

Doing harm reduction better: syringe exchange in the United States

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ABSTRACT

Objective To trace the growth of syringe exchange programs (SEPs) in the United States since 1994–95 and assess the current state of SEPs. **Methods** Annual surveys of US SEPs known to North American Syringe Exchange Network (NASEN). Surveys mailed to executive directors with follow-up interviews by telephone and/or e-mail. Response rates have varied between 70% and 88% since surveys were initiated in 1996. **Results** The numbers of programs known to NASEN have increased from 68 in 1994–95 to 186 in 2007. Among programs participating in the survey, numbers of syringes exchanged have increased from 8.0 million per year to 29.5 million per year, total annual budgets have increased from \$6.3 to \$19.6 million and public funding (from state and local governments) has increased from \$3.9 to \$14.4 million. In 2007, 89% of programs permitted secondary exchange and 76% encouraged it. Condoms, referrals to substance abuse treatment, human immunodeficiency virus (HIV), hepatitis C virus (HCV), hepatitis B virus (HBV) counseling and testing and naloxone for overdose were among the most commonly provided services in addition to basic syringe exchange. Each of these services was provided by 40% or more of SEPs in 2007. **Conclusions** While syringe exchange has remained controversial in the United States, there has been very substantial growth in numbers of programs, syringes exchange and program budgets. Utilizing secondary exchange to reach large numbers of injecting drug users and utilizing SEPs as a new platform for providing health and social services beyond basic syringe exchange have been the two major organizational strategies in the growth of SEPs in the United States.

Keywords Harm reduction, HIV, injecting drug use, substance use, syringe exchange, United States.

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INTRODUCTION

The concept of 'harm reduction' for psychoactive drug use clearly predates the discovery of acquired immune deficiency syndrome (AIDS) among injecting drug users. The physician prescription of heroin for maintenance treatment of opiate addiction in the United Kingdom and the development of methadone maintenance treatment are two important examples of pre-AIDS harm reduction. The discovery of AIDS among injecting drug users (IDUs), however, has focused attention on the harm reduction perspective. As an almost uniformly fatal disease, AIDS increased dramatically the harm associated with injecting drug use. Human immunodeficiency virus (HIV) can also be transmitted to sexual partners and newborn children of infected IDUs, so this new harm was not confined to the drug users themselves. Finally, because HIV is transmitted through the multi-person use

('sharing') of drug injection equipment rather than through drug use itself, it is quite possible to prevent HIV transmission among people who continue to inject drugs.

Syringe exchange programs (SEPs)—in which sterile needles and syringes are exchanged for used, potentially HIV-contaminated needles and syringes—have come to symbolize harm reduction programming for drug users. Models of how this exchange occurs vary (i.e. one-for-one versus unlimited supply) and have different goals and outcomes. It has now been more than 25 years since the discovery of AIDS among injecting drug users and more than 20 years since the first implementation of SEPs. Syringe exchange has been particularly controversial in the United States, with determined proponents clashing with entrenched opponents. There has been a consistent lack of federal government support for syringe exchange, but also growing support from state and local governments, foundations and from individuals. This paper will

examine the growth and current state of syringe exchange/harm reduction in the United States, while companion papers will examine syringe exchange/harm reduction in selected other countries. The overall purpose of the papers is to examine what has been learned over the last two decades and how syringe exchange/harm reduction programming might be improved over the coming years.

METHODS

The primary data presented here were collected through surveys of SEP directors in the United States. These surveys have been conducted since 1996 by the staff from Beth Israel Medical Center (BIMC) and the North American Syringe Exchange Network (NASEN). In the spring of each year, a survey form is mailed to the directors of all US SEPs known to NASEN. The survey includes questions on syringes exchanged, services provided, program characteristics, community relationships, budgets and funding for the previous calendar year. Follow-up telephone interviews are conducted to obtain missing data and to clarify responses.

NASEN provides multiple services to its member programs, including technical assistance, 'start-up kits' and large volume-low price purchasing of sterile syringes, with no membership fee. Thus it is highly likely that the great majority of programs in the United States belong to NASEN.

RESULTS

Basic syringe exchange services in the United States

Table 1 shows the numbers of programs known to NASEN, the numbers of programs participating in the surveys and the numbers of syringes exchanged and budget information for the participating programs that participated in the surveys from 1994–95 to 2007. There was a period of very rapid growth in numbers of programs, cities and states with programs, syringes exchanged and budgets during the mid- to late-1990s. More recently, there has been stabilization of the numbers of programs, although with continued increases in budgets and syringes exchanged.

