



Using social network analysis to evaluate a complex policy network

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Abstract

There are many challenges in evaluating international networks within the fields of health and international development. Use of conventional tools is not only difficult but may fail to provide the kind of information that is developmentally useful. Social network analysis tools offer many benefits for network evaluators. In particular, they allow documentation and analysis of inter-relationships between individuals and organizations, pointing to potential gaps as well as areas of development. This article describes the use of such tools in the evaluation of Sexuality Policy Watch (SPW), a global forum of organizations and individuals active within the field of sexuality, health and rights. It highlights the potential of these tools to provide visual representations of complex relationships within networks. In this case, the tools enabled the representation of SPW as a complex but ordered network, focused on sexual and reproductive rights, composed of individuals with a multiplicity of organizational affiliations.

Keywords

networks, sexual health, sexuality, sexual rights, social network analysis

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Networks and their evaluation

International networks have been defined as ‘groups of autonomous organizations (and perhaps individuals) in two or more countries or continents who share a purpose and voluntarily contribute knowledge, experience, staff time, finances and other resources to achieve common goals’ (Wilson-Grau, 2007: 1–2). Since the 1990s, the number of such networks that focus on advocacy for social change has increased. As a result, demand has grown for such networks to be evaluated rigorously. However, this presents significant challenges to evaluators. These networks are characterized by a myriad web of relationships. Tools are needed to understand these relationships, which have been described as complex, entangled, open, fluid and dynamic (Wilson-Grau, 2007). The network evaluator is often faced with a ‘messy’ situation in which activities and results are unpredictable and hard to make sense of. As a result, approaches that assume logical, orderly, linear processes; for example, from activities towards planned goals, are ‘not simply difficult but often useless’ (Wilson-Grau, 2007: 3).

The use of social network analysis to evaluate international networks

Consequently, evaluators have explored the body of methods known as social network analysis to understand international networks and their role in social change communications (Davies, 2009; Durland and Fredericks, 2006). These methods use a variety of tools – network diagrams, network matrices and mathematical measures – to depict and aid understanding of social networks. Social network analysis derives from network theory (Newman, 2010; Newman et al., 2006; Wasserman and Faust, 1994) and the use of graphs as representations of symmetric and asymmetric relations between what can be regarded as discrete objects. It is a flexible approach that can be used in many settings. The key distinctive feature of social network analysis is a focus on relationships between actors, rather than their individual characteristics (Davies, 2009).

Method

This article is based on experience gained through a mapping exercise conducted as part of an evaluation of the Global Dialogues on Sexual Health and Well-Being, supported by the Ford Foundation from 2002 to 2009. Overall lessons from this exercise have been reported elsewhere (Drew et al., 2009). This article focuses on the experience of mapping and evaluating one key but particularly complex component part of the Global Dialogues on Sexual Health and Well-Being, Sexuality Policy Watch (SPW). Particular features of this network, identified at the start of the mapping exercise, were that it is considered primarily to connect key individuals rather than organizations, and that each of these individuals has multiple organizational affiliations.

The mapping exercise was conducted in 2008. An initial meeting was held by the evaluation team with two members of the SPW Secretariat, Sonia Côrrea and Richard Parker, in Rio de Janeiro, where the SPW Secretariat has its base, in May 2008. Its purpose was to identify themes about which mapping questions would be developed and to generate a list of potential interviewees. The mapping questions developed from that meeting focused on the following, which were of interest both to the Secretariat itself and to the Ford Foundation, the funders of its work:

- the organizations and networks that each informant was involved in;
- the geographical and thematic focus of their work within the field of sexuality, health and rights;
- their links to up to ten other individuals working in sexuality; and joint activities conducted.

A list of 30 potential informants was drawn up during that meeting. These were categorized by the members of the SPW Secretariat according to their positions within SPW and its work:

- an inner circle (consisting of the SPW Secretariat);
- a set of close collaborators (those who were considered to have worked closely with SPW);
- an outer circle (those who had worked with SPW, albeit more distantly than close collaborators); and
- a wider circle (those working globally but more distant than the outer circle).

