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Donald E. Craven
Boston University

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Human Immunodeficiency Virus in Intravenous Drug Users:

Epidemiology, Issues, and Controversies

Donald E. Craven, M.D.

Intravenous drug users are the second most common risk group for acquired immunodeficiency syndrome (AIDS) in the United States, and they account for approximately 25 percent of the cases. Drug users may spread human immunodeficiency virus (HIV) by sharing contaminated drug injection paraphernalia and through sexual contact; women who use drugs can transmit the virus to their children. The rapid spread of HIV in this risk group and the fact that intravenous drug users are a source for heterosexual and perinatal transmission underscore the need for immediate intervention. In addition, many drug addicts are poor, have limited career possibilities, and lack health insurance, which leaves the cost of hospitalization and treatment to the public sector.

In the absence of a vaccine or an effective chemotherapy, efforts to prevent the spread of HIV must be focused on education, behavior modification, and drug treatment. Drug-treatment programs with a strong emphasis on HIV education should be available to all drug users. Community outreach programs will be difficult and expensive to initiate, because drug addicts have no formal organization or community AIDS prevention groups. To prevent the spread of HIV, federal, state, and local resources will have to be employed in conjunction with a community infrastructure dedicated to stopping drugs, providing effective drug treatment, and educating active drug users on methods of AIDS prevention. Intervention strategies for controlling the spread of HIV among active intravenous drug users should include teaching them safer sex practices and encouraging them to seek drug treatment and stop needle sharing. In addition, such strategies should be accompanied by information about needle disinfection and access to sterile needles.

There is no area in which there is so much mystery, so much misunderstanding, and so many differences of opinion as in the area of narcotics.

— President John F. Kennedy
Address to White House Conference on
Narcotics and Drug Abuse, September 1962

Dr. Donald E. Craven is associate professor of medicine and microbiology at the Boston University School of Medicine; associate professor of epidemiology and biostatistics at the Boston University School of Public Health; and director of AIDS Public Health Activities, City of Boston, Boston City Hospital.

In 1985, the report of the House Select Committee on Narcotics Abuse and Control labeled drug abuse the number one health problem in the United States. The report asserted that "more than 20,000,000 Americans use marijuana regularly, approximately 8,000,000 to 20,000,000 are cocaine users, about 500,000 are heroin addicts, 1,000,000 are regular users of hallucinogens and 6,000,000 people abuse prescription drugs."¹ The AIDS epidemic has exponentially increased the concern over drug use. Intravenous drug use is now the second most common risk factor for AIDS transmission in the United States,² and the use of oral and intravenous drugs has been implicated in the transmission of human immunodeficiency virus in gay men.³

Intravenous drug users (IVDUs) are universally regarded as outcasts, and public disdain toward them is widespread. Anti-narcotics crusader Richmond Hobson summarized public sentiment toward this group nearly fifty years ago: "Most of the daylight robberies, daring holdups, cruel murders and similar crimes of violence are now known to be committed chiefly by drug addicts, who constitute the primary cause of our alarming crime rate. Drug addiction is more communicable and less curable than leprosy. Drug addicts are the principal carriers of vice diseases and with their lowered resistance are incubators and carriers of the streptococcus, pneumonia, the germ of flu, of tuberculosis and other diseases. . . . Upon this issue hangs the perpetuation of civilization, the destiny of the world and the future of the human race."⁴ In the past, society has tended to ignore the problem of drug use, but the close association between AIDS and intravenous drug use has escalated the problem to a level that cannot be dismissed.

In less than a decade, AIDS has become the number one public health concern in the United States. It has had a greater impact on our health care system than virtually any other infectious disease in our history. The issues of AIDS touch the most sensitive nerves of our legal, moral, and social fiber. Discussion of such subjects as patient confidentiality, the use of the HIV antibody blood test for screening, and ways to respond to the epidemic invariably ignite controversy. Within a short period, AIDS has transformed our traditional public health approaches to epidemic control.⁵ Because there is no vaccine or effective chemoprophylaxis against HIV infection at the present time, epidemic control measures must consist mainly in education and behavior modification programs. Behavior modification will be a formidable task for all risk groups, but it will be especially difficult for intravenous drug users.

Although the problems of drug addiction and those of AIDS are separate, they are still closely related, and intervention strategies must consider the two sets of problems together. This article will examine the epidemiology of HIV infection in intravenous drug users, and will discuss selective issues and controversies surrounding the formulation of health policy to contain the spread of HIV. Problems related to intravenous drug users in Massachusetts, the New England state with the highest number of reported AIDS cases, will receive special emphasis. It is painfully obvious that the solution to the spread of HIV infection in intravenous drug users will not be quick or simple. We are facing a colossal problem with catastrophic implications that require immediate, multifaceted, and cost-effective intervention strategies.

Intravenous Drug Users

Between HIV-infected homosexual males and the intravenous drug user there are several notable differences that are critical to understand (table 1). The term *drug user* refers to any person who uses psychoactive substances outside the framework of the medical sys-

Table 1

Summary of Notable General Differences Between Intravenous Drug Users (IVDUs) and Homosexual Males (HSMs) with Infection Due to Human Immunodeficiency Virus (HIV)

Characteristic	IVDUs	HSMs
Sex	Male/female	Male
Usual sexual preference	Female	Male
Race	Minorities > white	White > minorities
Employed	No	Yes
Socioeconomic class	Middle/lower	Middle/upper
Average educational level	High school	College
Health insurance	None/Medicaid	Private
Access to health care	Limited	Good
Criminal record	Possible	No
Social structure	Fragmented	Intact
Support groups	Rare	Available
Psychosocial problems	Common	Variable
Advocacy groups	Sparse/ineffective	Numerous/effective
Access to AIDS information	Limited	Good

Sources: See article notes 9, 11, 12, and 13.

tem.⁶ The National Institute of Drug Abuse (NIDA) estimates that there are between 350,000 and 400,000 active intravenous drug users in the United States. Perhaps as many as 10 million Americans have used cocaine, and estimates from NIDA suggest that most cocaine users have injected it intravenously at least once.⁷

Information on patterns of drug use has been limited to studies of patients entering drug treatment programs.⁸ Of the 11,623 clients who self-administered intravenous drugs and who participated in the 1983 Treatment Outcome Prospective Study (TOPS) at the Research Triangle Institute in North Carolina, 73 percent were male, 45 percent were white, and 76 percent were between the ages of twenty-two and thirty-five.⁹ Most of the participants were in methadone maintenance or detoxification programs or in therapeutic communities. As expected, nearly all of the heroin users, compared to approximately half of the cocaine users, administered drugs intravenously. About half of the heroin users and 20 percent of the cocaine addicts used drugs daily. These data suggest that large numbers of intravenous drug users could be at risk for HIV.

