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Aligning Systems and Sectors to Improve Population Health: Emerging Findings and Remaining Uncertainties

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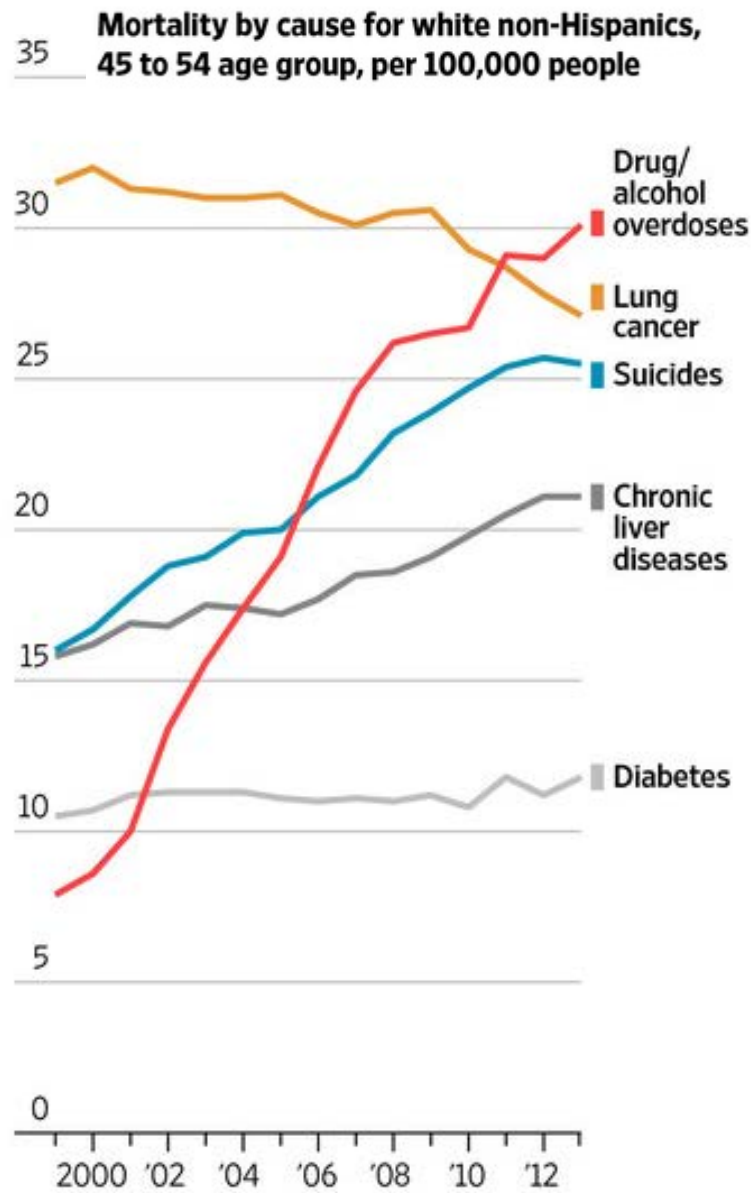
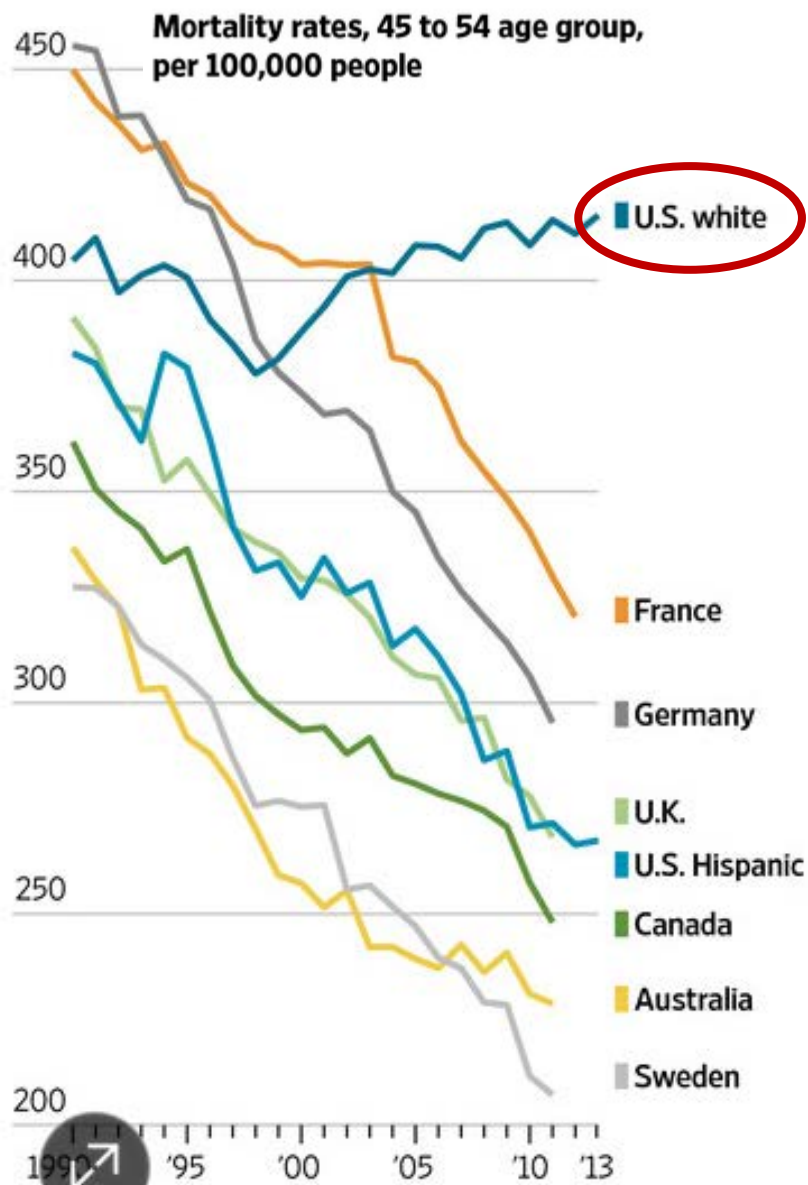


Systems for Action
National Coordinating Center
Systems and Services Research to Build a Culture of Health

Updates on two initiatives to evaluate alignment mechanisms & strategies

- RWJF Systems for Action Research Program
- PCORI Care Transitions Initiative

Losing ground in population health

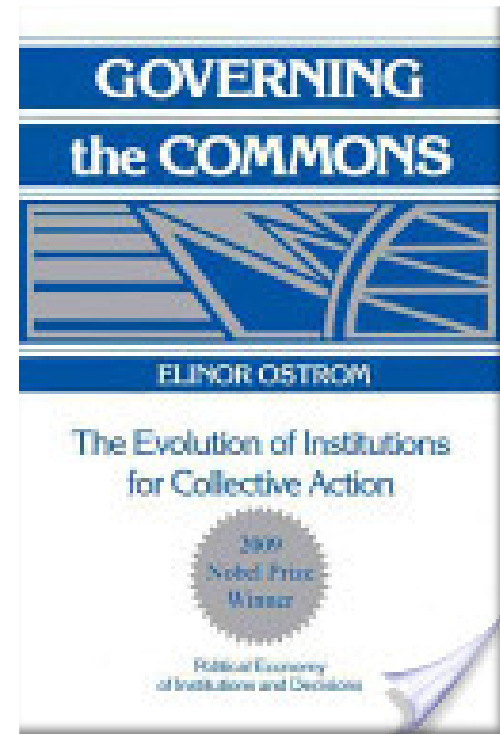


How do we support effective population health improvement strategies?