These categories were used by the SPW Secretariat prior to the evaluation being carried out. Allocation of all informants and key individuals to these categories was performed by the SPW Secretariat and these allocations were not revised by the evaluation team. Factors considered by the SPW Secretariat in allocating a person to a particular circle included how long they had worked together, how frequently they had interacted and how intensive was the feeling of partnership. Beyond this, the basis for allocation of people to one category or another was not defined more rigorously because no difficulties were identified or reported by the SPW Secretariat in deciding to which category an individual belonged.

Each potential informant first received an email from the SPW Secretariat informing them of the mapping exercise and inviting them to take part. Individuals were subsequently contacted by one of three evaluation team members. Data collection took place in June and July, 2008. Of the initial list of 30, three people did not respond to invitations to participate in the mapping, resulting in 27 individuals being interviewed. Of these, 12 were interviewed face-to-face and 15 by telephone.

Each person interviewed was asked to identify up to 10 key individuals that they worked with in the field of sexuality. This yielded data about 176 individuals. These were classified by members of the SPW Secretariat into the categories that they had identified - inner circle (four), close collaborators (33), the outer circle (53) and the wider circle (86).

Mapping information was recorded onto a pro-forma and then entered into an online database by members of the team. Prior to data transfer, some data cleaning was required. This particularly involved ensuring that the same organization/individual was referred to consistently in all the data. In some cases, assigned names were shortened to make data transfer easier and data presentation clearer. In a few cases, errors in data entry were identified and corrected. Also, in a few cases, duplicate data entries were identified and removed.

An attribute table was generated for all individuals in the data set. Attributes covered included organizational affiliations and type, description of the individual, geographical focus, primary thematic focus and other areas of focus. A challenge encountered in compiling this table was that data had been provided about the same individual by different respondents and sometimes conflicted. A single table was compiled by one team member using the following principles: (i) where information was provided by an individual themselves this was used; (ii) in the absence of information from the individual themselves, the majority view was followed; and (iii) in general, less priority was given to negative or uncertain information. This was particularly relevant in the case of secondary thematic focus. If one respondent said that a particular individual had a secondary focus on a particular issue; for example, HIV, but another said they did not, the individual was recorded as having this particular thematic focus. The only exception to this approach was where information about an individual was available directly from them. In such cases, that information was always used.

In a very few cases, these principles failed to produce a clear answer. In these cases, one team member used their judgement to decide between possibilities and recorded this decision. In most cases, the issue related to an individual's primary focus. Once the primary focus was determined all other areas of work mentioned were recorded as areas of secondary focus.

Information was analysed using UCINET (Version 6.188) to identify individuals' key characteristics (such as their focus of work) and their relationships with other individuals or organizations (such as joint activities). Maps were drawn using NetDraw 2.080. Linkages are shown as lines on the maps with the direction of the arrows indicating which individuals reported the connection (arrow tail) and to whom (arrow head).

An initial set of generic maps was produced for each centre. These were discussed among the evaluation team and with representatives of SPW. Maps and other data forms; for example, tables were identified through these discussions and then generated for the reports.

A particular feature of the method used in relation to Sexuality Policy Watch (SPW) was the use of two mode data (Hannemann and Riddle, 2005), allowing relationships between both individuals and organizations to be identified and tracked. This differed from the approach used for the four other centres which focused primarily on relationships between organizations.

As with all evaluation processes, there were a number of challenges to be faced in using the selected tools. Because responses are represented by arrows leading from one organization to another, it is not possible to guarantee respondents absolute confidentiality. Questions tend to be similar in style and somewhat 'closed' in nature. A mapping exercise like this requires the use of categoric data, i.e. responses received had to be allocated to a particular category. Some concerns were expressed about the validity and value of such an approach given the complexity of the issues being addressed and the diversity of context. Data collection is a relatively time-consuming process because of needing to interview informants. Email or web-based forms might offer some time savings but these were not widely used in this case because of concerns over possible reductions in response rates and data quality. Limited resources and time meant that the mapping exercise was mostly only able to consider the perspective of one respondent from a particular organization. The data presented is based on respondents' perspectives and is not an objective reality.

