



Research paper

Trends in sources and sharing of needles among people who inject drugs, San Francisco, 2005–2012

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ABSTRACT

Background: Globally, people who inject drugs (PWID) are disproportionately at risk for HIV and HCV due to risky injection drug use behaviors, such as sharing used needles and injection kits. In response, San Francisco, one of several cities with a sizable PWID population that had quickly committed to stopping the spread of HIV/HCV, have expanded needle access, including in pharmacies and hospitals, in order to ensure that PWID inject with clean needles. However, there was no current research on whether each source of needles is equally associated with always using new sterile needles in San Francisco. Furthermore, no research in San Francisco had examined behavioral trends in needle-sharing practices, the relationship between PWID and their injection partners, and knowledge of their injection partners' HIV or HCV status.

Methods: Therefore, we analyzed data from three cycles of the National HIV Behavioral Surveillance studies from 2005 to 2012 in San Francisco among PWID.

Results: The results from our analysis suggest that overall risky drug injection practices, such as injecting with used needles, sharing used cookers or water, and dividing drugs with a used syringe, among PWID in San Francisco has decreased from 2005 to 2012. An increasing proportion of PWID are injecting with their friend/acquaintance than with their sex partner. Also, a declining portion of PWID report knowing their last injection partner's HIV-positive or HCV-positive status. In terms of sources of needles, less PWID are getting their needles from friends and drug dealers while a greater proportion are using pharmacies and needle exchanges. However, pharmacies as a source of needles are negatively associated with always using new sterile needles.

Conclusion: From 2005 to 2012, overall high-risk injection behavior among PWID in SF has decreased including PWID that are injecting with others. However, our results suggest caution over the expansion of pharmacies as a source of needles in San Francisco and in similar cities due to their negative association with always using a new sterile needle. Since more PWID are injecting with their friend/acquaintance, interventions at needle access programs at pharmacies, hospitals, and needle exchanges should stress the potential to transmit HIV and HCV even in one-on-one sharing situations. Furthermore, since a decreasing percentage of PWID know about their injection partner's HIV/HCV status, such interventions should also highlight the importance of having a conversation about HIV and HCV status with one's injecting partner.

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Introduction

People who inject drugs (PWID) are at high risk for HIV and HCV infection due to injection drug use behaviors such as sharing used syringes, needles, or other injection drug equipment (Kral et al.,

2001; Strathdee et al., 2001). Consequently, there are 3 million or 13.1% of PWID infected with HIV and 10 million PWID infected with HCV globally (Grebely & Dore, 2014; World Drug Report 2014, 2014). In the United States, PWID accounted for around 8% of new HIV diagnoses in 2010 and around 50% of all cases of HCV (Centers for Disease Control and Prevention, 2012; Grebely & Dore, 2014; Spach, 2014).

Globally, one of the main interventions that the research literature has shown to help prevent the spread of HIV and HCV among PWID is distributing clean needles (which from this point

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onwards refer to both the syringe and needle as they are distributed together) or exchanging them for used equipment with the goal that each injection is done with new, sterile equipment (Dutta, Wirtz, Baral, Beyrer, & Cleghorn, 2012; Turner et al., 2011). To help meet this goal, public health departments and other organizations in the United States have implemented 200 needle access programs in 34 states and expanded access to new clean needles through pharmacies, hospitals, and other locations without need of a prescription (Federal Funding for Syringe Services Programs: Saving Money, Promoting Public Safety, and Improving Public Health, 2013). Specifically, the city of San Francisco has officially been involved with needle access programs and a harm reduction model of care since 1992 and is constantly trying to expand access to clean needles in order to its population of 13,000–15,000 PWID (Knight, 2007; Seal, 2000). For example, pharmacies in San Francisco can now sell needles to people 18 years or older without a limit on the amount of needles given to each individual (Ross, 2014).

However, we do not know whether each source of needles in San Francisco (i.e. needle exchanges, pharmacies, hospitals, etc.) is equally associated with always using new sterile needles among PWID. Furthermore, no research had examined important, behavioral trends among PWID in San Francisco, such as the frequency of sharing needles and injection equipment, the kinds of relationships that PWID have with their injection partners (i.e. acquaintances or sexual partners), and whether injecting dyads know their partner's HIV or HCV status. The answers to these questions can help inform HIV/HCV prevention interventions while guiding policy concerning the expansion of needle access programs not only in San Francisco, but also in similar cities throughout the world with a significant PWID population and a vision for increasing legal access to sterile needles. Therefore, we analyzed data on injection drug use behavior and sources of needles from the three rounds of the National HIV Behavioral Surveillance (NHBS) surveys of PWID in San Francisco in 2005, 2009, and 2012.