Table 2 presents the distribution of programs by program size in 2007. The greatest amount of exchanging is clearly carried out by the very large and large programs. Only 10% of the programs are 'very large', but these programs exchanged more than half of all syringes for 2007. The very large and large programs together comprise 46% of the programs, but exchanged more than 95% of the syringes.

Most (66%) US programs do not adhere to a 'one-for-one' policy (in which a participant is to obtain only the

Table 1 Characteristics of syringe exchange programs (SEPs) participating in Beth Israel Medical Center (BIMC)/North American Syringe Exchange Network (NASEN) Surveys—United States, 1994–2007.

Numbers of . . .	1994–95	1996	1997	1998	2000	2002	2004	2005	2006	2007
SEPs known to NASEN	68	101	113	131	154	148	174	166	188	186
SEPs Participating in survey (%)	60 (88%)	87 (86%)	100 (88%)	110 (84%)	127 (82%)	126 (85%)	109 (63%)	118 (71%)	150 (80%)	131 (70%)
Cities with SEPs participating	44	69	78	77	98	97	88	90	113	100
States with SEPs participating ^a	21	29	33	33	36	32	32	29	32	31
Syringes exchanged (millions)	8	13.9	17.5	19.4	22.6	24.9	24	22.5	27.6	29.5
Total of SEP budgets (\$, millions)	6.3	7.3	8.4	8.6	12	13	11.6	14.5	17.4	19.6
Total of SEP public funding (\$, millions)	3.9	4.5	5.6	5.9	8.9	8.7	8.8	10.7	13.8	14.4

^aThis category includes the District of Columbia and/or Puerto Rico.

Table 2 Number of syringes exchanged by syringe exchange programs (SEPs), by program size: United States, 2007.

SEP size	Syringes exchanged, 2007	No. of SEPs, 2007	Total, syringes exchanged, 2007	% of total syringes exchanged, 2007
Small	<10 000	23	80 402	0.30%
Medium	10 000–55 000	37	1 162 722	4.40%
Large	55 001–499 999	57	10 727 292	40.60%
Very large	<500 000	13	14 472 373	54.70%
Total		130	29 500 000	100

Table 3 Secondary (satellite) exchange and methods of encouraging it, by syringe exchange programs (SEPs) in 2007.

Secondary exchange	
SEPs allowing secondary exchange	116 (89%)
SEPs encouraging secondary exchange	99 (76%)
Methods of encouragement	
Talked about it	93 (71%)
Had no limit on syringes exchanged	78 (60%)
Gave extra supplies	91 (69%)
Provided sharps containers	86 (66%)
Enrolled people receiving syringes from secondary exchange	29 (22%)
Peer education	62 (47%)

same number of new syringes as he or she brought to the program at that visit). Forty-nine per cent of the programs provided 'start-up packs' (syringes and other materials given to participants at their first visit). Thirty-three per cent provide a minimum number of new syringes regardless of the number of used syringes returned to the program at that visit. Seven per cent of the programs operate on a 'distribution' model in which the participant receives the number of syringes requested, regardless of the number of syringes being returned.

A very large majority of US SEPs (89%) permit 'secondary exchange' in which an individual participant is permitted to exchange for peers (who do not necessarily attend the exchange). Table 3 shows the percentages of programs that permit secondary exchange, encourage secondary exchange and utilize different specific strategies to encourage secondary exchange.

Other services provided by US SEPs

Table 4 shows the percentages of US programs that provided various prevention supplies, on-site services and referrals to off-site services in 2007. Almost all programs provided condoms, alcohol pads and HIV counseling and testing, referrals to substance abuse treatment and education about HIV, hepatitis A virus (HAV), hepatitis B virus (HBV) and hepatitis C virus (HCV), condom use, vein care and abscess prevention. More than half pro-

Table 4 Number and percentage of syringe exchange programs (SEPs) by selected types of services and supplies provided: United States, 2007.

	2007: no. (%)
Prevention supplies	
Condoms	130 (99.2%)
Receptive condoms	112 (86%)
Alcohol pads	131 (100%)
Bleach	77 (59%)
Narcan (naloxone)	52 (40%)
Buprenorphine	9 (7%)
Clothes	83 (63%)
Food	89 (68%)
Hygiene items	107 (79%)
Referrals	
Substance abuse treatment	120 (92%)
Screening and services	
HIV counseling and testing	115 (88%)
HAV testing	22 (17%)
HCV testing	72 (55%)
HBV vaccine	58 (44%)
HAV vaccine	59 (45%)
STD screening	64 (49%)
TB screening	31 (24%)
On-site medical care	43 (33%)
Delivery service	59 (45%)
Education	
HIV/AIDS prevention	124 (95%)
HAV, HBV and HCV prevention	127 (97%)
Safer injection	126 (96%)
Vein care	123 (94%)
STD prevention	
Abscess prevention	123 (94%)
Condom use	124 (95%)
Receptive condom use	104 (79%)

