'Dropouts' or 'Drop-ins'? Client Retention and Participation in New Haven's Needle Exchange Program

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Synopsis

Although evidence is accumulating that needle exchange programs can lower the risk of parenterally transmitted infections, their effectiveness is compromised if they suffer from low client participation. A legal needle exchange in New Haven, CT, has been studied since its inception in November 1990, employing a tracking system to analyze the characteristics of clients participating during the first 20 months of the program.

Thirty-four percent of injection drug users who enrolled in the program during the study period made only a single visit. Younger clients were more likely to be in the single visit group. For clients who visited the program more than once, the retention fraction, defined as the ratio of total client-specific observed person-days to full enrollment person-days during the 20-month study period was 67.7 percent, with a median duration of participation of 333 days.

Further analysis of the client characteristics, based on surveys completed upon enrollment in the program, revealed several predictors of continuing participation. Most significant were the observations that (a) those injecting for 10 years or longer participated longer than clients who injected drugs for less than 10 years and (b) nonwhite injectors participated longer than whites. The longest duration of participation (median = 501 days) was among nonwhite injectors with 10 years or more of injecting history.

There have been limited data on client participation in needle exchange programs. This gap in information must be overcome to allow thorough evaluations of such programs.

THREE RECENT REPORTS sponsored by U.S. Government agencies highlight the increasing role for needle exchange programs in reducing the risk of HIV transmission among injecting drug users (*1–3*). There are increasing data showing that those who regularly exchange their syringes in such programs benefit by lowering their risk of HIV acquisition (*4–10*). But benefit is dependent on participation and, to date, the limited data, available from British needle exchange programs, show a low rate of client retention (*4,11,12*). This has led critics to argue that these programs are flawed because they suffer from high client dropout and low client retention (*13*).

A legal needle exchange program began in New Haven, CT, in November 1990. The enabling State legislation exempted program participants from criminal penalties for possession of syringes without a prescription. In July 1992, new legislation decriminalized syringe possession and permitted the purchase of up to 10 syringes from a pharmacy without a prescription. We have analyzed data from the program to investigate client participation during the 20-month period when it was the sole legal source of syringes. During the course of this study period, the New Haven program operated on a fixed schedule of 6 hours per day, 4 days a week. It provided a one-to-one exchange with a maximum of five needles per visit.

Methods

Subjects for this study were participants in the New Haven needle exchange program. The sources of our data were twofold. One was the self-reported questionnaire completed at the time of enrollment. For each participant, we considered the following variables: sex, ethnicity, age, city of residence, duration of drug injection, frequency of injection,

frequency of syringe sharing, frequency of syringe cleaning, cocaine use, heroin use, and the location of exchange. Chi-square statistics were used to assess differences between clients making a single visit and clients making repeat visits with respect to these variables.

The second source was the syringe tracking and testing system described previously (*7*). Briefly, each time a client visited the exchange, the date, location, and program pseudonyms were recorded. Program pseudonyms are nonidentifying client-specific codes used to link client visits. This tracking system allowed us to measure client retention by defining two variables.

For each client, the observed person-days were defined as the time from first visit through the date of the last visit (or June 30, 1992, if the last visit was after this date). At the time of the study, we had data on client visits through April 1993, 10 months after the study period. Full retention person-days were defined as the time from first visit through June 30, 1992, inclusive, as this equaled the maximum possible time a client could spend in the program during the study period. Totals of observed and full retention person-days were calculated by summing the data from the 922 clients with 2 or more visits. The ratio of total observed person-days to total fully retained person-days yielded a measure, the retention fraction for these clients.

Client participation, based on client-specific observed person-days, was further analyzed using Kaplan-Meier survival function estimates, calculating the probability of client participation in the program for given time intervals. Median participation times were calculated and compared for different client groups. Median participation times were preferred to means due to the large number of clients who continued to make visits in the 10 months following the study cutoff point. The log-rank procedure was used to test for the homogeneity of participation curves over different strata (that is, ethnic groups, sex, and so forth) (*14*).

The relationship between the mean number of client visits and participation time was also examined. Lastly, the percentages of clients making visits in four consecutive quarters in the year following enrollment were calculated.