- Target **large-scale** health improvement: neighborhood, city/county, region
- Address **fundamental** and often **multiple** determinants of health
- Mobilize the **collective actions** of multiple stakeholders in government & private sector
 - Infrastructure
 - Information
 - Incentives

Challenge: overcoming collective action problems across systems & sectors

- Incentive compatibility → public goods
- Concentrated costs & diffuse benefits
- Time lags: costs vs. improvements
- Uncertainties about what works
- Asymmetry in information
- Difficulties measuring progress
- Weak and variable institutions & infrastructure
- Imbalance: resources vs. needs
- Stability & sustainability of funding



ACA creates new incentives & infrastructure for population health work

- Health insurance coverage expansion:
ability to redeploy charity-care resources
- Hospital community benefit requirements
- Insurer and employer incentives
- Value-based payment models
- CMS Innovation Center demonstrations
- Prevention & Public Health Fund
- National public health accreditation standards

Questions of interest

- Which organizations contribute to the implementation of population health activities in local communities?
- How does do these contributions evolve under ACA implementation?
- What are the health and economic effects attributable to population health activities?

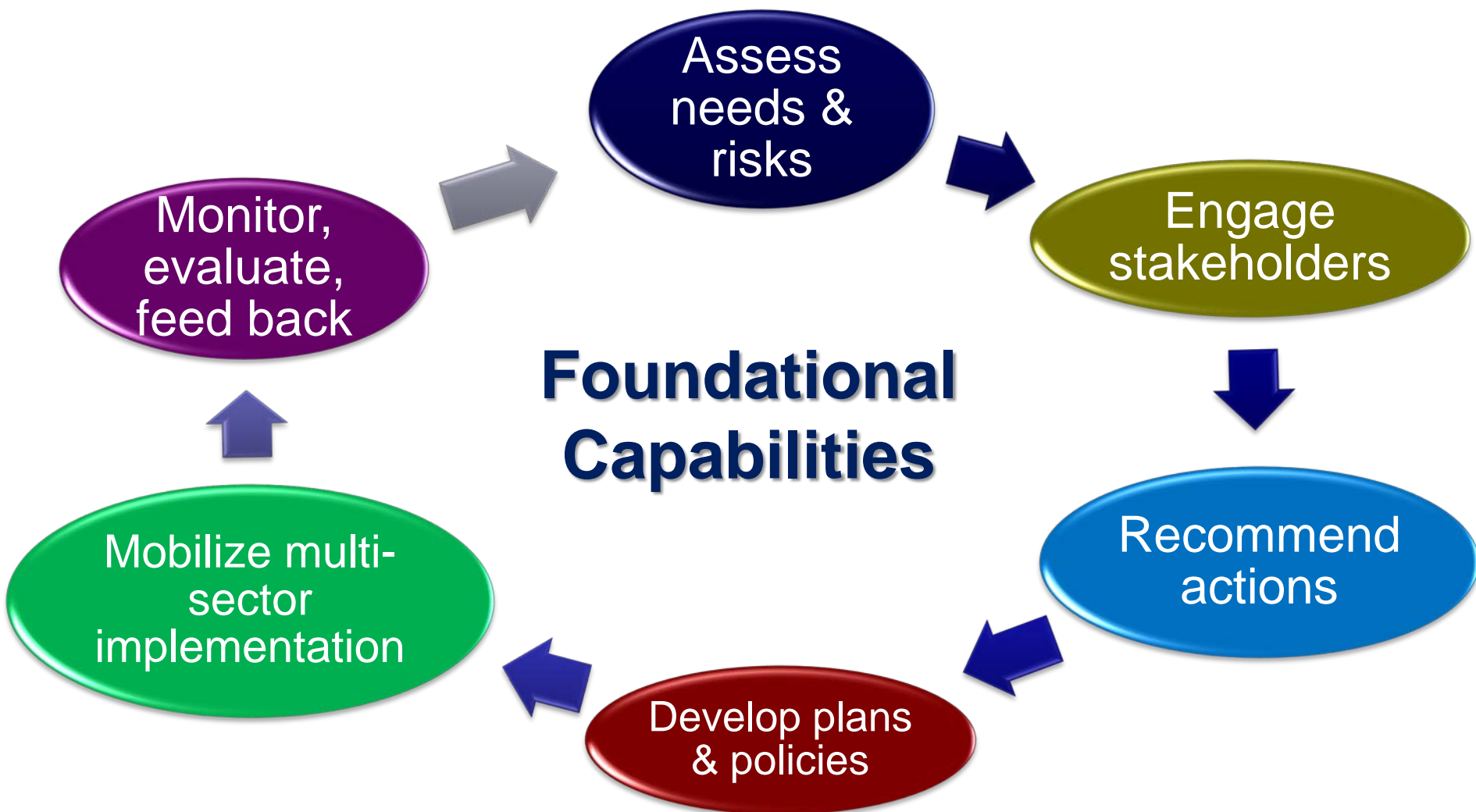
Primary data source

National Longitudinal Survey of Public Health Systems

- Cohort of 360 communities with at least 100,000 residents
- Followed over time: 1998, 2006, 2012, 2014** (2016)
- Local public health officials report:
 - **Scope**: availability of 20 recommended population health activities
 - **Network**: organizations contributing to each activity
 - **Centrality of effort**: contributed by governmental public health agency
 - **Quality**: perceived effectiveness of each activity

** Additional sample of 500 non-metro communities added in 2014 wave

Measures of population health activities



Data linkages

- **Area Health Resource File:** health resources, demographics, socioeconomic status, insurance coverage
- **NACCHO Profile data:** public health agency institutional and financial characteristics
- **PHAB:** public health agency accreditation status
- **CMS Impact File & Cost Report:** hospital ownership, market share, uncompensated care
- **Dartmouth Atlas:** Area-level medical spending (Medicare)
- **CDC Compressed Mortality File:** Cause-specific death rates by county
- **Equality of Opportunity Project (Chetty):** local estimates of life expectancy by income

Estimating changes associated with ACA implementation

Dependent variables:

- **Scope**: Percent of population activities performed
- **Organizational centrality**: relative influence of organizations and sectors in supporting population health activities
- **System capital**: composite measure of multi-sector contributions to population health activities

Independent Variables/Comparators:

- Pre-post ACA time trend
- Medicaid expansion vs. Non-expansion states (DD)
- Post-expansion coverage gains
- Public health accreditation status (DD)

