Beyond Single Networks: Examining the Domain-Level Architecture of Public Health Collaboration

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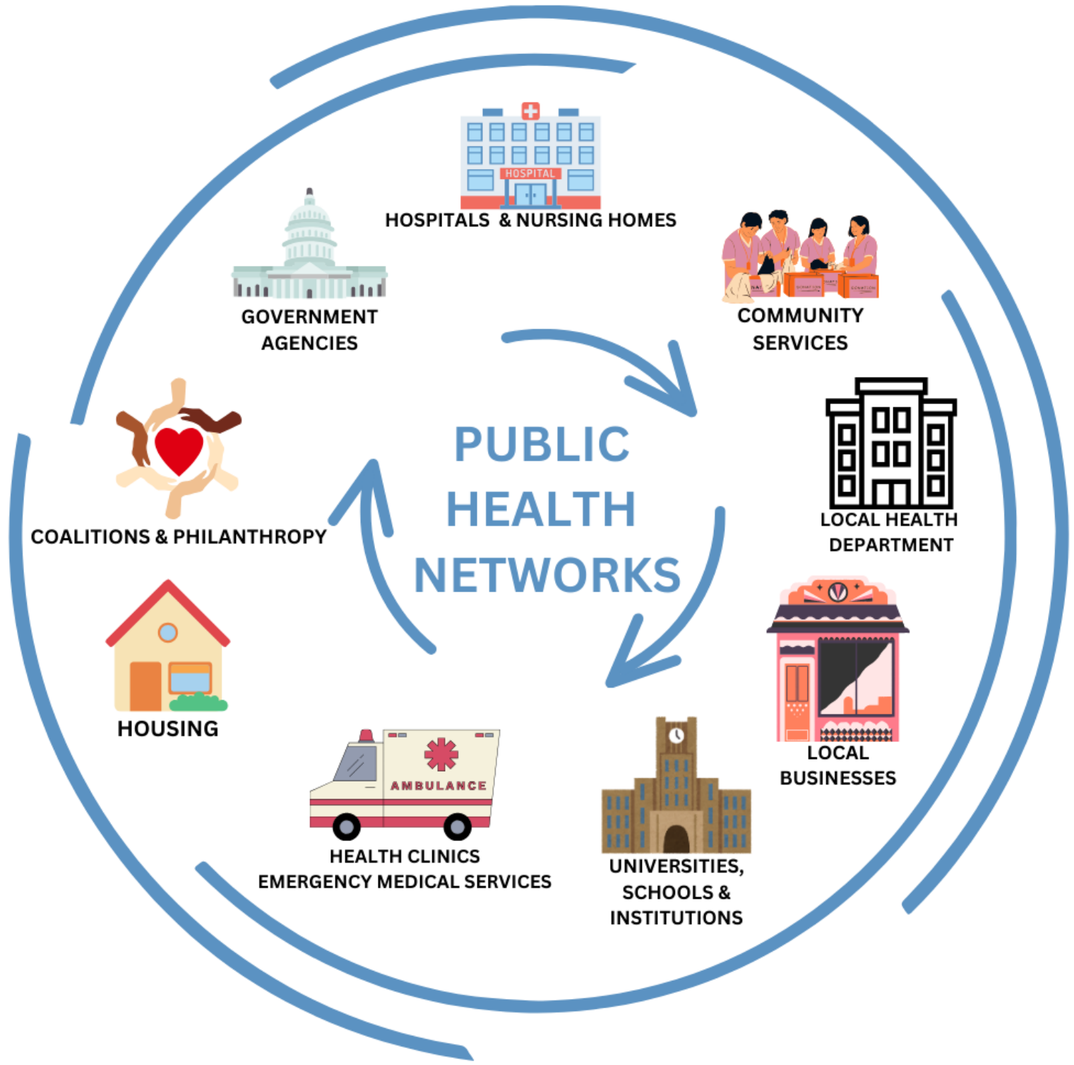
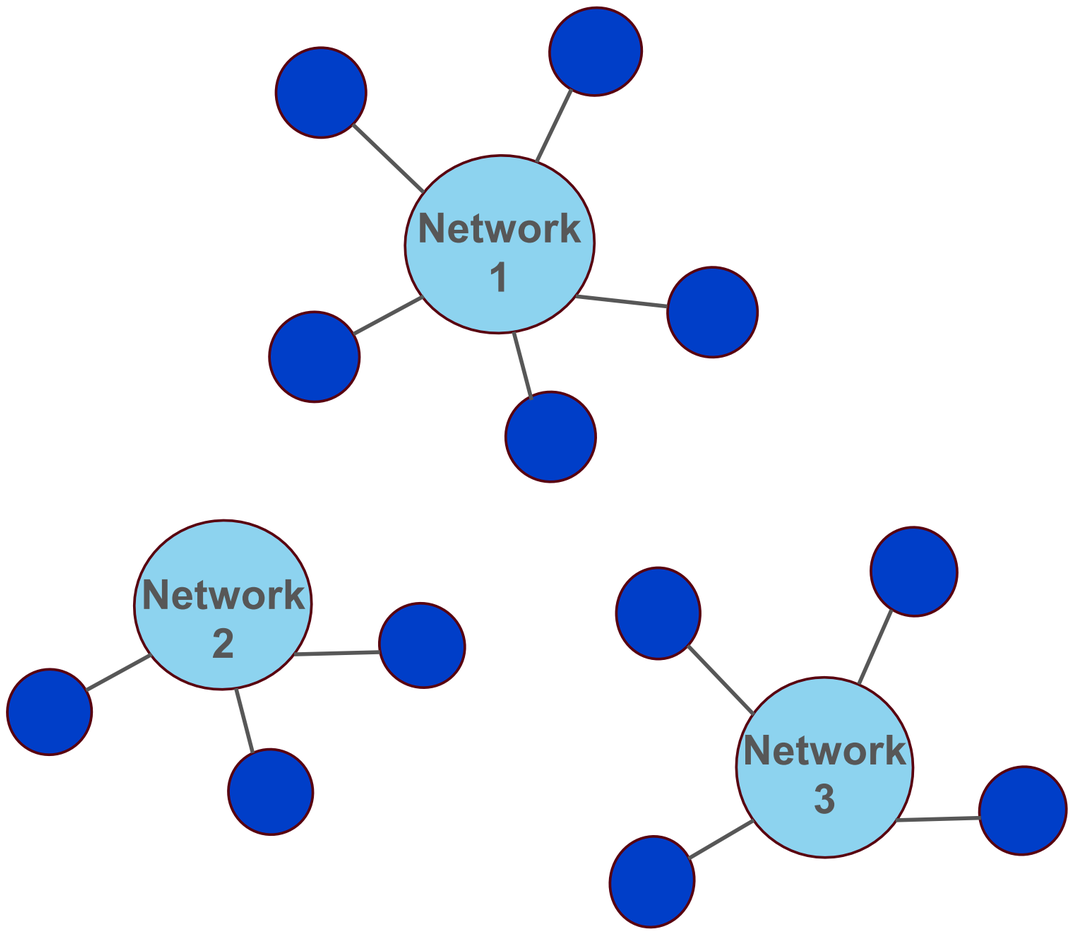
The Complex World of Public Health Services



