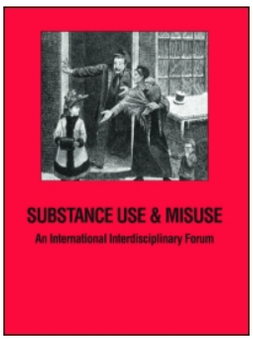

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ORIGINAL ARTICLE

Factors Associated with Frequency of Recent Initiation of Others into Injection Drug Use Among People Who Inject Drugs in Los Angeles and San Francisco, CA, USA, 2016–17

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ABSTRACT

Objective: Drug injection initiation is often assisted by a person who injects drugs (PWID). How often PWID provide this assistance has not been examined. We examine frequency of injection initiation assistance and factors associated with high (4+) and low frequency (1–3) initiation assistance as compared to no initiation assistance among PWID. *Methods:* Participants were 979 Californian PWID. PWID were interviewed about providing injection initiation assistance in the last 6 months among other items. Multinomial regression analysis was used to examine factors associated with levels of frequency of injection initiation assistance. *Results:* Among participants, 132 (14%) had initiated 784 people into injection (mean = 5.94 [standard deviation = 20.13]; median = 2, interquartile range = 1,4) in the last 6 months. PWID engaged in high frequency initiation (26% of sample) assisted 662 new initiates (84% of total). Using multinomial regression analysis with no initiating as the referent group, we found that high frequency initiating was statistically associated with higher injection frequency, having a paying sex partner, taking someone to a shooting gallery, and providing injection assistance. Lower frequency initiation was statistically associated with having a paying sex partner, illegal income source, and providing injection assistance. *Conclusion:* Differences between high and low frequency initiators were not found. Sex work and assisting with drug injection were linked to initiating others. Individual-level interventions that reduce this behavior among PWID and structural interventions such as safe consumption sites and opioid medication treatments that interrupt the social process of injection initiation should be considered as ways to reduce injection initiations.

KEYWORDS
Injection drug use; injection initiation; observational epidemiology; injection assistance; sex work; PWID

Introduction

Changing drug use patterns in the United States may lead to increases in the number of people who inject drugs (PWID). Specifically, the advent of abuse deterrent opioid prescription medications followed by more restrictions on prescribing of any opioids appear to be resulting in some people with opiate use disorders transitioning into heroin use (Cicero & Ellis, 2015; Cicero, Ellis, Surratt, & Kurtz, 2014; Jones, 2013; Mars, Bourgois, Karandinos, Montero, & Ciccarone, 2014; Martins et al., 2017; Victor, Walker, Cole, & Logan, 2017). Several studies have now found that people who use heroin are more likely to report injection as a route of drug administration (Irwin et al., 1996; Novak & Kral, 2011) and transitions to drug injection occur more rapidly for people who use heroin than people who use other drugs (Bluthenthal et al., 2018; O'Keefe, Horyniak, & Dietze, 2016). Given, the well-established dangers of drug injection, including HCV infection, HBV infection, HIV infection, overdose, skin and soft tissue infections, and infective endocarditis (Onyeka et al., 2016; Roy, Boudreau, & Boivin, 2009; Vlahov, Fuller, Ompad, Galea, & Des Jarlais, 2004; Wurcel et al., 2016), understanding additional facilitators of progression to injection drug use is timely.

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Quantitative examinations have shown that the first injection drug use for most people requires the assistance of an established PWID (Crofts, Louie, Rosenthal, & Jolley, 1996; Doherty, Garfein, Monterroso, Latkin, & Vlahov, 2000). Quantitative reports of receiving assistance at first injection range from 53 to 90% (Guichard, Guignard, Lert, & Roy, 2015; Vidal-Trecan, Varescon-Pousson, & Boissonnas, 2002). The consistent role of PWID in assisting injection initiation has led researchers and harm reduction organizations to focus on them as a means of preventing assisted injection initiation (Werb et al., 2018). Both historic and recent studies indicate that this approach is promising (Hunt, Stillwell, Taylor, & Griffiths, 1998; Strike et al., 2014).