Estimating ACA effects on multi-sector population health activities & systems

- Panel regression estimation with random effects to account for repeated measures and clustering of public health jurisdictions within states
- Difference-in-difference specification to estimate ACA expansion and public health agency accreditation effects on system:

$$E(\text{Scope/Centrality/System}_{ijt}) = f(\text{ACA}, \text{ACA*Post}, \text{Accred}, \text{Accred*Post}, \text{Agency}, \text{Community})_{ijt} + \text{State}_j + \text{Year}_t + \varepsilon_{ijt}$$

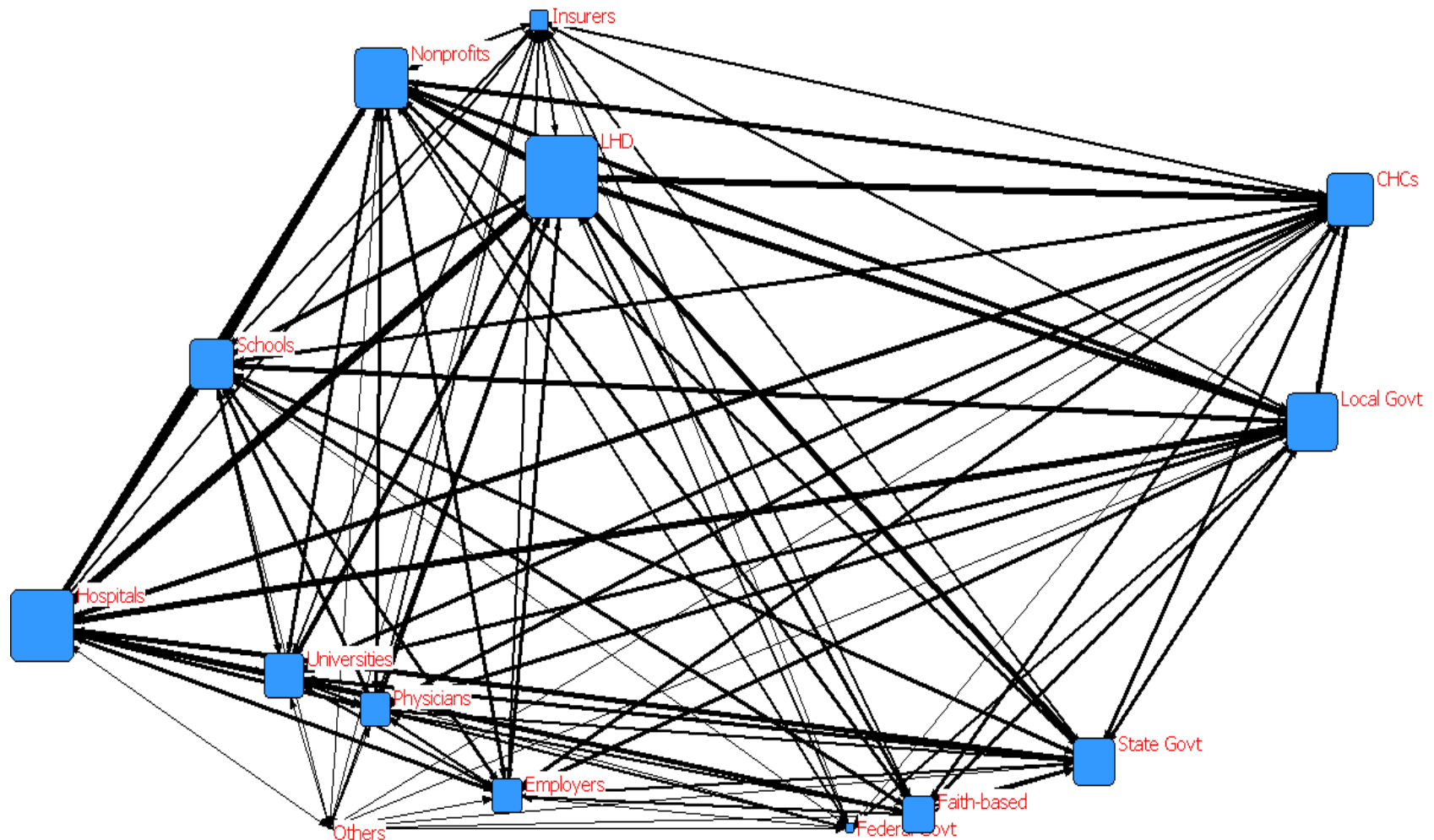
- Two-stage IV model to estimate long-run effect of system changes on population health

$$\text{Prob}(\text{System}_{ijt} = \text{Comprehensive}) = f(\text{Governance}, \text{Agency}, \text{Community})_{ijt} + \text{State}_j + \text{Year}_t$$

$$E(\text{Mortality/LE}_{ijt}) = f(\text{System+resid}, \text{Agency}, \text{Community})_{ijt} + \text{State}_j + \text{Year}_t + \varepsilon_{ijt}$$

All models control for type of jurisdiction, population size and density, metropolitan area designation, income per capita, unemployment, poverty rate, racial composition, age distribution, physician and hospital availability, insurance coverage, and state and year fixed effects. **N=1019 community-years**

