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An External Evaluation of a Peer-Run "Unsanctioned" Syringe Exchange Program

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ABSTRACT *In Vancouver, British Columbia, Canada, difficulty accessing syringes at night has been shown to be strongly associated with human immunodeficiency virus (HIV) risk behavior among the city's injection drug users (IDUs). On September 1, 2001, the Vancouver Area Network of Drug Users (VANDU) initiated an unsanctioned all-night needle-exchange program on a street corner in the heart of the neighborhood where many of the city's IDUs are concentrated. An external evaluation of the population reached by the VANDU exchange was performed through the Vancouver Injection Drug User's Study, a prospective cohort study of IDUs begun in 1996. Persons accessing syringes through the exchange were compared to those active injectors who acquired their syringes from other sources, including the city's fixed site exchange, which closes at 8:00 PM. Overall, 587 active IDUs were seen during the period September 2001 to June 2002; of these individuals, 165 (28.1%) reported using the VANDU exchange. In multivariate analyses, participants who used the VANDU table were more likely to frequently inject cocaine (adjusted odds ratio [AOR] = 1.56; 95% confidence interval [CI] = 1.00–2.44), inject in public (AOR = 2.71; 95% CI = 1.62–4.53), and require help injecting (OR = 2.13; 95% CI = 1.33–3.42). Interestingly, use of the table was also independently associated with safer syringe disposal (AOR = 2.69; 95% CI = 1.38–5.21). Results indicate that the unsanctioned exchange appears to have reached those IDUs at highest risk of HIV infection. Although the cross-sectional nature of the study design warrants caution, we also found that use of the nighttime exchange was strongly associated with higher rates of safe syringe disposal. The data suggest that drug user organizations can play a major role in reducing harm among their peers by reaching the highest risk drug users with harm reduction services. The findings also suggest that other forms of syringe-exchange programs should consider the benefits of offering fixed site nighttime service.*

KEYWORDS *Harm reduction, HIV/AIDS, Peer, Vancouver, VANDU.*

INTRODUCTION

Scientific evaluations have shown that providing injection drug users (IDUs) with access to clean needles substantially reduces the transmission of human immunode-

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ficiency virus type 1 (HIV-1) and HIV risk behaviors, while providing a place where contaminated syringes can be safely discarded.[1–3] As a result, needle-exchange programs (NEPs) have been endorsed by numerous independent scientific bodies, including the US National Institutes of Health Consensus Panel, US National Research Council, and the American Public Health Association, among others.[4]

Nevertheless, federal funding of needle-exchange programs remains illegal in the United States, and limited funding for needle-exchange programs and restrictive service design remain constraints to optimal service delivery in many settings.[5,6] As a result, exchange operators are often forced to provide limited hours of service and only exchange syringes on a strict "one-for-one" basis. In addition, police presence around needle exchanges has been cited in multiple studies as a barrier to accessing sterile syringes.[7–10] These and other barriers to sterile syringe acquisition have been shown to reduce the benefits of needle-exchange programs.[9,11,12] For instance, in Vancouver, British Columbia, Canada, difficulty accessing syringes has been shown to be the strongest predictor of syringe sharing,[12] a concern that has been primarily attributed to the operating hours of the NEP, which is closed at 8:00 PM each evening.[9] As a result of the existing barriers to sterile syringe acquisition, several studies have demonstrated that IDUs will often obtain syringes from secondary sources, including their peers.[13–15]

In fact, in some settings, organizations of drug users have mobilized themselves in an effort to prevent the ongoing spread of HIV and overdoses among their peers.[14,16–18] The activities of these organizations range from education and advocacy to syringe exchange. Although their impact has rarely been quantified, drug user organizations are believed to have major potential to improve the health of these users' peers.[16] In public health circles, the Vancouver Area Network of Drug Users (VANDU) has been recognized as one of the most successful peer-based drug user organizations internationally. VANDU was formed in 1997 and has over 1,300 members and over 800 volunteers annually; in 2002, VANDU was the recipient of an international human rights award for direct action on HIV/AIDS (acquired immunodeficiency syndrome).[16,19]

Due to the ongoing problem of difficulty accessing syringes at night in Vancouver,[9,12,20] on September 1, 2001, VANDU initiated an unsanctioned program of exchanging syringes at night from a small tent located in the heart of the city's open drug scene when the city's exchange was closed. On average, 1,200 syringes were exchanged every evening, 7 days a week, from 8:00 PM to 4:00 AM, for 9 months without incident by VANDU volunteers. These volunteers were required to undergo a "best practices in needle exchange" training program that included workshops by several local public health experts. This program was implemented to augment VANDU's syringe recovery and alley patrol outreach programs and provided a place where users could obtain syringes in the evening.