Traditional stereotypes of heroin addicts and cocaine users are disappearing or changing.^{10, 11, 12, 13, 14, 15} Two reasons for this are changes in the drug culture and the recent trend toward polydrug use. Intravenous drug users comprise a wide spectrum of persons and personalities. Characteristics of the addict may vary with the type of drug used, geographic area, social class, and the local drug culture. The addicted person may be a teenager, an athlete, an artist, a businessperson, or a prostitute — in short, nearly anyone. Drugs may be injected daily, on weekends, or at parties. The addict may inject alone, with another person, or with a group.

Some addicts are employed and work regularly; others have a drug habit that consumes their entire life. For some drug users, maintaining a habit that costs \$100 to \$400 per day is a full-time job, one that requires “copping” (stealing and reselling) about two to four times this amount to pay for the habit.¹⁶ In some cases, the economics and social interactions associated with the use of heroin may provide a welcome escape from routine life. Addicts who survive on the street must be active, skillful, and clever.

Most people do not appreciate that drug addiction is a serious psychological and physiological disease. The drive to sustain a habit or to avoid opiate withdrawal is powerful, and does not preclude stealing from loved ones or becoming involved in violent crime. William Burroughs, a well-known author and drug addict, referred to addiction as a disease caused by the “junk virus”: “Junk is the ideal product . . . the ultimate merchandise. No sales talk necessary. The client will crawl through a sewer and beg to buy. . . . He does not improve and simplify his merchandise. He degrades and simplifies the client. He pays his staff in junk. . . . A dope fiend is a man in total need of dope. Beyond a certain frequency need knows absolutely no limit or control. . . . You would lie, cheat, inform on your friends, steal, do *anything* to satisfy total need.”¹⁷

Cocaine is a more social drug than heroin and therefore is more likely to be associated with needle sharing. Because the effect of cocaine is short-lived, users often require frequent injections of small doses. Groups of cocaine users may share needles and syringes until the supply of drug is exhausted. About 40 percent of cocaine users snort the drug, 30 percent freebase, and about 20 shoot the drug intravenously (figures may vary between cities).¹⁸ Heroin addicts may also “shoot” cocaine intravenously¹⁹ or use the two drugs together (“speedballing”). In a recent study conducted in New York City, approximately 70 percent of the addicts attending a methadone maintenance clinic reported that they had also used cocaine.²⁰

Cocaine holds a special appeal for the white middle-class male, who is usually employed and is well educated. The use of cocaine is often associated with bursts of energy and high levels of productivity, followed by periods of little activity.^{21, 22} Many cocaine addicts use alcohol, sedatives, or heroin to relieve the mood change that follows the cocaine euphoria. The desire to repeat the cocaine “high” and avoid the “post-high depression” may lead to an obsession to get the drug regardless of the risk involved.²³ In a survey of 500 cocaine users who called a hotline, 455 said they had stolen money from their employers, family, or friends to support their habit: more than half had used up at least

Table 2

Possible Methods of Transmission of Human Immunodeficiency Virus (HIV) in Persons Who Have Intravenous Drug Use as a Risk Factor

Blood Transmission

- Contaminated needles, syringes, or cookers
- Needle sharing
- Use of shooting galleries

Sexual Transmission

- Homosexual male intravenous drug user
- Female sexual partner of an intravenous drug user
- Intravenous drug user prostitute

Perinatal Transmission

- Transplacental exposure
- Exposure to HIV-infected genital secretions or blood
- Breast milk contaminated with HIV

Sources: See article notes 23 and 29.

half of their savings; half were in debt; and 42 percent had lost their financial assets.²⁴ A large number had also lost a loved one, a job, or a friend. Twenty-eight percent had participated in illegal activities to obtain their drug. Clearly, drug addiction is a serious disease with many implications.