Maps generated through social network analysis provide a clear visualization of 'circles' of influence within SPW

During preliminary discussions between the evaluation team and members of the SPW Secretariat, it became clear that SPW conceptualized itself as a global forum, which the SPW Secretariat described as a series of concentric circles:

- An inner circle consisting of four members of the SPW Secretariat
- A set of 'close collaborators' who had worked closely with the SPW Secretariat
- An outer circle who had done some work with the SPW Secretariat but less than close collaborators
- A wider circle who were considered 'knowledgeable experts', i.e. those known to be working globally on relevant issues but had done little, if any, work directly with the SPW Secretariat

This conceptualization was used as a lens for analysis of the maps generated (see Figure 1). Each respondent and all the individuals they identified were allocated to one of these circles. This resulted in a representation of the network grouped around the four central figures of the inner

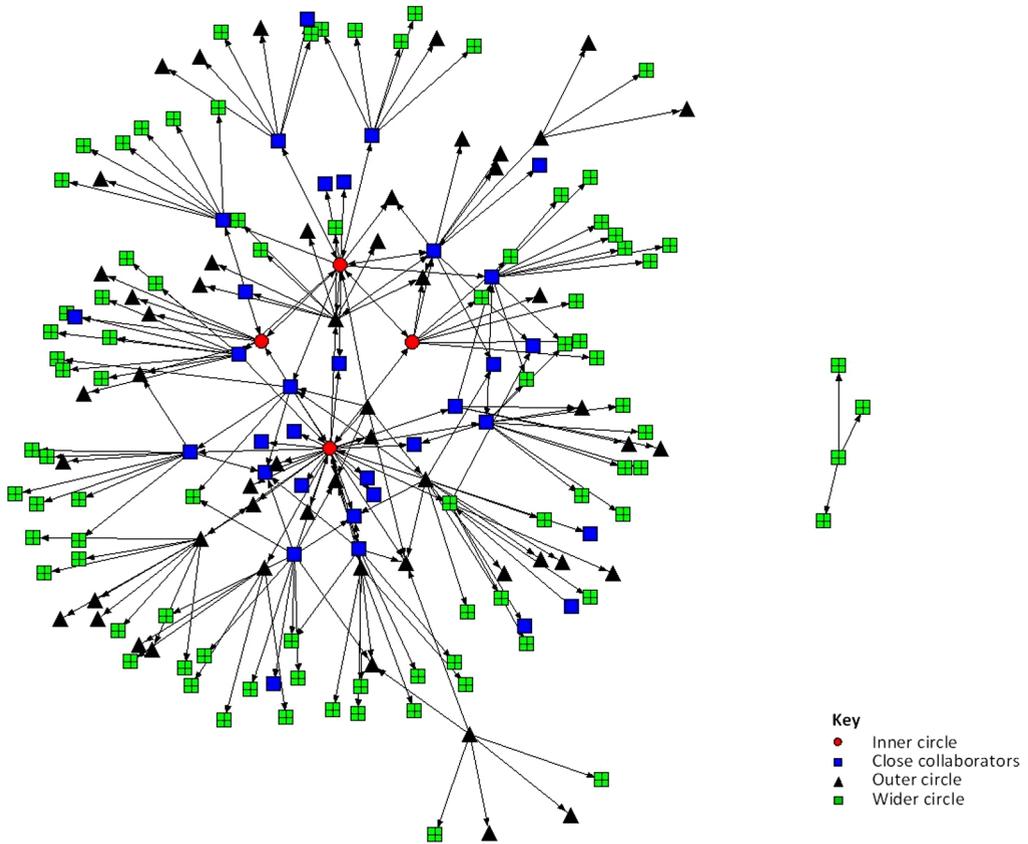


Figure 1. SPW Network

circle. Actors' positions in the diagram are determined by an algorithm that locates highly-connected actors in the centre and least-connected actors on the periphery. Most close collaborators (dark squares) are close to the centre with people in the wider circle (light squares) around the perimeter. A few close collaborators appear to be on the outer limits of the network. The position of those in the outer circle (black triangles) is the most varied with some on the periphery of the network, a few in the inner circle and some more scattered.

