
Access to Sterile Syringes through San Francisco Pharmacies and the Association with HIV Risk Behavior among Injection Drug Users

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ABSTRACT *Increased options for syringe acquisition and disposal have been associated with reductions in high-risk behaviors. This study determined the extent of pharmacy uptake in accessing syringes among injection drug users (IDUs) and estimated associations between pharmacy uptake and safer injection/disposal practices. Two years after the implementation of California's Disease Prevention Demonstration Project, which removed restrictions to non-prescription syringe sales through pharmacies with local authorization, IDUs were recruited through street outreach in San Francisco and interviewed regarding recent syringe acquisition, use, and disposal. The sample of 105 persons included a high proportion of men (67%), people of color (49%), and homeless persons (71%). The most common syringe source was a syringe exchange program (SEP) (80%), with pharmacies being accessed by 39% of respondents. The most commonly cited source of disposal was a SEP (65%), with very few reports of pharmacy disposal (2%). Adjusted analysis showed that unsuccessful attempts to purchase syringes at a pharmacy increased the odds of both injecting with a used syringe and giving away a used syringe. Using a SEP decreased the odds of unsafe injection and disposal practices. Thus, 2 years after the initiation of the California Disease Prevention Demonstration Project, results from this small study suggest that SEPs still provide the majority of syringe distribution and disposal services to San Francisco IDUs; however, pharmacies now augment syringe access. In addition, unsafe injection behavior is reported more often among those who do not use these syringe sources. These results are consistent with prior studies in suggesting that increasing the availability of syringes through SEPs and pharmacies, and developing bridges between them, may further reduce syringe-related risk.*

KEYWORDS *HIV Risk, Injection Drug Use, Pharmacy*

INTRODUCTION

Injection drug use is a major risk factor for blood-borne pathogens, accounting for one fifth of human immunodeficiency virus (HIV) and the majority of hepatitis C

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virus (HCV) infections in the USA.¹ Syringe exchange programs (SEPs) and pharmacies are acknowledged in the fields of medicine and public health as the two main sources of safe (i.e., sterile) syringes.²⁻⁴ Disposal options that are widely accepted as safe include SEPs, pharmacies, and specialized receptacle programs such as syringe drop boxes.⁵ Research indicates that increased access to sterile syringes through SEPs results in reduced syringe sharing among injection drug users (IDUs)⁶ and lower levels of HIV infection among individuals and communities.⁷⁻⁹ Studies regarding the impact of syringe acquisition through pharmacy sales are few. Those conducted suggest the value of pharmacies in HIV prevention, as evidenced by lower rates of HIV risk behaviors among IDUs who successfully use pharmacies to purchase syringes,¹⁰⁻¹² the significant contributions of pharmacists as HIV prevention service providers,¹³ and the importance of community-level education regarding pharmacies as syringe resources.¹⁴ Many state and local municipalities throughout the USA have therefore amended laws by permitting the sale of non-prescription syringes.

In addition to sterile syringe access, parallel public health concerns exist regarding a lack of safe syringe disposal options, which have been associated with publicly discarded syringes.⁸ It is possible that non-prescription pharmacy syringe sales may also reduce unsafe syringe disposal by virtue of onsite disposal facilities. For instance, individuals' safe syringe disposal increased over time following a 2001 New York demonstration program that allowed legal pharmacy sales of syringes without prescriptions.¹⁵ On the other hand, a study regarding pharmacy sales in Minnesota found no changes in syringe disposal practices during the 1-year following legal non-prescription pharmacy sales.¹⁶ Whether differences in these studies are due to geographic differences (e.g., attitudes or culture that are location-specific) is unclear.

