Using Social Network Analysis to understand the impact of systems integration efforts: A Case Study from Thunder Bay

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Data that Makes a Difference

University of Calgary

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Overview

- Background
- Methods
- Results and next steps

Origin of the project

- Grew out of partnership with Thunder Bay CAB
- Interest in systems integration efforts
  - CAB and Community focus on expanding systems integration work
  - Academic interest in understanding the outcomes of these efforts

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Why Social Network Analysis?

- Social Network Analysis (SNA) is a tool for:
  - assessing relationships among individuals
    - Some studies conducted SNA among homeless individuals
  - interorganizational and/or intraorganizational relationships
    - Some studies assessing integration in certain areas of social and health services
    - Limited use for homelessness service providers networks*
      - Keast in Brisbane, Gold Coat, Townsville and Cairns
      - Fleury in Montreal through AHCS

Keast, R., Waterhouse, J. M., Brown, K., & Murphy, G. (2008). Closing the gaps and opening doors: The function of an integrated homelessness service system: Place-based networks analysis and case studies.

Fleury, M. J., Grenier, G., Lesage, A., Ma, N., & Ngui, A. N. (2014). Network collaboration of organizations for homeless individuals in the Montreal region. International journal of integrated care, 14(1).

Methods

- Adaptation of Keast data collection tool
  - Questions about Shared information, Joint delivery of programs, Funding relationship
  - Questions about strength of relationship
- Data collected in 2017
- Survey distributed by email to the Thunder Bay CAB and open for wider distribution
- 19 organisations participated and 34 organisations were identified in data analysis

