Acknowledgements

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• Collaborators include S4A research team, Beth Lacy, Josh Bush, Teresa Waters, and Mane Nikolaou

• Findings and conclusions are my own and do not necessarily represent views of AHRQ and RWJF
Addressing population health outcomes requires a multisector approach
Background

• Attention toward addressing the social and environmental factors that influence health outcomes continues to grow
• Payers and providers thinking about health in different ways
• Potential financial gains for insurers when they participate in population health initiatives
System-wide factors driving change

- Reduction in the number of uninsured individuals
- Insurers recognizing the importance of population health and the social determinants of health
- Individuals accessing care that have greater unmet medical and social needs

  - Reallocation of resources toward population health
  - Increased engagement between insurers and other sectors
Questions of Interest

• How do insurers engage in population health activities at the community level?
• How has insurer participation in population health networks changed over time?
• What is the relationship between insurer participation and diabetes-related preventable hospitalizations?
Data Used

• National Longitudinal Survey of Public Health Systems (NALSYS)
• Cohort of 360 communities with at least 100,000 residents
• Followed from 1998-2018
• Local public health officials report:
  ➢ **Scope:** availability of 20 recommended core public health activities
  ➢ **Network:** organizations contribution to each activity
  ➢ **Centrality of effort:** contributed by the governmental public health agency
  ➢ **Quality:** perceived effectiveness of each activity
**NALSYS activities**

**Assessment**
- Conduct periodic assessment of community health status and needs
- Survey community for behavioral risk factors
- Investigate adverse health events, outbreaks, and hazards
- Conduct laboratory testing to identify health hazards and risks
- Analyze data on community health status and health determinants
- Analyze data on preventative services use

**Policy and planning**
- Routinely provide community health information to elected officials
- Routinely provide community health information to the public
- Routinely provide community health information to the media
- Prioritize community health needs
- Engage community stakeholders in health improvement planning
- Develop a community-wide health improvement plan
- Allocate resources based on community health plan
- Develop policies to address priorities in community health plan
- Maintain a communication network among health-related organizations

**Assurance and evaluation**
- Link people to needed health and social services
- Implement legally mandated public health activities
- Evaluate health programs and services in the community
- Evaluate public health agency capacity and performance
- Monitor and improve implementation of health programs and policies
Data Used

• NALSYS data from 2012 - 2018
• Linked with:
  – HCUP (Healthcare Cost and Utilization Project)
    State Inpatient Databases (SID), 2016 and 2018
  – Area Health Resource File to control for community
    and delivery system characteristics
• Final sample n=586 local public health
  jurisdictions across 20 states
Analytic Approach

• Key explanatory variables:
  – Insurer contributions to population health activities
    • Any activity, total contributions, and three functions of public health
  – Insurer connectivity in population health networks
    • Insurer betweenness centrality- how frequently insurers maintain stronger connectivity with other sectors than those sectors have with each other directly
Analytic Approach

• Key dependent variables:
  1. Diabetes short-term complications
     • Emergencies from imbalance of glucose and insulin
  2. Diabetes long-term complications
     • Complications from sustained poor control of diabetes
  3. Uncontrolled diabetes
     • High blood sugar levels
  4. Lower extremity amputation in diabetic patients
  5. Composite of all diabetes-related hospitalizations
Why diabetes-related preventable hospitalizations?

• Preventable hospitalizations are a set of acute and chronic conditions for which access to strong outpatient care can prevent, or significantly reduce, the chance of hospitalization.

• Very little is understood about the relationship between hospitalization and other community supports.

1. Improves likelihood patient is connected to other community supports
2. Increase strength and provision of population health capabilities

Reduces unmet social needs and preventable hospitalizations

Greater connectivity across population health network
Why diabetes-related preventable hospitalizations?