On January 1, 2005, California legislation (SB1159; the Disease Prevention Demonstration Project (DPDP)) removed restrictions to the purchase of syringes without a prescription in areas of local authorization (e.g., county or city). In analysis of this policy change, Stopka et al. found broad disparities in the authorization of over-the-counter syringe sales by both local health jurisdictions and pharmacies throughout California; overall, a relatively small proportion of pharmacies registered to participate, resulting in inconsistent implementation.¹⁷ San Francisco was one of 17 California Health Jurisdictions to enact the DPDP by 2007,¹⁸ and it experienced one of the highest levels of participation by pharmacies among approving jurisdictions, with 81% of surveyed pharmacists reporting participation.¹⁹ As part of a larger evaluation to assess the impact of the DPDP implementation, the goal of the current study was to assess the uptake of pharmacies as a source of syringe acquisition and disposal, as well as associations between pharmacy uptake and HIV risk behaviors among a street-recruited sample of San Francisco IDUs.

METHODS

A convenience sample of IDUs was recruited for this cross-sectional study by outreach workers who were deployed to high drug-traffic areas in San Francisco during July 2007. The selection of recruitment locations was based on rates of drug treatment entry; San Francisco zip codes with the highest per capita drug use were chosen. Specific blocks of high drug activity, that were also considered safe for outreach workers during daylight hours, were identified through discussions with

outreach workers, service providers, researchers from the San Francisco General Hospital Stimulant Treatment and Methadone Programs.

Recruitment

Study interviewers distributed HIV prevention literature and condoms to passersby, indicating that a survey among IDUs was also being conducted. Persons expressing interest in the survey were asked to step away from congregated individuals (to increase privacy for the interview), confirm eligibility (i.e., identification proving that the individual was at least 18 years of age and had visible scarring, or “track marks,” from injection) and, after being informed of study procedures, provide consent for study participation. Interviews were conducted in English; however, no one was excluded from the study due to an inability to speak English. Personal identifiers were not collected. The average duration of interviews was 15 min, and individuals were reimbursed \$5. This protocol was conducted with the approval of the Committees on Human Research from the University of California, San Francisco, California State University, Dominguez Hills, and the California Department of Public Health.

Data Analysis

Outcome variables covered the prior 30 days and included obtaining a syringe from a potentially unsafe source (i.e., a source other than a pharmacy or SEP), injecting with a syringe that had been previously used by another person, giving a syringe that the respondent had used to another person, and unsafe disposal of a used syringe (i.e., trash, toilet, or a public place). Potential correlates of interest included purchasing syringes at a pharmacy, as well as sociodemographic factors, self-reported HIV and HCV infections, injection frequency, drug last injected, age at time of first injection, having concern about potential legal ramifications from carrying syringes, obtaining syringes from a SEP, and reporting an unsuccessful attempt to purchase syringes at a pharmacy. Data were collected before syringe disposal in the municipal garbage system was made illegal by the State of California (SB 1305, September 1, 2008) and before the installation of public syringe disposal boxes (San Francisco Chronicle, Friday, August 3, 2007, Page A1).

Odds ratios (OR) and 95% confidence intervals (CI) were used to determine the magnitude of effect as well as the amount of variability in each estimate; inferences were based on simultaneous adjustment for independent variables using multiple logistic regression. Assuming an alpha of 0.05, the study had 80% power to see an effect size of 0.27. The current study was considered exploratory; to avoid errors in the interpretation of exploratory observational data, adjustment was not made for multiple comparisons.²⁰

RESULTS

Recruitment efforts resulted in 105 individuals being interviewed during the month of July 2007. Less than 2% of self-identified IDUs refused to participate. The sample population was comprised of 51% Caucasian, 14% African American, 12% Latino (a), and 18% “other” persons, while women comprised 33% of the sample population (Table 1). Almost three quarters (71%) of respondents were homeless, the median age was 42 years (interquartile range (IQR)=35–49), and the median age at first injection was 17 years (IQR=14–26). The median number of injections was five during the prior week (IQR=2–20); the most common drugs last injected were

heroin (51%) and methamphetamine/speed (35%). HIV infection was self-reported by 17% of respondents, while 64% self-reported HCV infection.

Syringe Sources

The most common sources of syringes in this population were a SEP (80%), friend (46%), pharmacy (39%), “on the street” (37%), drug dealer (7%), and diabetic (3%). Among those who obtained syringes at a pharmacy, 24% reported obtaining at least half of all syringes used during the prior 30 days there. By comparison, 89% of participants who obtained syringes at a SEP obtained at least half of all syringes there. The only significant correlate of obtaining syringes from an unsafe source (non-SEP and non-pharmacy) was homelessness (OR=2.95, CI=1.19–7.33; Table 1).