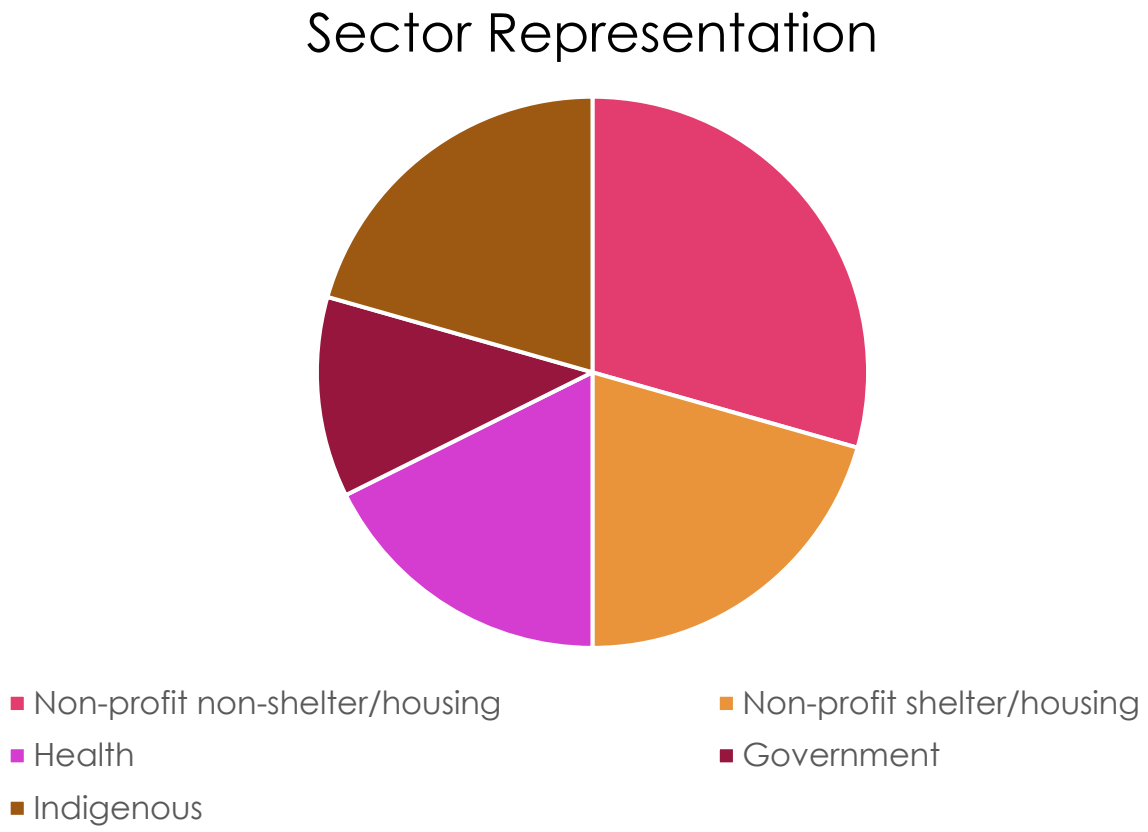
Findings

Network Statistic	Whole Network	Shared Info	Funding	Joint Delivery
Nodes	34	34	23	33
Edges	427	376	47	102
Percentage	100	88.06	11.01	23.89
Avg Degree	12.559	11.059	2.043	3.091
Avg Wgt. Degree	15.441	13.824	4.435	5.667
Network Diameter	2	3	5	5
Graph Density	0.381	0.335	0.093	0.097
Connected Components	1	1	1	1
Avg Clustering Coefficient	0.637	0.614	0.203	0.327
Avg Path Length	1.319	1.333	2.304	2.402

Average Degree: the average number of connections across an entire network

Graph Density: Completeness of a network; a network will all possible connections has a density of 1

Findings



Non-profit non-shelter/housing	29.4%
Non-profit shelter/housing	20.6%
Indigenous	20.6%
Health	17.6%
Government	11.8%