In samples of PWID, reports of ever assisting with injection initiation has been as low as 14% and as high as 38% (This behavior is different than peer-to-peer injection which involves an established PWID assisting an established PWID with an injection) (Kral et al., 1999; Lamb et al., 2018; Mittal et al., 2017; Uusküla et al., 2018). Recent injection initiation assistance (in the last 6 to 12 months) is typically much lower and ranges from 1% to 7% in published studies (Bluthenthal et al., 2014; Uusküla et al., 2018). Demographic and drug use characteristics associated with this behavior include use of non-injection cocaine, heroin, and methamphetamine use (Ben Hamida et al., 2018; Bluthenthal et al., 2014; Rafful et al., 2018) and more frequent injection drug use (Melo et al., 2018). Younger age has also been associated with initiation, as has longer injection career (Melo et al., 2018; Mittal et al., 2017; Rotondi et al., 2014; Uusküla et al., 2018). Being male has also been found to increase odds of injection initiation (Meyers et al., 2018; Uusküla et al., 2018). Prior studies have found that people who initiate others into injection are often unemployed and are more likely to be unstably housed (Rotondi et al., 2014). In qualitative studies, motivations to assist with injection initiation include exchanges of money, drugs, sex, or a place to stay (Guise et al., 2018; Rotondi et al., 2014; Wenger, Lopez, Kral, & Bluthenthal, 2016).

Among those who have assisted with injection initiation, the average number of people assisted has varied from a mean of two people within the first five years of one's own initiation to a mean of ten people per year (Bluthenthal et al., 2014; Bryant & Treloar, 2008), indicating that not all PWID who initiate others into injection drug use are doing so at the same frequency. Studies to date have not examined whether there are demographic or other differences among people who initiate many people, some or no one into injection drug use. Our study sought to better understand difference in frequency of initiation and to contribute to the ongoing characterization of PWID who initiate others into drug injection with an overall goal of better understanding intervention opportunities related to preventing injection initiation.

Methods

Sampling and recruitment

As part of a randomized controlled trial to determine the efficacy of an intervention to prevent injection initiation assistance by PWID, we recruited 979 PWID in Los Angeles and San Francisco, California during 2016 and 2017 using community outreach and targeted sampling methods (Bluthenthal & Watters, 1995; Kral et al., 2010; Watters & Biernacki, 1989). Study eligibility included being 18 years of age or older and self-reported drug injection within the past 30 days, which was confirmed by visual inspection of injection sites (Cagle, Fisher, Senter, Thurmond, & Kastar, 2002). After providing informed consent, participants answered questions on demographic characteristics, drug use patterns, involvement in injection initiation and behaviors that socializes others into drug injection (e.g., injecting in front of non-injectors), peer to peer injection, drug treatment involvement, and other items in a one-on-one computer assisted personal interview using the Questionnaire Development System (Nova Research, Bethesda, MD). Participants received $15 for completing this interview. This cross-sectional analysis includes data from 979 PWID representing 471 from Los Angeles and 508 from San Francisco. All study procedures were reviewed and approved by the institutional review board at the Keck School of Medicine at the University of Southern California.

Study measures

To determine whether injection initiation had occurred in the last 6 months, we asked each participant the following questions: "Have you ever injected someone for their first hit? By this I mean given someone their first hit or injection?" Those responding 'yes' were then asked a similar question for the last 6 months and asked how many people they had initiated into injection in the last 6 months. Participants who reported either never initiating someone (as assessed in a prior question), reported not doing so in the last 6 months, or reported "don't know" ($n = 4$) or "refused to answer" ($n = 1$) were included in the 'None' category.

Those responding 3 or fewer initiates in the last 6 months were classified as low frequency initiators, and those reporting 4 or more were classified as high frequency initiators. The high frequency initiator threshold number corresponds to the 75th percentile of people initiating others in this sample, a threshold we developed *de novo*.

We collected participant information on demographic and socioeconomic characteristics. Socio-demographic variables included in our analysis were age (<30, 30 to 39, 40 to 49, or 50 or older), sex (female, male, transgender), race/ethnicity (White, Latinx, Black, Asian/Pacific Islander, Native American, and mixed race), relationship status (single, married, living as married), sexual partners (types—steady, casual, paid), and sexual orientation (heterosexual, bisexual, gay, or lesbian). Socioeconomic characteristics include monthly income (<$1,401 vs. $1,401 or more—the U.S. federal poverty threshold for a 2 person household in 2016), homeless (yes or no), income sources (job, unemployment, veteran's benefits, welfare, disability, social security, spouse, family, friends, recycling, panhandling, and illegal or possibly illegal sources), and education (high school graduate or equivalent).

