Published in final edited form as:
Am Psychol. 2013 ; 68(4): 274–285. doi:10.1037/a0032745.

HIV Infection Among People Who Inject Drugs: The Challenge of Racial/Ethnic Disparities

Don C. Des Jarlais, **Dennis McCarty**, **William A. Vega**, and **Heidi Bramson**
Don C. Des Jarlais Baron Edmond de Rothschild Chemical Dependency Institute, Beth Israel Medical Center, New York, New York; Dennis McCarty, Department of Public Health & Preventive Medicine, Oregon Health & Science University, Portland, Oregon; William A. Vega, Roybal Institute on Aging, School of Social Work, University of Southern California, Los Angeles, and Heidi Bramson, Baron Edmond de Rothschild Chemical Dependency Institute, Beth Israel Medical Center, New York, New York

Abstract

Racial/ethnic disparities in HIV infection, with minority groups typically having higher rates of infection, are a formidable public health challenge. In the United States, among both men and women who inject drugs, HIV infection rates are elevated among non-Hispanic Blacks and Hispanics. A meta-analysis of international research concluded that among persons who inject drugs, racial and ethnic minorities were twice as likely to acquire an HIV infection, though there was great variation across the individual studies. To examine strategies to reduce racial/ethnic disparities among persons who inject drugs, we reviewed studies on injection drug use and its role in HIV transmission. We identified four sets of evidence-based interventions that may reduce racial ethnic disparities among persons who inject drugs: HIV counseling and testing, risk reduction services, access to anti-retroviral therapy, and drug abuse treatment. Implementation of these services, however, is insufficient in many countries, including the US. Persons who inject drugs appear to be changing drug use norms and rituals to reduce risks. The challenges are to 1) develop a validated model of how racial/ethnic disparities in HIV infection arise, persist, and are reduced or eliminated over time, and 2) implement evidence-based services on a sufficient scale to eliminate HIV transmission among all persons who inject drugs.

Keywords

HIV; injection drug use; health disparities

The assessment of racial/ethnic disparities in HIV infection, in this issue of *American Psychologist*, would be incomplete without assessing disparities among persons who inject drugs (PWID). A Centers for Disease Control and Prevention (CDC) analysis of HIV/AIDS rates within racial/ethnic groups found elevated rates per 100,000 injection drug users among non-Hispanic Blacks and Hispanics: men (Asian-Americans/Pacific Islanders = 1.6, Whites = 1.7, American Indians/Alaskan Natives = 2.7, Hispanics = 12.7, non-Hispanic Blacks = 26.9); women (Asian-Americans/Pacific Islanders = 0.6, Whites, = 1.0, American Indians/Alaskan Natives = 2.2, Hispanics = 4.8, non-Hispanic Blacks = 14.2) (Prejean, Satcher, Durant, Hu, & Lee, 2006). Rates of HIV infection associated with injecting drug use were especially disproportionate among non-Hispanic Blacks (13% of the population in

Direct correspondence to Don C. Des Jarlais, Chemical Dependency Institute, Beth Israel Medical Center, New York, New York 10038. DDesJarlais@chpnet.org..

the reporting states but 54% of cases among men and 60% of cases among women who inject drugs) (Prejean et al., 2006).

Racial/ethnic group disparities in HIV prevalence are not confined to the United States. A systematic review and meta-analysis of racial and ethnic disparities in HIV prevalence among PWID analyzed 72 U.S. and international studies that a) reported data on HIV prevalence based on laboratory testing, b) did not recruit study participants from an HIV treatment center (where all subjects would be HIV positive), c) presented data separately for PWID (not combined with other non-injecting drug users), and d) reported HIV prevalence among PWID by racial/ethnic group status (Des Jarlais et al., 2012). Racial/ethnic majority and minority group memberhip was operationalized in terms of the relative size of the population groups in the country in which the study was conducted: the largest racial/ethnic group in the country was considered to be the “majority” group. The 72 eligible studies included 144 racial/ethnic comparisons. The minority group had a significantly higher HIV prevalence than the majority group (the lower bound of the 95% confidence interval for odds ratios was greater than 1.0) in 75 comparisons. HIV prevalence rates did not differ significantly between the minority and majority groups (95% confidence interval for the odds ratio included 1.0) in 66 of the comparisons. The majority group had a significantly higher HIV prevalence (upper bound for 95% confidence interval was less than 1.0) in only three comparisons. The weighted summary odds ratios across the 144 comparisons was 2.06, indicating that minority group members were twice as likely to be HIV seropositive as majority group members across all of the studies (studies completed in China and the U.S. observed the largest disparities) (Des Jarlais et al., 2012). Thus, the problem of racial/ethnic disparities in HIV infection among PWID must be considered an international one, and not just limited to the US. It is critical to note, however, that there was great heterogeneity (variation) among the studies, with I squared = 75%. Thus, the issue is not just explaining why racial/ethnic minority group PWID are more likely to be HIV seropositive, but explaining the great variation in the likelihood of higher HIV prevalence among minority versus majority PWID.