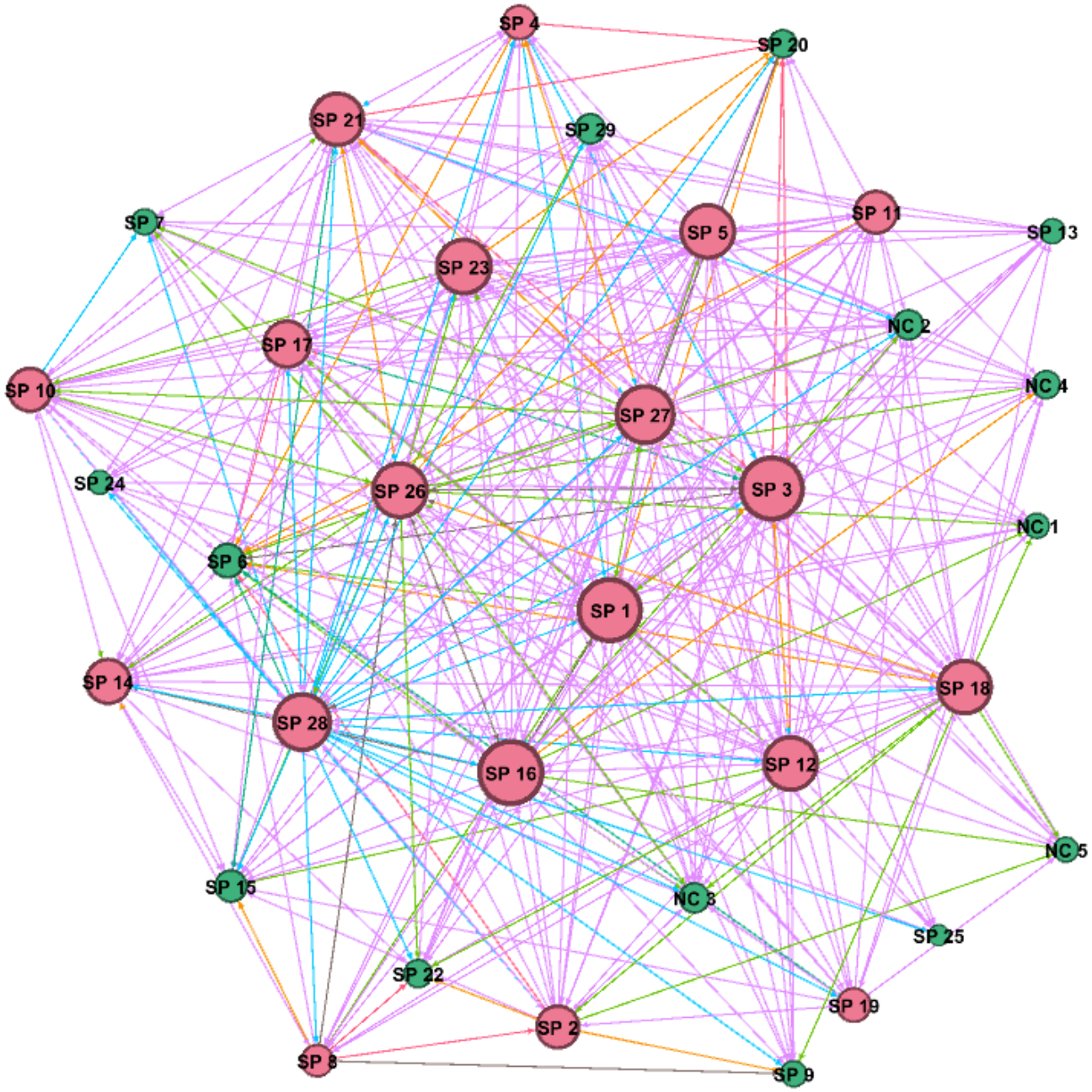
Interpreting the SNA Maps

- Role of organisations within the network
  - Identifying changing role of organisations within the network
    - Size of node
      - changes depending on nature and strength of relationship
      - Multiple relationships change relative size of nodes
    - Directionality
      - Important context for understanding the nature of relationship
- Complete network is at bottom of each slide for an initial comparison

The Network

activity-string

Shared Info	(70.49%)
Shared Info, Joint Delivery	(10.07%)
Joint Delivery	(8.43%)
Shared Info, Funding, Joint Delivery	(4.45%)
Shared Info, Funding	(3.04%)
Funding	(2.58%)
Funding, Joint Delivery	(0.94%)



Shared info

activity-string

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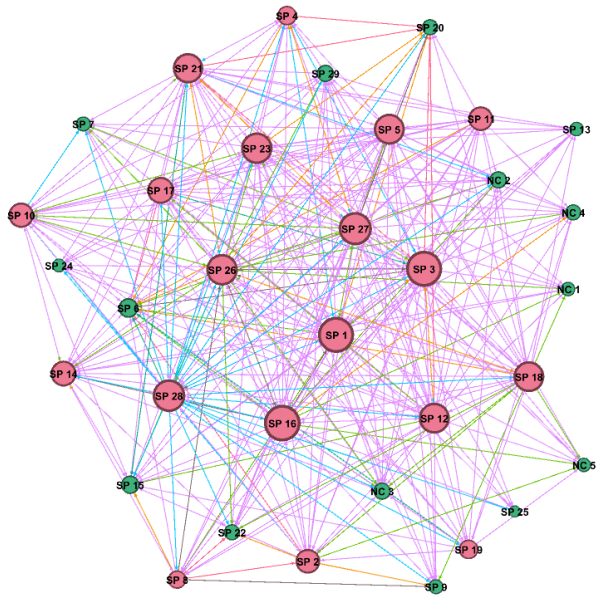