Public Health Networks



- **Networks** are a widely adapted approach to tackle these complex public health challenges.
- **Organizations** come together and form **networks** (e.g., The Illinois Health & Hospital Association, The Collaborative for Community Wellness, Asian Health Coalition, Partnership for Healthy Chicago, etc.).
- **Purpose-oriented networks (PONs):** bounded, self-referencing collectives of individuals and/or organizations who consciously come together around a shared purpose (Nowell & Milward, 2022).

Example PON – Asian Health Coalition

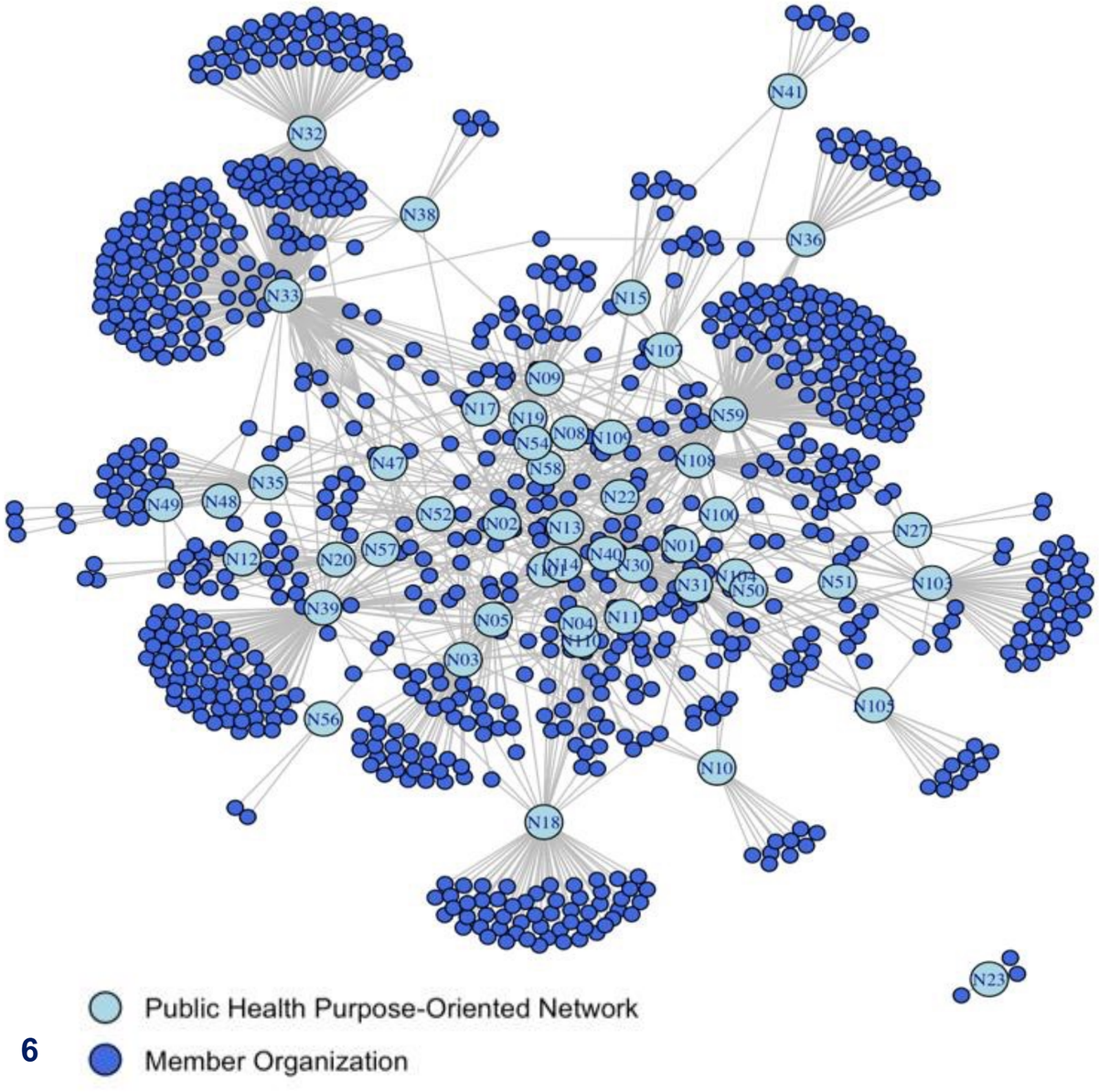
Local Community Partners

Asian Health Coalition

The Asian Health Coalition has been committed to eliminating health disparities among Asian, Native Hawaiian, Pacific Islander, African, and other underserved communities.

But the reality is even more complex…

Network Domain

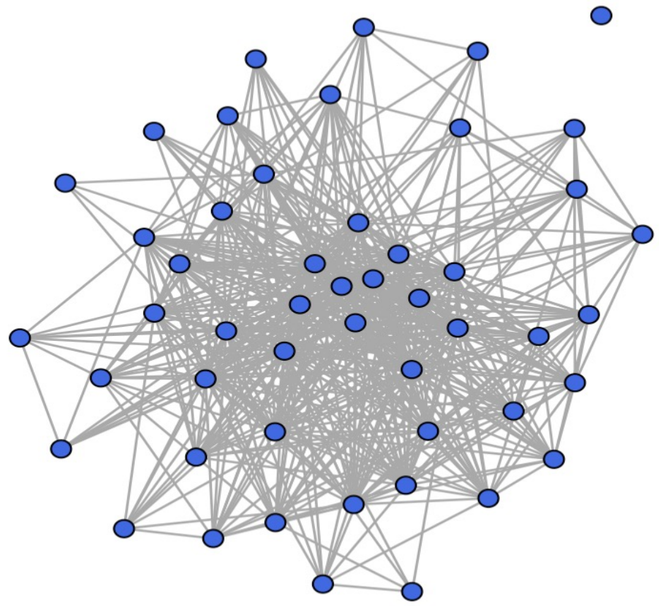


The Idea of Network Domain:

Multiple PONs within **a specific geographic area**, where interconnections across networks foster resource-sharing and interdependent action (Nowell et al., 2019).

One – Mode Network

One-Mode Network
PON-PON Connections



- PONs

Motivation

Chicago Metropolitan:

- **25+ PONs** address overlapping public health issues
- **1 in 4** organizations participate in multiple PONs

A **highly interconnected** system!