This map allowed a number of questions to be identified and discussed with the SPW Secretariat. The first question was whether close collaborators on the 'edges' of the network are less involved with SPW than other close collaborators. These individuals were not reported by members of the inner circle but by one other person. Consideration of this question led to a useful discussion of what it meant to be a close collaborator within SPW. Elements of this relationship include the duration of the relationship, frequency and intensity of contact and the number of connections within the network. The most important factor in being considered a close collaborator with SPW was conducting some joint work with a member of the SPW Secretariat or close collaborator over a period of a few months or more.

The second question was whether some people who the SPW Secretariat considered to be in their outer/wider circle were sufficiently well-connected that they should be identified as people that could be potential new close collaborators. Such individuals appear close to the centre of the maps generated (see Figure 1) because of the relatively large number of connections reported to them.

The mapping identified 28 key individuals who were identified by at least two respondents. Unsurprisingly, these key individuals included everyone within SPW's inner circle. In addition, they included one third of the close collaborators (11 people), 15 percent of the outer circle (eight people) and six percent of the wider circle (five people). The evaluation concluded that if SPW was considering expanding its close collaborators, these key individuals within SPW's outer/wider circle might be potential candidates for such a role.

Maps generated through social network analysis provide a clear visualization of SPW's focus on sexual and reproductive rights

One of the aims of the mapping was to seek to identify topics and themes that individuals associated with SPW were working on. Each individual was therefore assigned to one of nine thematic areas as their primary focus and to any number of these areas as an area of secondary focus (see Table 1). The nature of these thematic areas was identified in collaboration with two members of SPW's secretariat.

Displaying the data as a table allows analysis of the network as a whole. For example, it is apparent that just over one third (34%) of individuals were considered to be working primarily on sexual and reproductive rights and almost two thirds (63%) had either a primary or secondary focus on this topic. However, a table does not show how those working on sexual and reproductive rights are distributed throughout the network or how they relate to each other or to those within the network not working on this theme. A map does provide this information (see Figure 2).

This shows that all individuals at the centre of the SPW network have a focus on sexual and reproductive rights. Although some of the individuals towards the periphery of the SPW network do have a focus on sexual and reproductive rights, there are some for whom such a focus was not

Table 1. Focus (%) of sexuality work reported across the SPW network

	Primary focus	Primary/Secondary focus
Sexual and Reproductive Rights (SRR)	34	63
HIV	17	43
Feminism	15	45
Lesbian, Gay, Bisexual, Transgender and Intersex (LGBTI)	13	39
Sexual and Reproductive Health	11	38
Education	3	19
Religion	3	11
Masculinity	2	19
Unknown	2	
Young People	1	11