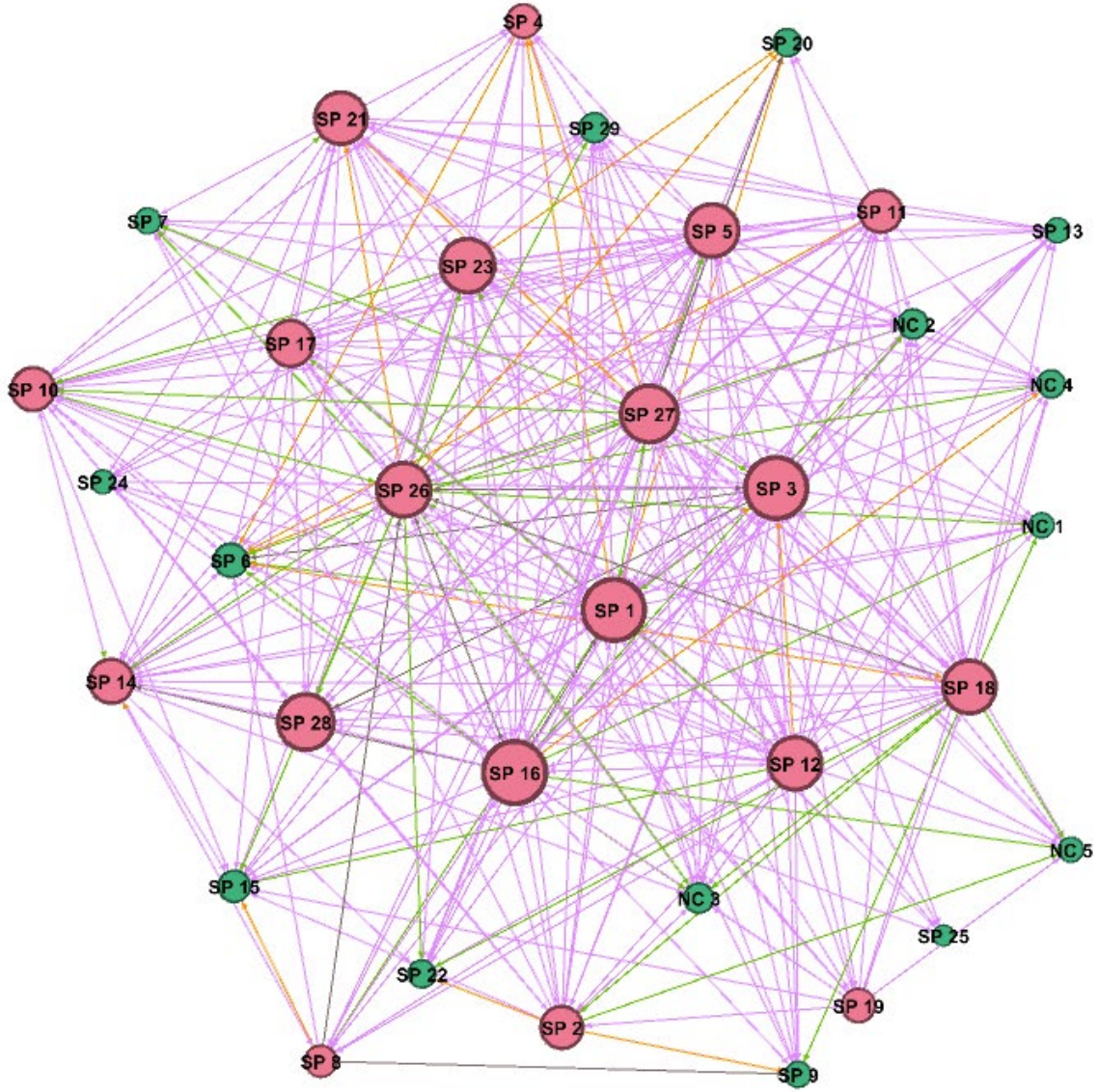

Joint Delivery of Programs

activity-string

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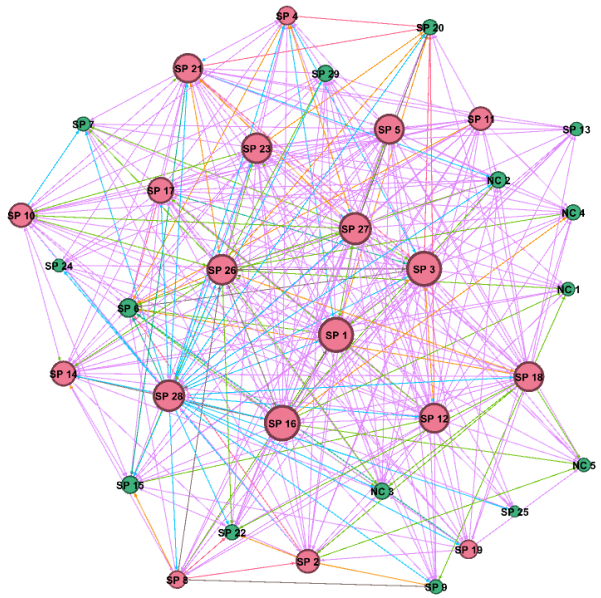

