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A U.S. Needle Exchange Program Dramatically Reduces HIV Transmission

Evaluation of model needle exchange program

SUMMARY

Investigators with the Yale University School of Organization and Management and the City of New Haven, Department of Health, worked to expand and evaluate a model needle exchange program in New Haven.

Needle exchange programs seek to reduce the spread of HIV via infected needles by providing intravenous (IV) drug users with clean syringes. In 1990, New Haven's local government mandated a demonstration needle exchange program along with an independent program evaluation.

Key Results

- During the RWJF-funded period, the needle exchange program saw approximately 800 clients quarterly, and a total of more than 2,300 individuals.
- By the end of the funded period, the needle exchange program assisted over 1,000 clients to enter drug treatment programs.

Key Findings

- The investigators estimated that the needle exchange program reduced the risk of HIV transmission among program participants by one third.
- There was no evidence of an increase in drug use through injection as a result of this needle exchange.
- Based on estimates of population, rates of needle exchange, program costs, and predictions of future HIV infections, the researchers concluded that the program was cost-effective.
- Decriminalization of the purchase and possession of a syringe without a prescription resulted in a reduced demand for the needle exchange program.

Funding

The Robert Wood Johnson Foundation (RWJF) provided two grants to the Yale University School of Organization and Management totaling $208,132 from January 1992 to June 1992. RWJF provided a grant of $515,544 from June 1992 to May 1999 to the City of New Haven, Department of Health.

THE PROBLEM

By 1987, over three-quarters of all AIDS cases in New Haven, Conn., resulted from IV drug use, either directly (through sexual contact with a user or through a shared syringe) or indirectly (from an infected mother to her fetus). In a 1987 survey, IV drug users in New Haven revealed that fear of arrest, scarcity of sterile needles, and the high cost of syringes significantly contributed to needle sharing.

To reduce the transmission of HIV through the sharing of these needles, New Haven's local government mandated a demonstration needle exchange program with an independent program evaluation. The needle exchange program, started in November 1990, employed a mobile van to visit several sites during its four-day-a-week operation.

Staff members exchanged sterile needles for used ones and distributed bleach, water bottles, condoms, and HIV literature. In addition, they gave clients drug treatment information and provided them with referral assistance.

THE PROJECT

These grants from RWJF supported the expansion of New Haven's model needle exchange program and its evaluation. The evaluation (ID#s 019227, 020049) provided an opportunity to demonstrate that needle exchange could be an effective HIV-infection reduction strategy without promoting drug use or increasing the number of IV drug users in the community.

The researchers believed that the needle exchange program would not increase the number of needles in circulation because users would be required to return a distributed needle at the same time they received a new one.

Instead, by providing users with an opportunity to exchange their used needles for clean ones, the researchers' goal was to reduce the amount of time each needle remained in circulation, reducing the likelihood that it would become contaminated with HIV. That, in turn, would reduce the number of contaminated needles in circulation.

The researchers developed a syringe tracking and testing system to assist in the evaluation of the program. They monitored the amount of time needles remained in circulation before being turned in, and they tested the needles for the presence of HIV

proviral DNA. The evaluation also monitored client enrollment, demographics, and the number of participants entering drug treatment programs.

The evaluation used information from self-reported questionnaires, completed by each client at the time of enrollment and at follow-up. Along with client demographics, the questionnaire collected behavioral information such as how long a client had been injecting drugs, the frequency of drug injection, the frequency of syringe cleaning and sharing, the risks taken in sexual practice, and the use of condoms.

Concurrently with the evaluation, RWJF provided a grant to expand the program (ID# 019924). The expansion was meant to ensure that the evaluation would be examining a robust, fully functioning project.

The principal objectives were to: Increase the number of program staff to include outreach workers, a drug treatment coordinator, and a field manager. Purchase and outfit a second mobile van. Increase the number of sites covered and expand the program's hours of operation. Enhance health education, referral, and client follow-up.

The first year of the needle exchange program evaluation was completed by Yale University on a pro bono basis. Investigators also received a three-year, $1-million grant from the National Institute on Drug Abuse (NIDA) to fund program activities.

RESULTS

- **During the RWJF-funded period, the needle exchange program saw approximately 800 clients quarterly, and a total of more than 2,300 individuals.** During these client encounters, needle exchange program staff provided information leading to behavior modification in addicts, including increased condom usage and cleaning of syringes. In addition, RWJF funds allowed the needle exchange program to hire additional outreach workers and other staff and purchase a second van, enabling staff to increase the program's number of targeted neighborhoods and hours of operation. A van operated by the Yale New Haven Hospital accompanied the needle exchange van to each site and offered treatment of less-complicated health complaints and referral to hospital system services.
- **By the end of the funded period, the needle exchange program assisted over 1,000 clients to enter drug treatment programs.** The addition of a full-time drug treatment coordinator increased the success of the needle exchange program by doubling the number of clients entering drug treatment (from an average of 14.4 persons per month to 28.8 persons per month).