AIDS: acquired immune deficiency virus; HIV: human immunodeficiency virus; HAV: hepatitis A virus; HBV: hepatitis B virus; HCV: hepatitis C virus; STD: sexually transmitted disease; TB: tuberculosis.

vided HCV counseling and testing. Slightly fewer than half of the programs provided HAV and HBV vaccination and sexually transmitted disease (STD) screening. Forty per cent provided naloxone for reversing opiate overdoses, 33% provided on-site medical care and 7% provided buprenorphine treatment. A majority of programs

Table 5 Problems encountered by syringe exchange programs (SEPs) in 2007.

Lack of resources/lack of funding	74 (56%)
Staff shortage	62 (47%)
Staff burnout	43 (33%)
Lack of political support	27 (21%)
Lack of community support	24 (18%)
Lack of outreach	28 (21%)
Legal status	15 (11%)
Police harassment of participants (at/near site)	38 (29%)
Police harassment of staff/program	10 (8%)
Reaching or recruiting participants	46 (35%)
Retaining participants	20 (15%)
Any type of problem due to gentrification	24 (18%)
Other	23 (18%)

provide food, clothing and personal hygiene products (soap, shampoo, etc.).

Operational issues

US SEPs encountered a variety of operational problems in 2007. Table 5 presents various problems reported by US exchanges in 2007. The most common problem was 'lack of funding/lack of resources', reported by 56% of the programs. Staff shortages (47%), reaching participants (35%), staff burnout (33%) and police harassment of participants (29%) were the other commonly reported problems.

DISCUSSION

Syringe exchange began rather late in the United States. First, HIV prevalence among IDUs in New York City had already reached 50% [1] before AIDS was discovered among IDUs. Secondly, the United States experienced a crack cocaine epidemic during the middle and late 1980s [2]. The crack epidemic was associated with dramatic increases in violent street crime that led to strong anti-drug sentiments and intense opposition to syringe exchange among racial/ethnic minority groups in the United States [3]. The combined opposition from social conservatives, law enforcement and racial/ethnic minority groups delayed official support for syringe exchange by many years. That many drug users were members of ethnic minority groups both increased stigmatization of drug users and made opposition to syringe exchange by minority community leaders more intense.

Two other factors were important in the initial development of syringe exchange in the United States. The United States has a federal governmental system, with individual states having great authority in matters of public health. Thus, while the US federal government has refused to provide any federal funding for

syringe exchange, state and local government have often provided such funding. (Approximately half of all US exchanges currently receive state or local funding, and almost all the very large programs receive such funding.) The federal system and the lack of any national plan for syringe exchange has also led to great diversity in programs across the country.

Large numbers of AIDS cases occurred in the United States shortly after AIDS was first identified. The number of AIDS cases doubled approximately every 6 months in the initial years. This led to great public fears about AIDS and discrimination against people with AIDS. It also led to grass-roots activism to establish prevention and care services, which included the development of SEPs in many areas. Because these programs were started without official government sponsorship, they were often more free to adopt organizational tactics that might have been precluded had they been part of a more regulated public health system.

Syringe exchange programming in the United States expanded rapidly in the early and mid-1990s and has grown and evolved within two guiding principles: providing large numbers of sterile syringes to the IDU community through secondary exchange and using the exchange as a platform for providing many other health and social services to IDUs.

While it is difficult to draw precise causal inferences, the expansion of syringe exchange in the United States has been followed by substantial reductions in HIV prevalence and incidence among IDUs in the country [4]. In the 33 US states with consistent reporting, new HIV diagnoses declined by approximately 10% per year during 2001–05 [5]. Injecting drug use was the only transmission category that declined over this time-period. Cohort studies [6] and serial cross-sectional studies [7] indicate that HIV incidence among IDUs has declined from approximately 4/100 person-years at risk to under 1/100 person-years in US cities with initially high HIV prevalence. Interestingly, these same studies indicate that the majority of new HIV infections among IDUs in these cities are due to unsafe sexual behavior rather than unsafe injecting behavior.