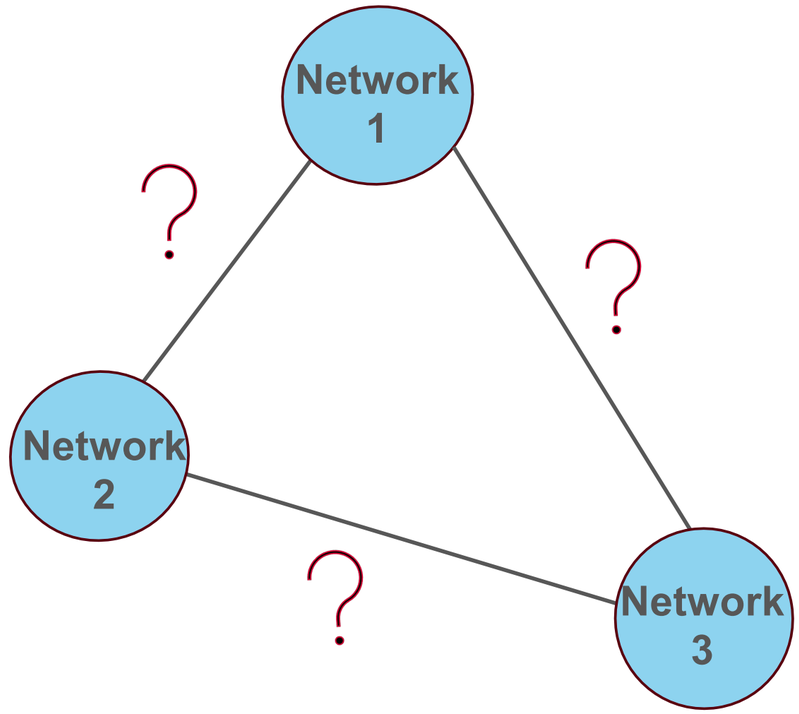
Connectivity is **UNEVEN**!

- Some networks tightly integrated
- Others remain peripheral

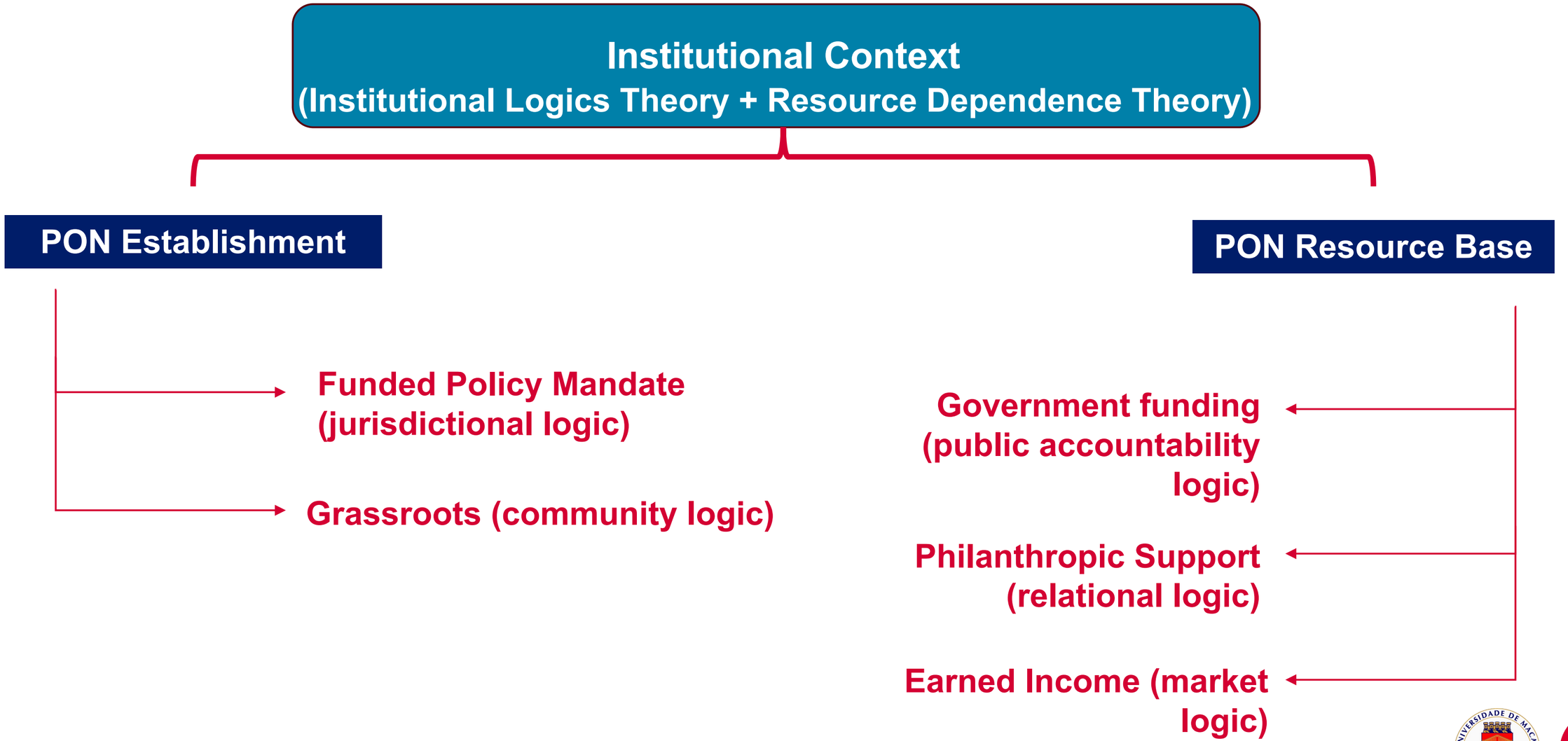
What factors are associated with the likelihood of connections *between* networks?

