

## Social Network Analysis

### An Introduction to Social Network Analysis (SNA)

*The content of this fact sheet is based on a literature review of the Social Network Analysis (SNA) approach and its application to evaluation and research projects. The fact sheet provides an overview of the SNA approach, including key steps involved in applying this method, limitations of its use and additional examples and resources for the interested reader.*

#### WHAT IS SOCIAL NETWORK ANALYSIS?

Social Network Analysis (SNA) is an approach used to analyse the social relationships between different actors within a network. It is used to explore and visually represent how nodes (for example, individuals or organisations) are connected or not connected (that is, their relationships or links) to one another through a network. A network can be large or small, depending on the number of actors and their relationships with each other.

The SNA approach provides insight into the characteristics of a social network, including identifying and reporting on:

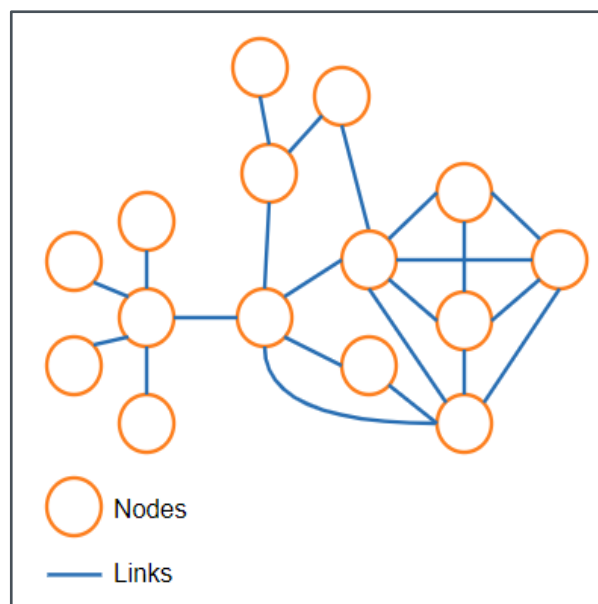
- patterns and types of relationships between nodes
- the most active nodes
- the influence of different nodes
- inter-group relationships
- the overall health and functionality of the network
- weak or absent ties or relationships and ways to improve these.

The use of SNA in evaluation has grown alongside the greater interest and attention being paid to the importance of social networks and increased availability of software (Fredericks, 2005; Hargreaves and Podems, 2012). In particular, the approach is useful for evaluating programs in which relationships may affect program implementation or outcomes.

#### 1. Introduction

Social networks are ubiquitous in our world. They link people and things with other people and things for a particular purpose. Examples are friendship groups, family relations and organisational structures.

Social networks can be conceptualised as a set of nodes and links, which can be studied through SNA.





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### 2. Why use SNA?

SNA is a means of visualising and exploring the structure and functioning of a social network, including factors that may facilitate or inhibit network interactions. It is a useful approach for evaluations seeking to understand the relationships embedded in a program or initiative and whether these are operating as intended. Typically, it is used to answer questions about interactions between network members, such as:

- Who is communicating/working with whom?
- Who gives/seeks advice or mentors others?
- Who is related to whom?
- Who has access to whom?
- How influential are different actors?

In turn, this can help to understand and address any weak or absent connections in the network.

### 3. How to conduct a SNA

To maximise the value and utility of SNA, program implementers and network members should be involved early in the process to gain buy-in and shape the design, based on the purpose of the SNA. Ideally, network representatives would also be involved throughout analysis to share insights into the context, actors, linkages and other factors that have contributed to the current network structure and functioning. These individuals are best placed to explore and interpret information about network relationships and advise on the specific needs and issues present in the network.

There are five key steps for conducting SNA:

#### Define the scope

When using SNA, the first step is to define the scope of your study (that is, the social network of focus). The key issues to consider include:

- The boundaries of the network
  - The network as a whole may be too large, or you may only be interested in a particular subgroup. You will need to consider the actors or parts of the network on which you will focus.
- The time period for the analysis
  - Capturing a longer time period may provide a richer understanding of network relationships and whether these have changed over time. This requires additional time and resources.