Mapping who contributes to population health

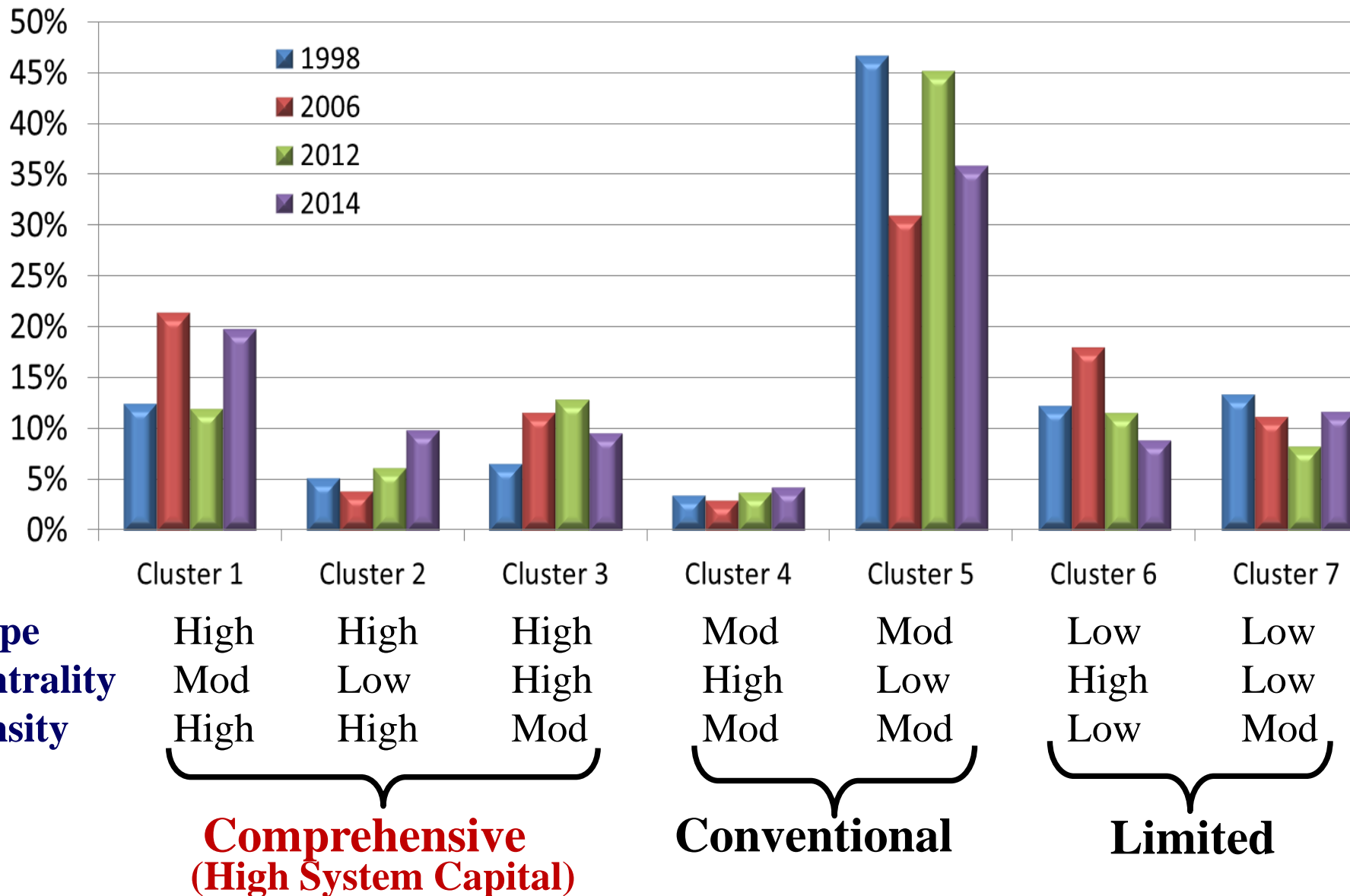


Node size = degree centrality

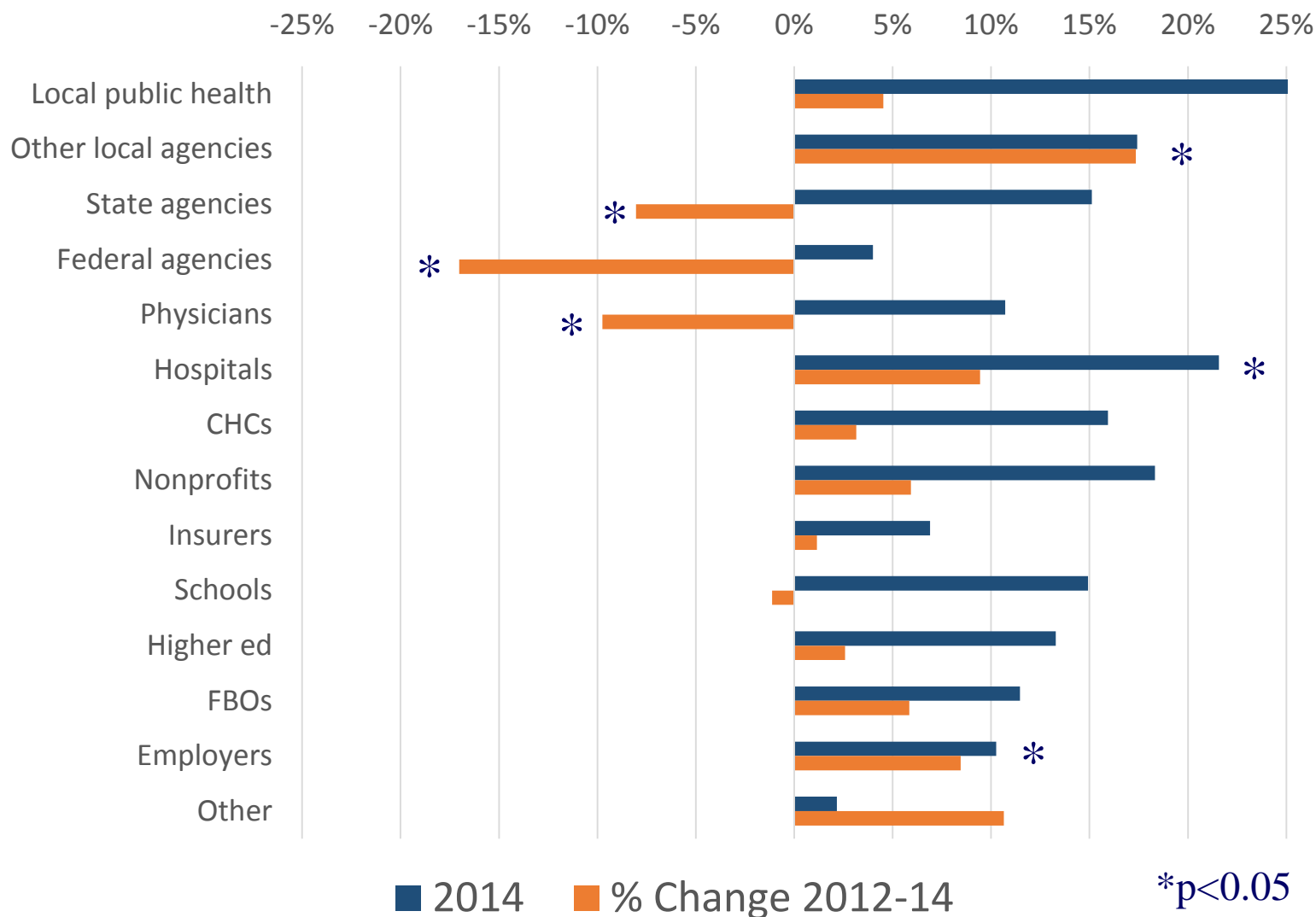
Line size = % activities jointly contributed (tie strength)

Mays GP et al. Understanding the organization of public health delivery systems: an empirical typology. *Milbank Q.* 2010;88(1):81–111.