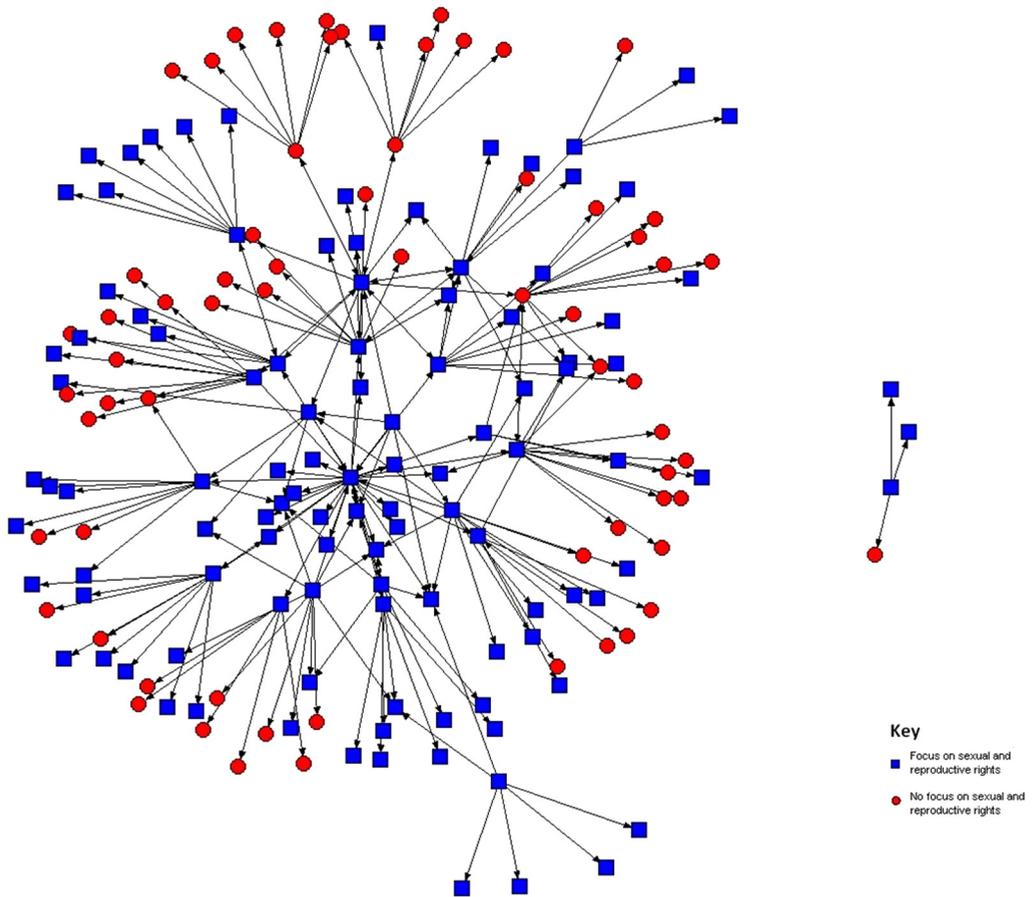


Figure 2. SPW Network showing individuals with a focus on sexual and reproductive rights

reported. They work on other areas of SPW focus, such as HIV, feminism, LGBTI, sexual and reproductive health, education, religion, masculinity and young people (see Table 1).

Two mode data allows the complex relationships between individuals and organizations in SPW to be visualized

During preliminary discussions between the evaluation team and members of the SPW Secretariat, it became clear that SPW differed from other networks being reviewed by the evaluation team, in that SPW was not conceptualized as primarily a network of interlinked organizations but rather a network of key, influential individuals, and that those individuals often had multiple complex organizational affiliations. For example, one member of the SPW Secretariat might hold an academic appointment at a university and be a board member of one or more NGOs and networks. It was therefore decided to capture something of this complexity using two mode data, i.e. capturing information about both individuals and organizations. Figure 3 shows both individuals (circles)