'Coverage' by syringe exchanges refers to the numbers of syringes exchanged/distributed per year divided by the number of injections by IDUs per year. (Syringes obtained from other 'guaranteed sterile' sources such as pharmacies can also be included in estimating coverage.) One hundred per cent coverage would be ideal for preventing transmission of blood-borne viruses and reducing skin infections, but clearly is not required for preventing HIV transmission. IDUs can re-use their own syringes, HIV seronegatives can share among themselves and HIV seropositives can share among themselves without transmitting the virus. Templaski and colleagues [8]

conducted a national study of syringe exchange coverage using 1996 estimates of the numbers of IDUs and 2000 data on the numbers of syringes exchanged. They found extreme variation in the extent of coverage—from two syringes exchanged per 10 injection events to three syringes per 10 000 injection events, with a mean of three syringes per 100 injection events. Higher coverage was associated with the number of males-who-have-sex-with-males (MSM) per 1000 population in the MSA (Metropolitan Statistical Area) (a proxy for political activism), longer length of exchange program operation, and the exchange receiving public funding. (Note, however, that US exchanges have increased the numbers of syringes exchanged since 2000; see Table 1.) Bluthenthal and colleagues [9,10], conducted studies of coverage in California exchanges, and found higher coverage was associated with less restrictive exchange policies and lower rates of risk behavior. Given the complexities in attempting to assess 'adequate' coverage and the great variation among programs in the United States, it is not possible to make an overall assessment. The reductions in HIV incidence and prevalence noted above are clearly an optimistic sign, but it is also certain that there are many areas of the country with less than adequate coverage.

The increasing relative importance of sexual transmission of HIV among IDUs in the United States is consistent with increasing HIV prevalence among non-injecting drug users in the country. HIV prevalence among non-injecting drug users in New York City is now equal to HIV prevalence among injecting drug users [11]. Reducing sexual transmission of HIV among both injecting and non-injecting drug users and MSM drug users is the next major challenge for harm reduction HIV prevention in the United States.

HCV is also transmitted through the sharing of drug injection equipment, including filters, cookers and rinse water [12]. Because HCV is transmitted much more efficiently than HIV, the extent to which syringe exchange and other types of harm reduction programs can reduce HCV transmission among IDUs is still an open question. HCV prevalence has clearly declined among IDUs in New York City since the expansion of the SEPs in the mid-1990s. It fell from 80% prevalence in 1990–91 to 63% prevalence in 2000–01 among the population of IDUs, and from 80% to 38% among HIV seronegative new injectors (people injecting for 6 years or less) [13]. Among the new injectors, however, the 38% prevalence corresponds to an average incidence of 18/100 person-years. We suspect that it will be necessary to reduce incidence among new injectors to 5/100 person-years or less before the majority of IDUs will be able to avoid becoming infected with HCV during their injection careers. This clearly would require a massive expansion of 'safer injection' programs.

The great majority of US SEPs have encouraged secondary exchange in order to reach IDUs who do or do not personally attend the programs. Sales of sterile needles and syringes through pharmacies have complemented the SEPs. As discussed above, the available epidemiological data indicate that this strategy appears to have been very successful in reducing injecting-related HIV transmission in the country. Incidence of HIV has declined to under 1/100 person-years and the majority of new HIV infections among IDUs appear to be sexually transmitted. This strategy has also led to a reduction in HCV prevalence among IDUs, although HCV infection among IDUs in the United States is still a major public health problem.

The second major strategy utilized by US SEPs have been to use the programs as a platform for providing multiple health and social services to IDUs (and to a limited extent to other community members). As shown in Table 4, the programs are providing a wide variety of services. The provision of naloxone to drug users themselves to reverse opiate overdoses among their peers is a notable example of a service that was not provided to IDUs until SEPs adopted it. A cost-effectiveness analysis would probably be the most relevant method for assessing the provision of these additional services to IDUs through SEPs. Given the very modest budgets of US SEPs (see Table 1), it is almost certain that utilizing SEPs is cost-effective providing these services.

Doing syringe exchange/harm reduction better, in the United States and globally

SEPs in the United States started well after HIV had already infected large numbers of IDUs in the country. The programs have faced intense political opposition, although this has declined over time at the state and local level. Important operational concerns also exist, most related to lack of resources (Table 5). Despite these problems, the two guiding principles of utilizing secondary exchange to increase the diffusion of sterile syringes in the IDU population and utilizing the programs to provide multiple other health and social services have provided an excellent basis for the development of SEPs in the country. No one, however, would argue that the present system in the United States is optimal for continued provision of services to drug users.

The obvious areas for improvement are: (i) an increased and stable source of funding for the programs; and (ii) a national plan for addressing HIV and other health problems among injecting and non-injecting drug users.

The third issue is much more debatable. SEPs in the United States have developed separately from mainstream health-care services. Indeed, SEPs are largely independent of drug abuse treatment programs in the United

States. Among the programs with relatively good funding, syringe exchange has been moving towards becoming an alternative health-care system for injecting drug users, with many services provided on site.

