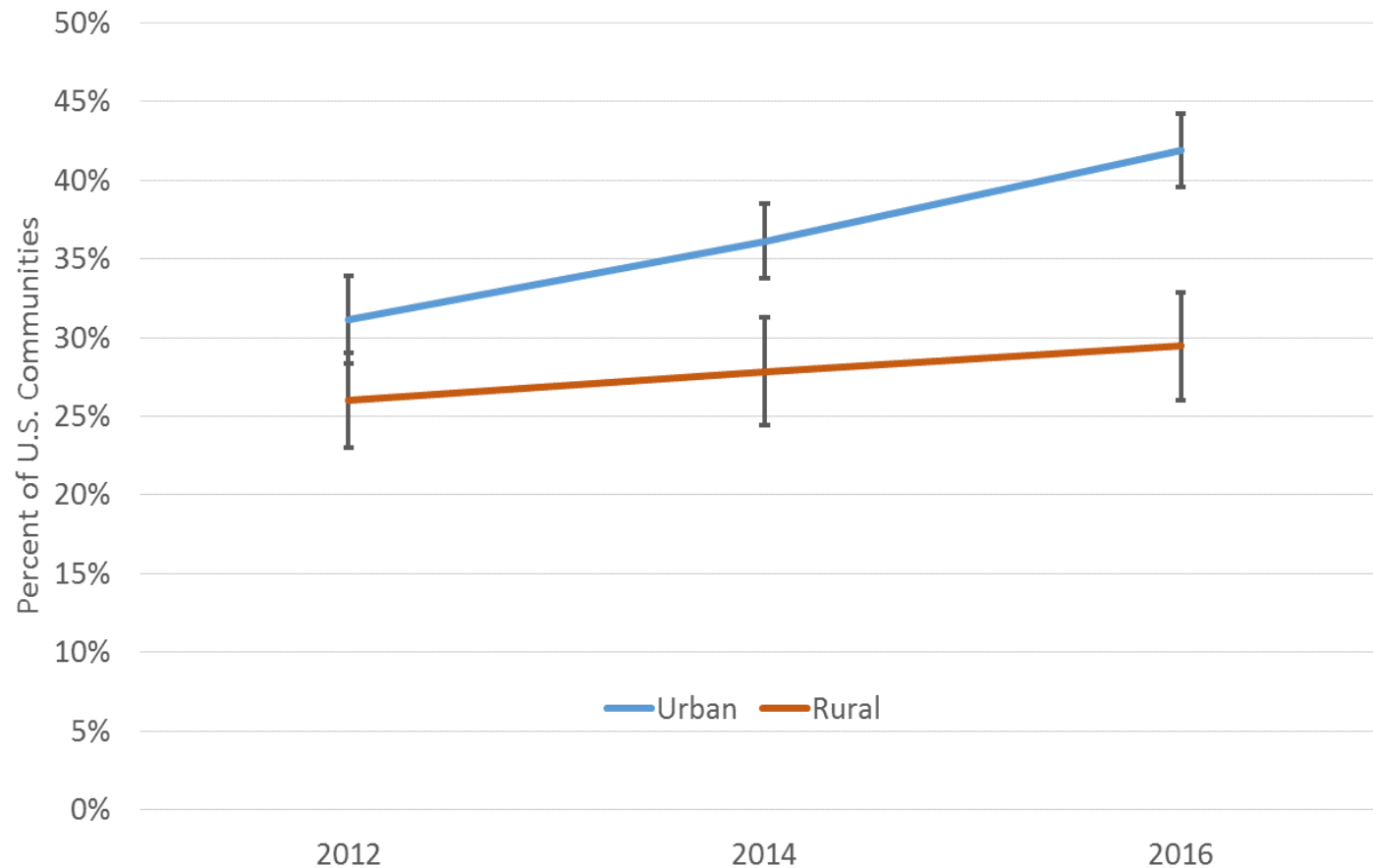
Underlying drivers: organizational

Participation in Healthcare Preparedness Coalitions



Underlying drivers: community and systems

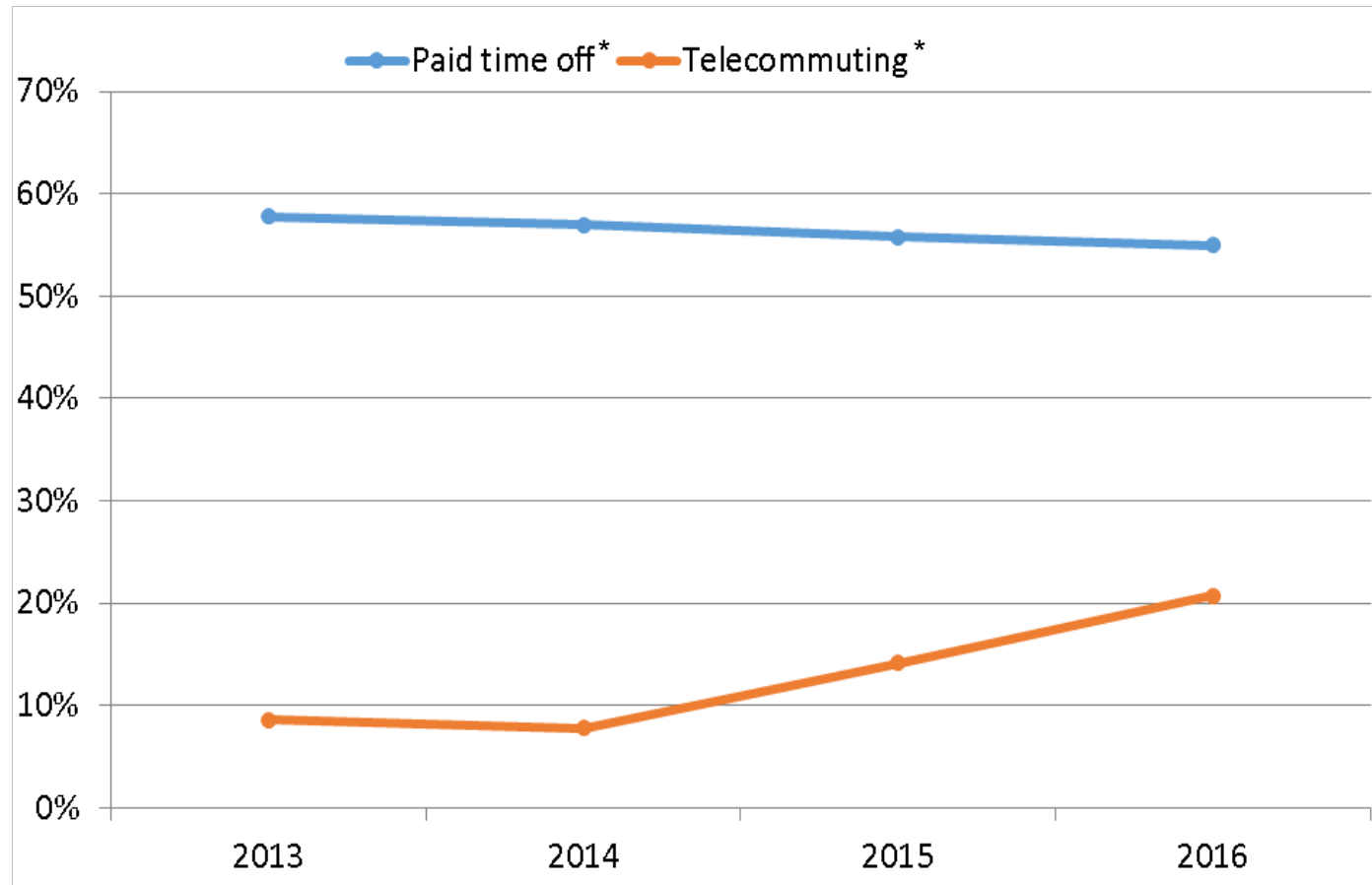
Communities with Strong Multi-Sector Networks (Comprehensive Public Health Systems)



*statistically significant difference

Underlying drivers: occupational

Percent of workers with paid sick leave and telecommuting opportunities



*statistically significant change

Conclusions & Implications

- National progress is clear, can we accelerate & spread?
- Geographic stratification is a vulnerability -- address geographic differences with regional partnerships
- Networks and coalitions are key drivers
- Private sector contributions are important
- Social determinants matter
- Strengths & weaknesses are state-specific, flexibility and tailoring are key
- Better data & measures are needed



Caveats and cautions

- Imperfect measures & latent constructs
- Timing and accuracy of underlying data sources
- Unobserved within-state heterogeneity
- Observational, not causal, estimates
- Trends limited to 5 years

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