Twelve individuals (11%) reported injecting with a syringe during the past 30 days that had been previously used by another person. After adjusting for white/Caucasian race (adjusted OR (AOR)=5.23, CI=1.08–25.21), reporting a failed attempt to purchase syringes at a pharmacy increased the odds of injecting with a used syringe (AOR=12.00, 95% CI=2.79–51.66), while obtaining syringes at a SEP decreased the odds of injecting with a used syringe (AOR=0.18, 95% CI=0.03–0.75; Table 1).

Syringe Disposal

The most common sources of syringe disposal in this population were an SEP (65%), trash (41%), flushed down the toilet (12%), gave away (9%), pharmacy (2%), and left in a public place (1%). Among those who disposed of syringes at an SEP, 82% reported disposing at least half of all syringes used during the prior 30 days there.

Seven individuals (7%) reported giving away their used syringes. Adjusted analysis showed that reporting a failed attempt to purchase syringes at a pharmacy increased the odds of giving away a used syringe (AOR=9.32, 95% CI=1.73–50.19), while obtaining syringes at an SEP decreased the odds of giving away a used syringe (AOR=0.15, 95% CI=0.03–0.75; Table 1).

Fifty individuals (48%) reported unsafe disposal of their syringes (i.e., trash, toilet, or public place) during the past 30 days. In adjusted analysis, obtaining syringes from a SEP decreased the odds of unsafe disposal (AOR=0.17, CI=0.05–0.95), and being homeless increased the odds of unsafe syringe disposal (AOR=3.75, CI=1.41–9.55; Table 1).

DISCUSSION

Two years after the implementation of California’s DPDP, and in a city where 81% of pharmacists report selling syringes without a prescription,¹⁹ results from this small study suggest that SEPs still provide the majority of syringe distribution and disposal services to San Francisco IDUs. However, 39% of IDUs who participated in this study now also access sterile syringes from pharmacies in a jurisdiction where both sources are available. After adjusting for SEP use, unsuccessful attempts to purchase syringes at a pharmacy were significantly associated with using and giving away previously used needles. These data suggest public health benefits from reducing barriers to syringe access at pharmacies.

The association between an inability to obtain syringes from a pharmacy and giving away used syringes is noteworthy. Whether this association is confounded or

TABLE 1 Unadjusted and adjusted associations (past 30 days) between syringe use behaviors and study characteristics among San Francisco street-recruited injection drug users (N=105), July 2007