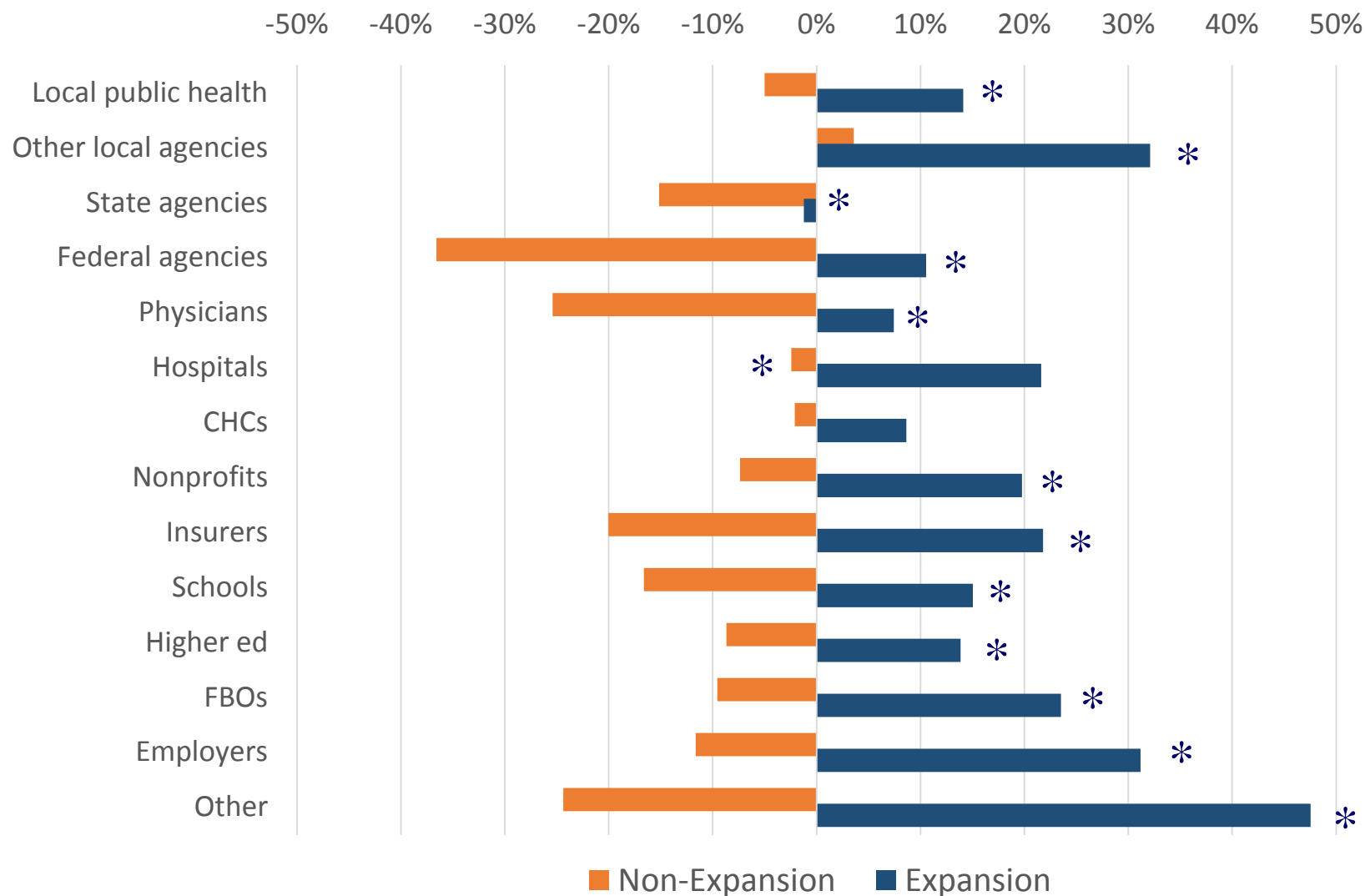
Classifying multi-sector delivery systems for population health activities, 1998-2014



Changes in organizational centrality for population health activities, 2012-2014



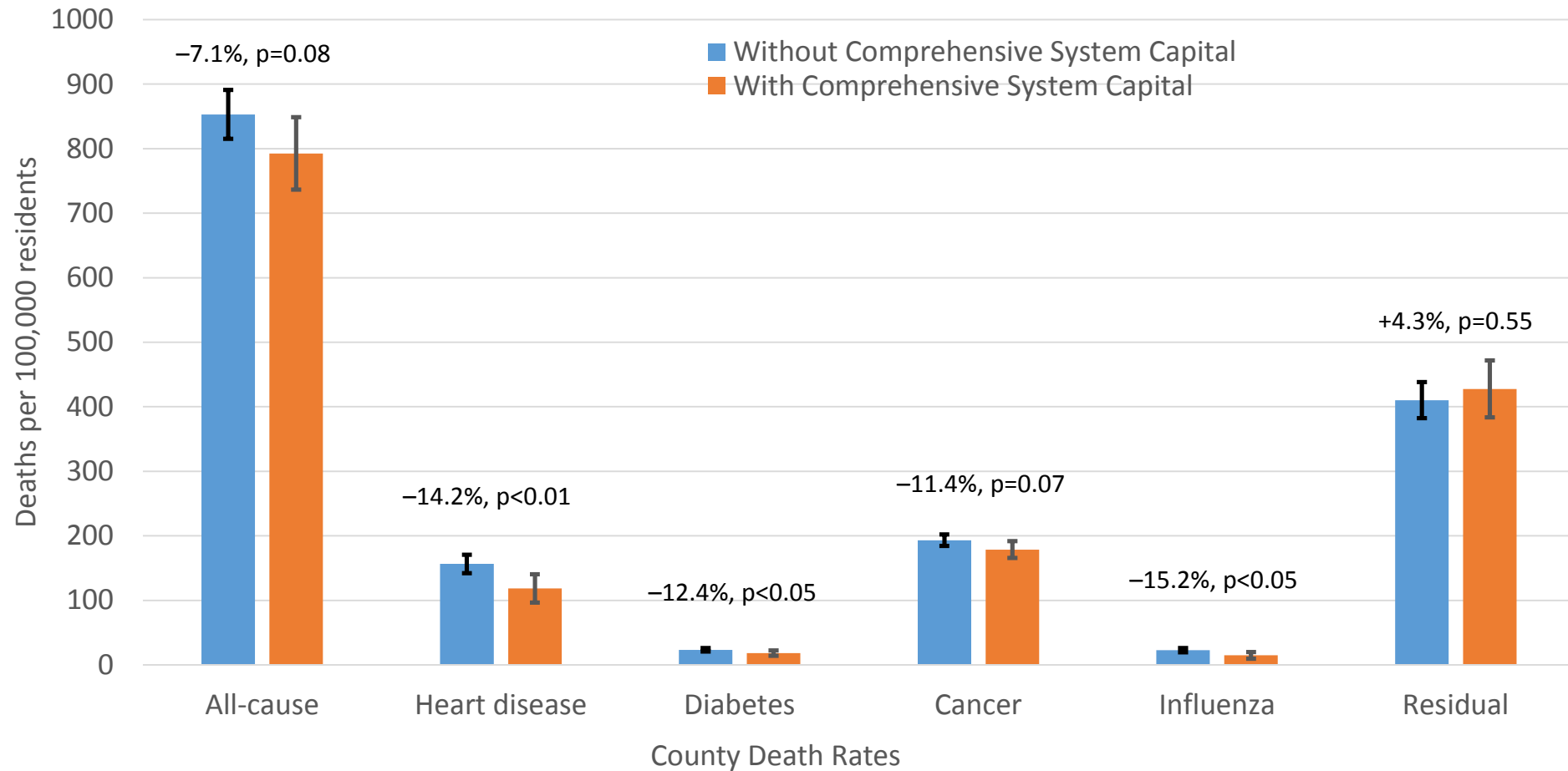
Changes in organizational centrality by ACA Medicaid expansion status, 2012-2014