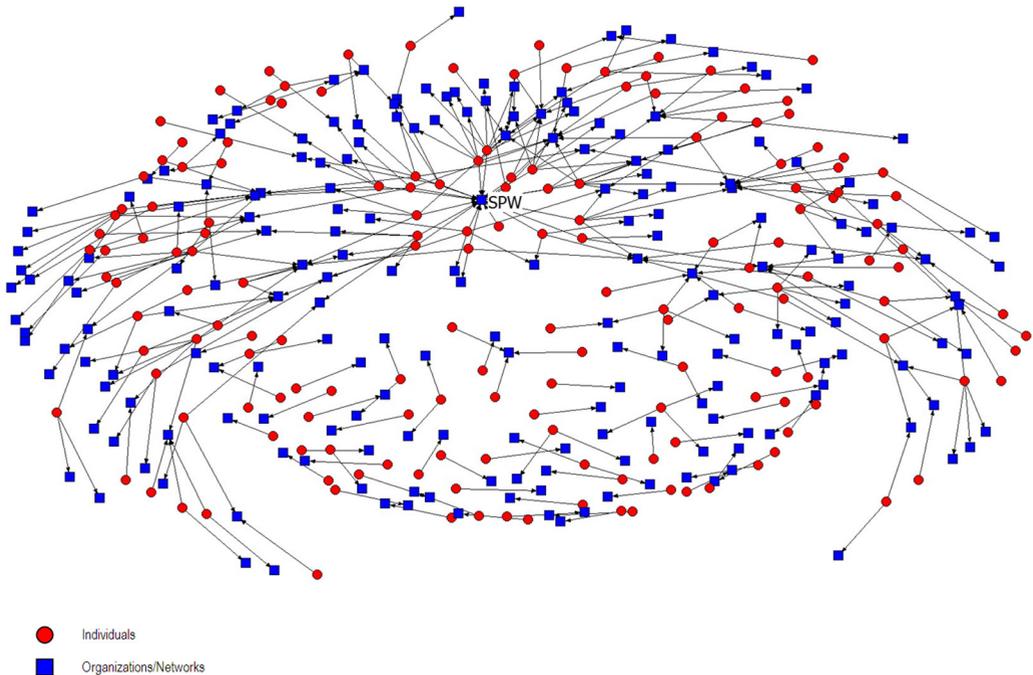


Figure 3. Network map for SPW showing complex interactions between individuals and organizations

and organizations (squares) within the SPW network. This diagram has been produced using the Spring-embedding algorithm in NetDraw to minimize the overlap in lines.

This map depicts the complexity of the SPW network in a manageable way. SPW (labelled) is reported as an organizational affiliation of 17 individuals. These are reported as affiliated to a wide range of other organizations. Through these organizations, the SPW network is connected to a wide range of other individuals and organizations.

Figure 4 provides examples of two individuals for whom six organizational affiliations were reported each. Featured individuals are shown as enlarged circles. Organizations to which they are affiliated are shown as enlarged squares (labelled).

Individual X leads an Indian organization, SANGRAM, which works for the empowerment of people in sex work. This organization is linked to VAMP (Veshya Anyay Mukti Parishad), a collective of women in sex work. She is also involved in a National Network of Sex Workers in India, the Asia Pacific Network of Sex Workers (APNSW) and the global Network of Sex Work Projects (NWSP). She is also involved in Action Plus, a network of organizations working on HIV, social justice and human rights focused on the concerns of stigmatized communities of sex workers, sexual minorities and people living with HIV. She was reported to be mainly an activist with a primary focus on HIV. Other areas of focus included feminism, sexual and reproductive rights, sexuality education, masculinity and young people.

Individual Y holds an academic appointment at Miriam College in the Philippines. She is involved in the Women Studies Association of the Philippines (WSAP) and the Asia-Pacific Resource and Research Centre for Women (ARROW). She is reported to be involved in a number of international networks including ISIS International, Development Alternatives with Women for