Research Question

What **network-level** attributes **predict** the **formation of ties** between PONs?



Theoretical Context



Data

Building the sampling frame

Network domains lack formal boundaries: Need **Systematic Construction**

3-stage identification strategy

Keyword Search

- Chicago + public health + coalition/network terms
- Issue areas: mental health, substance use, chronic disease, etc.

Inclusion Criteria (PON Definition)

- Distinct identity
- ≥ 3 independent organizations
- Clear public health purpose
- Active within last 24 months

Snowball Sampling

- Follow inter-network references
- Continue until saturation

50 PONs identified!

Data

Network Level Variables

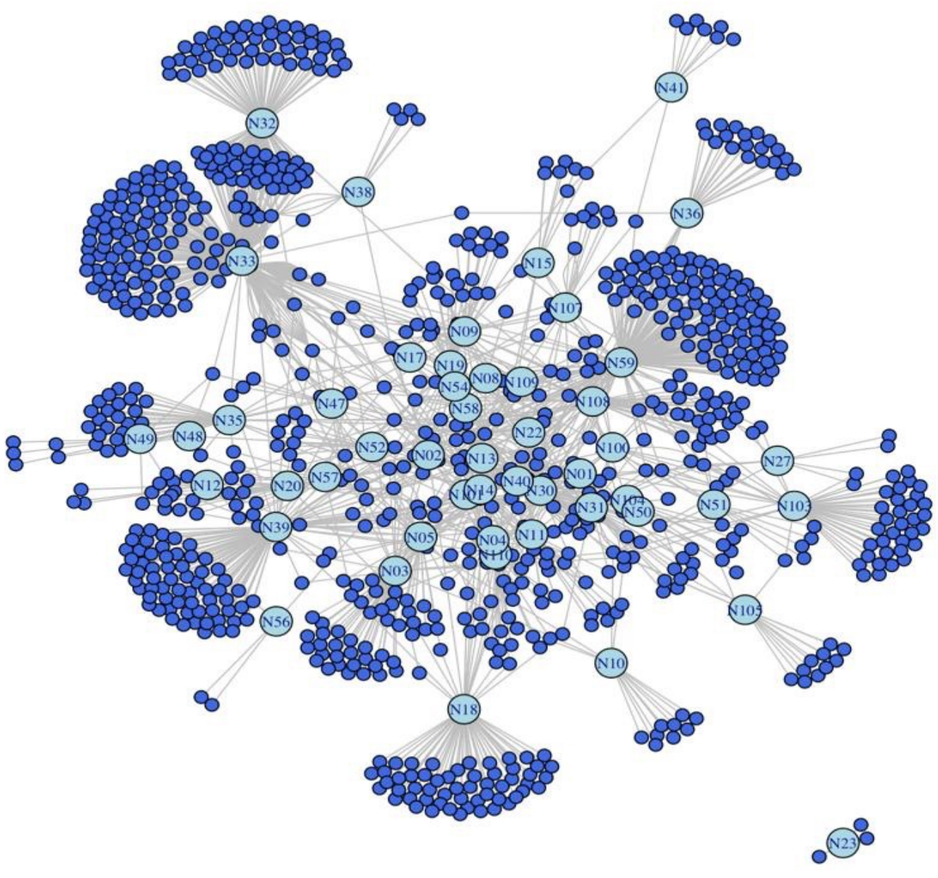
For each of the 50 PONs, we coded:

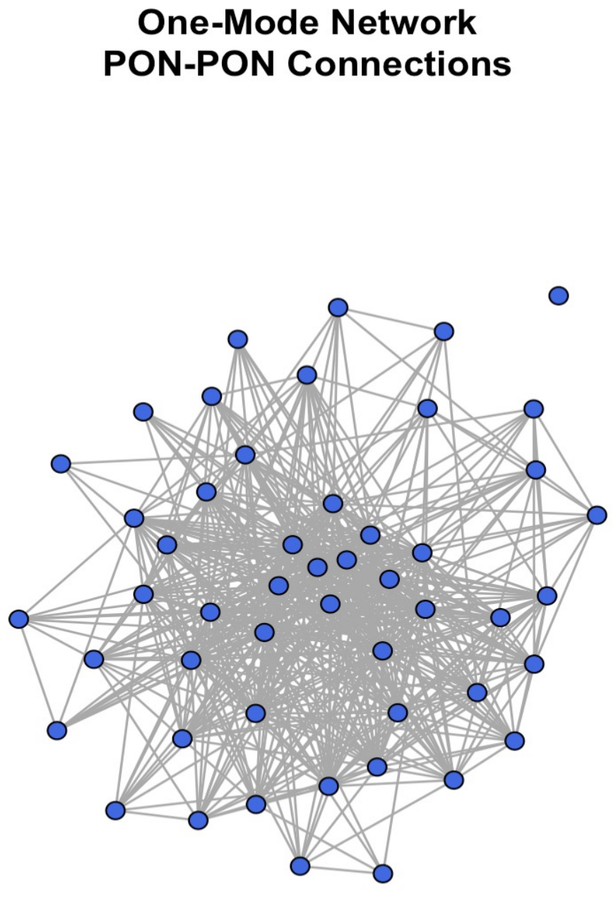
- **Activity Scope** — Count of coordination/service function
- **Funding Source** — Government/Philanthropic/Earned income
- **Institutional Origin** — Funded Policy Mandate vs grassroots

Captures institutional logics + capacity

Analysis

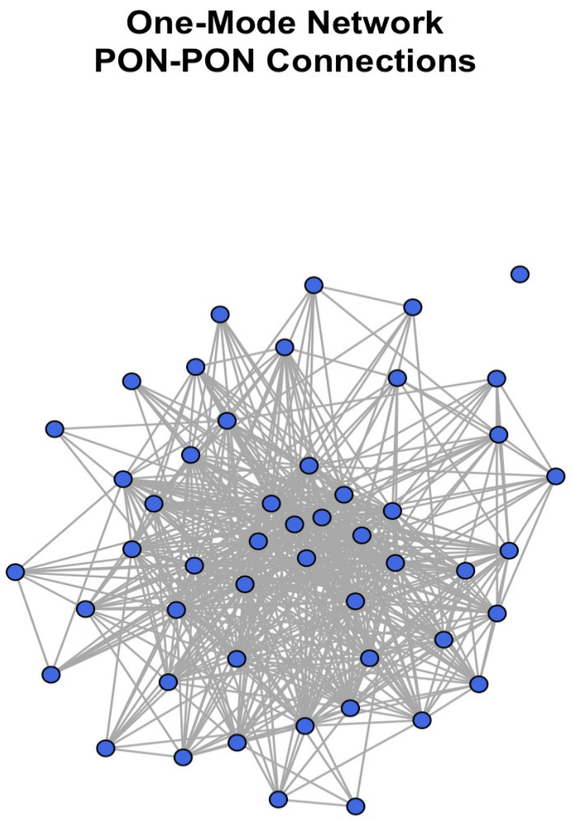
Transformed the bipartite network into a unipartite PON-to-PON projection using RStudio





Analysis

- We specified an ERGM for this projection.
- **Exponential random graph models:** "Describe parsimoniously the local selection forces that shape the global structure of a network" (Hunter et al. 2008).
- Help predict the probability that a pair of nodes in a network will have a tie between them, and which factors are associated with ties between networks: basically, **what makes connection more or less likely!**



Expectations

1. **Network Size: larger** PONs **more likely** to form external ties due to greater visibility and membership overlap
2. **Institutional Logic Effects:** PONs that receive **philanthropic funding** are expected to exhibit **higher connectivity** *(relational logic)*

   Those dependent on **earned income** are expected to exhibit **lower connectivity** *(market logic)*
3. **Geographic Homophily:** PONs operating at the **same territorial scale more likely** to connect
4. **Institutional Siloing:** with **funded policy-mandated PONs less likely** to connect with one another (jurisdictional boundaries might create turf-protective behavior)

Results

One – Mode ERGM

Term	Estimate	Std. Error	p-value
Edges	-0.564	0.547	0.303
Activity Scope	-0.125	0.048	0.010*
Network Size	0.044	0.004	<0.001***
Funded Policy Mandate	0.260	0.108	0.016*
Government Funding	-0.194	0.219	0.376
Philanthropic Funding	0.324	0.105	0.002**
Earned Income	-0.551	0.210	0.009**
Homophily: Funded Policy Mandate	-0.300	0.134	0.025*
Homophily: Geographic Scale	0.591	0.146	<0.001***
Homophily: Government Funding	0.094	0.249	0.706
Homophily: Philanthropic Funding	0.080	0.134	0.551
Homophily: Earned Income	-0.027	0.240	0.909
Difference: Activity Scope	-0.119	0.066	0.071.
Difference: Network Size	-0.032	0.005	<0.001***

Findings

Interdependence Without Uniformity: Strong domain connectivity: 24% of PON pairs connected

Activity Scope: PONs with **broader activity scope** are **less connected**, but the marginally significant difference term suggests that as **difference in activity scope increases**, probability of tie formation **decreases**

Philanthropic Funding: **More likely** to form PON-to-PON ties.