*p<0.05

Long-run health effects attributable to multi-sector systems

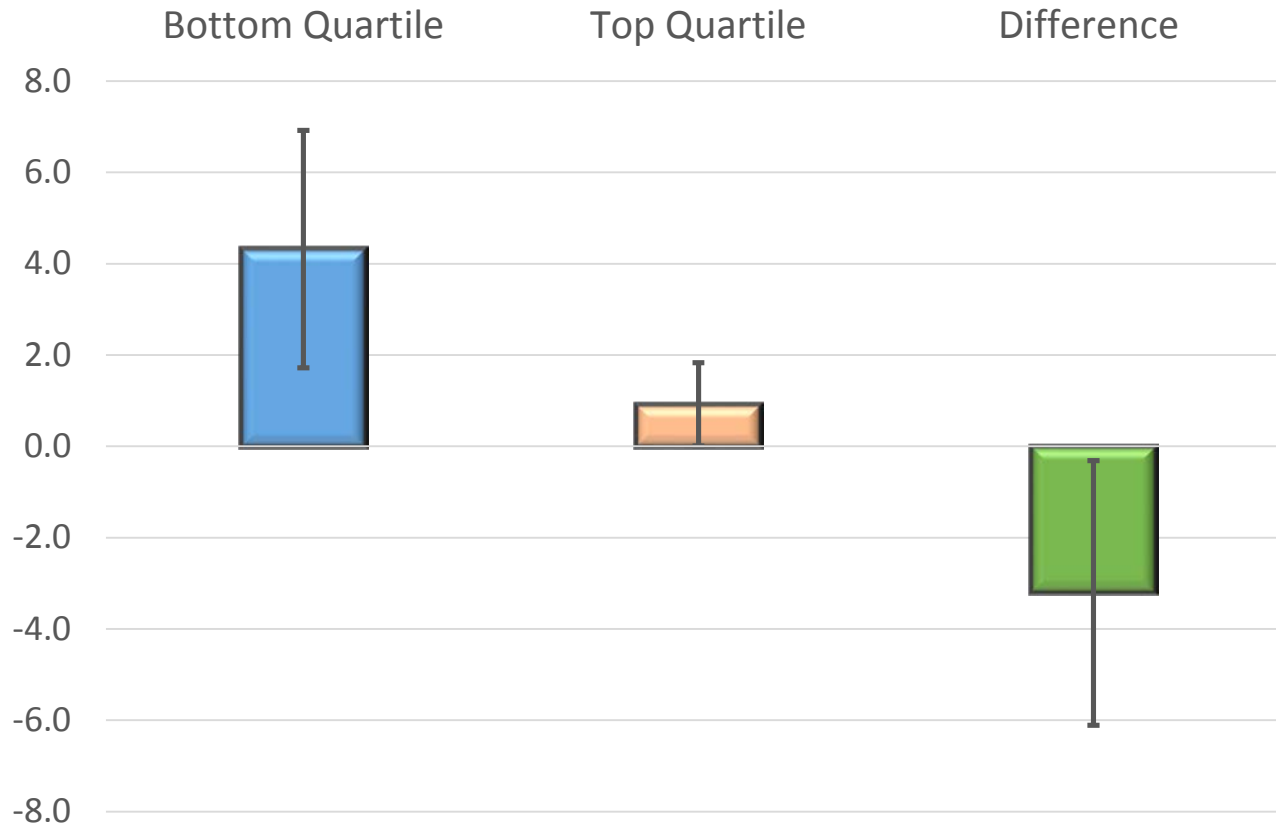
IV Estimates on Mortality, 1998-2014



Models also control for racial composition, unemployment, health insurance coverage, educational attainment, age composition, and state and year fixed effects. N=1019 community-years

Long-run health effects attributable to multi-sector systems

IV Estimates of Comprehensive System Capital Effects on Life Expectancy by Income (Chetty), 2001-2014



Models also control for racial composition, unemployment, health insurance coverage, educational attainment, age composition, and state and year fixed effects. N=1019 community-years. Vertical lines are 95% confidence intervals

Conclusions and Implications

- ACA-related coverage expansions are associated with significant increases in multi-sector contributions to population health activities.
- Multi-sector population health activities may reduce preventable mortality and reduce income-related disparities in life expectancy.
- Health gains from population health are additive to the gains attributable to coverage expansion

Limitations

- Low-resolution measures of population health activities
- Measure extensive margin of population health activities rather than intensive margin
- Do not directly observe incidence of other ACA population health components (e.g. community benefit)

Other S4A studies now underway

- **Chicago's Comprehensive Care, Community and Culture Model:** align hospital, physician, social and cultural services for seniors
- **Indiana's Population Health Analytics and Advisor Model:** integrate public health and social services data into the EHR, add public health nurses to the care team
- **Phoenix's Decision Theater for Serious Mental Illness:** Link mental health, public health, jail and probation data to better manage services for the SMI population

Multi-Component / Multi-Level
Interventions

project ACHIEVE



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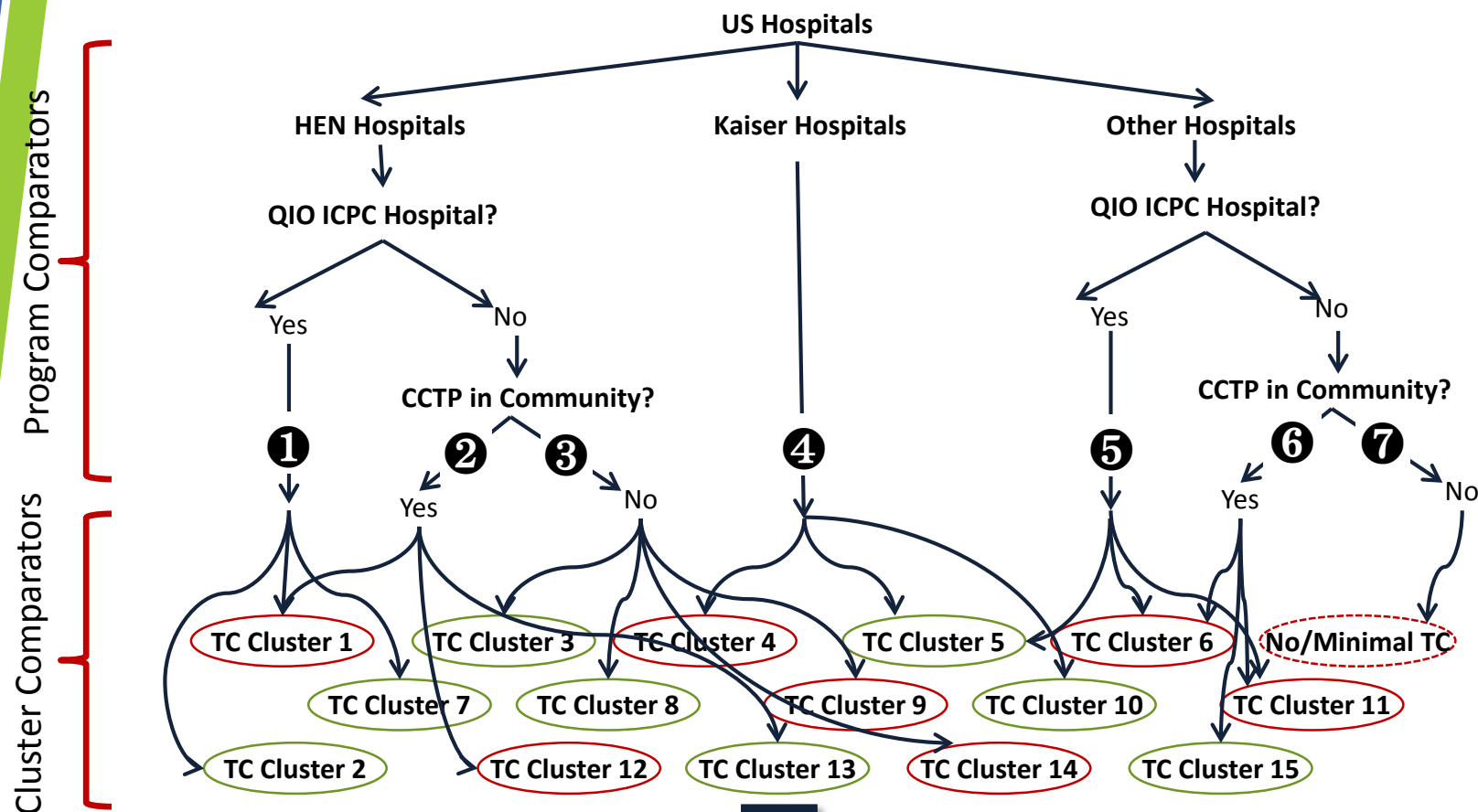
How to align services & supports for patients transitioning from hospital to community

