



# Using network analysis in the evaluation of community partnership building: An overview.

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## Background

Community health development (CHD) is a partnership building approach in which a community identifies factors which influence population health status, assesses available resources, engages in planning and takes action to address the identified needs (Burdine, Felix, & Wendel, 2007). CHD focuses on two goals – building community capacity and improving population health – through activities which target structural changes, infrastructure development, sustainable health service delivery systems and environmental changes. Measuring the frequency and nature of the relationships built during this development process has been identified by Goodman et al. (1998) as a measurable dimension of community capacity building.

In 2001 the community health development model was deployed in the Brazos Valley of Central Texas in an effort to build local capacity for community health improvement. An interorganizational network survey was administered in 2004, 2006 and 2009.

## Objectives

1. Describe how network analysis is appropriate for use in measuring community capacity changes.
2. Describe the Interorganizational Network Survey (ION) utilized in the Brazos Valley, Texas.
3. Discuss network analysis procedures relevant to measuring the community health development process in Brazos Valley, Texas.

## Survey Administration Methods:

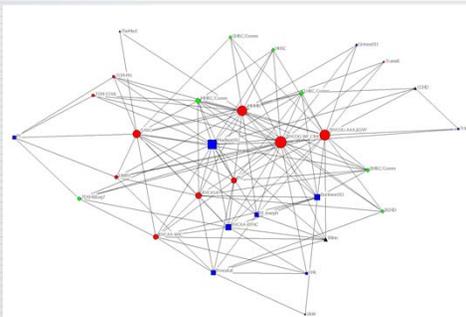
A survey of the Brazos Valley Health Partnership (BVHP) organizations regarding shared information, joint planning and implementation, shared resources, and formal contracts.

Three administrations of the survey – 2004 (n=36), 2006 (n=35), and 2009 (n=33). A paper survey was utilized in all three years; a web version was also available for use in 2009.

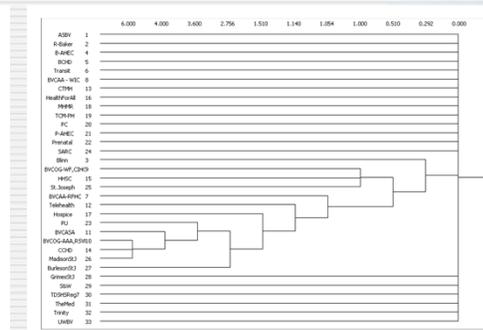
All data was entered and analyzed using UCINET 6.288. Diagrams were constructed using network visualization software Netdraw 2.097.

## Network Analysis Measures

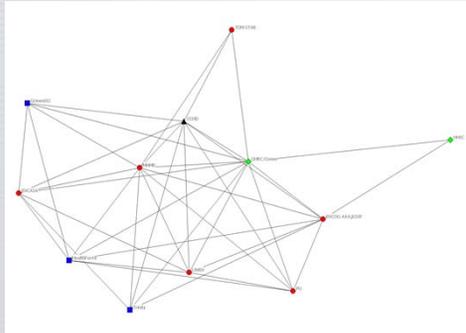
Network analysis (NA) has the ability to provide a picture of relationships that exist between a set of factors, i.e., individuals or organizations (Valente, 2010). There are many applications for NA including behavior change and improving organizational performance. In community partnership building, NA can be used for describing, examining and evaluating the network and its change over time. Techniques discussed here include procedures such as network composition, cliques, key players, and Bonacich power, as used in the evaluation of the Brazos Valley Health Partnership.



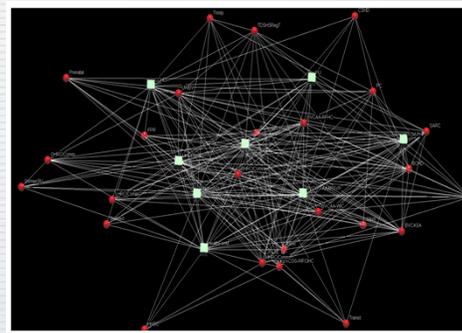
Formal Memorandums of Understanding/Contracts, 2009  
Network Composition



Sharing Tangible Resources, 2004  
Clique Analysis Dendrogram



Sharing Tangible Resources, Grimes HRC 2009  
Egocentric analysis



Network Sharing of Tangible Resources, 2009  
Key Player Analysis

## Results/Application

### 1. Egocentric analysis

Analysis of the Grimes Health Resource Center in 2009 revealed an increase in the number of ties present (since 2006) related to sharing tangible resources – increasing from 8 to 11. Further examination reveals changes in with whom ties exist. As the Resource Center's needs evolved, ties were forged with different organizations in 2009 than in 2006, retaining only 3 of the original baseline ties.

### 2. Clique analysis

Using data from the survey about sharing tangible resources, a clique analysis was performed on both 2004 and 2009 network data using a minimum clique size of 6. In 2004 only 7 cliques existed, with 3 cliques containing 7 members. Thirty cliques were found in 2009, with 4 cliques containing seven members and the remainder containing 6. This exemplifies the purposes of community health development by increasing the number of organizations with ties to one another for the purposes of sharing resources.

Common to most 7-member cliques in both 2004 and 2009 were organizations shown in other analyses to have high centrality and Bonacich power, i.e. BVCOG-AAA/RSVP, Madison St. Joseph, Burleson St. Joseph, CCHD, and Project Unity.

### 3. Bonacich Power

Using Bonacich Power, we were able to define organizations with more power (i.e., they are tied to organizations who were not well connected, therefore creating dependence). Analysis of BVHP network data regarding sharing of tangible resources revealed 4 of the original top 7 organizations in 2004 were also in the top 7 organizations with most power in 2009.

## Discussion

Network analysis can be used to describe a variety of characteristics of the relationships among individuals and organizations. When used as a repeated measure, changes can be seen over time that indicate the development of new relationships, the strengthening of existing relationships, and within a network, who the "hubs" are for dissemination of information and who may be influential in negotiating change. In a community capacity-building effort, these data highlight key partners for initiating activities, as well as which partners are peripheral and perhaps need more targeted communication.

## References

- Burdine, J.N., Felix, M.R.J., Wendel, M.L. (2007). The basics of community health development. *Texas Public Health Association Journal*, 59(1), 10-12.
- Goodman, R.M., Speers, M.A., McLeroy, K.R., Fawcett, S., Kegler, M., Parker, E., et al. (1998). Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Education & Behavior*, 25(3), 258-278.
- Valente, T.W. (2010). *Social networks and health*. New York, NY: Oxford University Press.