Measuring Social Networks: Understanding and Supporting Relationships to Transform Health Care

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Who do you know in this room?
With whom have you collaborated within the past year?
Overview

- What is a network?
- Why are networks important?
- What is “Social Network Analysis” (SNA)?
- How can SNA be used to improve health care?
What is a Network?

Set of entities (*people, organizations, nations*) connected to each other through relationships.
Types of relationships

- Who do you...
  - Like?
  - Collaborate with?
  - Communicate with?
  - Go to for advice?
  - Share information with?
Information Sharing

Referrals
Why are networks important?

- Obtaining information
- Solving problems
- Learning how
- Collaborative project work
- Social support
- Service coordination
- “Informal structure” of an organization

Critical to professional successes, including success of initiatives to improve health care
Networks in health care: Example

All local doctors in given specialty

- Relationships
  - share advice & information
  - discuss cases
  - socialize

- Diffusion of innovation: Timing of new drug use (prescription records)

Networks in health care: Example

Health Professions Education Fellowships: Communities of Practice

- Trust
- Support (emotional, resource-sharing)
- Personal & collective learning
- Common interests & challenges
- Connection to larger HPE community
- Expansion of network

Lown, B.A. et al. (2009). The personal & professional impact of a fellowship in medical education. Academic Medicine, 84(8), 1089-1097.

What is “Social Network Analysis”? 

- **Patterns** of relationships
- Identify...
  - Key information sources
  - “Bridges” between groups
  - Untapped expertise
  - “Bottlenecks” of too many ties for too few people

**SOCIAL NETWORK ANALYSIS (SNA)**
SNA Components

- Individuals (“nodes” or “actors”)
- Relationships (“edges” or “ties”)
- Structure of relationships
Network Structure

- Density
- Fragmentation and Isolation
- Distance
- Centrality
- Reciprocity (2-way ties)
- Clusters, Cliques, & Subgroups
Density of network

16%

79%
Isolated network members
Distance between network members

Collaborative Relationship of ONE DEGREE between “A” and “B”

Agency “A”  →  Agency “B”

Collaborative Relationship of TWO DEGREES between “A” and “B”

Agency “A”  →  Agency “C”  →  Agency “B”

Collaborative Relationship of THREE DEGREES between “A” and “B”

“Gatekeeper” on shortest path (betweenness centrality)
Social Capital

- **Brokerage**
  - “bridges” between groups / institutions

- **Closure**
  - “bonding” within groups / institutions

Burt, R.S., & Ronchi, D. (2007). Teaching executives to see social capital: Results from a field experiment. Social Science Research, 36, 1156-1183.
How can SNA be used to improve health care?

- Information is only helpful if you use it
  - improve information flow
  - support collaborations
  - promote innovation
  - develop communities of practice
  - Examine change in relationships over time
SNA in health care: Example

- ICU team - patient family
  - team communication

- Interdisciplinary advisory committees for career development awardees
  - inter-departmental shared committee membership

- Directors of Clinical Translational Sciences Institute
  - knowledge & interaction between administrative units

SNA in health care: Example

University-Community collaboration to **improve community capacity** to address chronic disease

Communities using SNA results to build partnerships

- Which community agencies are most central in the network? Are these agencies essential for addressing community needs?
- How can subgroups with strong working relationships be mobilized to meet broader network objectives?

SNA in health care: Example

- Network analysis in public health
  - Disease transmission
  - Information transmission (e.g., education campaigns)
  - Social support and health
  - Health systems, inter-organizational networks

Example: FAIMER community

7 types of networks – With whom do you....?

- **Work**: Exchange information to be effective in your job?
- **Innovation**: Brainstorm, share and explore novel, untested ideas?
- **Expert Advice**: Seek expert knowledge about your work?
- **Career Advice**: Seek personal or career support and advice?
- **FAIMER Community**: Find out FAIMER community news?
- **Collaboration**: Collaborate on projects, activities, problem solving?
- **FAIMER Strategy**: Discuss FAIMER’s global strategy or vision?

*NetForm instrument* -- [www.netform.com](http://www.netform.com)
Description of the Global FAIMER Community

- What types of interactions/relationships are most important to foster in the FAIMER community? Why?

- Data to inform discussion of question...
"Work" predominates

<table>
<thead>
<tr>
<th>Network</th>
<th>N of Participants</th>
<th>Percent Response</th>
<th>Average No of Contacts</th>
</tr>
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<tbody>
<tr>
<td>Work</td>
<td>341</td>
<td>74.8%</td>
<td>19.4</td>
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<tr>
<td>Innovation</td>
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<td>6.1</td>
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<td>Collaboration</td>
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<td>FAIMER Strategy</td>
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<tr>
<td>All Networks</td>
<td>341</td>
<td>78.0%</td>
<td>20.3</td>
</tr>
</tbody>
</table>
Alumnae change over time

- **Work Network**
- 2-way contacts
- By Institute class years

2001 class (increasing years clockwise)

PHIL by Class (Time 1 Only)
Description of GLOBAL and REGIONAL Networks within the FAIMER Community

- How do we balance achieving a “global community of practice” with achieving “regional communities of practice”?
- Do we need different strategies for enhancing the effectiveness of the global and the regional programs?
- Data to inform discussion of questions...
Ties within & between regions

- **WORK** Network
- 2-way contacts
- By geographic region
Building and Sustaining the FAIMER Community

- How can we best support and benefit from the expertise and resources of “key connector” individuals in the FAIMER community?
- What role(s) do we envision for these individuals in the community?
- Data to inform discussion of questions...
Key connector individuals

Who is...?

- **directly connected** to large numbers of individuals within a population.
- **strategically connected** -- on critical pathways between subgroups and key individuals.
- **indirectly connected** to a large portion of the network.
Alumnae “key connectors”

- Work Network
- 2-way contacts
- By Institute class years

2001 class (increasing years clockwise)
Summary

- What is a network?
- Why are networks important?
- What is “Social Network Analysis” (SNA)?
- How can SNA be used to improve health care?
Additional Resources

International Network for Social Network Analysis (INSNA) [http://www.insna.org/]

Introductory e-text: Hanneman & Riddle “Introduction to social network methods” [http://faculty.ucr.edu/~hanneman/nettext/]

Analytic technologies (UCINET software) [http://analytictech.com/]