Characteristic	n (%)	Unadjusted odds of syringe acquisition ^a OR (95% CI)	Adjusted odds of unsafe syringe acquisition ^a OR (95% CI)	Unadjusted odds of injecting with a used syringe OR (95% CI)	Adjusted odds of injecting with a used syringe OR (95% CI)	Unadjusted odds of giving away a used syringe OR (95% CI)	Adjusted odds of giving away a used syringe OR (95% CI)	Unadjusted odds of unsafe syringe disposal OR (95% CI)	Adjusted odds of unsafe syringe disposal OR (95% CI)
Sociodemographic									
Age	Median=42	0.49 (0.22-1.11)		0.45 (0.12-1.59)		1.33 (0.28-6.29)		0.82 (0.37-1.79)	
White race	51%	2.02 (0.90-4.53)		4.31 (1.09-17.01)		5.87 (0.68-50.68)		1.37 (0.63-2.97)	
Female sex	33%	1.14 (0.48-2.68)		0.92 (0.26-3.30)		0.29 (0.03-2.50)		1.16 (0.51-2.62)	
Monthly income > population median	Median=\$900	0.63 (0.27-1.48)		0.57 (0.16-2.03)		0.88 (0.19-4.20)		0.77 (0.34-1.74)	
Homeless	71%	2.95 (1.15-7.43)	2.95 ^b (1.15-7.43)	4.44 (0.54-36.19)		2.36 (0.27-20.60)		8.91 (1.21-12.02)	3.75 ^b (1.41-9.95)
Self-reported infections									
HIV positive	17%	0.52 (0.19-1.45)		1.64 (0.40-6.80)		0.76 (0.09-6.77)		0.62 (0.22-1.76)	
HCV positive	64%	1.62 (0.71-3.67)		7.33 (0.91-59.29)		1.46 (0.27-7.92)		0.75 (0.34-1.67)	
Drug use									
Injection frequency	Median=6 times/week	2.15 (0.95-4.89)		3.92 (1.00-15.46)		1.48 (0.31-6.988)		1.11 (0.51-2.42)	
Drug last injected= methamphetamine/speed	35%	1.33 (0.60-2.96)		0.52 (0.15-1.86)		1.48 (0.31-6.98)		1.85 (0.85-4.03)	
Age at first injection	Median=18	1.96 (0.87-4.43)		0.82 (0.24-2.77)		0.87 (0.18-4.10)		1.35 (0.62-2.92)	
Fear of arrest for carrying paraphernalia	44%	1.04 (0.46-2.31)		1.57 (0.45-5.52)		0.23 (0.03-2.06)		2.18 (0.98-4.83)	
Syringe sources									
Pharmacy	39%	- ^c	- ^c	2.00 (0.59-6.73)		0.75 (0.14-4.09)		1.45 (0.66-3.19)	
Unsuccessful attempt to buy syringes at a pharmacy	10%	- ^c	- ^c	12.03 (2.81-52.01)	12.00 ^b (2.79-51.66)	13.32 (1.13-65.17)	9.32 ^b (1.73-50.19)	2.78 (0.68-11.41)	
Syringe exchange program (SEP)	80%	- ^c	- ^c	<0.01 (0.00-0.01)	0.18 ^b (0.05-0.65)	0.75 (0.14-4.09)	0.15 ^b (0.03-0.75)	<0.01 (0.00-0.01)	0.17 ^b (0.05-0.55)

^aNon-pharmacy and non-syringe exchange program syringe source

^bAdjusted odds from the final model

^cNot considered due to collinearity

mediated by an unmeasured factor, or whether it is indeed a true effect, is currently unclear. While the current study is unable to determine the mechanism through which barriers to pharmacy-sold syringes would influence giving away used syringes, several possibilities exist. For instance, an inability to purchase syringes at a pharmacy may be correlated with an inability to dispose. If the closest pharmacy to which an individual lives does not dispose of syringes, s/he may have more syringes on hand to lend. Additionally, if the closest pharmacy to which an individual lives does not sell syringes, s/he may keep the few owned in her/his possession, making these syringes more accessible and thus more likely to be loaned.

Due to the cross-sectional nature of the current study, results presented herein cannot be directly compared to several longitudinal studies regarding the impact of syringe access through pharmacies on IDU risk behavior. However, given that an inability to access syringes through a pharmacy was correlated with using and giving away previously used syringes, these results are consistent with the longitudinal evidence to date, indicating that increased options for syringe access predict lower risk behaviors. For instance, Cleland et al. found that safe syringe disposal increased following New York's expanded syringe demonstration program;¹⁵ Singer et al. reported that pharmacies were an important source of sterile syringes 4 years after policy changes that allowed sales in Connecticut,²¹ and results reported by Des Jarlais et al. suggested that a comprehensive public health approach, using multiple strategies across systems, could enhance the prevention of blood-borne pathogens.²² Taken together, these studies suggest that pharmacies can be an effective and sustainable mode of reducing injection-related HIV risk by augmenting syringe access established at programs such as SEPs.