We were also interested in drug use factors that might be associated with injection initiation frequency. We collected information on peer-to-peer injection assistance which includes injecting another PWID (but not for their first inject) and receiving an injection from another PWID (Kral et al., 1999; Lamb et al., 2018). In addition, we collected information on frequency of injecting with other PWID and injecting in public spaces. Finally, we also asked about drug scene involvement (yes or no) in the last 6 months (Friedman et al., 1998; Sherman & Latkin, 2002) using the following items: "Have you taken others to a location where they could inject drugs such as your hotel room, a shooting gallery, or your encampment?"; "Have you operated a shooting gallery or place where people can inject?"; "Have you bought syringes or needles for another person?"; Have you sold needles or syringes?"; "Have you bought drugs for other people?"; and "Have you sold drug to other people?"

Drug use measures included injection frequency, types and times of drugs used by route (injection or non-injection), and years of injection. Injection frequency was the sum of self-reported injection times with the following drugs: cocaine, crack cocaine, methamphetamine, heroin, speedball (admixture of cocaine and heroin), goofball (admixture of heroin and methamphetamine), prescription opiates, stimulants, sedatives, tranquilizers, methadone, and buprenorphine in the last 30 days. We converted injection frequency in last 30 days into a categorical variable with the following classifications: less than daily use (<30 injections), once or twice a day (30 to 89 injections), and three or more times a day (≥90). Any injection and non-injection use of the drugs listed above was also considered along with marijuana, bath salts or synthetic cathinones, and synthetic cannabinoids (i.e., Spice). Years of injection was calculated by subtracting current age from age at first injection and categorized as < 10 years, 10 to 19 years, and 20 or more years.

Statistical analysis

Descriptive statistics (e.g. frequencies, means, standard deviations, among others) were examined for all study variables. Bivariate analysis was conducted to determine factors correlated with injection initiation (none, low or high). Variables significant ($p < .05$) in bivariate analysis were assessed for collinearity. Statistical significance of bivariate comparisons was set at $p < .05$ and was tested using chi-square test for categorical variables and t test for continuous variables. Correlations were assessed using multinomial logistic regression with injection initiation in the last 6 months classification as the dependent variable. Variables found to be significant at the $p < .05$ level were considered to be independently associated with injection initiation category in the last 6 months and were retained in the final model. Collinear variables were removed from the final analysis based on strength of association with the dependent variable.

Results

Participants in this study were 42% white, 23% Latinx, 20% black, 7% American Indian; 76% male; 68% under the age of 50; 19% gay, lesbian, or bisexual, 7% HIV positive, and 83% homeless with 71% of participants reporting a total monthly income of less than $1,401 (Table 1).

In the last 6 months, 132 (14%) PWID had initiated 784 people into injection (mean = 5.94, standard deviation [SD] = 20.13; median = 2, interquartile range [IQR] = 1,4). Of the 132 PWID who had initiated others into injection in the last 6 months, 26% ($n = 34$) had initiated four or more people in the last 6 months ("high frequency", mean = 18.88, SD = 37.09, median = 6.00, IQR = 4,15). Three and a half percent of all PWID (34/979; high frequency

Table 1. Demographic, socioeconomic and drug use characteristics of study sample ($N = 979$).

Characteristic	*n* (%)
Gender	
Female	223 (23%)
Male	742 (76%)
Transgender or other	14 (1%)
Race	
White	410 (42%)
Latinx	229 (23%)
Black	197 (20%)
Asian/Pacific Islander	11 (1%)
Native American	68 (7%)
Mixed Race	61 (6%)
Age	
Less than 30	191 (20%)
30–39	232 (24%)
40–49	245 (25%)
50 or more	311 (32%)
High school education or more	
Yes	703 (72%)
Homeless	
Yes	814 (83%)
Gay, Lesbian, or bisexual	
Yes	187 (19%)
Relationship status	
Single, no main partner	675 (69%)
In relationship but not living as married	203 (21%)
Married or living as married	96 (10%)
HIV positive	
Yes	64 (7%)
Monthly income	
<$1,401	691 (71%)
$1,401 plus	286 (29%)
Income source, last 6 months	
Welfare, general relief	418 (43%)
Recycling	216 (22%)
Illegal or possibly illegal source	399 (41%)
Panhandling	264 (27%)
Years of drug injection	
Less than 10 years	301 (31%)
10-19 years	208 (21%)
20 or more years	469 (48%)
Injection drug use, last 30 days	
Crack cocaine	122 (13%)
Powder cocaine	154 (16%)
Methamphetamine	598 (61%)
Heroin	837 (86%)
Opiate prescription medication	106 (11%)
Speedball	313 (32%)
Goofball	526 (54%)
Non-injection drug use in the last 30 days	
Marijuana	639 (65%)
Crack	392 (40%)
Powder cocaine	129 (13%)
Heroin	206 (21%)
Methamphetamine	474 (48%)
Opioid prescription pills	219 (22%)
Tranquilizer prescription pills	284 (29%)
Methadone	148 (15%)
Injection frequency, last 30 days	
Less than once a day	168 (17%)
Once or twice a day	266 (27%)
Three times or more a day	545 (56%)
Drug treatment in the last 6 months	
Detoxification	138 (14%)
Methadone maintenance	265 (27%)
Buprenorphine	79 (8%)
Outpatient	175 (18%)
Inpatient	113 (12%)
Residential	115 (12%)
Initiation of non-injectors	
Ever	405 (41%)
Last 6 months	132 (13%)
Low frequency (1–3 people)	98 (10%)
High frequency (4 or more)	34 (4%)

