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## HIV Prevention Among Injection Drug Users: the Need for Integrated Models

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**ABSTRACT** *Opportunistic infections (OIs) were first recognized among injection drug users (IDUs) in New York City in 1981. By the mid-1980s, OIs had become associated with HIV infection, and attention began to focus on efforts to prevent HIV transmission among IDUs. Since then, a range of prevention strategies has been implemented and evaluated in an attempt to reduce the spread of HIV infection among drug users. These prevention strategies include (1) HIV testing and counseling and educational and behavioral interventions delivered through community outreach; (2) condom, bleach, and needle distribution and syringe access and exchange programs; (3) substance abuse treatment; and, more recently, (4) prevention interventions targeting HIV-positive IDUs. Data from evaluations of these strategies over the past 20 years have provided substantial evidence of effectiveness and have helped to inform network-based and structural interventions. Despite the cumulative empirical evidence, however, research findings have yet to be widely disseminated, adopted, and implemented in a sustained and integrated fashion. The reasons for this are unclear, but point to a need for improved communications with program developers and community planners to facilitate the implementation and evaluation of integrated intervention strategies, and for collaborative research to help understand policy, legal, economic, and local barriers to implementation.*

**KEYWORDS** *HIV infection, Injection drug users, AIDS, Prevention.*

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### INTRODUCTION

The AIDS epidemic among injection drug users (IDUs) in the United States was first recognized in 1981. Through case surveillance conducted by the Centers for Disease Control and Prevention (CDC), IDUs with opportunistic infections (OIs) and poor immune response were identified and classified as cases of what was then known as gay-related immune disease. These early cases among IDUs had significant epidemiologic impact. They provided the first evidence that the disease was not restricted to men who have sex with men (MSM), and raised the possibility that the causal agent was blood-borne and likely transmitted through the reuse of contaminated injection equipment.

Before 1981, research on drug users had been almost exclusively focused on those found in treatment programs or other institutional settings. There were no measures of syringe use and reuse, and knowledge of injection practices was ex-

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tremely limited. Perhaps most important, there were no existing connections to the drug-using community not in treatment. Thus, recognition of the AIDS epidemic among IDUs required the development of new research strategies to identify IDUs in the community, assess drug-using practices, and intervene in an attempt to reduce HIV transmission. This work expanded the focus of substance abuse research into a new and broader arena of public health.

Procedures to test for HIV antibodies were developed by 1984. The availability of the HIV test had enormous impact on the ability to conduct meaningful epidemiologic studies necessary for understanding transmission behaviors and planning and targeting prevention efforts. The first report by the CDC on HIV test results for known risk groups was in 1984 in the CDC's *Morbidity and Mortality Weekly Report (MMWR)*. It included antibody test results for 121 IDUs in New York City, and reported that 87% or 75 of 86 active IDUs from the community were positive for antibodies to HIV, while fewer than 10% or 3 of 35 long-term methadone patients tested positive. Thus, in the very first published report on HIV test results, a clear difference in prevalence was found among IDUs relative to their methadone treatment status.<sup>1</sup>

This article reviews the research findings regarding core strategies of HIV prevention that have targeted IDUs, including (1) community-based outreach, testing, education, and behavioral interventions; (2) risk reduction strategies designed to increase access to sterile injection equipment; (3) substance abuse treatment; and (4) interventions for HIV-positive IDUs. It concludes with a brief discussion of the potential association between substance abuse treatment completion and reductions in risky sexual behaviors among drug users.

## **OUTREACH AND COMMUNITY-BASED INTERVENTIONS**

In 1987, the National Institute on Drug Abuse (NIDA) began to fund large-scale HIV prevention efforts that targeted IDUs.<sup>2</sup> The first initiative was a 29-site project called the National AIDS Demonstration Research (NADR). NADR was designed to deliver and evaluate HIV outreach interventions to IDUs in the community. The outreach-based interventions varied considerably across sites, but they included the core components of education about HIV transmission and prevention and the distribution of condoms and bleach kits. At most of the NADR sites, subjects were tested for HIV and randomly assigned to a standard outreach intervention or the standard plus an enhanced intervention designed by researchers at the site in response to the community and characteristics of the local epidemic. In 1990, NIDA initiated the successor to NADR, a 23-site project called the Cooperative Agreement (CA) for HIV/AIDS Community-Based Outreach/Intervention Research Program. The CA included a more structured approach to outreach and study design than NADR.<sup>3</sup> Together, the NADR and CA multisite intervention programs examined the effectiveness of HIV/AIDS prevention approaches among over 150,000 IDUs and their sex partners.

