Public Health Systems: A Social Networks Perspective

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Acknowledgments

- The Robert Wood Johnson Foundation's Public Health Systems Research Initiative
- Local health department directors, key informants, and survey respondents in 8 communities
- State and Regional health department representatives

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Public Health Systems

- "the full complement of public and private organizations that contribute to the delivery of public health services for a given population, including governmental public health agencies as well as private and voluntary entities"
  - Mays, Halverson, and Scutchfield 2003, 180
- "the human, informational, financial, and organizational resources, including public, private, and voluntary organizations and individuals, that contribute to the public's health"
  - NACCHO, 2003)

Public Health Systems Research

- As public health systems
  - Turning Point Collaboratives
  - Zahner's and Varda's work on characterizing systems
  - National Public Health Performance Standards Program assessment by a representative community group
- Research related to public health systems
  - Networks within local health departments (Merrill)
  - Effects of public health funding (Mays)
  - Generic rather than domain specific
  - De-contextualized – does not take into account state public health governance
  - Inclusion of rural communities rare

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Research Questions

- How does state public health governance affect participation (density) in public health systems?
  - Centralized / Decentralized
- How does community size affect participation?
  - Non-core / Micropolitan
- How does health status affect participation?
- How does organizational participation (centrality) differ across domains?
  - How central are LHDs across domains?
  - Adolescent health, senior health, preparedness

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Sample

8 rural communities sampled to contrast

- Centralized & decentralized state public health governance
  - States from a similar region with similar public health expenditures
- Community size: Non-core and micropolitan
- Domains: Adolescent health, senior health, preparedness
  - Adolescent health and senior health sampled to contrast health status

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Methods: Site Visits & Key Informant Interviews

- LHD directors assisted in selection of respondents and interview locations
- Structured interview protocols
- 12 to 14 key informants were interviewed in each community
- Interviewees helped identify survey sample

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Methods: Survey

- Survey: within each domain measured
  - assessment, assurance, advocacy, and co-funding organizational networks in adolescent and senior health
  - assessment or planning, equipment purchase, training, and response to an emergency networks in preparedness
  - use of information for assessment, assurance activities, evaluation of performance
- Survey instrument pre-tested
- Survey implemented by email (SurveyMonkey)
- Response rate 63% (142/225)

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Analysis

- 96 networks: 8 communities * 3 domains per community * 4 networks per domain
- Graphical analysis: UCINET two-mode graphs
- Multivariate analysis using a negative binomial regression to regress the number of times each organization was mentioned as participating in a network on
  - Density: Governance * Community size * Domain
  - Density: Health status in domain
  - Centrality conditional on density: Organization * Domain
  - Community random effect (because of correlated errors)
  - Over-dispersion allowed for

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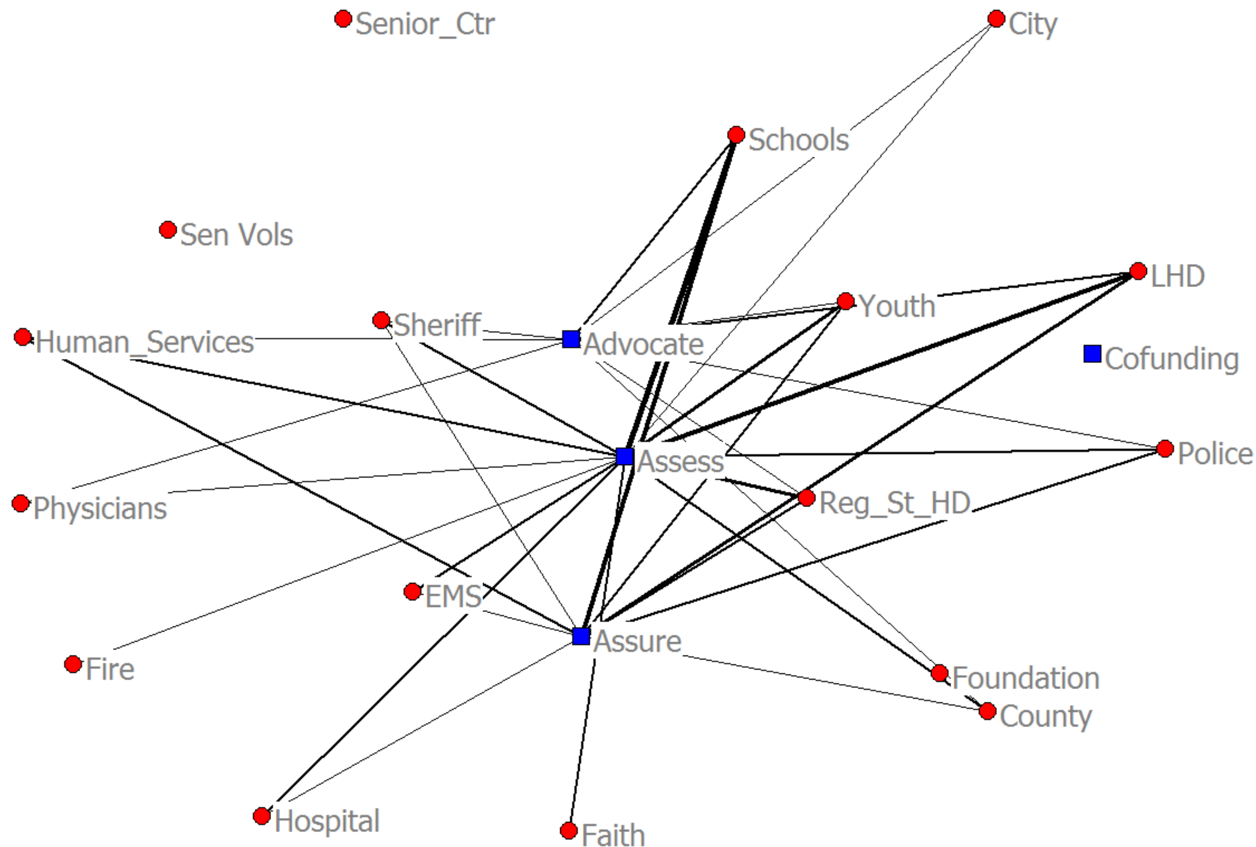
Organizational Participation in Risky Youth Behavior Activities – Non-core