- What outcomes matter most to patients & families?
- What combination of care transition strategies used by hospitals and communities work best, for whom, in what contexts?

ACHIEVE Design

- 3 years, \$15M, 30+ partners
- 40 patient and caregiver focus groups in 10 communities
- Surveys of care transition teams in 500 hospitals
- Retrospective: 5 years Medicare claims on 10M patients
- Concurrent: site visits + surveys at 40 hospitals
- Prospective: Survey 12,000 discharged patients + caregivers + physicians from 40 hospitals

Overview of ACHIEVE Quantitative Design



Retrospective Claims Analysis: All hospitals/patients in all clusters included
 Prospective Analysis: red TC clusters selected by Fractional Factorial Design

Stratified probability sample of hospitals (5 hospitals from each of 8 clusters)
 (sampling probabilities within strata proportional to hospital patient volume)
 Stratified random sample of 300 patients from each hospital (12,000 total)

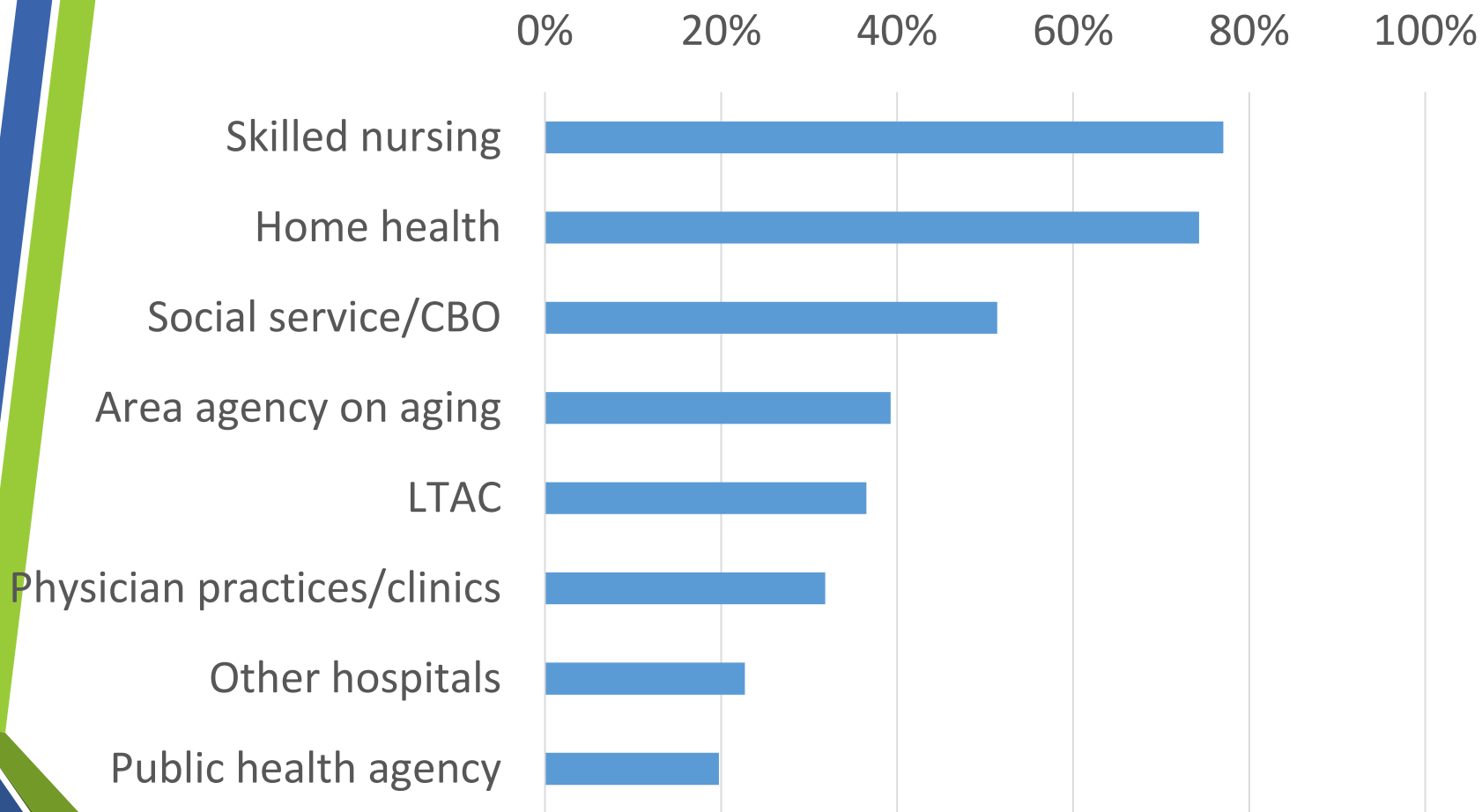
Use of specific care transition strategies

<u>Transitional Care Strategies</u>	<u>Percent</u>
1 Risk Assessment: uses a protocol to identify patients who are at high risk of readmission.	
Identify medical risks only.	23.3%
Identify medical and social risks.	16.0%
2 Assess Patient Needs: conducts assessment of each patient's post-DC needs.	54.7%
3 Assess Caregiver Needs: conducts assessment of each caregiver's post-DC needs.	38.2%
4 Shared Decision-Making: uses shared decision-making protocol with patient and caregiver.	20.9%
5 Risk Factor Screening: screens all patients by using explicit criteria to identify post- DC risks	31.0%
6 Risk-specific Interventions: implements risk specific interventions tailored to a patient's risks	39.4%
7 Medication Reconciliation:	35.0%
Contacts with outside pharmacies and/or primary care providers for clarifying current medication list.	
Uses designated person responsible for conducting medication reconciliation at discharge.	
8 Patient and Caregiver Education: uses teachback techniques for all of the following:	37.1%
Discharge Instruction/Summary.	
Educational information about the disease when relevant.	
Action plan for patients and caregivers to help them manage changes in condition.	
Personal health record (diagnoses, allergies, medications, physicians, contact information).	
Signs/symptoms that should prompt PCP call or a return to the hospital.	
Emergency plan (e.g. direct contact information for a specific provider).	
Names, doses, frequency, and purpose of each medication.	
Information about new, change in dose/frequency, and stopped medication.	
9 Follow-up Appointment:	72.9%
Ensures patients leave the hospital with an outpatient follow-up appointment already arranged.	
10 Social Determinants:	51.9%
Identifies social service needs and makes referrals to community-based services.	
Asks patients whether they can afford their medications at DC.	