Persistent HIV infection disparities among minority PWID pose at least three challenges for practitioners and policy makers. First, elevated HIV transmission rates among minority injection drug users and their sexual partners are puzzling because the risk of infection should be similar for anyone who shared needles and syringes. Second, differences in the rates of sexual and syringe sharing risk behaviors do not explain the observed racial/ethnic disparities. Racial and ethnic minority disparities in HIV infection persist when variation in risk behaviors is controlled statistically – usually with little or no difference in the strength of the statistical association (Hallfors, Iritani, Miller, & Bauer, 2007; Koblin, McCusker, Lewis, & Sullivan, 1990). Third, racial/ethnic disparities persist in locations with similar access to HIV prevention programs (Friedman, Des Jarlais, & Sterk, 1990). Racial/ethnic disparities in rates of HIV infection challenge healthcare systems to develop effective HIV prevention and treatment interventions to eliminate disparities and reduce infection rates.

Sharing syringes and drug preparation materials are not the only risk behaviors for HIV infection. People who inject drugs may also acquire and transmit HIV through unsafe sexual behavior. Use of psychoactive drugs through non-injecting routes of administration also increases risk for HIV with apparent racial/ethnic disparities in HIV infection among non-injecting drug users (Des Jarlais et al., 2012). The factors associated with racial/ethnic disparities in sexual transmission and racial/ethnic disparities in injecting-related transmission undoubtedly have important commonalities, but an adequate consideration of underlying factors in sexual transmission related to non-injecting drug use is beyond the scope of this paper. If programs to prevent injecting-related HIV transmission were implemented on a large scale in a local area, resulting in injection -related transmission

being reduced to near zero in all ethnic groups, important ethnic disparities due to sexual transmission of HIV will remain among persons who inject drugs (Des Jarlais et al., 2009). Eliminating disparities among persons who inject drugs may require addressing both injecting-related HIV transmission and how environmental and personal factors are associated with sexual transmission.

Our review focuses on injection drug use, its role in HIV transmission, and racial/ethnic disparities in seroprevalence rates among PWID. Studies of HIV and injection drug use, however, tend to view PWID as a minority group (compared to men who have sex with men or, in some countries, heterosexuals) and examine racial/ethnic disparities among PWID infrequently. Empirical data on racial/ethnic disparities among PWID, therefore, are limited. The review provides an overview of the historical and current services available for PWID to prevent and treat HIV infection noting change over time. We assess four categories of HIV prevention and treatment services and the potential to use the services to reduce disparities in treatment access and effectiveness: HIV counseling and testing, risk reduction services (e.g., syringe exchange), anti-retroviral therapy and HIV services, and drug abuse treatment services.

HIV Counseling and Testing

Injection drug use is usually a covert activity; drug users are a hidden population with a unique culture and drug use rituals (Wiebel, 1990). Investigators using qualitative methods illuminated sub-populations of injection drug users including women who were sexual partners of PWID (Rosenbaum & Murphy, 1990; Wechsberg, 2009), and Chicanos (Ramos, 1990). Ethnographic studies provided insights into the spread of HIV through sharing needles, water, cookers, and trading sex for drugs (Carlson, Singer, Stephens, & Sterk, 2009; Lambert & Wiebel, 1990).

Much of the initial ethnography was completed within the National Institute on Drug Abuse's National AIDS Demonstration Research Program and the Cooperative Agreement for AIDS Community-Based Outreach/Intervention Research Program (National Institute on Drug Abuse, 1996) during the late 1980s and early 1990s. Study sites combined research and services; they gathered data on drug use, provided HIV counseling and testing, and studied HIV risk reduction strategies. The projects developed educational interventions for HIV testing and risk reduction counseling (Coyle, 1993; Rhodes, 1993) and for community outreach and change (Wiebel, 1993). Indigenous (local) outreach workers educated drug users, increased use of sterile syringes, increased the use of bleach to clean needles before and after use, and facilitated behavior change to attenuate risk of infection (Booth, Kwiatkowski, & Stephens, 1998; Needle, Coyle, Normand, Lambert, & Cesari, 1998). Active referral strategies enhanced admissions to drug abuse treatment (Booth, Crowley, & Zhang, 1996).