In addition to the nighttime operating hours, the exchange differed from other fixed-site exchanges in the city in that it had a more flexible trading policy that enabled users to obtain up to 10 "loaners" if no syringes were available to trade. On May 31, 2002, however, the Vancouver Police Department unexpectedly closed the VANDU exchange, citing the fact that VANDU did not have a permit to operate the service.[21]

At this time, the value of the VANDU exchange was put in question by the operators of the city's sanctioned exchange program. The service was closed temporarily, and VANDU's funding for the exchange was subsequently partially cut.[22] The present study was therefore conducted to evaluate the risk profile of the popu-

lation served by the VANDU exchange and to determine factors associated with acquiring syringes from the VANDU exchange table.

METHODS

Beginning in May 1996, persons who had injected illicit drugs in the previous month were recruited into the Vancouver Injection Drug User Study (VIDUS), a prospective open cohort study that has been described in detail previously.[23,24] Persons were eligible for the study if they had injected illicit drugs at least once in the previous month, resided in the greater Vancouver region, and provided written informed consent.

At baseline and semiannually, subjects provided blood samples and completed an interviewer-administered questionnaire. The questionnaire elicits demographic data as well as information about drug use, HIV risk behavior, and drug treatment. The study was approved by the University of British Columbia's Research Ethics Board.

Soon after the VANDU exchange table was initiated, the VIDUS questionnaire was revised to evaluate if study participants were obtaining syringes from this source. These data were obtained by adding the VANDU exchange table to the list of syringe sources included in the VIDUS questionnaire since the inception of the cohort and includes the city's large exchange, exchange vans, pharmacies, friends, dealers, and so on.

To evaluate the risk behavior of the population served by the VANDU exchange table, we compared participants who reported that they had obtained syringes from the VANDU exchange to those who did not report using this source during the last 6 months. This analysis was restricted to participants who reported actively injecting drugs during the 6 months prior to the interview to avoid confounding due to initiation of exclusive noninjection crack cocaine use, noninjection heroin use, or abstinence among those who did not report using the VANDU table. Those participants who were followed up during the period June 2001 to June 2002 were eligible for the present analyses.

Univariate and multivariate statistical techniques were applied to determine factors associated with obtaining syringes from the VANDU exchange. Sociodemographic characteristics considered in the analyses included gender, ethnic background (aboriginal versus other), HIV serostatus, age, unstable housing, accidental overdose, residence in the Downtown Eastside HIV epicentre, and sex trade work. Unstable housing was defined as living in a single room occupancy hotel, transitional living arrangements, and homelessness, whereas stable housing was defined as an apartment or house. Sex trade work was defined as trading sex for money or drugs.

Behavioral and drug use variables, regarding activities in the last 6 months, included whether participants reported that they currently find it hard to get clean needles, injecting in public, frequency of cocaine and heroin injection, average needle reuse, syringe borrowing, requiring help injecting, and injecting alone. As in our previous work,[9,19] persons who reported injecting cocaine or heroin once or more per day were defined as frequent cocaine or frequent heroin users, respectively. Requiring help injecting was defined as having a fellow user assist in the injection process.

We also evaluated safety of syringe disposal among those that did and did not report using the VANDU exchange. Safe syringe disposal was defined as "using a

sharps container, a needle exchange, or a safe place," whereas unsafe disposal was defined as "threw it in the garbage, on the ground, gave it to another user, or flushed it down the toilet."