Earned Income: **Lesser probability** of PON-to-PON ties

Geographic Scale: PONs operating at the **same geographic scale** are **more likely** to connect

Funded Policy Mandate: Such PONs are **more likely** to form ties but are **less likely** to be connected to other policy mandated PONs!

Network Size: PONs **connect** with others of **similar size,** but **larger size differences reduce** tie formation probability

Implications For Practice

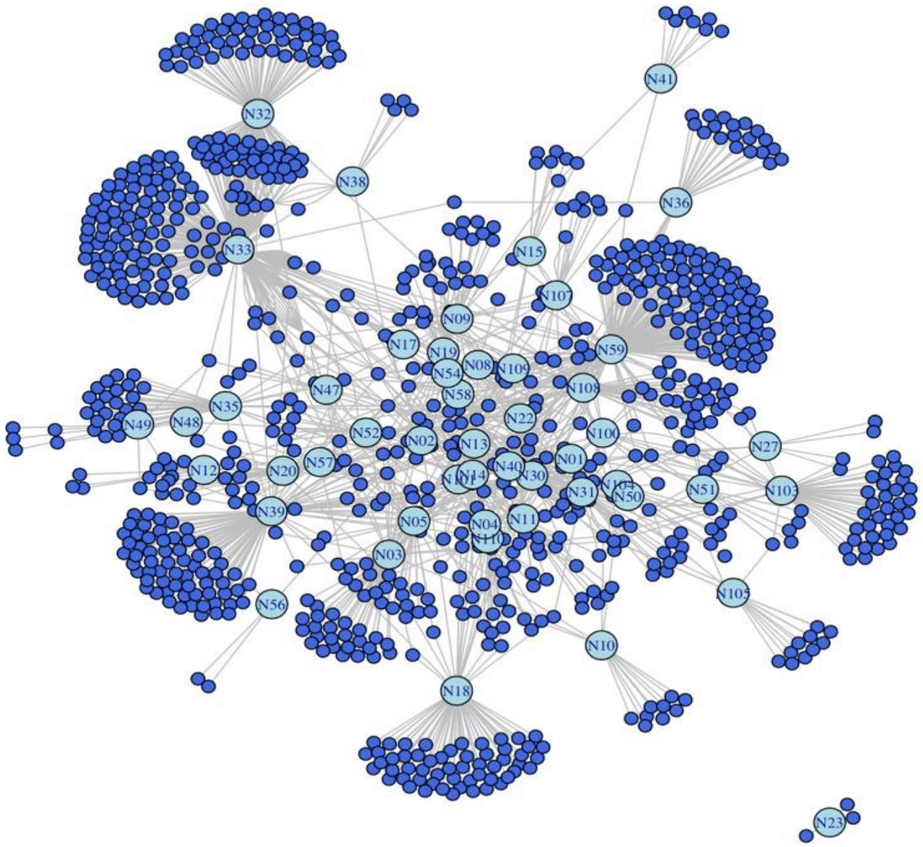
- Institutional siloing suggests need for ***intentional*** cross-mandate coordination
- Market models associated with decreased connectivity
- Connectivity might be enhanced through interventions that address institutional and resource barriers to collaboration, particularly for smaller networks and those operating under market-based revenue models!

