
Collaboration Between National Network of Local Health Departments

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Background of Study

Objective:

- Investigate whether certain local health department (LHDs) attributes create stronger or weaker ties within LHDs network.

Data¹:

- 2016 data from National Association of County and City Health Officials (NACCHO)
- Survey assesses LHDs infrastructure, finance, staffing, jurisdiction, and services provided.



Asymmetric & Symmetric ties:

- State
- Population Size
- Full-Time Equivalents
- Top Executive Tenure
- Nutrition program
- Tobacco prevention program

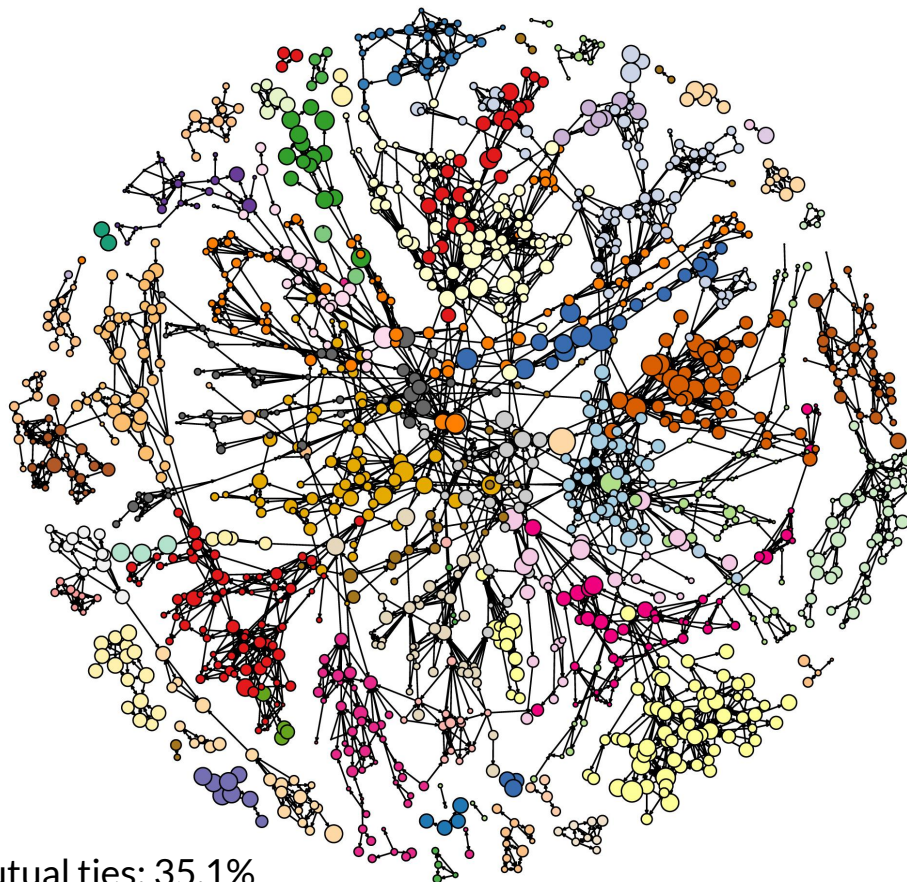
1. "About | NACCHO Profile Study." N.p., n.d. Web. 30 Apr. 2017
Image source: <http://nacchoprofilestudy.org/>

Network analysis

Full-time Equivalent Staffing Among NACCHO 2016 Local Health Departments

Table 1. Local Health Department network characteristics (n= 1397), n (%) or Median

Characteristics	LHDs, n (%)
Population	
<25000	474(33.9)
25000-49999	306(21.9)
50000-99999	233(16.7)
100000-499999	295(21.1)
>=500000	89(6.4)
FTE	
0-25	822(58.8)
25.01-50	221(15.8)
50.01-100	181(13.0)
≥100	173(12.4)
Jurisdiction type	
City	193 (13.8)
City-county	4 (0.3)
County	1024 (73.3)
Multi-city	53 (3.8)
Multi-county	123 (8.8)
Top executive tenure (years)	
1-2	381(27.3)
3-5	345(24.7)
6-10	280(20.0)
≥11	391(28.0)
Missing data	
Names missing	25
Listed their own LHD	50
Missing survey response	586
Prevention programs	
Nutrition	
Yes	1065(76.3)
No	332(23.8)
Tobacco	
Yes	1058 (75.8)
No	339(24.3)



Density: 0.0019

Percentage of mutual ties: 35.1%

Model Results

Table 2. Strong and weak tie predictors among local health department network, b (SE).