Should the programs continue in this direction of becoming an alternative health-care platform for drug users? The advantages of being an independent, alternative system include responsiveness to the needs of the participants, organizational flexibility, increased innovation, relatively low cost and, most importantly, providing services within a harm reduction framework—treating IDUs with dignity and respect. There are many practical problems in attempting to provide a wide variety of health and social services to drug users through syringe exchanges, but the primary disadvantage of an alternative system is simple. In the words of the US Supreme Court, ‘separate . . . facilities are inherently unequal’. [14]. In the absence of an AIDS crisis mentality, it may be very difficult to maintain even the present level of services for drug users within a separate delivery system. Integrating the services currently provided at syringe exchanges into the regular health-care system, however, would require the system to adopt a harm reduction perspective—including treating drug users with dignity and respect. While there are many individuals and organizations in the current US health-care system who treat drug users with dignity and respect, this attitude certainly does not pervade the system as a whole.

Whether HIV prevention and other services to drug users should be provided primarily within an alternative system or whether these services should be provided primarily within the regular health-care system is not simply a matter of cost-efficient service delivery. Rather, it reflects the stigmatization of drug users in society. The issue is certainly not relevant only to the United States.

Declarations of interest

None.

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References

1. Des Jarlais D. C., Friedman S. R. Intravenous cocaine, crack, and HIV infection. *JAMA* 1998; **259**: 1945–50.

2. Golub A., Johnson B. D. The crack epidemic: empirical findings support a hypothesized diffusion of innovation process. *Soci-Econ Plann Sci* 1996; **30**: 221–31.
3. Anderson W. The New York needle trial: the politics of public health in the age of AIDS. *Am J Public Health* 1991; **81**: 1506–17.
4. Santibanez S., Garfein R., Swartzendruber A., Purcell D. W., Paxton L. A., Greenberg A. E. Update and overview of practical epidemiologic aspects of HIV/AIDS among injection drug users in the United States. *J Urban Health* 2006; **83**: 86–100.
5. Centers For Disease Control and Prevention. HIV diagnoses among injection drug users, 33 states. *MMWR* 2005; **54**: 1149–53.
6. Strathdee S., Galai N., Safaeian M., Celentano D. D., Vlahov D., Johnson L. *et al.* Sex differences in risk factors for HIV seroconversion among injection drug users: a 10-year perspective. *Arch Intern Med* 2001; **161**: 1281–8.
7. Des Jarlais D. C., Perlis T., Arasteh K., Torian L. V., Beatrice S., Milliken J. *et al.* HIV incidence among injection drug users in New York City, 1990 to 2002: use of serologic test algorithm to assess expansion of HIV prevention services. *Am J Public Health* 2005; **95**: 1439–44.
8. Tempalski B., Cooper H., Friedman S. R., Des Jarlais D. C., Brady J., Gostnell K. Correlates of syringe coverage for heroin injection in 35 large metropolitan areas in the US in which heroin is the dominant injected drug. *Int J Drug Policy* 2008; **19**: S47–58.
9. Bluthenthal R., Ridgeway G., Schell T., Anderson R., Flynn N. M., Kral A. H. Examination of the association between syringe exchange program (SEP) dispensation policy and SEP client-level syringe coverage among injection drug users. *Addiction* 2007; **102**: 638–46.
10. Bluthenthal R., Anderson R., Flynn N., Kral A. Higher syringe coverage is associated with lower odds of HIV risk and does not increase unsafe syringe disposal among syringe exchange program clients. *Drug Alcohol Depend* 2007; **89**: 214–22.
11. Des Jarlais D., Arasteh K., Perlis T., Hagan H., Abdul-Quader A., Heckathorn D. D. *et al.* Convergence of HIV seroprevalence among injecting and non-injecting drug users in New York City: a new stage in a very large HIV epidemic. *AIDS* 2007; **21**: 231–5.
12. Hagan H., Thiede H., Weiss N. S., Hopkins S. G., Duchin J. S., Alexander E. R. Sharing of drug preparation equipment as a risk factor for hepatitis C. *Am J Public Health* 2001; **91**: 42–6.
13. Des Jarlais D. C., Hagan H., Perlis T., Arasteh K., Torian L. V., Beatrice S. *et al.* Reductions in hepatitis C virus and HIV infections among injecting drug users in New York City, 1990–2001. *AIDS* 2005; **19**: S20–25.
14. *Brown v. Board of Education*, 347 U.S. 483. 1954. Available at: <http://caselaw.lp.findlaw.com/scripts/getcase.pl?court=US&vol=347&invol=483> (accessed 25 September 2008).