initiators) accounted for 82% (642/784) of the total initiations by the sample.

In bivariate analysis (Table 2), we report statistically significant differences across a variety of demographic, economic, drug use, and drug scene involvement variables by initiation category. People who reported low and high frequency initiating were younger, identified as gay, lesbian, or bisexual at higher proportion, reported at least one steady, casual, and paying sex partner in the last 6 months more often, and were more likely to report homelessness as compared to those who reported no initiations. In terms of drugs, higher injection frequency, use of multiple injected drugs (methamphetamine, prescription opiates, and speedball), greater drug scene involvement variables (e.g., sold drugs), and providing and receiving assistance with injection were found to be more common among low and high frequency initiators as compared to those who reported no initiations in the last 6 months.

In multinomial regression with no initiating as the referent group (Table 3), we found that high frequency initiating was associated with higher injection frequency (adjusted odds ratio [AOR] = 1.002, 95% confidence interval [CI] = 1.001, 1.004), having a paying sex partner (AOR = 2.99; 95% CI = 1.35, 6.58), taking someone to a shooting gallery (AOR = 3.26; 95% confidence interval[CI] = 1.11, 9.62), and providing injection assistance (AOR = 12.20; 95% CI = 1.62, 90.91). Lower frequency initiation was associated with having a paying sex partner (AOR = 2.11; 95% CI = 1.23, 3.61), illegal income source (AOR = 2.21, 95% CI = 1.40, 3.48), and providing injection assistance (AOR = 2.60; 95% CI = 1.42, 4.76) as compared to non-initiators. Overlapping confidence intervals between low and high frequency initiators indicates that there were not statistically significant differences between these two categories of PWID who initiate others into injection.

Discussion

Our results suggest that a small number of PWID facilitated a large number of injection initiations. These results contribute to the growing recognition that prevention of injection initiation needs to include interventions focused on current PWID and perhaps most importantly high frequency initiators. Research on motivations for assisting with injection initiation are underway and examining differences by frequency of initiation will be considered (Simpson, Kral, Wenger, Strike, & Bluthenthal, 2018). In addition, we may need more focused studies on high frequency initiations given the disproportionate contribution of this behavior

Table 2. Bivariate factors associated with initiation frequency in the last 6 months ($N = 979$).