Results

A total of 1,388 clients enrolled in the program during its first 20 months of operation. Of those, 466 (33.6 percent) made only a single visit. The remaining 922 clients made 2 or more visits (range 2–205, median 6 visits) to the program during this time period. Tables 1 and 2 demonstrate the monthly distribution of enrollments by single-visit clients and compare their characteristics with more regular clients during the study period. A higher proportion of clients who enrolled in the program in the latter months of the study period (compared with those who enrolled in the beginning months) were single-visit clients because of their reduced opportunity to make repeat visits. Based on chi-square analysis, only the age variable was significantly different between the two groups with a greater than expected proportion of younger clients in the single-visit group.

To determine client retention, we analyzed tracking data for all 922 clients who visited the program two or more times during the study period. There were 413 clients (45 percent) who made visits in the 10 months following the study period. The full enrollment person-days for the 922 clients equaled 342,443 while the observed (actual) enrollment person days totaled 231,714, resulting in a client retention fraction of 0.677. The median duration of participation for

Table 1. Enrollment of clients with single visit to the New Haven needle exchange, November 1990–June 1992

Month	Total enrolled	Clients with single visit	
		Number	Percent
November 1990	105	26	25
December 1990	105	22	21
January 1991	100	27	27
February 1991	87	24	28
March 1991	86	16	19
April 1991	114	40	35
May 1991	84	33	39
June 1991	61	18	30
July 1991	66	28	42
August 1991	72	27	38
September 1991	67	19	28
October 1991	42	14	33
November 1991	57	21	37
December 1991	61	17	28
January 1992	42	19	45
February 1992	33	11	33
March 1992	39	15	38
April 1992	57	24	42
May 1992	47	23	49
June 1992	63	42	67

'There are increasing data showing that those who regularly exchange their syringes in such programs benefit by lowering their risk of HIV acquisition.'

Kaplan-Meier analysis of the participation of the 922 clients making two or more visits to the New Haven needle exchange, November 1990 to June 1992. Of these clients, 413 (45 percent) returned after June 30, 1992. The median participation interval was 333 days.

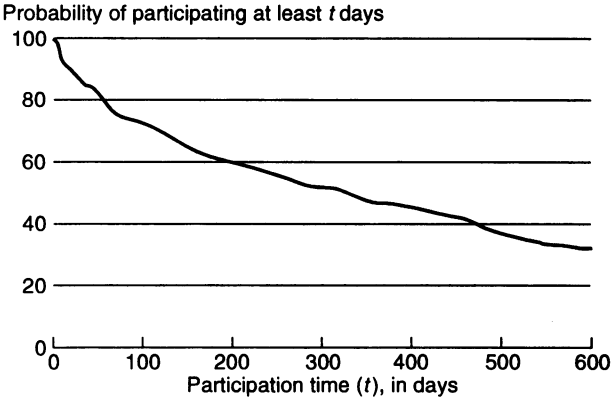

Table 2. Comparison of New Haven needle exchange clients with one visit versus others, November 1990–June 1992

Variables[1]	Clients with one visit (N = 466) Number	Percent	Clients with two or more visits (N = 922) Number	Percent	P[2]
Sex:					.858
Men	342	73	710	77	
Women	93	20	198	21	
Missing	31	7	14	2	
Age:					.034
Younger than 35	257	55	439	48	
35 or older	173	37	447	48	
Missing	36	8	36	4	
Race:					.152
White	170	36	407	44	
Nonwhite	260	56	494	54	
Missing	36	8	21	2	
New Haven residency[3]:					.270
Yes	128	27	183	20	
No	29	6	55	6	
Missing	309	66	684	74	
Duration of injection (years):					.235
Less than 10	207	44	396	43	
10 or more	206	44	455	49	
Missing	53	11	71	8	
Frequency of injection (per day):					.483
Less than 1	102	22	178	19	
1 or more	299	64	666	72	
Missing	65	14	78	8	
Cocaine use:					.877
Yes	300	64	617	67	
No	110	24	231	25	
Missing	56	12	74	8	

[1]All variable categories are not shown.
[2]Based on chi-square analysis; all variable categories were considered in the analysis.
[3]Question added in the second year of the program.

this group was 333 days, representing 56 percent of the 596 calendar days that passed between November 13, 1990, and June 30, 1992, (chart).

We investigated potential predictors of retention for 922 clients with two or more visits. No significant differences in retention were found with respect to age, sex, city of residence, daily frequency of injection, fraction of time sharing syringes, cocaine use, heroin use, and fraction of time cleaning syringes. Differences in retention were seen, however, among ethnic groups, in long-term (10 years or longer of injection history) versus short-term injectors (less than 10 years injection history), and among clients exchanging at different sites. Significant differences in participation by ethnicity were evident between nonwhites, who had the longest participation times with a median of 443 days, and whites with 311 days ($P = 0.03$).

