Introduction

This overview and annotated bibliography summarizes key recent research on syringe exchange programs in the United States and related data on injection drug users, HIV, and hepatitis C published after 2006. Findings continue to support the effectiveness of syringe exchange, corroborated by declines in HIV incidence and hepatitis C prevalence among injection drug users in the U.S. Additional research characterizes dynamics and mediators of injection-related risk, assesses coverage levels of syringe exchange programs, and examines the role and impact of ancillary services at syringe exchange sites such as HIV testing, hepatitis B vaccination, and referral to substance abuse treatment.

Overview

The majority of research on the effectiveness of syringe exchange programs (SEPs) in the United States was conducted and published in the 1990s. These findings have been summarized in numerous reports and reviews, and provide conclusive evidence that syringe exchange reduces injection-related HIV risks (e.g. syringe sharing) without increasing drug use among SEP participants, nor do SEPs result in other negative consequences (e.g. improperly discarded syringes, crime). The most recent and comprehensive review of evidence for the effectiveness of syringe exchange was conducted for the World Health Organization and published in 2004 as part of WHO’s “Evidence for Action” series. A 2006 article synthesized the findings related to HIV prevention (Wodak and Cooney, “Do Needle Syringe Programs Reduce HIV Infection Among Injecting Drug Users: A Comprehensive Review of the International Evidence”). A 2008 commentary provides context for these assessments, describing lessons for programs and policymakers on HIV prevention for injection drug users (Des Jarlais and Semaan, “HIV Prevention for Injecting Drug Users: The First 25 Years and Counting”).

A 2007 report in the CDC’s Morbidity and Mortality Weekly offers a current snapshot of SEPs in the United States based on a 2005 national survey, with an analysis of size and scope of programs, services offered, and funding sources (CDC, “Syringe exchange programs -- United States, 2005”). Recent epidemiological studies have attempted to quantify and describe the injection drug user population in the United States, estimating roughly 1.5 million injection drug users nationally (Brady JE, et al., “Estimating the prevalence of injection drug users in the U.S.

Mounting epidemiologic data points to an overall decline in new HIV infections among injection drug users (IDUs) over the past 20 years in the United States, with parallel but more modest decline in hepatitis C rates. The newly released revised HIV incidence estimates from the CDC projected that in 2006, injection drug use accounted for 6,600 HIV infections in the 50 U.S. states and Washington, DC (excluding Puerto Rico), with an additional 2,100 new infections among men who have sex with men (MSM) who also report injecting drugs. The authors note: “Overall, HIV incidence among individuals exposed through IDU has decreased approximately 80% in the United States. Over that time, those exposed through IDU have reduced needle sharing by using sterile syringe available through needle exchange programs or pharmacies and have reduced the number of individuals with whom they share needles.” (Hall et al., “Estimation of HIV Incidence in the United States”). Similar declines in hepatitis C prevalence among IDUs, though lesser in magnitude, have been reported in several U.S. cities with SEPs (e.g., Amon et al., “Prevalence of hepatitis C virus infection among injection drug users in the United States, 1994-2004”).

Given that the fundamental questions about the effectiveness of SEPs in HIV prevention have long been considered resolved by the scientific and public health communities in the United States, much of the recent research on syringe exchange by U.S. researchers has shifted to focus on international settings, particularly in countries in Asia, Eastern Europe and the former Soviet Union where explosive HIV/AIDS epidemics are driven by injection drug use. A few new U.S.-based studies provide additional corroboration of the evidence base supporting syringe exchange and contribute to knowledge on factors influencing injection-related risks, and one recent directly demonstrated the effectiveness of SEPs in reducing HIV risk (Huo and Ouellet, “Needle exchange and injection-related risk behaviors in Chicago: a longitudinal study”). Other studies have evaluated ancillary services provided by SEPs and related health benefits (HIV testing, entry to substance abuse treatment).