Variable	No initiation in last 6 months ($n = 847$) *n* (%)	Low frequency initiation in last 6 months ($n = 98$) *n* (%)	High frequency initiation in last 6 months ($n = 34$) *n* (%)	*p*=
Age				.02
Under 40	351 (42%)	52 (53%)	20 (59%)	
Homeless				.02
Yes	692 (82%)	90 (92%)	31 (91%)	
Gay, lesbian, or bisexual				.05
Yes	156 (18%)	19 (20%)	12 (35%)	
Illegal or possibly illegal source in last 6 months				<.0001
Yes	317 (38%)	61 (62%)	21 (62%)	
Any sex partner in the last 6 months				.02
Yes	554 (66%)	74 (77%)	28 (82%)	
Casual sex partner in the last 6 months				<.0001
Yes	270 (32%)	44 (44%)	20 (59%)	
Paying sex partner in the last 6 months				<.0001
Yes	86 (10%)	22 (22%)	10 (29%)	
Injection frequency				.002
Less than once a day	152 (18%)	13 (13%)	3 (9%)	
Once or twice a day	243 (29%)	20 (20%)	3 (9%)	
Three times or more a day	451 (53%)	65 (67%)	28 (82%)	
Injection drug use, last 30 days				
Crack cocaine	101 (12%)	12 (12%)	9 (27%)	.04
Methamphetamine	500 (59%)	72 (74%)	26 (77%)	.004
Opiate prescription medication	83 (10%)	16 (17%)	7 (21%)	.03
Speedball	259 (31%)	38 (39%)	16 (47%)	.04
Goofball	439 (51%)	65 (66%)	22 (65%)	.01
Non-injection drug use, last 30 days				
Powder cocaine	99 (12%)	23 (23%)	7 (21%)	.002
Opioid prescription pills	178 (21%)	30 (31%)	11 (32%)	.04
Tranquilizer prescription pills	231 (27%)	41 (41%)	11 (32%)	.01
Methadone	117 (14%)	20 (21%)	11 (32%)	.004
Inject with others				.006
Yes	751 (89%)	96 (98%)	33 (97%)	
Injected in public setting				.002
Yes	648 (77%)	88 (90%)	31 (91%)	
Sold drugs in the last 6 months				.005
Yes	486 (58%)	71 (72%)	25 (74%)	
Bought drugs for other people				.03
Yes	570 (68%)	77 (78%)	27 (79%)	
Took someone to a place to shoot drugs				<.0001
Yes	480 (57%)	65 (66%)	30 (88%)	
Operated a shooting gallery				.01
Yes	138 (16%)	21 (21%)	12 (35%)	
Purchased syringes for another				.005
Yes	380 (45%)	53 (54%)	24 (71%)	
Injected other person in the last 6 months				<.0001
Yes	546 (65%)	84 (86%)	33 (97%)	
Injected by another person in the last 6 months				.002
Yes	422 (50%)	62 (63%)	25 (74%)	

to injection initiation. Qualitative and quantitative research that examines high frequency initiation by injection initiation request (Bluthenthal et al., 2015), social context, motivations, and variability in this behavior over time (i.e., is this behavior consistent?) is needed. Finally, we need interventions that reach this small subsample and provide them with the means and skillset to not engage in such behavior.

Further, the overlapping confidence intervals between high and low frequency initiators indicate that these groups did not differ significantly from each other with respect to demographic or drug use factors (Andrade, 2015). However, we did find differences between initiation frequency and not initiating others. For instance, we found engagement in drug scenes and illegal income-generating activities (measured as illegal income and sex work) were significantly more likely to occur among initiators as compared to non-initiators. These quantitative findings are consistent with qualitative studies where social contexts that included engagement in drug scenes and sex work were related to injection initiation (Guise, Horyniak, Melo, McNeil, & Werb, 2017; Rotondi et al., 2014; Wenger et al., 2016).

In addition, we found that providing injection assistance was also associated with both low and high frequency initiation; only one study has reported this association previously (Bluthenthal et al., 2014). Peer-to-peer injection assistance is common in populations of PWID (Kral et al., 1999; Lamb et al., 2018) and is likely

Table 3. Multinomial regression analysis of high and low frequency initiation among people who inject drugs, Los Angeles and San Francisco, California, 2016–17 ($n = 979$).

Variable	No initiation	Low frequency initiation AOR (95% CI)	High frequency initiation AOR (95% CI)
Injection frequency—continuous	Referent	Not significant	1.003 (1.001, 1.004)
Paying sex partner in the last 6 months	Referent	2.11 (1.23, 3.61)	2.99 (1.35, 6.58)
No			
Yes			
Illegal or possibly illegal income source in the last 6 months	Referent	2.21 (1.40, 3.48)	Not significant
No			
Yes			
Taken someone to a place to shoot drugs	Referent	Not significant	3.26 (1.11, 9.62)
No			
Yes			
Injected another person	Referent	2.60 (1.42, 4.76)	12.20 (1.62, 90.91)
Yes			

related to injection initiation due to the skill that PWID who provide injections to others possess (Simpson et al., 2018). A focus on working directly with PWID who provide injection assistance is warranted.

In the context of other quantitative studies on injection initiation, findings from this study differed in several respects. First, injection initiation in the last 6 months was substantially higher (14%) among PWID in this study as compared to 7% who reported initiating in the last year among PWID in Los Angeles and San Francisco in 2011–13 (Bluthenthal et al., 2014). Further, both reports are higher than <1–5% initiations in the last 6 months or year that have been found in other observational epidemiological studies in recent years (Ben Hamida et al., 2018; Melo et al., 2018; Uusküla et al., 2018). The most recent estimate (2007) of the number of PWID in Los Angeles was 69,664 (104.5 per thousand) and 28,088 (228 per thousand) in San Francisco (Tempalski et al., 2013). Our finding suggest that injection drug use may have increased substantially in Los Angeles and San Francisco, California in the last 5 years. Rapid implementation of interventions that prevent injection transitions are urgently needed (Werb et al., 2018), with an emphasis on the relatively small proportion of PWID who engage in high frequency injection initiation.