Statistical analyses were applied to compare participants who reported obtaining syringes from the VANDU exchange table to active injectors who obtained their syringes from other sources, including the city's exchange. Categorical explanatory variables were analyzed using Pearson's chi-square test, and continuous variables were analyzed using the Wilcoxon rank sum test. We then fit a logistic regression model to evaluate variables that were independently associated with obtaining syringes from the VANDU exchange table. The rationale for the use of multivariate analysis was not so that causation could be inferred, but instead to adjust for obvious potential confounders such as residence near the exchange. To control for potential confounders, all covariates that were statistically significant ($P < .05$) in univariate analyses were included in the final model. All reported P values are two sided.

RESULTS

Since the overall VIDUS study's inception, 196 of the 1,437 participants that have enrolled have died (41 of HIV/AIDS, 51 of an overdose, and 104 of other causes, including hepatitis and suicides). A total of 864 participants completed a follow-up during the study period for the present study. Of these, 277 (32.1%) participants were excluded from the analysis because they were not currently injecting.

Therefore, 587 participants were eligible for the present study. Among this population, 165 (28.1%) reported using the VANDU exchange, whereas 422 (71.9%) did not report obtaining syringes from this source. In comparison to the 598 study participants who were not followed during the study period, participants in this analysis were more likely to be male and older (both $P < .05$). We detected no statistical difference between these groups with regard to unstable housing, residence in the HIV epicentre, education, difficulty accessing syringes, requiring help injecting, or heroin use frequency (all $P > .05$).

The univariate analysis of sociodemographic characteristics of study participants is shown in Table 1. As shown here, HIV positivity (odds ratio [OR] = 1.5), younger age (OR = 0.97), residing in unstable housing (OR = 2.3), Downtown Eastside residence (OR = 4.5), sex trade work (OR = 1.7), and safe syringe disposal (OR = 3.7) were positively associated with obtaining syringes from the VANDU exchange. We found no evidence that gender, ethnic background, or recent nonfatal accidental overdose were statistically associated with obtaining syringes from the VANDU exchange.

Univariate analyses of variables related to drug use are shown in Table 2. Injecting in public (OR = 2.8), frequent cocaine injection (OR = .3), frequent heroin injection (OR = 2.5), injecting alone (OR = 2.3), and requiring help injecting (OR = 2.0) were positively associated with obtaining syringes from the VANDU exchange. Conversely, persons who obtained syringes from the VANDU exchange were less likely to use syringes more than once on average (OR = 0.6). We found no evidence that having difficulty accessing syringes and borrowing a used syringe were statistically associated with obtaining syringes from the VANDU exchange.

When all variables that were significant at the univariate level were entered into a logistic regression model, variables that were independently positively associated with obtaining syringes from the VANDU exchange were frequent cocaine

TABLE 1. Univariate analyses of study participants' sociodemographic characteristics stratified by the 165 participants who did report using the VANDU exchange and the 422 participants who did not report acquiring syringes at the VANDU exchange

	Acquires syringes from VANDU				
Characteristic	Non-VANDU n (%)	VANDU n (%)	Unadjusted odds ratio	(95% CI)	*P*
Gender					
Male	259 (61.4)	96 (58.2)			
Female	163 (38.6)	69 (41.8)	1.1	(0.8–1.6)	.477
Ethnic background					
Other	295 (69.9)	105 (63.6)			
Aboriginal	127 (30.1)	60 (36.4)	1.3	(0.9–1.9)	.143
HIV positive					
No	289 (68.5)	97 (58.8)			
Yes	133 (31.5)	68 (41.2)	1.5	(1.1–2.2)	.026
Age, years					
Median	40	38			
Interquartile range	33–46	30–44	0.97	(0.95–0.99)	.004
Unstable housing					
No	213 (50.5)	51 (30.9)			
Yes	209 (49.5)	114 (69.1)	2.3	(1.6–3.3)	.001
Accidental overdose*					
No	401 (95.0)	152 (92.1)			
Yes	21 (5.0)	13 (7.9)	1.6	(0.8–3.3)	.176
Downtown Eastside residence*					
No	227 (53.8)	34 (20.6)			
Yes	195 (46.2)	131 (79.4)	4.5	(2.9–6.8)	.001
Sex trade work*					
No	340 (80.6)	118 (71.5)			
Yes	82 (19.4)	47 (28.5)	1.7	(1.1–2.5)	.017
Syringe disposal					
Unsafe	102 (24.2)	13 (7.9)			
Safe	320 (75.8)	152 (92.1)	3.7	(2.0–6.9)	.001