Funding relationship

activity-string

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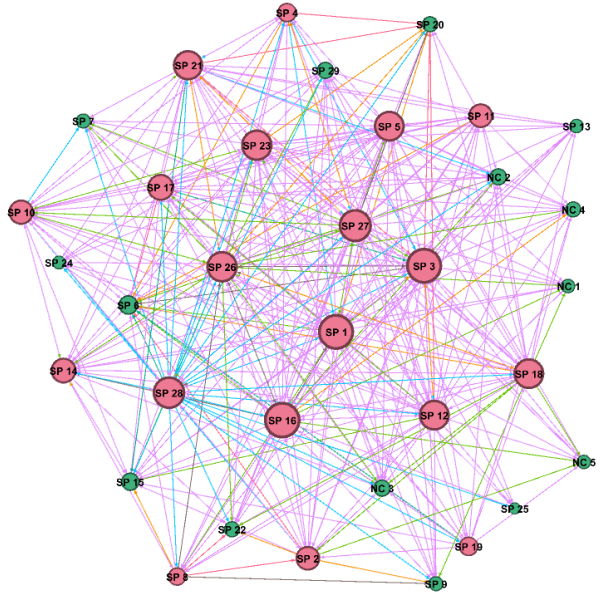
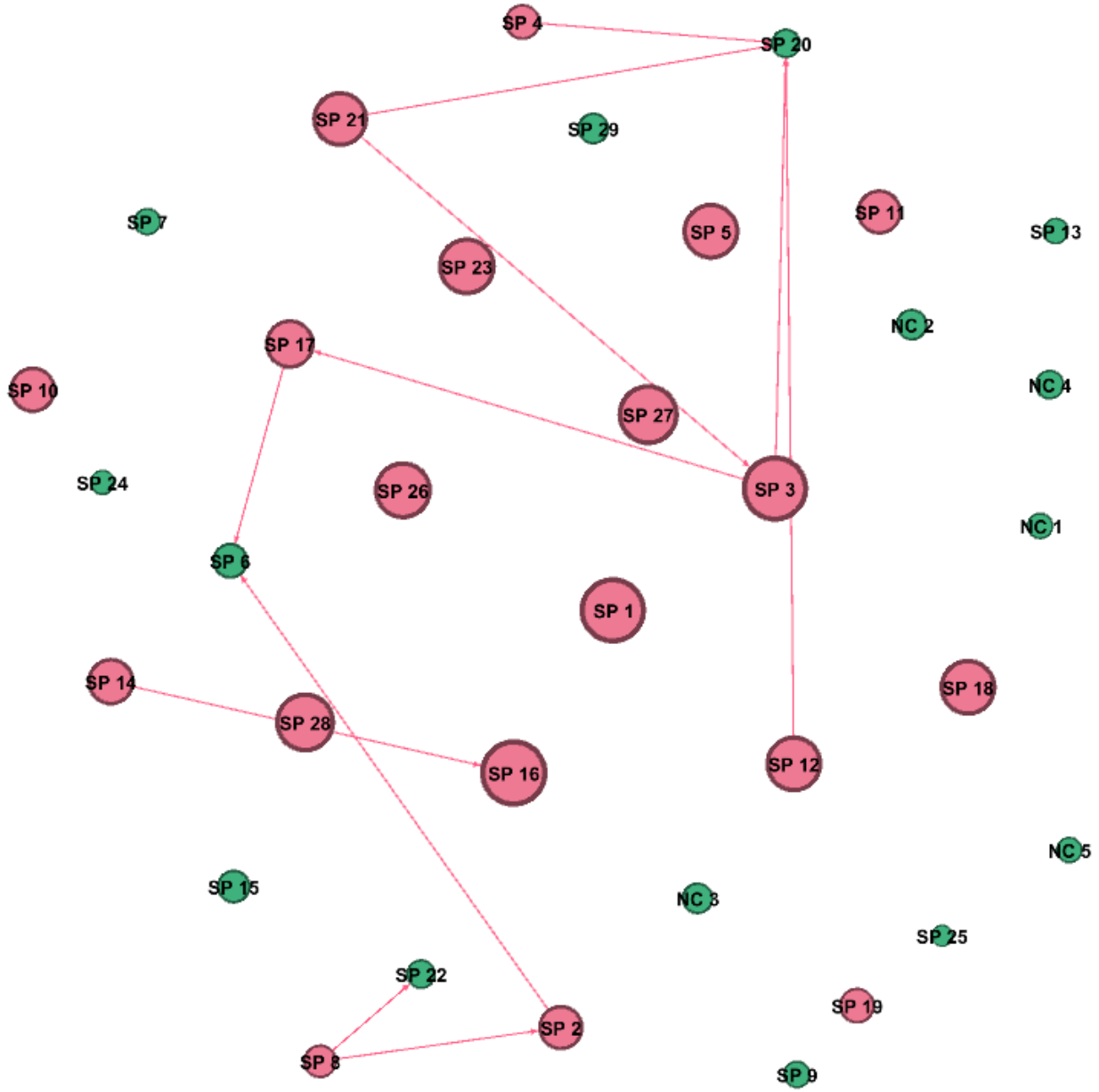
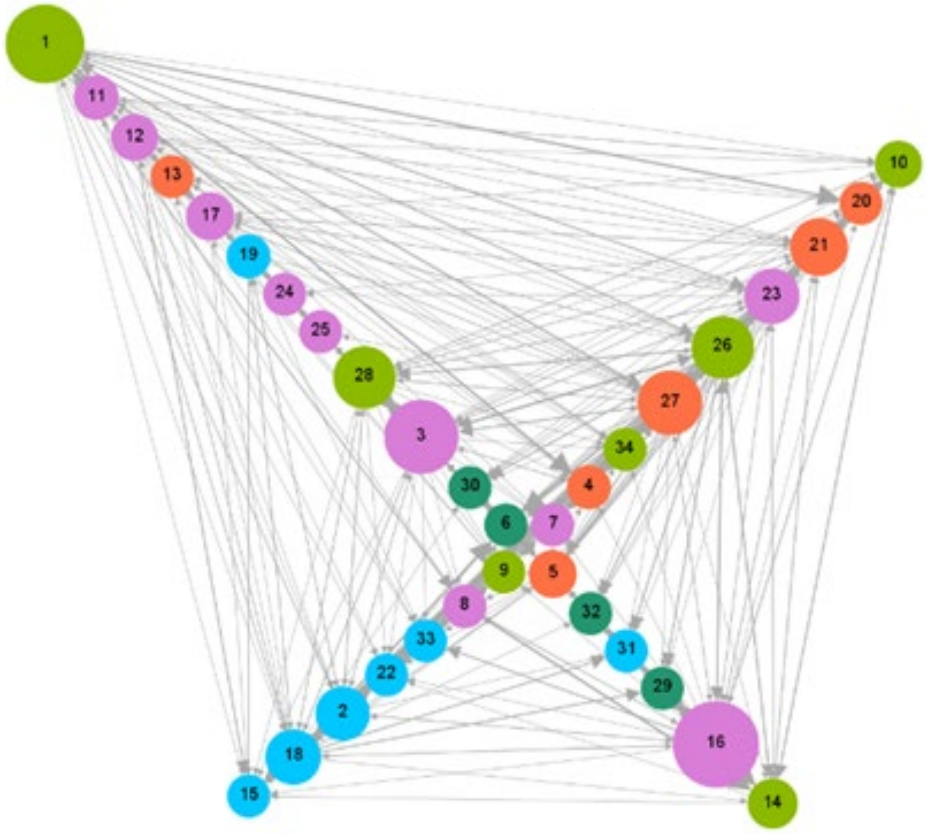