In addition, we did not find an association between initiation frequency and any type of drug use. Studies have found that non-injection drug use (Ben Hamida et al., 2018), non-injection cocaine (Ben Hamida et al., 2018; Bluthenthal et al., 2014), non-injection heroin and methamphetamine use (Ben Hamida et al., 2018), along with methamphetamine and heroin injection (Rafful et al., 2018) were associated with increased odds of initiating someone into injection. These data point to drug using networks that have been inadequately examined in the literature on injection initiation. One recent study did have geographic clusters of injection initiation (Des Jarlais et al., 2018) at the zip code level, suggesting network influences on initiation. Studies using social networking methodologies to study injection and non-injection drug using networks are urgently needed.

Prior studies have demonstrated that injection initiation is a social process that often includes repeated exposure of injection naïve people to the process and comparable advantages of drug injection (Guise et al., 2017; Khobzi et al., 2009; Simmons, Rajan, & McMahon, 2012; Strike et al., 2014). In our study, we found that PWID involved in injection initiation had higher odds of involvement in illegal activities and the process of helping others inject. Structural interventions that address these factors should be considered. For instance, supervised injection facilities or safe consumption sites (SIF/SCS: places where previously obtained substances can be used under trained supervision (Kinnard, Howe, Kerr, Skjødt Hass, & Marshall, 2014; Stoltz et al., 2007)) that engage PWID with histories of injection initiation could lead to reductions in initiation by reducing interactions with non-injecting drug users during the drug use process. Studies examining this potential benefit of SIF/SCS should be conducted. In addition, expanding access to medication treatments (i.e., methadone, buprenorphine, and naltrexone) for people with opioid and heroin use disorders is also indicated and could operate like SIF/SCS to reduce injection drug use and exposures to injection drug use. Cross-sectional analyses have indicated that PWID with a history of medication treatment were less likely to report injection initiation (Mittal et al., 2017) further supporting treatment as a reasonable means of reducing injection initiation.

Limitations

There are several limitations that should be considered when interpreting these findings. First, due to the

small population of high frequency initiators (3.5%), our sample of PWID who have initiated four or more people in the last 6 months is of a relatively small size which makes our findings imprecise. In addition, this is a cross sectional analysis, which means that causality cannot be concluded based on our findings. Further, the data presented here has been extracted from participant self-reports, which raises some question about the reliability and validity of the findings of this research due to social desirability and recall bias of survey respondents. However, the items used in this study have been previously established as reliable and valid in prior studies (Dowling-Guyer et al., 1994; Needle et al., 1995; Weatherby et al., 1994).

Conclusions

It appears that a small sub-population of PWID are involved with the vast majority of initiations and therefore it is of critical importance that interventions directed at this population are developed and tested. Existing injection initiation prevention interventions such as Change the Cycle (Strike et al., 2014)—a single session, peer-led active listening intervention, and Breaking the Cycle (Hunt et al., 1998)—a social marketing approach to reinforce norms against assisting others into injection drug use - which are focused on established PWID, should be tested in a variety of settings to establish applicability, feasibility, and efficacy. Other interventions such as the Sniffer intervention (Des Jarlais, Casriel, Friedman, & Rosenblum, 1992), a multiple session, group intervention that highlights risk of drug injection and is focused on injection naïve drug users or aluminum foil distribution to promote heroin smoking that might be considered relevant for both PWID and non-injectors (Pizzey & Hunt, 2008). Further, others are attempting to impact injection initiation trends through multi-level, combined community interventions including SIF/SCS) along with heroin assisted treatment, greater availability of other medication-assisted treatments, and reducing housing instability among PWID (Werb et al., 2016). At present, there are at least four ongoing trials that are developing and/or testing individual level and community interventions to reduce injection initiation behaviors by PWID (Acosta—R34DA043957; Bluthenthal/Kral—R01DA038965; Des Jarlais—R01DA039542; Werb—DP2DA040256). Efforts to move rapidly to implementation of efficacious interventions is urgently needed.

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Data statement

Data will be made available to other investigators 1 year following the completion of this study (July 2020).

Disclosure statement

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