	Null		Model 1		Model 2		Model 3	
	b(SE)	p-value	b(SE)	p-value	b(SE)	p-value	b(SE)	p-value
Edges	-6.25(0.02)	<0.001*	-5.67(0.04)	<0.001*	-9.85(0.16)	<0.001*	-9.74(0.15)	<0.001*
Asymmetric								
State	--	--	4.26(0.05)	<0.001*	6.34(0.11)	<0.001*	5.67(0.12)	<0.001*
Population Size	--	--	-0.08(0.05)	0.11	0.37(0.10)	<0.001*	0.29(0.12)	<0.02*
Full-Time Equivalents	--	--	-0.70(0.05)	<0.001*	-0.22(0.09)	<0.01*	-0.10(0.11)	0.36
Jurisdiction Type	--	--	-0.78(0.05)	<0.001*	0.03(0.09)	0.71	0.12(0.11)	0.87
Top Executive Tenure	--	--	-0.50(0.06)	<0.001*	0.17 (0.10)	0.08	0.08 (0.08)	0.32
Nutrition	--	--	-0.77(0.05)	<0.001*	0.11(0.10)	0.28	-0.12(0.11)	0.89
Tobacco	--	--	-0.67(0.05)	<0.001*	0.09(0.09)	0.32	0.08 (0.12)	0.46
Symmetric								
State	--	--	--	--	15.21 (1.00)	<0.001*	12.65(0.96)	<0.001*
Population Size	--	--	--	--	1.17(0.74)	0.11	0.87(0.28)	<0.002*
Full-Time Equivalents	--	--	--	--	0.14(0.62)	0.82	0.04(0.46)	0.93
Jurisdiction Type	--	--	--	--	0.51(0.58)	0.38	0.66(0.51)	0.20
Top Executive Tenure	--	--	--	--	0.28(0.60)	0.64	-0.22(0.56)	0.69
Nutrition	--	--	--	--	0.03(0.55)	0.96	-0.35(0.63)	0.58
Tobacco	--	--	--	--	-0.10(0.45)	0.82	0.41(0.38)	0.27
GWESP ($\alpha=0.2$)	--	--	--	--	--	--	0.98(0.07)	<0.001*
Model AIC	52,082		43,933		38,102		38,170	

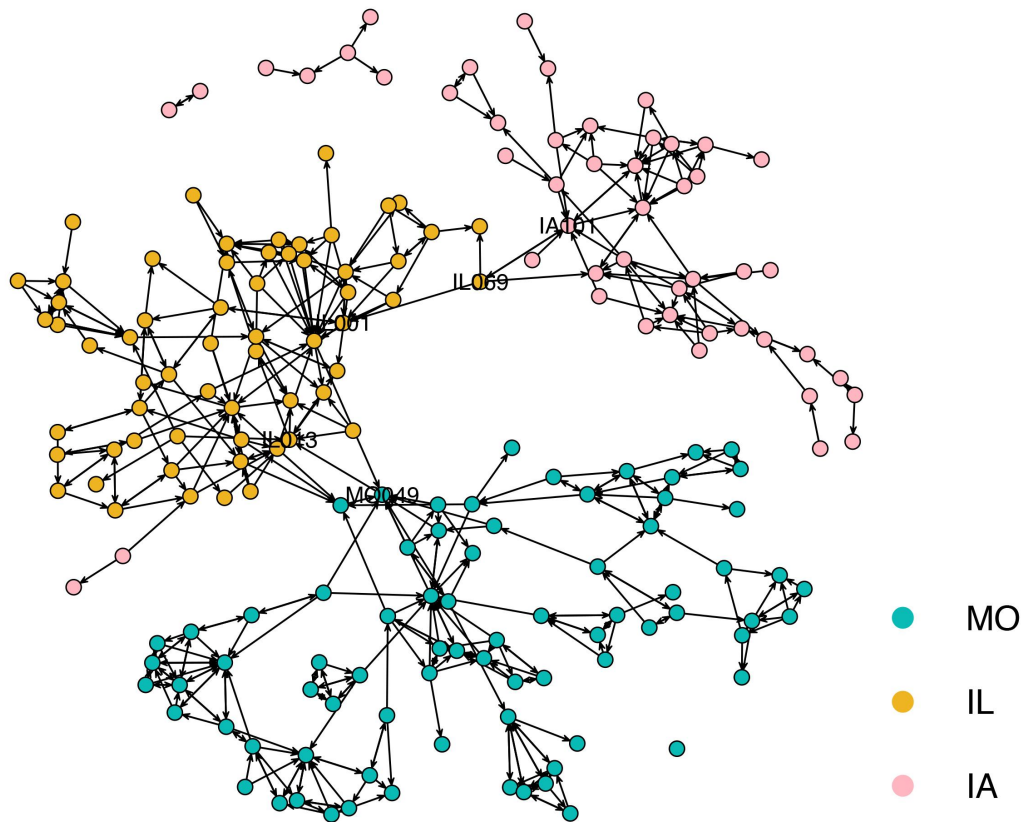
Note: boldface indicates significance. * $p<0.05$

Investigation of three states

Top 5 betweenness centrality values:

- **IL001:** Adams County Health Department, IL
- **IL013:** Cook County Department of Public Health, IL
- **IL069:** Schuyler County Health Department, IL
- **MO049:** Kansas City Health Department, MO
- **IA101:** Siouxland District Health Department, IA

Local Health Departments Network
in Missouri, Illinois, and Iowa



Conclusion

- The density of the 2016 NACCHO network analysis of LHDs has increased since the 2010 NACCHO network analysis.
- Asymmetric, or weak ties:
 - Being in the same state
 - Serving same population size
 - Full-time equivalent staff
- Symmetric, or mutual ties:
 - Being in the same state

- Suggestions for LHDs:
 - LHDs can create mutual ties with other LHDs of varying population sizes and staffing.
 - LHDs should create mutual relationships with other LHDs.

Help with dissemination and implementation strategies between LHDs.

Acknowledgements

Thank you to Dr. Luke and Beth for teaching us about the Social Network Analysis.

Thank you to Dr. Harris for providing the NACCHO dataset as well as guidance and support in this project.