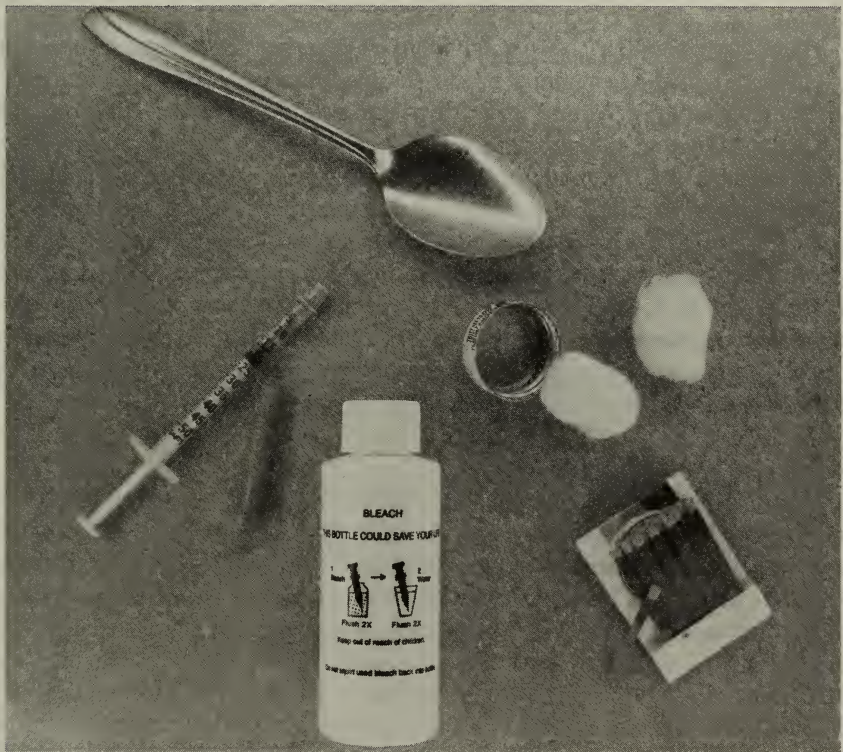
Epidemiology

Risk Factors for Intravenous Transmission

A drug user can transmit HIV intravenously or sexually; women who use drugs can transmit the virus perinatally to the fetus or newborn (table 2). Blood transmission of HIV may occur by using or sharing contaminated drug injection paraphernalia (“works”), such as needles, syringes, or “cookers” (figure 1).²⁵ A cooker is most often a bottle cap that is used by the addict to heat tap water in which to dissolve the heroin prior to injection. Transmission of HIV probably requires repeated exposures to small amounts of HIV on

Figure 1

Intravenous Drug Paraphernalia and Bleach Bottle for Disinfection



Depicted are a syringe; a needle; and a “cooker” (spoon or bottle cap), in which tap water is heated to dissolve the heroin; and cotton, which is placed in the cooker to remove particulate matter before the drug is drawn in to the syringe. Also shown is a sample bottle of bleach, which is used by some addicts to disinfect drug paraphernalia.

Table 3

Risk Factors Associated with Acquisition and Transmission of Human Immunodeficiency Virus (HIV) Among Intravenous Drug Users (IVDUs) and Their Sexual Contacts

Risk Factors Associated with IV Drug Use

- Number of drug injections
- Number of days of needle sharing
- Number of needle-sharing partners
- Number of HIV-antibody-positive needle-sharing partners
- Use of shooting galleries
- Sharing of cookers
- Not being in drug treatment

Other Risk Factors

- IVDU as sexual partner
- Prostitution
- No barrier precautions (use of condoms)
- Geographic location (reservoir of HIV)
- Minority (black or Hispanic) IVDU

Sources: See article notes 23, 27, 28, 29, and 33.

drug injection paraphernalia.²⁶ Seropositivity to HIV has been correlated with several risk factors (table 3), including amount of needle sharing, number of needle-sharing partners, and number of days of needle use.^{27, 28, 29, 30, 31} HIV transmission has also been correlated with the use of “shooting galleries.”^{32, 33} A shooting gallery is a place where an addict goes to shoot drugs or to have drugs administered.^{34, 35, 36} There is usually a small fee to enter; drug injection paraphernalia may be rented or purchased; and addicts with scarred and damaged veins can have drugs injected by a “street doctor” (usually an addict or an ex-addict). Unfortunately, the works that are sold, rented, or used by the street doctor may be contaminated with HIV. Efforts to control the spread of HIV by the intravenous route should focus on discouraging both intravenous drug use and sharing of drug paraphernalia; if these efforts are not successful, intravenous drug users should be taught proper methods of disinfection or should be given access to sterile syringes.

Risk Factors for Sexual Transmission

It is difficult to separate intravenous spread of HIV from sexual transmission. HIV is present in semen^{37, 38} and in female genital secretions.^{39, 40} Ample evidence shows that HIV can be transmitted from males to females, and data suggest that female-to-male transmission occurs as well.^{41, 42, 43} Transmission of HIV may not be as efficient as transmission of other sexually transmitted diseases,⁴⁴ and seropositivity appears to be associated with exposure to multiple sexual partners,^{45, 46} with specific host factors,⁴⁷ or with intrinsic differences in strains of HIV.⁴⁸ The use of condoms to prevent HIV infection has not yet been studied in sufficient detail, but it is likely that condom use will reduce the frequency of HIV transmission.^{49, 50} Strategies for containing the sexually transmitted spread of HIV in drug users would include abstaining from sexual relations, limiting the number of sexual partners, or using condoms and other types of safer sex practices. In contrast to other risk groups, intravenous drug users need to alter behavior with respect to both intravenous and sexual transmission of HIV.

AIDS in Intravenous Drug Users

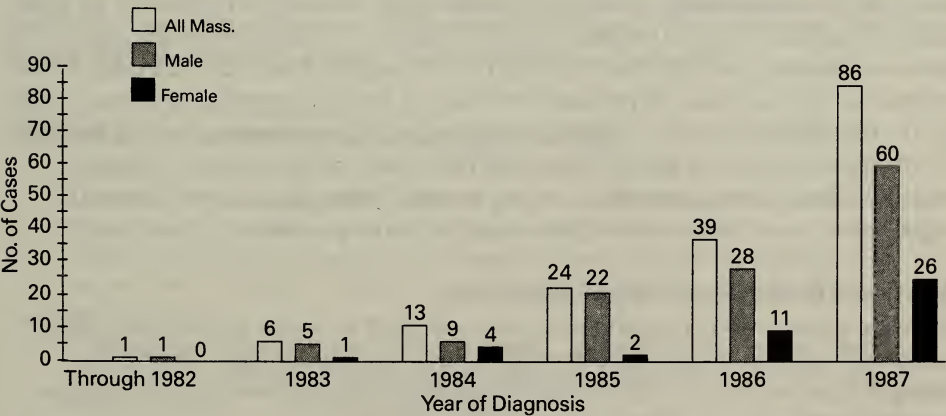
As of January 1, 1988, approximately fifty thousand cases of AIDS had been reported to the Centers for Disease Control (CDC). Of these patients, about half have succumbed to their illness.⁵¹ Intravenous drug use was the sole risk factor in 17 percent of the total number of cases; both intravenous drug use and male homosexuality/bisexuality were risk factors in another 8 percent of the cases. Thus, intravenous drug use, either alone or in combination with other risk factors, accounts for more than 25 percent of the AIDS cases in the United States. On the basis of the revised (September 1987) CDC definition of AIDS,⁵² the number of cases has increased by about 15 percent. It is possible that more intravenous drug users will be among these newly defined cases.