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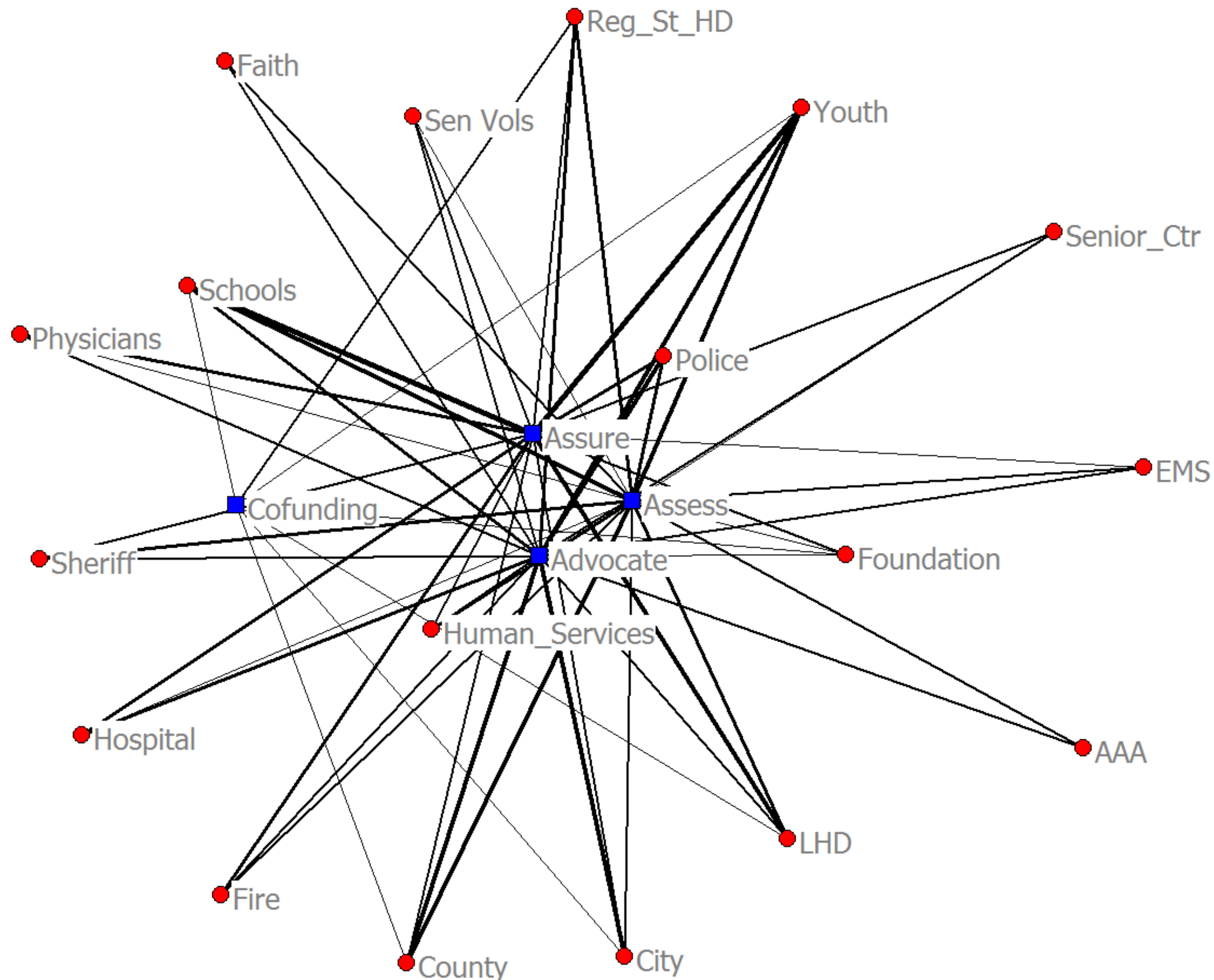
Organizational Participation in Risky Youth Behavior Activities – Micropolitan