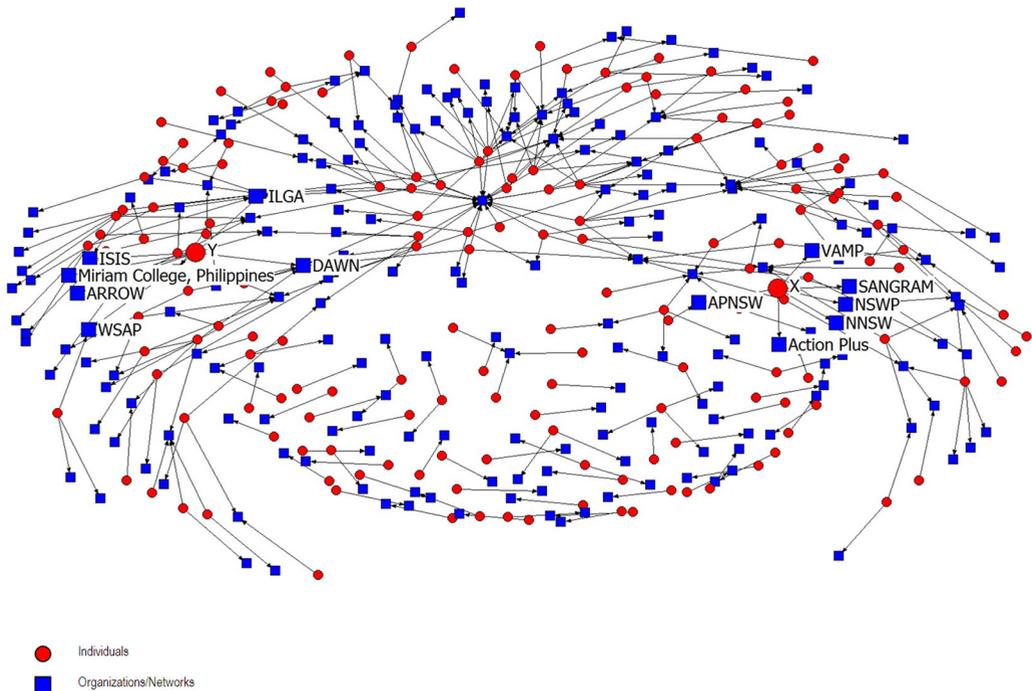


Figure 4. Network map for SPW: Examples of two individuals with multiple organizational affiliations

a New Era (DAWN) and the International Lesbian and Gay Association (ILGA). She was reported to be both an academic and an activist with a primary focus on sexual and reproductive rights. Other areas of focus included LGBTI, feminism, sexual and reproductive health and religion.

Both individuals X and Y were identified by the SPW Secretariat as part of their outer circle. Identifying individuals with multiple organizational affiliations and prioritizing them as potential close collaborators might be a way of SPW increasing its connections with a number of organizations and networks.

Figure 5 highlights those organizations that were identified as being affiliated to five or more individuals within the SPW network. These organizations are shown as enlarged squares and are labelled.

The SPW Secretariat is based in Rio de Janeiro, Brazil. It is therefore not surprising that several of the organizations with which individuals in the SPW network are frequently affiliated are based in Brazil. These include the Commission on Citizenship and Reproduction, the Latin America Centre on Sexuality and Human Rights (CLAM), the State University of Rio de Janeiro (UERJ) and the University of Sao Paulo. In the case of the first three of these organizations, individuals with reported affiliations to the SPW Secretariat also had reported affiliations with them. As a result, these organizations appear close to the centre of the diagram in Figure 5. However, affiliations with the University of Sao Paulo were reported for individuals who were not reported to have affiliations with the SPW Secretariat. As a result, the University of Sao Paulo is located more peripherally within the SPW network map. Given the number of individuals within the SPW network reporting affiliations to the University of Sao Paulo, this could be an organization with whom the SPW Secretariat might consider working more closely.

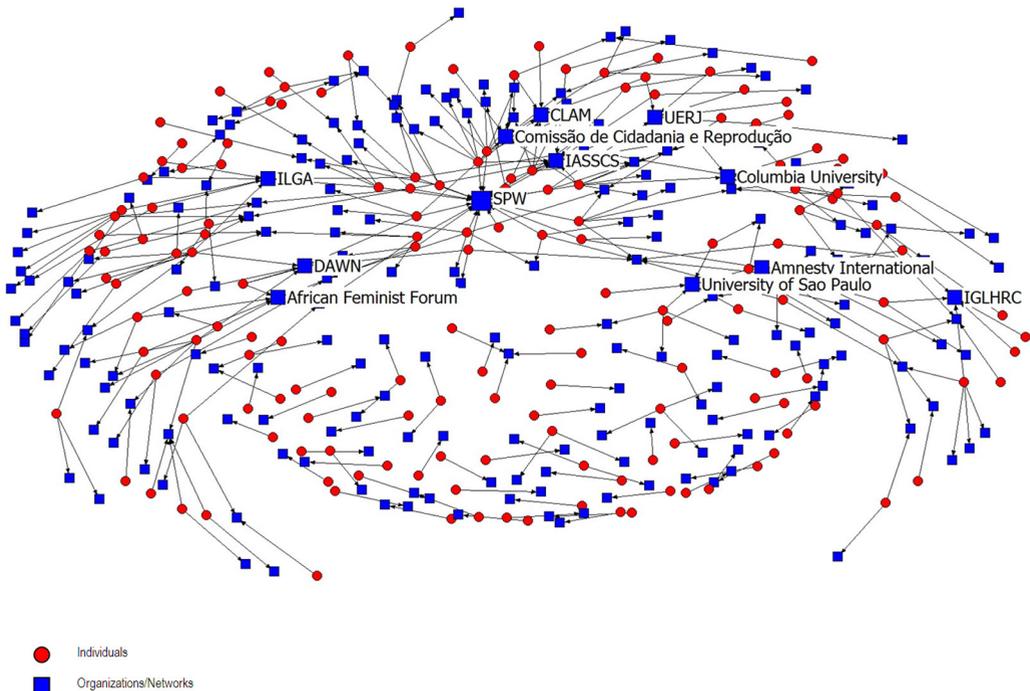


Figure 5. Network map for SPW: Examples of organizations with multiple individuals reporting affiliations