Findings

- **The investigators estimated that the needle exchange program reduced the risk of HIV transmission among program participants by one third.** Prior to the start

of the exchange program, 68 percent of needles found on the street and 93 percent of needles from drug shooting galleries had tested positive for HIV. Among needles obtained from program participants between 1990 and 1992, about 41 percent tested positive for the HIV virus. Based on the reduced prevalence of HIV-infected needles, the researchers estimated that the rate of new HIV infections among needle exchange participants would decline from 6 cases per 100 IV drug users per year to 4 cases per 100—a 33 percent reduction in the rate of new HIV infections. This estimate is based upon a model developed by the investigators, which relies solely on syringe testing and tracking data, rather than self-reported data, which may prove less reliable. Before the program began, New Haven had the state's highest number of reported AIDS cases. By 1996, New Haven was no longer the city with the highest number of reported AIDS cases in Connecticut.

- **There was no evidence of an increase in drug use through injection as a result of this needle exchange.** Decreased needle circulation time, rather than a change in participants' behavior from high-risk to low-risk behavior, appears to be responsible for the observed decrease in HIV prevalence. Data also indicated that exchange rates of needles increased over time; circulation times of needles decreased from an average of seven days to two to three days; and the level of infection in needles dropped, as needles spent progressively less time changing hands between possibly infected IV drug users.
- **Based on estimates of population, rates of needle exchange, program costs, and predictions of future HIV infections, the researchers concluded that the program was cost-effective.** Because of the high costs associated with treating HIV-positive individuals, even a tiny decrease in the fraction of infected needles circulating could potentially result in a significant reduction of health care expenditures. For example, the researchers estimated that 5 new cases of HIV were avoided during the first year of the program, and 20 during the second. With lifetime hospital costs then estimated at $50,000 to $100,000 per each new infection, the program was estimated to have saved $1 to $2 million in the first two years.
- **Decriminalization of the purchase and possession of a syringe without a prescription resulted in a reduced demand for the needle exchange program.** Connecticut law was amended in May 1992 to allow for the purchase of syringes without a prescription and the promotion of needle exchange programs statewide based on the New Haven model. During the three months prior to the Connecticut decriminalization, 164 clients joined the New Haven needle exchange program; during the three months after, only 80 clients joined, representing a 48 percent drop in enrollment. Although that drop was not as significant over the rest of the grant period, enrollment continued to decline over the remainder of the grant term.

Communications

The investigators published more than 30 articles in professional journals, including the *New England Journal of Medicine* and the *Journal of the American Medical Association.*

Project staff made presentations at numerous national and international conferences, including several international AIDS conferences, the American Public Health Association annual meeting, and meetings at the National Academy of Sciences and the Centers for Disease Control and Prevention.

The investigators were also interviewed on several local and national television stations, and appeared on the NBC "Today" show and the Discovery Channel's "Cronkite Report." The syringe tracking and testing research has been reported on in *US News and World Report,* the *New York Times,* and the *Washington Post.*

The General Accounting Office documented results of the program in a report to the House select committee on narcotics abuse and control. Within the research community, the evaluation won two prestigious awards—the Franz Edelman Award for Management Science Achievement and the Frederick Lanchester Prize.

The director of the needle exchange program made presentations to several municipalities considering establishing their own needle exchange programs. In addition, the New Haven AIDS Division operated a website concerning the needle exchange program for almost a year. Program staff also produced a television program that aired on BET, Lifetime, E!, and MTV for 13 weeks. (See the Bibliography for a complete listing of publications and presentations.)

AFTERWARD

The needle exchange program continues to operate. The loss of grant funds and city and state budget changes have led to the elimination of several staff positions. Staff members hope to develop a syringe disposal system and a home delivery program, and to expand the hours of operation at least one night a week into the early morning hours.

As a result of the research documenting evidence of the efficacy of the New Haven needle exchange program, other states have become interested in needle exchange programs. New needle exchange programs have begun in New York City, California, and Massachusetts.

Connecticut has expanded the program to include Bridgeport and Hartford.

Needle exchange programs continued to spread across the country. In 2007, New Jersey became the final state in the United States to adopt a needle exchange program.

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