Important new analyses on syringe exchange and injection drug use in the U.S. have examined questions of coverage (how many syringes are exchanged and how many people are reached,
Coverage is an emerging concept in SEP research that attempts to calculate the extent of syringe exchange (whether measured by proportion of IDUs reached, or numbers of syringes distributed relative to need) necessary to make an impact on HIV transmission rates. The World Health Organization recommends that SEPs strive to reach at least 60% of IDU populations, while the U.S. Public Health Service has long recommended using one new syringe for each injection. However, these levels of coverage have never been met in the United States – even in localities with well-established SEPs with strong community and government support. In large part, the coverage gap reflects the impact of the federal funding ban in constraining resources that limit the sites and hours of operation of SEPs. However, epidemiologic data suggests that even more modest syringe coverage levels can have a significant impact on HIV epidermics among IDUs, though higher coverage levels – associated with the availability of government funding for SEPs -- are correlated with lower HIV risks and greater decreases in AIDS diagnoses among IDUs.

Annotated Bibliography

**General/Reviews/Epidemiology**


See also:


Risk and Impact


A study of 901 Chicago IDUs compared changes in risk between those recruited from an SEP and those recruited from an area with no SEP coverage; all study participants received a standard behavioral HIV prevention intervention. SEP use substantially reduced the likelihood of syringe sharing, and the impact of SEP participation on risk reduction was greater than the effect of the behavioral intervention alone.


Compared injection risk and infection rates among 526 IDUs in New York City (where syringe exchange and pharmacy sale are legal) to Newark, NJ (where both forms of syringe access have been illegal until a recent change in New Jersey law allowing syringe exchange). Newark IDUs had substantially higher rates of HIV, hepatitis B, and hepatitis C infection compared to New York City IDUs (26% vs. 5%, 70% vs. 27%, and 82% vs. 53%, respectively). Newark IDUs were also more likely to report sharing syringes and less likely to obtain syringes from SEPs or pharmacies than NYC IDUs.

Analyzed studies of young IDUs in Seattle, WA over the course of a decade for changes in infection rates and risk. Hepatitis B and hepatitis C rates declined substantially (from 43% to 15%, and from 68% to 32%, respectively) and HIV prevalence remained very low (2-3%). While no trends were observed in overall injection-related risks, the proportion reporting SEPs as their primary syringe source increased significantly from 48% in 1994 to 68% in 2004.


Assessed syringe access and disposal practices among 680 HIV+ IDUs in three U.S. cities. Nearly three-quarters had ever visited an SEp. 52% reported safe syringe access sources (e.g., obtained from SEP or pharmacy), and 31% reported possibly safe syringe access (e.g., obtained from friend who had visited an SEP) vs. 18% reporting unsafe syringe sources (e.g. bought from street dealer). IDUs who had ever visited an SEP and those obtaining syringes from safe sources were significantly more likely to dispose of their syringes safely.

Des Jarlais DC, Braine N, Friedmann P. Unstable housing as a factor for increased injection risk behavior at US syringe exchange programs. AIDS Behav. 2007 Nov;11(6 Suppl):78-84.

Analysis of participants of 15 moderate-to-large sized SEPs across the U.S. with at least 50 survey subjects reporting recent unstable housing or homelessness. Unstably housed IDUs were twice as likely to report syringe sharing as stably housed IDUs participating in SEP.