In a review of 36 publications on findings from NADR, CA, and several other community outreach studies, Coyle et al. reported that a number of significant changes were identified between pre- and postmeasures of drug use frequency and drug-related risk behaviors.<sup>4</sup> Of participants in these studies, 26% reported that they were no longer injecting, and those who continued to inject reported an average of 28 fewer injections per month; 19% fewer IDUs reported reusing syringes, and 27% reported ceasing the reuse of other injection equipment.<sup>4</sup>

One of the more important results of these large-scale efforts to implement and evaluate community-based interventions was the finding that active drug users can be engaged in meaningful education, counseling, HIV testing, and referral in the community, and that these activities are, in and of themselves, associated with short-term behavioral change. Interestingly, enhanced interventions did not produce significantly greater reductions in drug use or drug-related risk behaviors than did the standard intervention.

This community-based outreach prevention model has been refined and applied in a wide variety of HIV behavioral interventions targeting out-of-treatment drug users. While the earliest efforts tended to focus on changing individual risk behaviors, there has been a growing awareness of the influence of social forces on behavior and the expanded and sustained impacts that can be achieved when interventions reach injectors, their sex partners, and their social networks.<sup>5</sup>

Latkin et al.<sup>6,7</sup> conducted two network intervention studies to demonstrate the potential of peer education to impact risk behaviors among IDUs. One, the SAFE study, used trained recovering paraprofessionals to administer a six-session cognitive-behavioral intervention.<sup>6</sup> In this study, participants and their network members were randomized to either risk reduction counseling or the control condition. The study showed that networks receiving the intervention reported significantly less frequent needle sharing and injection of heroin and cocaine. Controls were more than twice as likely to report needle sharing and sharing cookers in the previous 6 months. The second study, the SHIELD study, was developed based on lessons learned from the SAFE study. It used peer educators to train individual network members to promote HIV prevention within their networks and neighborhoods. After 18 months, networks that had a member in the intervention reported significant reductions in heroin use and sharing unclean needles.

The potential of delivering risk reduction interventions through social networks by training one member of the network to be the peer educator represents a major development in prevention research among IDUs.<sup>7</sup> Network strategies represent an evolution in community-based interventions because they move beyond the individual level and focus on changing community norms regarding the acceptability and practice of drug use and sexual risk behaviors within groups.

### **RISK REDUCTION AND ACCESS TO INJECTION EQUIPMENT**

HIV prevention messages aimed at IDUs have consistently stressed the importance of not reusing syringes and always using sterile syringes and other injection equipment for every injection. However, in the United States, law and policy that restrict the use of federal funds for their distribution have limited access to these supplies. Despite the logical necessity of such access, efforts to distribute sterile syringes by community-based organizations have met with public and political resistance out of concern that access to sterile syringes is an endorsement of injection drug use and is likely to result in increases in the frequency of injecting, syringe sharing, the number of discarded syringes, and the initiation of new injectors. Over the past 10 years, reviews of the research by the US General Accounting Office, the University of California at San Francisco for the CDC, and the National Research Council and Institute of Medicine have provided scientific support that refutes these concerns.<sup>8-10</sup> More recent evaluations of the impact of syringe exchange programs (SEPs) have demonstrated reductions in sharing of syringes among program partici-

pants.<sup>11-14</sup> The impact of SEPs has also been observed in surveys of community-recruited IDUs. A multisite project called the Collaborative Injection Drug Users Study (CIDUS) recruited 3,773 injectors from community-based and correctional settings and assessed 2,306 participants (61%) at least once following baseline. It found that participation in SEPs was protective against syringe reuse, a practice significantly associated with seroconversion among study participants. An important finding from CIDUS was that only 35% of participants reported that they had enough new syringes to meet their monthly requirement.<sup>15</sup> These research findings and reviews have diminished the intensity of the debate surrounding SEPs, yet the ban on federal funding of SEPs remains in effect.

New strategies to increase access to sterile syringes include pharmacy sales and physician prescription of syringes to active users.<sup>16-19</sup> Studies are currently underway to evaluate the effectiveness of these approaches in reducing HIV risk and preventing infection. Because they complement the services provided by SEPs, these new strategies have the potential to improve access to sterile syringes to those who need them and to advance understanding of the legal and public health policy issues related to syringe access, possession, and exchange.

### **SUBSTANCE ABUSE TREATMENT**

Research conducted over the past 20 years has shown that sustained methadone treatment is associated with reductions in injection drug use, lower rates of injection-related risk behaviors, and protection from HIV infection. Although methadone treatment programs vary and are implemented and used in various ways, the underlying mechanism of protection from HIV as supported by available data would appear to be rather simple. Individuals who participate in methadone treatment reduce their use of opiates.<sup>20,21</sup> Lower rates of opiate use lead to fewer instances of injection and drug-related risk behavior.<sup>22-28</sup> In turn, fewer injection-related HIV risk behaviors lead to fewer infections.<sup>29-38</sup>

Two independent and comprehensive reviews of the literature on substance abuse treatment as HIV prevention reach essentially the same conclusions, that there is substantial and convincing evidence that substance abuse treatment interrupts patterns of drug use sufficiently to reduce risk behaviors and infections with HIV.<sup>39-40</sup>

The most widely available and familiar form of substance abuse treatment intervention for drug users globally is drug detoxification. On this point, the research literature is quite consistent. The impact of treatment on HIV infections has been observed only for those users who remain in treatment for at least 1 year. Further, research suggests that the longer the duration of treatment, the greater the protective effects. For this reason, brief detoxification programs are not considered to be effective strategies for HIV prevention unless they are followed by a longer course of treatment.