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Density: Governance * Community Size * Domain

Governance	Community Size	Domain	
Centralized	Non-Core	Adolescent Health	1.36 (1.18,1.57)
		Senior Health	1.55 (1.35,1.77)
		Preparedness	1.89 (1.67,2.16)
	Micropolitan	Adolescent Health	1.25 (1.08,1.44)
		Senior Health	0.72 (0.59,0.87)
		Preparedness	1.44 (1.25,1.65)
Decentralized	Non-Core	Adolescent Health	0.74 (0.61,0.88)
		Senior Health	1.14 (0.99,1.33)
		Preparedness	1.44 (1.25,1.66)
	Micropolitan	Adolescent Health	2.63 (2.36,2.92)
		Senior Health	2.47 (2.21,2.75)
		Preparedness	2.59 (2.31,2.89)
F for Governance*Size*Domain 74.87 (p < .001)			

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Density: Domain

Collaboration Area	
Assess	2.75 (2.61,2.91)
Assure	2.25 (2.08,2.44)
Advocacy	2.18 (2.01,2.37)
Training	1.63 (1.44,1.84)
Responded	1.46 (1.29,1.66)
Equipment	0.71 (0.61,0.84)
Co-funding	0.65 (0.57,0.75)
F for Collaboration Area 117.26 (p < .001)	

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Density: Health Status

Health Status			
Governance	**Community Size**	**Domain**	**Estimate (T-Statistic)**
Centralized	Non-Core	Adolescent Health	-0.21 (-5.86)*
		Senior Health	0.71 (6.16)*
	Micropolitan	Adolescent Health	-0.06 (-2.01)*
		Senior Health	0.47 (3.28)*
Decentralized	Non-Core	Adolescent Health	3.16 (5.06)*
		Senior Health	-0.02 (-0.29)
	Micropolitan	Adolescent Health	-0.11 (-1.65)
		Senior Health	-5.37 (-2.64)*
* p < .05, F for Governance*Size*Domain*Health Status 15.30 (p < .001)			

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Organizational Centrality: Non-Core Communities

- Adolescent health
  - Schools, LHD, Youth Organizations, Regional HD, Police
- Senior health:
  - Area Agency on Aging, Senior Center, Hospital, Human Services, LHD
- Preparedness
  - LHD, City, Fire, County, EMS

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Organizational Centrality: Micropolitan Communities

- Adolescent health
  - Youth Organizations, Schools, County, Regional HD, LHD
- Senior health
  - Area Agency on Aging, LHD, Hospital, County, Schools
- Preparedness
  - Fire, Police, EMS, Sheriff, LHD

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Conclusion

- Context and collaboration
  - The effect of governance, community size, and collaboration
  - The best of both worlds? Core funding for non-core, delegation to encourage enterpreneuship
- The role of the local health department
  - Does the role differ by community size?
- Surge capacity? Involving peripheral actors.
- Funding Collaboration
  - Regional networks: Micropolitan and non-core

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Research Implications

- When are we really studying public health systems?
  - “The *structural capacity* of the public health system is the cumulative resources and relationships necessary to carry out the important processes of public health” (Handler, Issel, and Turnock ,2001)
  - Minimizing omitted variable bias / spurious effects
- Do we need domain specific theories rather than generic theories?
- Collaboration and health status: A complicated relationship

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Limitations and Implications

- Limitations
  - Eight communities in two states
  - Higher response rate by people active in LHDs
    - But no difference in type of responders across communities
- Implications
  - Public health systems involve communities – focusing solely on LHDs can result in biased results
  - Problem domains differ and researchers may find it useful to take those differences into account

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Conclusion

Thank you to all the people in eight great communities who taught us about their public health systems and made us optimistic for the future of public health in rural communities!

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