• Diabetes is costly to patients and providers
  – Over 10% of the US population has diabetes
• High prevalence of unmet social needs in diabetic patients
• Insurers may offset financial risk by adopting population health approaches to address health and social needs in their enrollees
Analytic Approach

• Generalized linear models with a longitudinal specification

• Control for community socioeconomic and demographic characteristics
Trends in community uninsured rate and insurer engagement in population health activities

Portion of communities reporting insurer contribution to any population health activity (％)
Insurer connectivity in population health networks

- **Insurer degree centrality**
- **Insurer betweenness centrality**

![Graph showing the trend of insurer connectivity over years](chart)
Longitudinal trends in insurer contributions to population health activities

<table>
<thead>
<tr>
<th>Composite Measures (%)</th>
<th>2012</th>
<th>2014</th>
<th>2016</th>
<th>2018</th>
<th>Percent change 2012-2018</th>
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## Longitudinal trends in insurer contributions to population health activities

<table>
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<tr>
<th>Individual Activities (%)</th>
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<td>Evaluate health programs and services in the community</td>
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<td>Evaluate local public health agency capacity and performance</td>
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<td>Monitor and improve implementation of health programs and policies</td>
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Longitudinal trends in diabetes-related hospitalizations

- Diabetes short-term complications, NALSYS
- Diabetes short-term complications, National
- Diabetes long-term complications, NALSYS
- Diabetes long-term complications, National
- Uncontrolled diabetes, NALSYS
- Uncontrolled diabetes, National
- Lower extremity amputation among patients with diabetes, NALSYS
- Lower extremity amputation among patients with diabetes, National
Association between insurer connectivity in health and social services networks and diabetes-related preventable hospitalizations

<table>
<thead>
<tr>
<th>Prevention Quality Indicators (PQIs)</th>
<th>Insurer betweenness centrality</th>
<th>Insurer participation in any activity</th>
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<td>Lower extremity amputation among patients with diabetes</td>
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<td>Composite PQIs</td>
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<td>All diabetes-related preventable hospitalizations</td>
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<td>-15.8**</td>
<td>-26.4</td>
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Observations=586

***p<0.01, **p<0.05, *p<0.10
Note: Models control for community health and social service network density, population size, geographic location, hospital beds per capita, primary care physicians per 100,000 population, percent of the population non-white, unemployment rate, percent of the population below the poverty level, percent of the population over 65, uninsured rate
Association between insurer connectivity in health and social services networks and diabetes-related preventable hospitalizations

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<td>Diabetes long-term complications</td>
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<td>-50.3**</td>
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Note: Models control for community health and social service network density, population size, geographic location, hospital beds per capita, primary care physicians per 100,000 population, percent of the population non-white, unemployment rate, percent of the population below the poverty level, percent of the population over 65, uninsured rate.
Conclusions

• Insurers participation in population health networks increased over time
• Insurers are playing more central roles in the delivery of population health activities and functioning as a bridging organization
Conclusions

• Insurer participation is associated with lower diabetes-related preventable hospitalization rates, BUT with variation in measures.

• Assurance and evaluation activities associated with higher rates in the composite and long-term complications.
Implications for Policy and Practice

- Insurer participation in the delivery of core population health capabilities has the potential to improve diabetes-related health outcomes.
- Implementing policies that expand insurance coverage will likely continue to shift insurer orientation toward population health initiatives.
Limitations and Next Steps

• Limited to those networks we could link to HCUP
• Broad insurer category, but not depth
• Not measuring quality of interaction
• Data coming from the local public health perspective
• Merging with additional data on the market
• Additional mixed methods work to further understand insurer roles
What’s happening in these networks?

**Network Structure**
- Largely centralized structure arranged around a few organizations
- Effort is evenly distributed between the less central organizations
- Low density, with only 7% of relationships in place
- Majority of partners are nonprofit organizations
- MCOs play an important role in the screening and referral network, but local public health and community nonprofits also hold central positions

*SNA completed with PARTNER Tool, https://visiblenetworklabs.com/partner-cprm/*
How frequently is your organization referring enrollees for an unmet social need?

Daily

Weekly

Monthly
Partnership Outcomes

Improved services and community capacity to address unmet social needs

Led to an exchange of resources and new funding opportunities
Trust and value perceptions

<table>
<thead>
<tr>
<th>Power/Influence</th>
<th>Level of Involvement</th>
<th>Resource Contribution</th>
<th>Reliability</th>
<th>In Support of Mission</th>
<th>Open to Discussion</th>
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<tbody>
<tr>
<td>MCO</td>
<td>Whole Network</td>
<td>Value</td>
<td>Trust</td>
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</table>

- Value
- Trust
Questions?

For more information contact:
Rachel Hogg-Graham
rachel.hogg@uky.edu