Although the scientific evidence demonstrates that substance abuse treatment is associated with reductions in HIV risk behaviors and infection, the overall public health impact of treatment has been limited by the scarcity of resources to make treatment services available and accessible to those who need them most. With a few notable exceptions, communities have not adequately or consistently provided treatment services to meet the needs of drug users. In some areas, in fact, funding for substance abuse treatment programs has been reduced during the course of the AIDS epidemic.<sup>41,42</sup> Many communities have lengthy waiting lists of eligible individ-

uals seeking treatment, and in other areas treatment is simply not available to those in need. These problems are compounded for those dependent upon publicly funded services, or those in areas where public policy restricts certain modalities of treatment. Currently, substance abuse treatment systems serve only a fraction of the drug-using community. It is estimated that five out of six drug users are not in treatment at any given point in time.<sup>43</sup> Increasing the capacity, acceptability, and access of substance abuse treatment systems represents a critical public health challenge and an area of importance for future research.

Past research on the HIV prevention impact of substance abuse treatment has focused almost exclusively on injection-related risks among methadone patients in treatment for opiate dependence. Today, there is wider recognition of the need to improve substance abuse treatment for other commonly injected drugs, most notably cocaine and other stimulants. In addition, considerably more attention is now being given to risks of sexual HIV transmission among IDUs.

### **INTERVENTIONS WITH HIV-INFECTED IDUs**

Several large studies are currently in the field aimed at preventing HIV disease transmission by persons already infected. The outcomes of these studies have not yet been reported, but they signal an important area of HIV prevention research with great potential for achieving cost-effective public health benefits by focusing on the relatively small group of IDUs who are already infected and continuing to engage in unsafe behavior.

Medical care of HIV-infected IDUs is a critical aspect of HIV prevention. Such care provides regular contact between the patient and medical provider and can help facilitate adherence to medication regimens, reduce viral loads, and, presumably, reduce potential infectiousness. Unfortunately, medical care is difficult to access for many HIV-infected drug users not in substance abuse treatment.<sup>44-46</sup> This contrasts sharply to those in treatment, who have greater access to HIV care and medical services and, consequently, improved health outcomes.<sup>47,48</sup> There is strong evidence that links continued drug use, poor adherence to antiretroviral medication, and high viral load.<sup>49</sup> These findings suggest that an important new directions for HIV prevention research would be to improve outreach to HIV-infected, out-of-treatment drug users for HIV counseling and testing, access to HIV medical care, and entry to substance abuse treatment programs.

### **DISCUSSION**

This article has provided a brief historical overview and summary of HIV prevention research directed at IDUs. In this third decade of the HIV/AIDS epidemic, substantial scientific evidence is available that demonstrates how HIV prevention interventions are effective in reducing HIV risk behaviors, drug use frequency, risky sexual behaviors, and the overall health of drug-using populations.

Today, HIV prevention research among IDUs is shifting its focus toward group and structural interventions. New developments in HIV interventions show that they have become increasingly sensitive to the importance of group dynamics in risk reduction and behavioral change. Interventions involving social networks, syringe access and exchange, pharmacy sales and prescription for sterile syringes, substance abuse treatment, information on sexual risk reduction and safer sexual practices, and outreach to HIV-positive drug users and their peers provide evidence

of this shift from prevention strategies that target individuals to those that are community focused.

The HIV prevention strategies described in this article are seriously limited in both availability and accessibility. The rapid and dynamic shifts in the spread of HIV/AIDS underscore the need to develop responsive and creative approaches for providing HIV prevention interventions that address both drug use and sexual risk behaviors to populations at greatest risk. In addition, comprehensive, integrated models of HIV prevention are needed to address the increasing diversity of risk factors that characterize drug users and their communities today.

Perhaps the most important legacy of the HIV/AIDS epidemic among IDUs will be the recognition of the potential for the behaviors and health of a small segment of our communities to have profound effects on overall public health. Before 1980, concern for the health of drug users was marginal at best, which helped set the stage for the subsequent explosive HIV/AIDS epidemic in this vulnerable population. Concern for the health of drug users and their sex partners is, in this regard, a public health necessity and can only be achieved when the full array of integrated prevention, treatment, and medical care interventions are available and accessible to those who need them most.

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