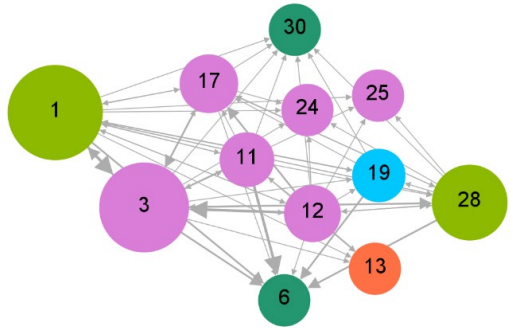
Modularity Analysis



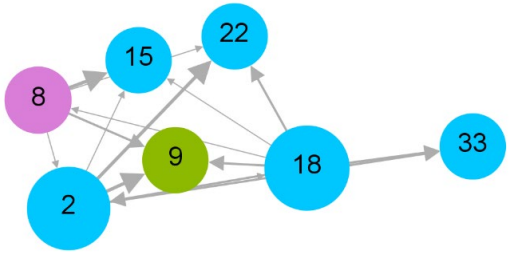
- Nonprofit other
- Nonprofit housing/shelter
- Indigenous
- Health
- Government

Modularity Analysis

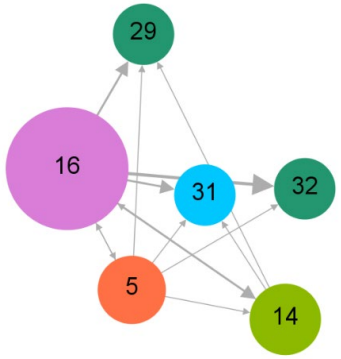
The following maps show the links within each community.



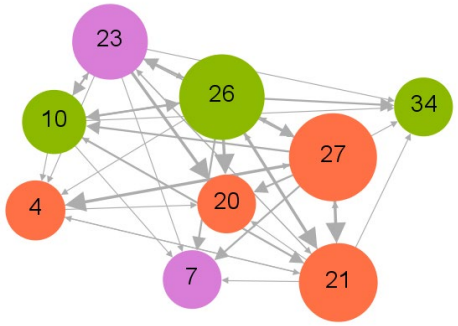
(a) Modularity Class 0



(b) Modularity Class 1



(c) Modularity Class 2



(d) Modularity Class 3

Lessons and next steps

- Initial analysis
  - Potential for more in depth analysis such as according to service provider type
- Limitations – lessons learned about survey design and delivery for improved data and results
  - Expanding network and organisational outreach and options for responses
  - In person data collection

Lessons and next steps

- Useful for demonstrating
  - types of relationships
  - strengths of relationships
  - differences in network performance between different types of relationships

- Currently collecting data for 2nd analysis to compare impacts of system integration activities using pre and post application
- Potential for comparison between cities and regions

Thanks!

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