As noted above, the number of AIDS cases among intravenous drug users varies by geographic region. Overall, the incidence of AIDS in intravenous drug users is higher on the East Coast than on the West Coast. New York City and the areas of New Jersey that surround New York City have reported the highest rates of AIDS in intravenous drug users in the United States.⁵³ In fact, intravenous drug users now account for more than 40 percent of the reported AIDS cases from New York City.

In Massachusetts, as of January 1, 1988, more than twelve hundred cases of AIDS had been reported.⁵⁴ Intravenous drug use was the sole risk factor in 12 percent of the cases, and 5 percent of the cases were reported among homosexual/bisexual males who also had a history of intravenous drug use. Most Massachusetts cases have been reported in the greater Boston area, but foci of cases have also been reported in Springfield, Holyoke, Worcester, and New Bedford. Of great concern is the increase in AIDS cases among intravenous drug users which has been reported in Massachusetts over the past three years (figure 2). In 1987 in that state, intravenous drug users accounted for 20 percent of the AIDS cases, compared to 13 percent in 1986. The number of AIDS cases in female intravenous drug users in Massachusetts is increasing dramatically, and minorities constitute a disproportionate number of IVDU AIDS cases in the state (table 4).

It is important to emphasize that reported cases of AIDS account for only a fraction of the population who are infected with HIV. In addition, there is an extensive incubation

Figure 2
Massachusetts Resident AIDS Cases in Intravenous Drug Users by Sex



Source: Data provided by Beverly Heinze-Lacey, AIDS Surveillance Unit, Massachusetts Department of Public Health and Boston Department of Health and Hospitals.

Table 4

**Summary of AIDS Cases in 157 Intravenous Drug Users
According to Race and Sex Which Were Reported in Massachusetts
as of December 15, 1987**

	White (%)	Black (%)	Hispanic (%)	Total (%)
Male	26 (57)	54 (77)	40 (98)	120 (77)
Female	20 (43)	16 (23)	1 (2)	37 (23)
Total cases	46 (29)	70 (45)	41 (26)	157 (100)

Source: Data provided by Beverly Heinze-Lacey, AIDS Surveillance Unit, Massachusetts Department of Public Health and the Boston Department of Health and Hospitals.

period before the onset of clinical disease. It is estimated that for every case of AIDS that is reported, there are approximately fifty more cases of HIV infection.⁵⁵

Seroprevalence data may provide more accurate information about the number of persons infected with the virus. Numerous rates of HIV antibody seropositivity have been reported.⁵⁶ Of course, the seroprevalence rate will vary with the specific type of population sampled. For example, the prevalence of HIV antibody will probably be higher among active drug users in the inner city than in drug users who are in drug treatment. Seroprevalence data from New York City suggest that HIV is present in 40 percent or more of the estimated two hundred thousand intravenous drug users there.^{57, 58} In Boston, there are an estimated sixteen thousand intravenous drug users. Among eighty-nine persons in the methadone treatment program at Boston City Hospital in 1986, the seroprevalence rate was approximately 15 percent, compared to a rate of about 28 percent for hospitalized addicts without AIDS.⁵⁹ Therefore, the author estimates that about 25 percent of the sixteen thousand drug users in Boston may be infected with HIV in 1988.

Intravenous Drug Use, AIDS, and Minorities

A disproportionate percentage of minorities in the United States have intravenous drug use as the reported risk for AIDS.⁶⁰ Although minorities comprise only 20 percent of the total population in the United States, about 40 percent of the AIDS cases have occurred in this group. In Massachusetts, minorities constitute approximately 10 percent of the population and approximately 25 percent of the AIDS cases.⁶¹ Cumulative data through 1987 in that state indicated that minorities accounted for 78 percent of the 120 AIDS cases in male intravenous drug users and 48 percent of the cases in female intravenous drug users (table 4). The cumulative incidence of AIDS among blacks in Massachusetts is nearly six times that of whites between the ages of fifteen and forty-nine, and the incidence in black women is fifteen times greater than in white women.⁶² These data point to the need to target resources and intervention efforts toward minority groups.

Women and Heterosexual Transmission of HIV

There are approximately fifteen hundred cases of AIDS in women in the United States,⁶³ and about 50 percent of these have intravenous drug use as a risk factor. In addition, among women who have AIDS, five times as many have been sexual partners of intravenous drug users as have been sexual partners of gay men.⁶⁴

Intravenous drug users represent the largest number of heterosexuals infected with HIV in the United States.⁶⁵ These persons are an obvious bridge for heterosexual transmission

of HIV. More than 90 percent of intravenous drug users are heterosexual, and more than 80 percent are sexually active.⁶⁶ Unfortunately, accurate data on heterosexual spread of HIV in drug users are difficult to assess because of the confounding by drug use.

Perinatal and Pediatric AIDS

Female drug users and female sexual partners of male drug users are an important source for perinatal transmission of HIV.⁶⁷ Nearly 30 percent of intravenous drug users are women, and of these, nearly all are in their prime childbearing years.⁶⁸ HIV may be transmitted in utero or in the period just after delivery, through contact with infected blood or genital secretions. Breast milk has also been suggested as a mode of transmission. Infection rates of children born of HIV-positive mothers may vary from zero to 65 percent.^{69, 70, 71} As of January 1, 1988, more than 77 percent of the 737 cases of pediatric AIDS in the United States had occurred in minority children, most of whom had mothers who were intravenous drug users or who were the sexual contact of an intravenous drug user.⁷² In Massachusetts, 56 percent of the 18 cases of pediatric AIDS have occurred in minorities, and most of these children have had a parent who was an intravenous drug user.⁷³