CI, confidence interval; VANDU, Vancouver Area Network of Drug Users.
*Refers to the last 6 months at time of interview.

injection (adjusted odds ratio [AOR] = 1.56; 95% confidence interval [CI] = 1.00–2.44), injecting in public (AOR = 2.71; 95% CI = 1.62–4.53), requiring help injecting (AOR = 2.13; 95% CI = 1.33–3.42), and safe syringe disposal (AOR = 2.69; 95% CI = 1.38–5.21). The final multivariate model was also adjusted for age, HIV positivity, unstable housing, residence in the HIV epicentre, involvement in the sex trade, frequency of heroin use, reuse of syringes, and injecting alone.

DISCUSSION

In the present study, we found that 28% of active IDUs surveyed during the study period reported obtaining syringes from the VANDU exchange. Variables that were

TABLE 2. Univariate analyses of study participants' drug use and behavioral characteristics stratified by those who did and did not report acquiring syringes at the VANDU exchange

Characteristic	Acquired syringes from VANDU: Non-VANDU n (%)	Acquired syringes from VANDU: VANDU n (%)	Unadjusted odds ratio	(95% CI)	*P*
Hard to get needles*					
No	337 (79.9)	128 (77.6)			
Yes	85 (20.1)	37 (22.4)	1.2	(0.7–1.8)	.540
Inject in public*					
No	357 (84.6)	109 (66.1)			
Yes	65 (15.4)	56 (33.9)	2.8	(1.9–4.3)	.001
Cocaine use frequency*					
<1 per day	332 (78.7)	102 (61.8)			
≥1 per day	90 (21.3)	63 (38.2)	2.3	(1.5–3.4)	.001
Heroin use frequency*					
<1 per day	314 (74.4)	88 (53.3)			
≥1 per day	108 (25.6)	77 (46.7)	2.5	(1.7–3.7)	.001
Average needle reuse*					
Once	316 (74.9)	137 (83.0)			
Greater than once	106 (25.1)	28 (17.0)	0.6	(0.4–1.0)	.034
Borrowed syringe*					
No	374 (88.6)	146 (88.5)			
Yes	48 (11.4)	19 (11.5)	1.0	(0.6–1.8)	.962
Injecting alone*					
No	145 (34.4)	31 (18.8)			
Yes	277 (65.6)	134 (81.2)	2.3	(1.5–3.5)	.001
Require help injecting*					
No	338 (80.1)	111 (67.3)			
Yes	84 (19.9)	54 (32.7)	2.0	(1.3–2.9)	.001

CI, confidence interval; VANDU, Vancouver Area Network of Drug Users.
*Refers to the last 6 months at time of interview.

independently associated with obtaining syringes from the exchange included frequent cocaine injection, injecting in public, and requiring help injecting. All of these variables have been associated with HIV risk in previous studies. In addition, we also found that use of the VANDU table was associated with safer syringe disposal.

These findings also suggest the potential for major harm to public health as a result of the closure of the exchange by police. Unfortunately, Vancouver policymakers continue to direct tax resources into the hands of police despite the lack of evidence of the effectiveness of law enforcement, while drug treatment and HIV prevention measures remain underfunded.[24,25] Given the social costs of avoidable HIV infections and an estimated cost to the Canadian taxpayer of $150,000 per case of HIV infection,[26] it is critical that future police operations be coordinated with public health service providers.