#### Decide on the approach

The approach used to look at the network will depend on the purpose of the SNA and the questions it is intended to answer. There are two key approaches:

- Sociocentric (whole network)
  - This approach analyses the whole network structure (within the scope of the study). Generally, all nodes in the network are pre-defined, and the SNA aims to explore the patterns of relationships between them. This approach is most useful for those wishing to understand relationships and interactions within a defined network.
- Egocentric (individual's network)
  - This approach focusses analysis at an individual level, exploring the network outwards by examining the individual's relationships with others. This approach is more appropriate where there are no preconceptions of who exists in the network. This is also useful in circumstances where participants are unlikely to know each other.

#### Decide what data to use and how to collect it

The next step involves collecting data. SNA largely relies on relational data, that is, data that looks at connections or interactions in the network. The SNA approach lends itself to both quantitative and qualitative methods (Rice et al., 2014). While quantitative data (such as surveys and existing records) will allow you to explore correlations between network variables, qualitative data (such as interview or observational notes) can reveal the nature of relationships between nodes and provide contextual information about the network's functioning.

#### Analyse data

The purpose of the SNA, and the questions it aims to answer, will guide data analysis. There are many tools and software packages to visually map data to explore relationships and interactions within a network.

While a network map (see Figure 1 for an example) offers an informative visual representation of the network structure, additional analyses (if quantitative data is available) can be used to further interrogate network characteristics and interactions. This can illuminate how the network operates and who may be more or less active or influential in the network.



## Social Network Analysis

The following list provides some key indicators for analysing a network. See [De Brún & McAuliffe \(2018\)](#) for further information and examples of how these may be applied.

Analyses	Description and purpose
Size	The number of nodes and number of links—this demonstrates the size and degree of activity within the network.
Density	The number of network ties relative to the total number of possible ties—this demonstrates the degree of network connectivity.
Centrality	There are multiple types of centrality measures, all of which provide insight as to the most important or central nodes in a network.  Degree centrality: the number of links connected to a node.  Betweenness centrality: the number of times a node acts as a bridge along the shortest path between two other nodes.  Closeness centrality: the shortest paths between a node and all other nodes.
Core-periphery	Uses the density of ties to determine whether nodes belong to a core group in the network, or have low density of ties and belong on the periphery.

### Feedback to stakeholders

Results from the SNA should be reviewed and discussed in consultation with relevant members of the network. This will confirm that the network depicted accurately reflects their views.

The SNA findings are most valuable to network members. These stakeholders are best placed to consider findings and collectively identify opportunities to improve social connections or communication within the network and drive any resulting actions. Analysts should share findings with the network and facilitate discussions about using these to improve network functionality.

## 4. Limitations

Some key limitations of SNA include:

### Data

As SNA focusses on relationships between nodes, it is sensitive to missing data (for example, non-responses on a survey). For relationships to be mapped accurately, high participant response rates are required, otherwise analysts may only be able to map a partial network.

### Resources

Conducting SNA can be time-consuming. The time and number of people required to complete data collection and analysis will depend on the amount of data and analysts' familiarity with the network and with the method.

### Stakeholder burden

In addition to participating in the study, analysts would ideally engage members of the network throughout the process, from securing their buy-in early in the project, participating in data collection, providing insight to the network, discussing findings and driving the resulting actions or recommendations within the network. These steps require a substantial time commitment by members of the network.

### Bias

The results of SNA using qualitative data will depend on which members of the network participated. It can also be difficult to combine different perspectives to produce a cohesive and accurate network map.

### Participant confidentiality

As participants are being asked to comment on the quality of their relationships with others in their network, the analyst should take precautions to protect participant confidentiality.



## Social Network Analysis

### 5. Examples

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### 6. Additional Resources

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