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Research Paper

Back to the core: A network approach to bolster harm reduction among persons who inject drugs

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ABSTRACT

Background: Injecting drugs safely almost always includes the presence of one's social network, especially for the prevention of overdose. Yet, the systematic analysis of users' social networks has yet to be established as a focal method in harm reduction research, and interventions.
Methods: This study draws from 200 interviews with persons who inject drugs recruited from North America's first sanctioned supervised injection facility and a drug user's advocacy group. Respondents were asked about the individuals they personally considered as facilitators of harm reduction, and the relations between them. Collectively, these 200 respondents provided over 900 individuals whom they considered as members of their harm reduction network. The aim was to locate individuals that would potentially make the network denser (harm reduction champions) and users that were situated in the "periphery" of the network, and in practice, further away from the harm reduction core.
Results: Of the 1135 network members, 63 individuals formed the "core" of the harm reduction network, collectively reaching approximately 70% of individuals in the network. We also uncovered 31 individuals that acted as "articulation points"– these individuals were not as connected, but were more effective at reaching peripheral individuals.
Conclusion: Former or current injecting drug users that were sampled were surrounded by a relatively rich harm reduction network, but the network approach showed that only a minority of individuals were true harm reduction "champions". Recruitment of a combination of well-connected harm reduction champions, and strategically connected articulation points, would be most effective in planning network interventions that encourage harm reduction behaviors among this population.

Introduction

Injecting drugs safely almost always involves the presence of others, especially for the prevention of overdose. Intervention efforts are most effective when we treat the networks of persons who inject drugs (PWIDs) as mechanisms for delivering services, education, and strategies to members embedded in their own social injection networks. Yet, while injection networks serve as a mechanism for support, they may also facilitate at-risk behaviors that are a source of health-related risks. Network methods provide opportunities to understand the flow of infectious diseases, insights into the at-risk behaviors of drug users, and a means to map the transmission of practices of safe behavior amongst drug users (Curtis et al., 1995; Friedman et al., 1997; Klovdahl et al., 1994; Latkin, Mandell, Oziemkowska, Vlahov, & Celentano, 1993; Suh, Mandell, Latkin, & Kim, 1997; Weeks, Clair, Borgatti, Radda, & Schensul, 2002). Harm reduction behaviors are not independent of the types of social exchange and interpersonal relationships that surround PWIDs. The use of harm reduction behaviors is associated with both the perceived acceptance, as well as the use of such practices by other injectors in one's social network (Andía, Deren, Robles, Kang, & Colón, 2008; Hawkins, Latkin, Mandel, & Oziemkowska, 1999 Unger et al., 2006).

This study draws from 200 interviews with PWIDs in Vancouver's Downtown Eastside (DTES) from a supervised injection facility and a drug users' advocacy group. Respondents were asked about the individuals they personally considered as facilitators of harm reduction, and the connections between them. The research design allowed us to map an important slice of the

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harm reduction amongst PWIDs in the DTES. Mapping the network of a relatively hidden phenomenon provides a unique opportunity to uncover its social structure. For example, are some PWIDs well supported and part of a harm reduction "core"? Alternatively, are some users isolated from others, situated on the periphery of the network and insulated from providing and receiving harm reduction services? The aim is to identify individuals that could help bring peripheral users back to the core of the harm reduction network.

Background

In 2003, InSite, North America's first sanctioned supervised injection facility was opened in the DTES, operating under a constitutional exemption. InSite has been subjected to dozens of peer-reviewed studies (Potier, Laprévotec, Dubois-Arbere, Cottencina, & Rollanda, 2014). The results of these studies have been overwhelmingly positive: Reduction in the human immunodeficiency (HIV) and hepatitis C (HCV) viruses in the DTES population, overdoses, public drug use, publicly discarded syringes and syringe sharing and risky injecting practices (e.g. Kerr, Tyndall, Li, Montaner, & Wood, 2005; Markwick et al., 2014; Marshall, Milloy, Wood, Montaner, & Kerr, 2011; Milloy, Kerr, Tyndall, Montaner, & Wood, 2008; Wood et al., 2003).

One of the issues emerging from these studies, however, is that supervised injection sites are unable to supply even close to the daily harm reduction needs of drug users in the area. For instance, in the early 2000′s it was reported that there were approximately 8000 injection drug users residing the DTES (Wood et al., 2004). In 2015, InSite reported approximately 263,713 visits to the site by over 6532 individuals. That is, an average of 722 visits per day across its 13 injection booths (Vancouver Coastal Health, 2017), which is estimated to supply approximately 5% of the daily needs in the area. The need for additional harm reduction services in the DTES is partly supplied by more informal peer-driven program "networks" that exploit the interpersonal relationships of users (Greer et al., 2016; Jozaghi, 2014; Jozaghi, 2015; Kerr et al., 2006; McNeil, Small, Lampkin, Shannon, & Kerr, 2014; McNeil, Kerr, Lampkin, & Small, 2015; Small et al., 2012). Researching the social structure of harm reduction is important in understanding the types of users who have direct access to harm reduction mentors or peers, and users who are relatively isolated from harm reduction services across the informal, network-driven services like the Vancouver Area Network of Drug Users (VANDU), and the more established supervised facilities like InSite.

