Patterns of Interaction in Public Health Research Networks: Insight from Network Analysis

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Patterns of Interaction in Public Health Research Networks: Insight from Network Analysis

Glen P. Mays, PhD, MPH
University of Kentucky

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The Logic of Public Health PBRNs

- Translation & application
- Data exchange
- Analysis & interpretation
- Engaged practice settings
- Identify Common questions of interest
- Research partner
- Apply Rigorous research methods
The Robert Wood Johnson Foundation’s Public Health PBRN Program

- First cohort (December 2008 start-up)
- Second cohort (January 2010 start-up)
- Affiliate/Emerging PBRNs

Map of the United States showing different states colored to represent the different cohorts and affiliate/emerging PBRNs.
PBRN Network Analysis Methods

- Used to take an early “snapshot” of network structure and interaction
- Draft instrument developed and validated with Round I networks
- Fielded with first cohort of five PBRNs in 2010, second cohort of 9 PBRNs in 2011
PBRN Network Analysis Methods

- Responses from 356 of 420 individuals meeting case definition for PBRN participant (85%)
- 391 separate organizational participants identified
- 4376 organizational ties
- Constructed network summary measures and diagrams from responses to question about frequency and types of interaction for research
Types of Public Health PBRN Participants

- Local government agency: 48%
- Academic Institution: 27%
- State government agency: 11%
- Other: 6%
- Professional association: 7%
- Federal agency: 1%
Roles played by participants in PBRN activities

 Helping others apply findings
 Applying findings within own organization
 Disseminating findings
 Implementing research studies
 Seeking funding for studies
 Designing/planning studies
 Identifying research topics/ideas

 Research organizations
 Practice organizations

 *p<0.05
PBRN Network Structures - CT

Network Centralization = 35.4%

Local practice
State practice
Professional assoc.
Research

Legend:
- Local practice
- State practice
- Professional assoc.
- Research
PBRN Network Structures – NE

Network Centralization = 42.5%

Local practice
State practice
Professional assoc.
Research
<table>
<thead>
<tr>
<th>Type of Organization</th>
<th>Degree Centrality</th>
<th>Betweenness Centrality</th>
</tr>
</thead>
<tbody>
<tr>
<td>All practice organizations</td>
<td>31.84</td>
<td>(16.16)</td>
</tr>
<tr>
<td>All research organizations</td>
<td>41.37</td>
<td>(19.43)</td>
</tr>
<tr>
<td>All organizations</td>
<td>34.84</td>
<td>(17.56)</td>
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</tbody>
</table>
### Network Structures Associated with Perceived Benefit

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Coeff.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network density</td>
<td>0.341</td>
<td>0.112 **</td>
</tr>
<tr>
<td>Degree centrality</td>
<td>-0.521</td>
<td>0.227 **</td>
</tr>
<tr>
<td>Betweenness centrality</td>
<td>0.148</td>
<td>0.108</td>
</tr>
<tr>
<td>Practice orientation</td>
<td>0.283</td>
<td>0.144 *</td>
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</tbody>
</table>

Estimates from hierarchical ordered logit model controlling for PBRN random effects  
**p<0.05    *p<0.10
### Network Structures Associated with Engagement in Dissemination and Translation Activities

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Coeff.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network density</td>
<td>0.325</td>
<td>0.109**</td>
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<tr>
<td>Degree centrality</td>
<td>0.673</td>
<td>0.318**</td>
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<tr>
<td>Betweenness centrality</td>
<td>0.914</td>
<td>0.231**</td>
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<td>Practice orientation</td>
<td>0.883</td>
<td>0.274***</td>
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</tbody>
</table>

Estimates from hierarchical logit model controlling for PBRN random effects. **p<0.05, *p<0.10**
Conclusions and Implications

- Roles and patterns of interaction within PBRNs vary widely.
- PBRNs can serve as effective mechanisms for research engagement and translation.
- Practice agencies that locate peripherally within networks are especially likely to benefit.
- Due to their peripheral location, practice agencies may require targeted resources and incentives to sustain their research engagement.