Limitations

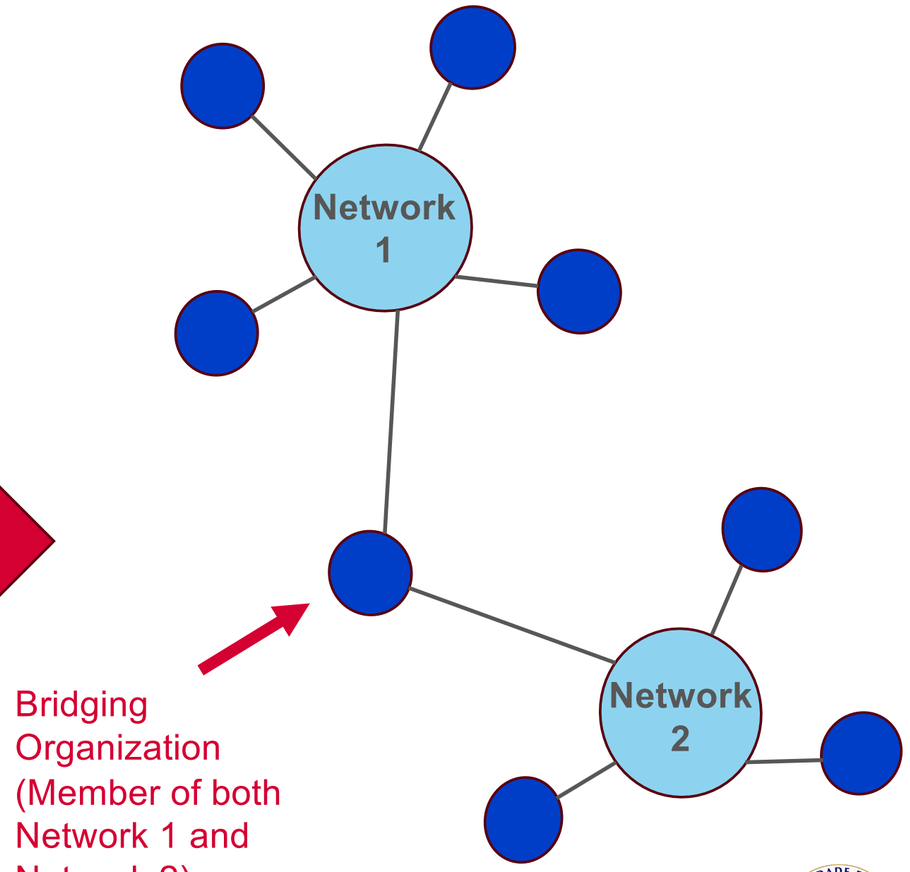
- Not a causal study
- Networks are dynamic: Our study is just a snapshot of the current network
- Scope of data is limited:
  - Only metropolitan Chicago
  - Only public data
  - Captures only *formalized* collaboration
- Qualitative insights: Ongoing research!

More From the Paper…

Bridging Organizations!

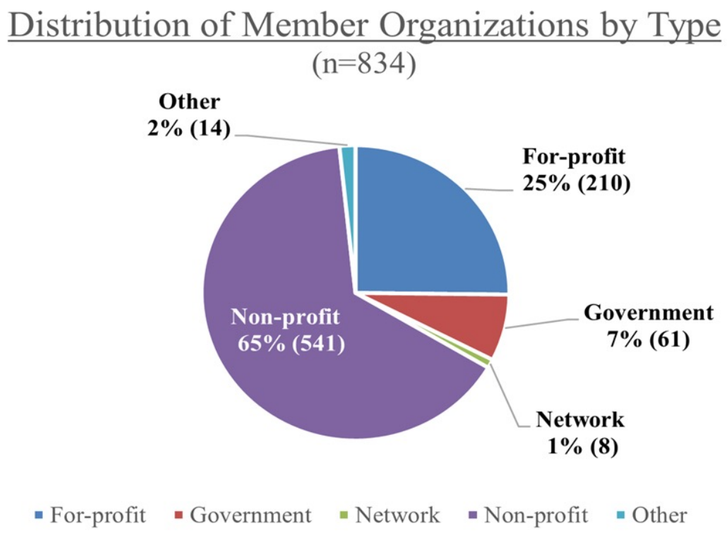


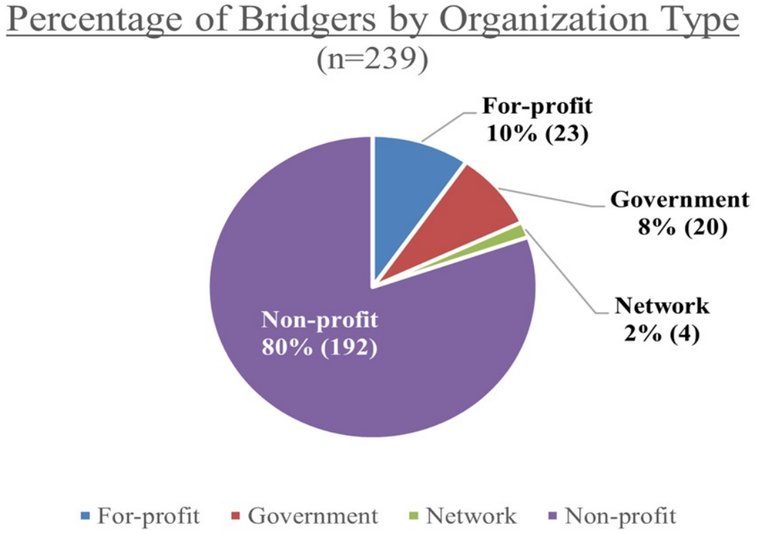
Zoom In



Bridging Organization (Member of both Network 1 and Network 2)

More From the Paper…





- What characteristics distinguish nonprofit organizations that serve as domain-level bridgers from those that affiliate with only a single PON?

- How do financial capacity, human resources, and revenue diversification shape an organization's propensity to bridge multiple networks, and do bridging organizations exhibit selective affiliation with specific types of PONs?

Thank you!