The role that injection of powder cocaine has played in fueling the Vancouver

epidemic has been well described.[12,27,28] Previous studies have shown frequent injection of cocaine to be among the strongest independent risk factors for syringe sharing, and injection cocaine has been associated with HIV seroconversion in a dose-dependent fashion.[12,28] The fact that frequent cocaine injectors were more likely to report obtaining syringes from the VANDU exchange indicates that the service may have performed a critical public health service by making sterile syringes available when other sources of syringes were limited to those IDUs at highest risk of HIV.[9]

In addition, we also found requiring help injecting to be independently associated with the use of the VANDU table. In the Vancouver setting, requiring help injecting has been associated with syringe sharing,[20,29] HIV seroconversion among female IDUs,[30] and with hepatitis C virus incidence among youths who inject drugs.[31] Similarly, requiring help injecting has been associated with HIV and hepatitis C virus risk in other settings.[32]

Additional evidence of the high-risk population reached by the VANDU table is the association between sex trade work and use of the VANDU table. Although this variable did not retain statistical significance after extensive covariate adjustment, this finding may be of special interest in Vancouver, where over 60 women, many of whom were IDUs involved in the sex trade, have gone missing from the Downtown Eastside during the last decade.[33] VANDU is presently organizing a women's group, and future outreach by this group may have great potential to reduce harm by providing care and support to female IDUs involved in the sex trade.[30]

Despite the fact that public drug use and cocaine injection have previously been associated with unsafe syringe disposal, it is interesting that participation with the VANDU table was associated with safer syringe disposal.[16,20,34] The cross-sectional nature of this association prevents any inference regarding causation. However, since it is among VANDU's primary objectives to collect used syringes from the neighborhood and since safe disposal of syringes is among their primary educational messages, this association deserves further evaluation.[16]

In previous studies in which difficulty accessing syringes was strongly associated with syringe sharing[12] and attributable to the operating hours of the city's exchange, it was argued that a fixed source of sterile syringes should be made available in the heart of the city's open drug scene to address this concern.[9] As such, it is clear that, by opening the night-time exchange, VANDU performed a critical public health function by reaching the highest risk IDUs. However, we should acknowledge that the study design was such that we were unable to determine if the ability of the exchange to reach the highest risk drug users was due to the fact that it was peer run or due to its nighttime operating hours. While it is likely that the extended hours played a major role in reaching the highest risk IDUs, previous studies have shown that user-run services may greatly extend the reach of traditional service provider/client models of service delivery.[14,35]

The use of public spaces for drug use is responsible for public nuisance, unsafe disposal of syringes and has been cited among the greatest concerns of residents and businesspersons in neighborhoods where public drug use is common.[16,20,34,36] While the provision of syringes from an outdoor table may play a beneficial public health role, interventions aimed at balancing public order and public health are clearly needed in these circumstances. In recognition of these concerns, VANDU has been engaging health policymakers in an effort to persuade them to initiate a pilot study of safer injecting facilities. A recent evaluation noted that no services presently available in North America address the problem of public drug use,[34] and

we have recently found that public drug use is associated with willingness to use safer injecting facilities if available.[37]

This study has several limitations that have not been addressed here. Most importantly, the present study relies on self-report of IDUs and is hence susceptible to socially desirable reporting.[38] With regard to this concern, the data were collected as part of an ongoing cohort study and not as part of a formal evaluation of the VANDU exchange. As such, interviewers and the IDUs surveyed were in effect blind to this eventual use of the data. Hence, the associations between attendance at the VANDU exchange and behaviors identified in the present study are unlikely to be the result of interviewer bias. Furthermore, in the context of a survey dealing extensively with drug use and criminal behavior, we know of no reason why attendance at any venue as a source of syringes would be differentially subject to socially desirable reporting.

In summary, we found that 28% percent of active IDUs surveyed during the study period reported obtaining syringes from the unsanctioned peer-run exchange. Variables that were independently associated with obtaining syringes from this source included frequent cocaine injection, injecting in public, and requiring help injecting. It is noteworthy that each of these variables has been associated with HIV risk in previous studies.

The finding that use of the VANDU table was independently associated with safer syringe disposal, despite extensive covariate adjustment, is worthy of further study as to whether this association is causal. In addition, there was evidence that participants involved in the sex trade were more likely to exchange syringes at the table.

Together, the data demonstrate that the unsanctioned exchange appears to have reached the highest risk IDUs, suggesting that in settings in which limited syringe availability continues to contribute to unsafe behavior, there is evidence to suggest that drug user organizations can play a major role in reducing harm among the users' peers by delivering harm reduction services to the highest risk drug users.

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