Use of specific care transition strategies

<u>Transitional Care Strategies</u>	<u>Percent</u>
11 Care Coordination by Specific Team:	30.9%
Use a specific transition team to coordinate TC plans across hospital and post-home sites of care.	
12 Timely Communication/Alerts:	30.6%
Organization has process to alert outpatient providers within 24 hours of patient admission.	
Organization completes a patient's discharge summary and available for viewing within 72 hours.	
13 Information Sharing:	84.2%
Sends discharge summary directly to the patient's primary care providers for all or most patients.	84.2%
Ensures outpatient care providers have access to inpatient electronic records for all or most patients.	31.5%
14 Pending Test Results:	53.0%
Assigns someone to follow up on test results that return after the patient is discharged.	
15 Lay-person Follow-up:	27.8%
Uses non-clinical laypersons to follow up with patients in person after discharge?	
16 Follow-Up Calls:	74.2%
Calls after discharge to either follow up on post- discharge needs or to provide additional education.	
17 Coordination with Post-acute Care:	
Conducts a nurse-to-nurse report prior to transfer.	60.3%
Provides a direct contact number to reach the inpatient treating physician.	24.5%
Average number of TC strategies used	7.3

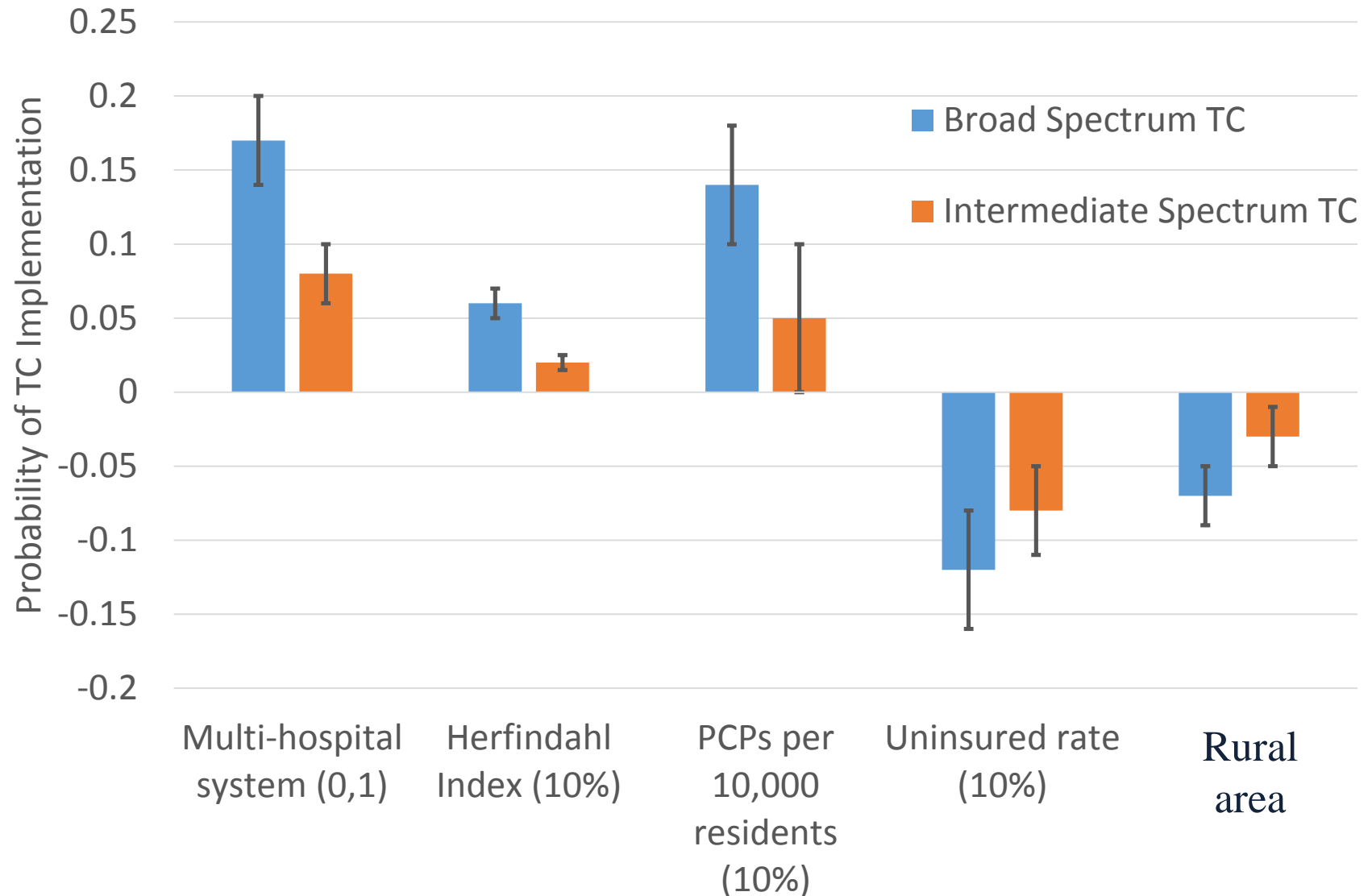
Agreements with other organizations for care transitions



Clusters of Care Transition Strategies

Variable	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>Uniq</u>
Risk assessment	***										0.145
Patient needs	**										0.356
Caregiver needs	**										0.096
Shared decision-making	**		*	**							0.245
Transitional care planning	**					**	**				0.319
Risk-specific interventions	*										0.288
Medication reconciliation		*		**							0.276
Teach-back techniques	*		*						**		0.385
Care plan education	***	**	*								0.301
Personal health record	**	**								**	0.502
Instruction warning signs	***	**									0.295
Follow-up appointment					**	**					0.485
Social needs/referrals	***										0.452
Care coordination	*										0.349
Communication/alerts	**		**				**				0.381
Information sharing	**		**		**						0.416
Follow-up test results										*	0.666
Coaching service								**			0.736
Follow-up calls to patient	**				**				**	*	0.422
Coordinating care with SNFs							**	**			0.596

Predictors of care transition strategies



Next steps

- Survey/Site visit concordance on TC implementation: 40 sites
- Claims data analysis: before/after adoption: 500 hospitals
- Survey Patient/caregiver experience & outcomes: 40 sites

For More Information

Systems for Action

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