Multiple individuals within the SPW network are also reported to have affiliations with a number of regional and international bodies. These include academic institutions, such as Columbia University in the USA and international NGOs and networks, such as Amnesty International, DAWN, ILGA and the Africa Feminist Forum. These organizations all have individuals with reported affiliations to them who have reported affiliations with the SPW Secretariat. In the case of the International Association for the Study of Sexuality, Culture and Society (IASSCS), there are several individuals that are reported to have affiliations with this organization and direct affiliations with the SPW Secretariat. As a result, this organization is shown near the centre of the diagram close to SPW Secretariat.

On the other hand, several individuals were reported to have an affiliation with the International Gay and Lesbian Human Rights Commission (IGLHRC) but none of these were reported to have a direct affiliation with the SPW Secretariat. As a result, this organization appears on the periphery of the SPW network diagram. Given the number of individuals within the SPW network reporting affiliations to IGLHRC, this could be an organization with whom the SPW Secretariat might consider working more closely.

Maps generated through social network analysis allow developmental opportunities to be identified

One of the main benefits of this mapping exercise was that it allowed SPW opportunity to identify ways in which its work could be developed in the future. Some of these possibilities have already

been noted. For example, this approach allowed gaps in the current network to be identified. These gaps were then used as the basis for discussing opportunities for the future development and direction of the work of SPW. Specifically, as indicated earlier, the mapping exercise identified a number of well-connected individuals within the network, currently considered to be in SPW's outer or wider circles, who could be potential new close collaborators.

In addition, the mapping exercise identified a number of organizations, such as the University of Sao Paolo and the International Gay and Lesbian Human Rights Commission to which a number of individuals within the SPW network are affiliated. However, such organizations appear somewhat peripheral within the SPW network and there could be an opportunity for SPW to work more closely with these organizations.

In addition, the mapping exercise generated information about the attributes of members within the SPW network. Although such information could have emerged from use of other, more conventional evaluation methods, the information gathered here would have complemented and reinforced any such data. For example, the mapping exercise demonstrated that SPW's reach into certain geographical areas; for example, Africa is through a relatively limited number of individuals in the network. In feedback, members of the SPW secretariat were encouraged to consider where and how access to Africa could be widened, either through these same individuals or through others not currently represented within the network. Finally, the mapping exercise also suggested some areas of activity relevant to the goals of SPW that are poorly represented in the network, for example, education and work with young people. This finding too provided a basis for discussion between members of the SPW Secretariat, leading to deliberate attempts to more fully involve these two areas of work in future planning and activity.

Conclusions

Prior to this mapping exercise, it had proved difficult to evaluate SPW's work rigorously. The SPW Secretariat believed that the network was exerting influence through the individuals in SPW and the organizations to which they were affiliated. However, it had proved difficult to demonstrate these effects using conventional evaluation techniques. By using social network analysis tools, the mapping exercise allowed SPW's internal, developmental and organic outcomes (Wilson-Grau, 2007) relating to the network's enormous number of relationships to be documented and visualized in a way that was helpful for members of the network and credible with SPW's funders.

The most significant benefit of the mapping exercise was to identify gaps in SPW's current work and network. For example, the identification of individuals and organizations who are well-connected within the network was considered useful in identifying those individuals and organizations with whom SPW might work more closely in the future.

Finally, this work has wider applicability. There are many networks that exist in order to exert influence and to promote different forms of social change. However, they often struggle to demonstrate rigorously the results of their work. In a resource-constrained environment in which there is pressure to demonstrate results, social network analysis tools provide those networks and their evaluators with an additional resource which can complement more conventional evaluation techniques by visualizing the important and extensive relationships that make up such networks.

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