Examining different ethnic groups by sex showed that nonwhite men had the longest participation times (median 459 days), followed by white men with 260, $P = 0.006$. For women participants, the differences among ethnic groups were not significant ($P = 0.98$). Clients who reported injecting drugs for 10 years or longer participated significantly longer with a median of 456 days than those injecting for less than 10 years with 269 days, ($P = 0.0001$). We detected differences in participation intervals among clients exchanging in different exchange sites. The longest participation intervals were observed among clients exchanging in the neighborhood with the highest concentration of minority injection drug users (IDUs) (84 percent).

Finally, an analysis by ethnic group and drug injection history simultaneously yielded significant differences ($P = 0.0001$). Nonwhites with reported duration of drug use of 10 years or longer had the longest participation time (median = 501 days). There was no significant difference in participation times among whites with respect to reported duration of injecting. The relationship between participation intervals and program visitation frequency is depicted in table 3. As expected, clients with longer program participation intervals also had the most number of visits. The correlation of the mean total visits with the participation times was 0.885.

Table 4 demonstrates yet another method for measuring client participation in the New Haven needle exchange program by looking at the proportion of clients (with two or more visits) who made visits in four consecutive quarters in a year following their enrollment. Overall, 29 percent of clients with two or more visits participated in the exchange in four consecutive quarters following their enrollment.

Discussion

Previous studies of participation in needle exchange programs, all conducted in Britain, found disappointing levels of client retention (*4,11,12*). Given the lack of data on these issues for needle exchange programs in the United States, we looked at client participation during the first 20 months of the legal needle exchange in New Haven. About 34 percent of IDUs who enrolled in the New Haven needle exchange did not return for a second visit; this percentage was similar to that observed in Britain (*11*).

The demographics and drug injection risk behaviors of these clients, with the exception of age, were not different from other clients. Younger clients were more likely to be in the single-visit group than in the client group with two or more visits. Currently, we have no explanation for factors preventing or promoting repeat visits. Inquiry by outreach staff members suggests that some of these clients have reregistered in the program using different code names thus increasing the number of one-time visits. Nevertheless, it may be more appropriate to consider clients who visited only once as "drop-ins" rather than "dropouts," and exclude them from analyses of participation. To the extent that younger clients are in fact choosing not to return to the exchange, it is important to devise strategies specific to the needs of younger injectors.

In contrast to the "drop-ins," clients who made two or more visits to the program persisted in their participation. They had a retention fraction of 0.677 during the study period, and their median participation interval was 333 days, corresponding to 56 percent of the 20-month study period. Furthermore, these measures of retention were conservative; they contained no correction for lost retention through placement of IDUs into drug treatment programs (*15,16*). The proportion of clients making visits in four consecutive quarters was significantly higher than the comparable results from the British study (29 percent versus 13 percent; $Z = 12$, one-tailed $P < 0.00001$) (*12*). The median participation interval of 333 days documents that a large fraction of the clients remained in contact with the program for close to a year. Prolonged exposure becomes particularly important as needle exchanges begin to diversify their services and offer other health-related interventions (*3,15*).

Further analysis determined that the longest participation intervals were among nonwhite males who had been injecting drugs for 10 years or more. To the extent that this group is at increased risk for human immunodeficiency virus (HIV) infection, their participation in needle exchange programs is crucial in removing HIV-infected syringes from circulation.

Table 3. Relationship between participation times and visitation frequencies among 922 New Haven needle exchange clients, November 1990–June 1992

Participation interval	Clients		Measures of visitation			
	Number	Percent	Mean	SD	Median	Range
Up to 6 months ...	418	45	5.4	5.7	3	2–51
6 months–1 year	198	21	11.8	10.3	8	2–48
1 year–20 months	306	33	26.9	32.1	14	2–205
All clients ...	922	100	13.9	21.7	6	2–205

Table 4. Participation in the New Haven needle exchange by clients with two or more visits, November 1990–June 1992

Quarter joined		Clients participating in four consecutive quarters	
	Number	Number	Percent
November–December 1990..	160	54	33.8
January–March 1991	200	67	33.5
April–June 1991.....	170	40	23.5
July–September 1991.....	127	30	23.6
Totals	657	191	29.1

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