AIDS in Prostitutes

Male and female prostitutes who use intravenous drugs are also a major group at risk for acquiring and transmitting HIV in the United States.⁷⁴ Approximately 30 to 50 percent of female intravenous drug users are also involved in prostitution.^{75, 76} Although female prostitutes in Africa appear to have a high prevalence of HIV without drug use as a risk factor, data from the United States suggest that in this country, the use of intravenous drugs was strongly correlated with HIV seropositivity.⁷⁷ Seroprevalence rates for HIV varied from 1 to 57 percent for prostitutes, depending on the geographic region, the incidence of AIDS in women, the use of intravenous drugs, and the use of condoms. Rates of seropositivity were 25 percent for black and Hispanic prostitutes who used IV drugs, compared to 7.7 percent for black and Hispanic prostitutes who did not use drugs; rates were 10.2 and 2.4 percent, respectively, for white prostitutes.⁷⁸

AIDS in Prisoners

As of 1986, 766 cases of AIDS had been reported from correctional facilities nationwide.⁷⁹ Approximately 75 percent of the cases were reported from the "mid-Atlantic region," and most have intravenous drug use as a risk factor.⁸⁰ The limited available data suggest that the rate of transmission among all inmates is 1 percent.⁸¹

Health Policy Issues for Controlling the Spread of HIV

There have been as many plagues as wars in history; yet always plagues and wars take people equally by surprise . . .

When war breaks out, people say: "It's stupid; it can't last long." But though a war may well be "too stupid," that doesn't prevent its lasting. Stupidity has a knack of getting its way . . .

A pestilence isn't a thing made to man's measure; therefore we tell ourselves that pestilence is a mere bogey of the mind, a bad dream that will pass away. But it doesn't always pass away . . . it is men who pass away.

— Albert Camus
The Plague

Unfortunately, the response of public health officials to the AIDS epidemic has been characterized by a great deal of confusion. The issue of containing the spread of HIV infection in intravenous drug users has been no exception, and few steps have been taken to address it. Obviously, the problems are complex and often controversial. Part of the controversy stems from ambivalent feelings on the part of politicians and public health officials toward drug users, addiction, and AIDS. These feelings may translate into a lack of strong moral, social, or economic commitment to education, treatment, and rehabilitation programs for intravenous drug users.

Health policy for the control of HIV in intravenous drug users needs to be targeted in three general areas. First, specific efforts are needed to educate the public about the explosive nature of HIV infection among intravenous drug users. It must be made clear that this group is a natural bridge for spreading the virus heterosexually and perinatally to children. Special efforts are needed to discourage persons from trying drugs. Second, addicts who are using drugs should be informed and urged to enter drug treatment programs. For the remaining group of active users who do not want to enter drug treatment, there should be risk-reduction programs to stop needle sharing, teach proper disinfection of works, provide access to sterile needles, and emphasize that HIV can be transmitted sexually as well as by dirty needles. A summary of possible intervention strategies for intravenous drug users is given in table 5.

Education and Risk Reduction

Education and risk-reduction programs are critical for controlling the spread of HIV in

Figure 3

Interactions Between AIDS Intervention Programs Based on Drug Treatment, Risk Reduction, Education, and Counseling

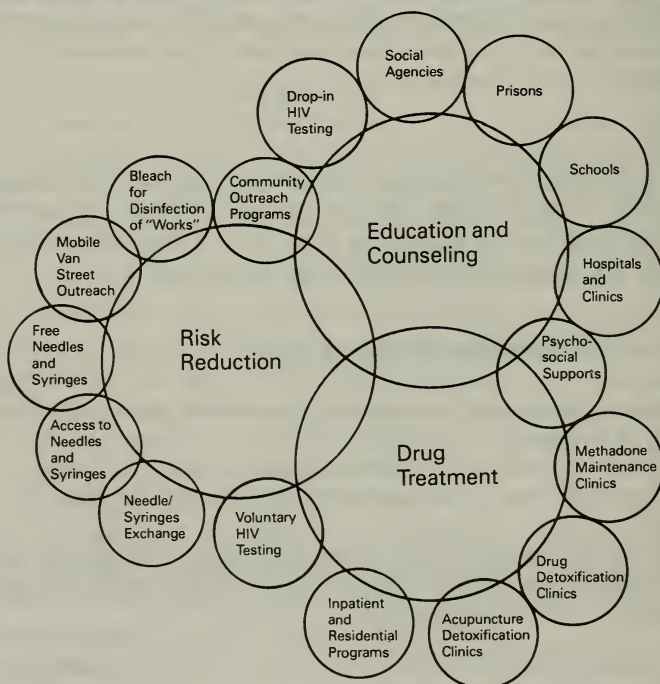


Table 5

Possible Strategies for Controlling the Spread of Human Immunodeficiency Virus (HIV) Among Intravenous Drug Users (IVDUs)

Education
Education of the general public
Prevention programs targeted at schools, dropouts, and high-risk areas
Culturally appropriate education and prevention programs
Education of IVDUs about prevention and risk reduction
Emphasis on double risk of IV drug use and sexual transmission
Efforts to alter drug culture
Multifaceted programs with credibility and community outreach
Drug Treatment
Better access to drug treatment
New and more diverse treatment
More customized treatment programs
Better rehabilitation after treatment
Preferential admission of HIV-antibody-positive IVDUs
Better access to HIV testing and counseling
Special programs for pregnant addicts
Prevention of Parenteral Transmission of HIV
Needle-syringe disinfection with bleach
Access to sterile needles
Needle exchange
Sale of sterile needles without prescription
Change in state laws regarding possession of needles
Closing of all shooting galleries
Elimination of drug use in prisons
Available anonymous and confidential HIV antibody testing with support, counseling, and education
Prevention of Sexual Transmission of HIV
Access to and/or distribution of condoms
Access to birth control
Available counseling and HIV antibody testing
Evaluation, counseling, and education of sexual partners
Legal Intervention
Strict enforcement of drug-trafficking laws
Higher penalties for possession of IV drugs
Mandatory education for drug users, prostitutes, prisoners
Mandatory education and listing of "johns"

Sources: See article notes 9, 11, 23, 27, 28, 29, 82, 86, 89, 90, 91, 92, 93, 94, 101, and 104.

the intravenous drug user. At the present time, it is essential that these programs be properly designed, implemented, and evaluated. Current AIDS education and risk-reduction programs need to be expanded and integrated into existing drug treatment and community outreach programs (figure 3). Many of these programs, however, are wrapped in a bu-

reaucracy that may prevent effective use of resources. Designing specific intervention programs for intravenous drug users is difficult; costly, because the programs need to be customized; and often controversial.