Surveyed participants of 6 large SEPs across the U.S. Between 10% and 27% of SEP participants at each program reported recent syringe sharing. Programs with higher HIV rates among participants had lower proportions of recent syringe sharing.
CIDUS/DUIT Papers


These three papers report findings on injection-related risk from a large survey of young adult IDUs in five U.S. cities (Collaborative Injection Drug Users Study III/Drug Users Intervention Trial, or CIDUS/DUIT). The research found high levels of receptive syringe sharing (over half injected with a syringe that had previously been used by someone else), distributive syringe sharing (nearly half gave another IDU a syringe that they had previously used), and indirect sharing (over half reported sharing of injection equipment other than syringes, such as cookers and cotton, or splitting drugs with a common syringe). However, 76.9% reported obtaining most of their syringes from SEPs or pharmacies, and this group was significantly less likely to report receptive syringe sharing or distributive syringe sharing than those IDUs obtaining syringes primarily from other sources. Despite the levels of injection-related risk reported, only 2.8% were HIV positive – a rate well below the overall average HIV prevalence among IDUs across the 5 cities – and 34.3% had been infected with hepatitis C (a figure well in range of available epidemiological data for this subpopulation, and still lower than most of the hepatitis C prevalence rates reported for the general IDU population). Also of note, a subsequent behavioral intervention component of the study (DUIT) successfully resulted in further reducing injection-related risks among participants.

Coverage

Assessed syringe coverage per heroin injector in cities with SEPs. Average coverage was estimated at only 3 syringes per 100 injections, though coverage rates varied widely. Cities with older SEP programs and larger MSM populations had greater syringe coverage. Government funding (city, county, and/or state) was associated with higher coverage levels, supporting arguments to lift the federal funding ban on SEPs.


Compared syringe coverage through SEPs (percentage of IDUs reached, or percent of syringes provided per injection) in two cities: Chicago, IL and New Haven, CT. In both cities, programs generally reached less than 10% of their estimated IDU populations each month, and had low levels of coverage compared to syringe need. Coverage rates were higher in Chicago, where SEPs had less restrictive exchange policies than in New Haven. Despite modest coverage levels, the proportion of AIDS diagnoses attributed to IDUs declined by 21.7% in New Haven and by 41.4% in Chicago, suggesting a significant impact on HIV transmission.


Evaluated the impact of different syringe dispensation policies on achieving adequate syringe coverage (defined as one new syringe per injection) for SEP participants (24 SEPs in California, 1576 IDUs). Results: IDUs were most likely to obtain adequate numbers of syringes from programs with the least restrictive policies (unlimited needs-based distribution models, vs. limited and/or one-for-one exchange models).


Evaluated the impact of syringe coverage (defined as one new syringe per injection) on HIV risk and unsafe syringe disposal among SEP participants (24 SEPs in California, 1577 IDUs). Results: IDUs with the highest levels of syringe coverage were least likely to share syringes, while IDUs with the lowest levels of syringe coverage were most likely to share syringes. Coverage levels did not have an impact on rates of safe syringe disposal – i.e.,
IDUs receiving more syringes were no more likely to dispose of their syringes unsafely than IDUs receiving the fewest syringes.

**Other Services/Health Benefits**


Surveyed HIV testing rates among 1543 IDUs in five cities. Overall, 93% of IDUs had ever been tested for HIV; among those not reporting a positive HIV test, 90% had been tested for HIV within the past 3 years. SEP participants were more likely both to have ever been tested and to have been tested recently.


Surveyed 24 California SEPs. 62% provided both HIV and hepatitis C testing; 21% offered only HIV testing; 17% had no testing services available. Utilization of HIV and hepatitis C testing by SEP participants varied, but was greater in programs operating with official legal authorization.


Assigned 1,964 IDU participants in SEPs in Chicago, IL and Hartford and Bridgeport, CT to two different hepatitis B vaccination schedules. Hepatitis B vaccination through SEPs was found to be feasible and cost-saving.


Compared the results of substance abuse treatment among 324 methadone maintenance patients referred from SEPs vs. other referral sources. While those referred from SEPs were more likely to screen positive for opioid and cocaine use during treatment and less likely to complete 12 months of treatment when compared to
patients referred from other sources, those differences were attributed to the greater baseline addiction severity among SEP referrals. When baseline factors were factored in to the analysis, outcomes did not differ significantly between SEP referrals and referrals to treatment from other sources.

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