Methods

Overall study design

The data for this analysis are from NHBS surveys conducted by the San Francisco Department of Public Health. The methods, sample characteristics, and use of preventive and health care services, including three indicators related to clean needle access and use have been previously published (Coffin, Jin, Hurliaux, Mirzazadeh, & Raymond, 2014). The present report expands beyond the previous one to focus on details of access to clean needles, sharing of injection equipment, characteristics of injection partners, and associations between sources of needles and clean needle use.

In brief, NHBS is a nationwide, collaborative effort led by the Centers of Disease Control and Prevention (CDC) to measure HIV prevalence and risk behaviors in heterosexual adults at increased risk for HIV, PWID, and men who have sex with men (MSM) (Gallagher, Sullivan, Lansky, & Onorato, 2007; Lansky et al., 2007). Cross-sectional respondent drive sampling (RDS) studies were completed among PWID in 2005, 2009, and 2012. RDS is a sampling and recruitment method based on long-chains of peer referrals used internationally to access hard-to-reach populations for surveillance and research purposes (Heckathorn, 1997; Magnani, Sabin, Sidel, & Heckathorn, 2005). Participants were 18 years of age or older, had reported injecting illicit drugs in the past 12 months, and had been given a referral coupon by another participant. In order to start sampling, seed subjects (i.e., the first study participants purposely chosen to start RDS recruitment) were selected to reflect the diversity of the PWID population in San Francisco with respect to neighborhood, race/ethnicity, age, sexual

orientation, and drug of choice. Each seed received three to five study coupons to pass on to other PWID within their social network. In turn, subsequent PWID presented their study coupons to the research staff for eligibility screening, consent, and enrollment. Each newly enrolled participant then received three to five coupons to give to other PWID. This process continued until the desired sample size and stability (i.e., when subsequent recruitment did not change with further recruitment) were achieved. Eligible participants were given \$50 (USD) for completing the survey questionnaire and HIV testing. If participants successfully referred someone to the study, then they received \$10 for each eligible recruit.

Measures

Measures consisted of demographic characteristics, injection drug use behavior, sources of new sterile needles, and other injection equipment. Our team collected data from participants through an electronic interviewer-administered survey.

Analysis

Survey results were stored in a database and then exported to SAS 9.3 which we used to calculate crude (unweighted) frequencies and percentages. We then used RDSAT (version 7.1) to determine RDS-weighted point estimates of indicators and 95% confidence intervals (CI). Associations between always using clean needles and the source of needles was done using bivariate logistic regression analysis in SAS (unweighted).

Analysis of trends was used to assess evidence for or against a linear increase or decrease in the level of indicators across the three survey years using a Cochran–Armitage approach and a chi-square test for trend (one degree of freedom) (Chen, 2014). To accomplish this, we used the population adjusted estimates (RDSAT) and the number of observations for the indicator of interest. We then compared the test statistic to a chi-square distribution with one degree of freedom to get the *P*-value. We considered *P*-values less than 0.05 as statistically significant.

Results

Recruitment

As previously reported, over the three rounds of the RDS surveys for NHBS in 2005, 2009, and 2012, the number of initial seeds varied from 7 to 16, the time to complete recruitment from 17 to 32 weeks, the mean number of waves from 1.7 to 7.9, recruits per wave from 35.3 to 81.4, and coupon return rate from 43.9% to 51.7% (Coffin et al., 2014). The 2005 survey round required the most seeds, took the longest time, had the fewest waves of recruitment, lowest number of recruits per wave, and lowest rate of coupon return. The total sample sizes achieved in 2005, 2009, and 2012 were 565, 535, and 570 eligible PWID, respectively.

Demographic characteristics

Demographic characteristics of the three samples have been previously reported (Coffin et al., 2014). In brief, over the three waves, there were significant increases in the proportion of PWID in the 21–30 year ($P = 0.009$) and 51–60 year ($P = 0.023$) age groups and a significant decrease in the proportion in the 31–40 year age group ($P = 0.014$). The proportion of Latino PWID decreased from 12.9% in 2005 to 6.8% in 2012 ($P = 0.001$). In terms of highest education level achieved, completing only elementary school decreased from 5.5% to 4.4% ($P = 0.024$) while getting a college degree increased from 2.5% to 5.9% ($P = 0.050$). Significant trends in employment status included an increase in being disabled (3.8% to

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