Empirical studies of this type of population have made use of the conceptual tools offered by network theory. In fact, sharing behaviors are found to be reflective of peer influences, and social norms, that are practiced in ones' network (Andía et al., 2008). Network characteristics such as the size, density, and quality of relationships have been used to examine exposure to harm reduction or at-risk behaviors (Andía et al., 2008; Booth et al., 2016; Cox et al., 2008; Gyarmathy et al., 2009; Hoffman et al., 2013; Latkin et al., 1993). For instance, across a sample of PWIDs, Andía et al. (2008) found that norms encouraging at-risk behaviors such as believing it is okay to share paraphernalia resulted in an increase in paraphernalia sharing. Alternatively, if PWIDs observed their peers participating in HIV-related safe behaviors (always cleaning needles before use), they were likely to report lower frequencies of HIV-related risk behaviors (unclean needle sharing) and increased frequency of HIV-related safe behaviors (Hawkins et al., 1999).

Network composition may also act as both a protective and risk factor. Klovdahl et al. (1994) focused on how the structural properties of networks impacted the ways in which infectious agents were spread among a population of prostitutes and injecting drug users in Colorado. His findings demonstrated how small changes in practices of safe behaviors not only affected the immediate, personal, network of the individual, but also persons in the larger network, indirectly connected to that individual.

Weeks et al. (2002) and Booth et al. (2016) both advocated for peer educators, showing the extent to which peers can influence the prevalence of at-risk behaviors (HIV incidence rates; diffusion of safe behaviors) in their social networks. Weeks et al. (2002) examined how HIV prevention techniques implemented in high-risk sites could diffuse along the network of drug users. Peer educators proved to be the most effective means for diffusing prevention information and materials through the network with the placement of 14 peer educators reaching 50% of drug users in the largest component. In a randomized trial of PWIDs, Booth et al. (2016) found a reduction in HIV incidence rates in the network of peers that were encouraged to provide safe behavior interventions, and skills training, to members of their own network on how to reduce HIV risk behaviors, relative to the control condition.

While injecting in public, decreases the probability of overdose, injecting in public settings (e.g. shooting galleries, cars), surrounded by a network of others, is also related to frequent and receptive syringe sharing (Cox et al., 2008) and other paraphernalia (Thiede et al., 2007). Larger, less dense networks, have conventionally been associated with higher levels of needle sharing (Latkin, Mandell, Vlahov, Oziemkowska, & Celentano, 1996) and risky sexual behaviors such as having multiple sexual partners, exchanging drugs or money for sex and sex with an unknown partner (Latkin et al., 1993). Network interventions, when employed, are most efficient when they encourage risk reduction communication, and discourage communication among network members that would promote risk behaviors (Gyarmathy et al., 2009).

The current study exploits the *peer* based nature of the network design. By highlighting central individuals in the harm reduction network, we suggest utilizing the placement of these individuals as conduits that bring peripheral users closer to the core of the network. The objective was to map the social structure of the harm reduction behaviors, and to uncover individuals who are most likely to reduce the distance between the most vulnerable PWIDs and the harm reduction core. A harm reduction network, if implemented through peer-educators, has the power to reach a population of drug users who may not be able to (or feel comfortable) accessing harm reduction initiatives by providing access and knowledge to: supplies (new syringes, new needles, alcohol swabs etc.), conventional health care services, shelters, housing services, income centers, food, and access to centers tailored to their community. Seeking focal individuals that have influence over network members' behaviors is a strategic, and potentially a more efficient approach, to diffusing positive behavioral change across a difficult to reach population (Booth et al., 2016).

Data and methods

Data collection sites and peer recruitment

InSite opened in 2003. It is North America's first legally sanctioned supervised injection facility located in Vancouver, B.C. VANDU was founded in 1998. It brings together drug users from an adjacent area, and encourages practices of safe behaviors by providing users the opportunity to design and implement harm reduction interventions through peer-based models. VANDU has historically operated through peer-based unsanctioned syringe exchange services, supervised injections and smoking rooms (McNeil et al., 2014; McNeil et al., 2015; Wood et al., 2003).

Peers, often current or ex-injecting drug users themselves, are well-connected to the community of injecting drug users in the area.