While AIDS action groups in the United States have successfully educated gay men, drug addicts are often less compliant and less interested in being educated. They also have no advocacy group to disseminate information. Drug treatment centers appear to be the logical site for initiating contact with drug addicts and providing them with education about AIDS. All intravenous drug users entering treatment should be informed of HIV transmission and transmission prevention. They can receive this information from drug counselors or from recovered addicts who have been trained as counselors. In general, intravenous drug users respond better to the personal approach than to being given a pamphlet on AIDS. Videos on risk reduction may be an even more effective educational tool. Introductory courses on AIDS are offered to counselors and intravenous drug users on a regular basis by the National Institute of Drug Abuse, AIDS action committees, and some public health departments.

In many cities, there is a sense of urgency about instituting education and risk-reduction programs while seroprevalence rates are relatively low. Thus, the risk of waiting must be weighed against the need for scientific proof of a program's efficacy. Scientific or well-designed studies are difficult to perform on intravenous drug users, but recent data indicate that it is possible to educate drug users about AIDS and to modify their behavior.^{82, 83, 84}

Knowledge of AIDS and its routes of transmission were evident in a 1985 study of intravenous drug users in jail (N=115) and in methadone maintenance (N=146) and found that 97 percent of both groups knew that sharing needles could transmit AIDS virus.⁸⁵ Sixty percent of the intravenous drug users in methadone treatment had used risk-reduction methods, of which decreased needle sharing was the most common; 42 percent stated that they had stopped sharing needles, and 24 percent reported decreased needle sharing. Behavior change was less evident among incarcerated intravenous drug users; 23 percent stated that they had stopped needle sharing, and 38 percent reported decreased needle sharing. Data from Friedman et al. in New York City found that 59 percent of the intravenous drug users interviewed had adopted new behaviors, such as using clean needles, disinfecting needles, and reducing needle sharing.⁸⁶ Further data from New York and New Jersey indicate that drug users appear to be switching from injecting cocaine and heroin to smoking it.⁸⁷ In San Francisco, AIDS is a topic of "grave concern" for intravenous drug users. Biernacki and Feldman have reported that intravenous drug users want to learn how to protect themselves and, more specifically, how to sterilize drug paraphernalia.⁸⁸

Efforts to reach IVDUs not in treatment are necessarily labor-intensive. To be effective, such efforts require establishing intervention programs in such places as hospitals, clinics, jails, prisons, and court-mandated rehabilitation centers, and at welfare and unemployment offices. Participation in an education program on AIDS risk reduction should be mandated for persons charged with soliciting or prostitution and as a condition for release from jail or prison. The message at each site must be clear, concise, and non-judgmental. It can be delivered personally, by video, or — probably less effectively — through well-designed pamphlets. Messages about AIDS prevention should be displayed on community billboards and on signs in stores, subways, and buses. The messages should discourage drug use, provide access to help, and, where it is culturally appropriate, be posted in foreign languages.

Many drug users are aware that sharing needles and using contaminated works present risks. However, the possibility of acquiring or transmitting HIV sexually is not widely appreciated among this group, and therefore sexual preventive strategies are not commonly used. Specific efforts will be required to teach intravenous drug users that unprotected sexual intercourse, exposure to multiple sexual partners, and ignoring safer sex guidelines are important factors for HIV transmission. This may be the most difficult task to accomplish.

Community outreach programs that educate and encourage active drug users to seek drug treatment need to be established.⁸⁹ Health officials in New Jersey have successfully linked risk reduction for AIDS with drug treatment by distributing coupons that addicts can use for drug detoxification.⁹⁰ These coupons eliminate co-payment by the intravenous drug user for drug treatment. Recovered drug addicts can be trained as health educators and can be used to disseminate information about AIDS in the drug-using community. The message should be simple and nonjudgmental: Stop drugs and seek treatment; don't share needles, syringes, or cookers; use bleach to disinfect all drug paraphernalia.

Mobil vans appear to offer an effective method of community outreach. They are less costly than traditional programs but need to be further evaluated. In Amsterdam, methadone and information about AIDS are distributed by van,⁹¹ and in New Jersey, mobil vans are staffed by physicians and social workers who provide medical information and referrals.⁹² Because intravenous drug users often congregate in certain areas in the city, mobil vans may provide the optimal vehicle for control of HIV among this population.

Recently, the National Institute of Drug Abuse provided several community outreach demonstration projects with funds to conduct comprehensive prevention programs for intravenous drug users.⁹³ These programs will stress the importance of avoiding drugs, seeking drug treatment, disinfecting drug paraphernalia, and practicing safer sex. Although it is not clear what impact these programs will have on the course of the AIDS epidemic in this population, the approach seems promising, in that education and prevention are the only tools currently available. Failure to initiate these prevention programs, particularly when seroprevalence rates are low, could prove to be a costly mistake.⁹⁴

The schools are of critical importance as a locus for disseminating information about AIDS. Special efforts should be made to reach school dropouts. In the Boston Public Schools, more than 40 percent of the students who start high school do not finish. This is probably the group who are most at risk for running away, starting to use drugs, or engaging in prostitution as a means of support; thus, individuals in this group are probably at the highest risk for contracting AIDS.

Grants from the Centers for Disease Control to establish AIDS educational programs in schools have been awarded to twelve cities, including Boston. Multifaceted intervention — including traditional methods of teaching, peer teaching, the use of videos, and so on — is needed in order to provide basic information about AIDS and HIV infection. Appropriate and timely intervention may provide an effective deterrent against dropping out and thus against acquiring HIV infection.