Potential discrepancies within and between studies regarding pharmacy access to syringes should be noted. First, an unsuccessful attempt to purchase syringes through a pharmacy was a significant correlate of high-risk behavior in the current study; however, successfully purchasing a syringe through a pharmacy was not a protective factor. This suggests differences between persons who are able and those who are unable to purchase syringes at a pharmacy, and emphasizes a need to focus prevention efforts on persons who are unable to access resources. Given the cross-sectional nature of the current study, it is possible that persons who unsuccessfully attempted to purchase syringes at a pharmacy may have had higher baseline risk profiles, not that unsuccessful attempts to purchase a syringe prompted high-risk behavior. In addition, given the nature of the available data, an inability to purchase syringes may have stemmed from unusual purchasing times/locations¹² or an inability to pay rather than reluctance on the part of the pharmacists. However, using the example of giving away used syringes, variables that have been traditionally associated with baseline risk behavior, such as injection frequency, income, and age, were not strong correlates. Thus, the results suggest that barriers to accessing syringes through a pharmacy may have potential detrimental effects on the risk behavior of IDUs. In addition, even though Cotton-Oldenburg et al. reported increases in pharmacy use and decreases in syringe sharing following changes in Minnesota legislation that permitted non-prescription syringe sales,¹⁶ there were no reported differences in safe syringe disposal. The current study also found no significant association between purchasing syringes at a pharmacy and safe syringe disposal, which is inconsistent with results from New York City. Whether differences are due to study design or geographical differences in legislation implementation or IDU behavior are unclear. Legislation is often passed more quickly than research

funding can be obtained to evaluate it; however, future individual-level longitudinal data collected before and after policy change would provide important data to address these potential differences. While a better understanding of the differences within and between studies is needed, as well as a more detailed understanding of how and why the studies presented herein influenced IDU risk behavior, each study cited has found significant associations between non-prescription syringe access and decreases in injection-related risk behavior, consistently indicating a role for pharmacies in the reduction of blood-borne pathogens.

These results, in combination with others cited herein, have implications for further reductions in syringe-related risk that may be possible in the context of legal syringe access through pharmacies. First, increasing the number of pharmacies that sell syringes without a prescription may decrease the number of persons who unsuccessfully attempt to purchase syringes at a pharmacy. In addition, as reported in New York, an increase in the use of pharmacies over time would be expected among IDUs who have not yet accessed them.²³ Increased availability through pharmacies and increased uptake by IDUs could decrease the risk of injecting with a used syringe and giving away used syringes. Second, efforts to develop more accessible systems of accepting and disposing used syringes at pharmacies, and efforts to encourage IDUs to dispose of used syringes at pharmacies, may increase pharmacy-based syringe disposal. Third, developing bridges between pharmacies and SEPs would increase options for safe acquisition and disposal. In this environment, educating SEP staff and IDUs about pharmacy options and locations, as well as educating pharmacists about SEP options and locations, would be important. The education and coordinated efforts of pharmacists, health care providers, and public health practitioners to improve access to sterile syringes through pharmacy sales is a long-standing goal^{24,25} that has been substantiated by more recent findings¹⁹ as well as the current study.

While this study's strengths lie in its community-based approach, some limitations should be considered. Even though interviewers did not collect identifying information, data were self-reported, thus socially desirable responding as well as recall bias were possible. However, no evidence exists to suggest that either response or recall bias would differ by persons who do or do not use pharmacies or SEPs. Data were also cross-sectional, making it impossible to establish incidence or change over time. Additionally, the small number of respondents resulted in wide CIs for some associations. Finally, in the context of California's current implementation of expanded syringe access, these results may only be representative of California Jurisdictions with the highest levels of syringe access. This is because the county of San Francisco enacted the DPDP, and the proportion of participating pharmacies was high (81%) relative to other approving California Local Health Jurisdictions.¹⁹ In this environment, accepting and giving away used syringes were more likely among individuals who had unsuccessfully tried to purchase syringes at a pharmacy.

In an environment where SEPs are available, pharmacy syringe sales are legal, and a high proportion of pharmacies register to sell syringes; over one third of IDUs draw on both syringe sources, and measures of success in accessing each are associated with safe syringe-related behavior, while few IDUs utilize pharmacies for disposal. This and earlier studies suggest that increasing the number of options for syringe access and disposal in other California Local Health Jurisdictions would facilitate lower risk behaviors, thereby decreasing the risk of infections with blood-borne pathogens.

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