Drug Treatment Programs

Access to drug treatment is a cornerstone for controlling the spread of HIV. Drug treatment programs are the most logical site to begin education and risk-reduction programs for intravenous drug users. Many drug treatment programs, however, have not instituted effective AIDS education, nor are they equipped to care for HIV-infected patients and

their psychosocial needs. In Massachusetts, opportunities for drug treatment are insufficient, and there are long waiting periods for different treatment facilities, especially for women, who traditionally have had a more difficult time finding placements in rehabilitation programs.

Fortunately, intravenous drug users appear to fear AIDS enough to change or modify their behavior and reduce risk by entering drug treatment. According to Des Jarlais et al., more than 50 percent of the drug users seeking drug treatment cited fear of AIDS as one reason for entering treatment.⁹⁵

In New York City, about 100 drug treatment programs care for thirty thousand persons, which accounts for about 15 percent of the total number of addicts there.⁹⁶ In Boston, there are an estimated sixteen thousand intravenous drug users and about 900 treatment slots. There is a severe shortage of drug treatment facilities in nearly all U.S. cities, owing in large part to insufficient funds, lack of treatment sites, and poor use of existing facilities.

Nationally, methadone maintenance programs have been the mainstay of outpatient treatment programs for the past twenty years.⁹⁷ Methadone does not produce sedation or euphoria but reduces the craving for narcotics. In essence, methadone stabilizes the life of many addicts, and removes them from the daily hustle of the search for drugs. The counseling and support that accompany methadone treatment are a critical part of most programs. Methadone is dispensed daily in most clinics, and is administered under the observation of clinic staff. Many clinics monitor urine samples of patients to determine whether the intravenous drug user is still injecting drugs, because some addicts continue to use drugs while they are on methadone.

In Amsterdam, methadone is distributed cost-free by mobile van. Addicts are carefully observed to make certain that they ingest the drug.⁹⁸ This type of program appears cost-effective; facilitates access to drug treatment; maintains contact with the addict; and obviates the problems of establishing detoxification or methadone maintenance clinics in the neighborhood. Mobil vans may not provide the necessary social support, but can refer patients to Narcotics Anonymous or other groups. It is questionable whether this type of program would be accepted in the United States.

There is a great deal of controversy in the United States about whether the aim of treatment should be methadone maintenance or complete nonuse of drugs, particularly in view of the high relapse rates and continued drug use among persons on methadone maintenance.⁹⁹ Despite the high relapse rates, Dole and Nyswander report that the lives of many patients who are on methadone maintenance are more stable and more productive, since the patients are free of the constant craving for heroin and thus have stopped engaging in the criminal activities associated with its use.¹⁰⁰ The heroin addict may not be medically cured, but if he is integrated into society and is less likely to contract or spread AIDS virus, the treatment should be considered successful.^{101, 102}

Testing for HIV Antibody

Because of the dearth of drug treatment slots, many public health and drug rehabilitation programs have decided to selectively admit addicts who are HIV-antibody-positive. This provides an incentive for voluntary HIV testing, but, ironically, access to testing is limited.

The importance of HIV testing as an impetus for the intravenous drug user to modify or change behavior is unclear at this time. Many public health officials argue that all intravenous drug users should consider themselves HIV-positive, refrain from sharing needles,

and practice safer sex. Others argue that an individual's knowledge of his or her HIV antibody status may reinforce the use of condoms, limit the number of sexual partners, and eliminate the sharing of drug paraphernalia. Studies in gay men and limited studies in intravenous drug users suggest that there is a wide spectrum of behavioral responses to HIV testing.^{103, 104, 105, 106} Recent data from Kings County Hospital in Brooklyn reveal a wide range of psychological reactions to HIV testing in intravenous drug users, and indicate that psychological reactions are apparent more frequently and are more severe in female intravenous drug users than in gay men.¹⁰⁷ Many of these female intravenous drug users had a documented increase in drug use following HIV testing. The use of voluntary HIV testing for drug users in treatment remains moot and requires further evaluation.

In general, intravenous drug users have not used the state-run alternative HIV test sites, which offer free and anonymous blood testing for HIV, perhaps because of the need to make appointments for testing several weeks in advance.¹⁰⁸ In order to improve access to HIV antibody testing for drug users, the Massachusetts Department of Drug Rehabilitation and the Boston Department of Health and Hospitals have opened an anonymous drop-in HIV counseling and testing program called Project Trust at Boston City Hospital for intravenous drug users, their sexual contacts, needle-sharing partners, and families. Project Trust also provides education, support groups, and referral for drug treatment.

With respect to programs for HIV antibody testing, it is important to realize that the screening test for HIV has limitations and that false-positive and false-negative results may be obtained.¹⁰⁹ The number of false-positive screening tests in intravenous drug users is likely to be lower than in healthy blood donors, but the number of false-negative tests would probably be greater.

HIV antibody testing in pregnant intravenous drug users raises particular issues. In Boston, New York City, and New Jersey, pregnant addicts are given priority for treatment slots, and some drug treatment programs are specially equipped to deal with the pregnant addict. However, testing for HIV may have an adverse effect on the addicted mother. Cancellieri et al. suggest that approximately 44 percent of their pregnant addicts who had HIV testing had serious psychiatric sequelae and increased their use of "crack" during their pregnancy.¹¹⁰ Four of the sixty HIV-tested patients who were followed in the study required psychiatric hospitalizations for acute psychoses or suicidal or homicidal behavior following their binges with cocaine. In addition, pregnant intravenous drug users often avoided testing until after their abortion. In our experience at Boston City Hospital and in the experience of others, many HIV-seropositive pregnant intravenous drug users in whom an elective abortion is possible choose to continue their pregnancy, in spite of the risk of fetal infection.^{111, 112}

Voluntary HIV testing, with appropriate counseling, should be made available to all prisoners and their sexual contacts. However, few programs for voluntary testing have been established in prisons, and data concerning the acceptance and efficacy of those programs which do exist are sparse.

In many U.S. cities, prostitutes have access to voluntary HIV blood testing in clinics for sexually transmitted diseases. In some U.S. states, such as Nevada, and in Amsterdam, licensed prostitutes must routinely be screened for HIV antibody.¹¹³ In data that have been gathered on the subject of prostitution in the United States, HIV seropositivity has correlated with intravenous drug use and absence of condom use.¹¹⁴ Because prostitutes are a sexually active population, it would be reasonable for health departments to set up education and voluntary testing programs for them and to work with prostitutes' unions, where

they exist, in this process. In New Jersey, women arrested for prostitution undergo mandatory HIV testing. Some public health officials believe that educational programs and voluntary testing should be offered to "johns," or individuals caught soliciting.

Disinfection of Drug Paraphernalia

The primary emphasis of all educational materials for intravenous drug users is to stop using drugs and seek drug treatment. Secondly, there should be a clear message not to share needles, to stay away from shooting galleries, and, if necessary, to disinfect needles and syringes with bleach. Given the limited access to needles and syringes in most U.S. states, many public health officials have supported efforts to distribute educational material on proper disinfection of drug paraphernalia. Limited laboratory data indicate that HIV is killed by heat; by many household disinfectants such as bleach and rubbing alcohol; by spirits such as vodka or wine; and by dish-washing detergent.^{115, 116} Boiling syringes is inconvenient and removes the silicon lubricant from the plunger. Therefore, use of Clorox has been recommended as an effective, safe, and convenient method of disinfection. Bottles of household bleach, with instructions for proper use, are now being distributed in Massachusetts, New Jersey, New York, California, and Maryland, along with hotline numbers that can be called for information about disinfection procedures.

Access to Sterile Needles and Syringes

Data from Des Jarlais et al. indicate that there is a demand for sterile needles in New York,¹¹⁷ but laws limiting access to needles and syringes prohibit the sale of needles without a prescription. Heated debates are in progress over the importance of access to sterile drug paraphernalia in limiting the spread of AIDS. Proponents of distributing free needles and syringes or instituting needle exchange programs argue that high rates of HIV are present in many states that limit access to free needles, and that preventing one case of AIDS would more than pay for these programs. Opponents of the policy argue that distributing free needles would encourage intravenous drug use and would not be useful to most addicts, because needle sharing is part of the drug culture and the means for disinfection are widely available.

In Canada and some European countries, needles and syringes can be purchased without a prescription. In many places where this policy prevails, seroprevalence rates are low, but whether the rates are the result of the policy or of cultural differences and a smaller reservoir of virus is unclear. Greater access to needles and syringes in U.S. states would require decriminalization of drug paraphernalia possession.

There are thirteen different needle and syringe exchanges in Amsterdam.¹¹⁸ The latest data indicate that 350,000 needles and syringes were exchanged there in 1986, and that needle sharing was reduced with no attendant increase in the patient load on drug-free treatment programs. Positive experiences with needle exchange programs have also been reported from Sydney, Australia, and from Liverpool, England.^{119, 120} Investigators in these studies emphasize that the programs provide a means of continuing education through constant contact with active drug users who do not want to be in treatment but who also do not want to acquire or transmit HIV. Needle exchanges are a logical site for providing free condoms, spermicides, and leaflets on safer sex and drug use.¹²¹ Advocates acknowledge that these programs would reach only a portion of the drug user population and emphasize that the approach should be incorporated into a more comprehensive strategy for risk reduction.

Quarantine

Quarantine has been a traditional means of preventing the spread of plague and smallpox. However, in comparison to AIDS, each of these diseases had a limited incubation period, and the duration of each was usually short. HIV infection is usually asymptomatic, and it is not transmitted casually. Quarantining persons with HIV would require mass screening, with all of its attendant complications, including follow-up screening for false negatives and an enormous amount of money to provide care for the 1 million to 2 million people in the United States who are probably HIV-infected and who will remain infected for life. For these reasons, and because AIDS is a preventable disease, quarantine is an unacceptable strategy.

Cost of Treating Drug Users Who Have Aids

The cost of treating an AIDS case in the United States varies among geographic regions and among hospitals. Estimates of the medical care costs per AIDS patient vary between \$47,000 and \$147,000.^{122, 123} These estimates do not include indirect costs for precautions; the cost of Azidothymidine (> \$10,000 per year); laboratory costs for transfusions; laboratory expenses to monitor treatment with Azidothymidine; the costs of treating the addiction; or the support services needed to care for this population. Moreover, the estimates do not include those hospitalization costs which precede the diagnosis of AIDS. Recent data suggest that patients with ARC and, possibly, intravenous drug users who are HIV-positive are also more likely to have recurrent bacterial infections that require hospitalization.¹²⁴

The CDC's projected increase in AIDS cases for 1991,¹²⁵ coupled with the potential rapid spread of HIV transmission among intravenous drug users,¹²⁶ translates into huge costs for AIDS treatment, let alone for treating drug addiction. Data suggest that 30 percent or more of seropositive intravenous drug users will eventually develop AIDS,¹²⁷ and that more than 70 percent of intravenous drug users who develop ARC will require medical attention. These estimates indicate that the medical costs for treating this population could be staggering. Furthermore, in contrast to many gay males, most heroin addicts do not have health insurance or support systems (table 1). This results in longer hospitalization and more costly post-hospital care,¹²⁸ and it underscores the importance of effective health policy programs for the intravenous drug user.

Conclusion

In the absence of a vaccine or an effective chemotherapy to cure or prevent HIV infection, efforts to prevent AIDS must focus on education and on behavior modification. The intravenous drug user is at risk both through drug use and through sexual contact with infected partners. Moreover, the addict has to deal not only with the threat of AIDS, but also with his or her own addiction. Intravenous drug users now comprise the second highest risk group for AIDS in the United States. Women, children, and minorities are widely affected as well. Therefore, intervention programs, which need to include risk-reduction strategies and drug treatment, must explain the risk factors in each of these groups. The challenge is formidable, and programs will need to be creative, multifaceted, and culturally appropriate. Social prejudice, political barriers, and economic constraints will only prolong the epidemic and magnify the risk for others. ♡

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