CDC currently recommends that counseling and testing be widely available and encourages HIV tests for everyone; individuals at elevated risk should be tested annually so that they know their HIV status and can seek treatment if infected (Branson et al., 2006). Many addiction treatment centers, however, do not offer routine HIV testing (Brown et al., 2007; Pollack & D'Aunno, 2010). SAMHSA now requires grantees to provide HIV testing and access to HIV testing in specialty addiction treatment services centers. On-site testing substantially enhances testing and awareness of HIV status. Participants enrolled in a randomized trial were 4.5 times more likely (adjusted relative risk rate) to report receiving HIV testing results 30 days post testing when tested on-site using rapid testing with HIV counseling (80% received test results) and without counseling (95% received test results) versus individuals referred off-site (18% received test results) (Metsch et al., 2012). Within

the on-site testing groups, HIV risk reduction counseling provided no additional benefit in terms of receiving test results. Subgroup analyses found that HIV counseling was associated with a reduction in needle sharing among injection drug users (Metsch et al., 2012). Unfortunately, the study did not examine racial/ethnic variation in response to on-site HIV testing. Addiction treatment programs, on the front lines of public health, have a unique opportunity and responsibility to provide on-site HIV testing and to contribute to more aggressive HIV testing and treatment interventions (Guerrero & Cederbaum, 2011).

Risk Reduction Services

HIV testing is a standard healthcare practice to identify people with HIV infection for treatment and intervention. Risk reduction strategies that directly address the HIV risks associated with injection drug use, however, generate debate, controversy, and resistance in the U.S. Many individuals, including some leaders in minority communities view certain interventions to reduce health risks (e.g., syringe exchanges, over the counter pharmacy sales of syringes, safer injection rooms, and heroin-assisted treatment for addiction) as enabling drug use and violating laws prohibiting the possession and use of illicit substances (Bowen, 2012). These attitudes persist despite a lack of evidence that risk reduction services promote drug use (National Research Council and Institute of Medicine, 1995; Wood et al., 2010)

Syringe Exchange

Syringe exchanges seek to replace used syringes with sterile syringes, increase access to sterile injection equipment, reduce syringe sharing, and inhibit the spread of HIV and hepatitis infections. Pioneers in syringe exchange observed reductions in the frequency of injection with used syringes and increased use of bleach to disinfect syringes but were unable to expand operations because of legal barriers (Hagan, Des Jarlais, Purchase, Reid, & Friedman, 1991). Analysis of the residue in used syringes documented reductions in the prevalence of HIV RNA or antibodies to HIV in returned syringes in New Haven, Connecticut (Heimer, Kaplan, Khoshnood, Jarlwala, & Cadman, 1993) solidifying the public health value of syringe exchange. International evidence similarly supports the effectiveness, safety, and cost-effectiveness of syringe exchange programs (Wodak & Cooney, 2006).

Evidence of the effectiveness of syringe exchange encouraged advocacy and services expanded slowly. San Francisco's syringe exchange program demonstrated reductions in shared needle use and did not find evidence of either increased drug use among users or initiation of injection among individuals new to drug use (Watters, Estilo, Clark, & Lorvick, 1994). Individuals using syringe exchanges in New York City had lower HIV incidence rates than those not using syringe exchanges (in these analyses, neither age nor race/ethnicity had a significant association with seroconversion rates) (Des Jarlais et al., 1996). Between 1990 and 2008, admission interviews at a New York City detoxification center assessed HIV prevalence and HIV risk behaviors among individuals who injected drugs; HIV prevalence and needle sharing declined after legalization and widespread implementation of syringe exchanges (1990 – 1994 = pre; 1995 – 2008 = post) (Des Jarlais et al., 2009). Rates of HIV infection were higher among non-Hispanic Black and Hispanic injection drug users both before and after the expansion of syringe exchanges; reductions in prevalence, moreover, were proportionate across race/ethnic groups (Des Jarlais et al., 2009). Non-Hispanic Blacks compared to Whites were less likely to share syringes or engage in unprotected sex following expanded access to syringe exchanges; an increased prevalence of injection risk and sex risk behaviors, therefore, did not explain the elevated rates of HIV prevalence among non-Hispanic Blacks (Des Jarlais et al., 2009).

Proximity to locations where sterile syringes were available was also associated with increased use of sterile syringes; legalization of over-the-counter sale of syringes within New York City increased use of sterile syringes (Cooper et al., 2011). Race/ethnicity were included as covariates in the analysis and relative to Hispanics, non-Hispanic Whites were about 20% less likely to use sterile syringes and differences between Hispanics and non-Hispanic Blacks were not significant (Cooper et al., 2011). Paradoxically, non-Hispanic Blacks who inject drugs have lower rates of risk behaviors and higher rates of HIV infection (Cooper et al., 2012; Cooper et al., 2011; Des Jarlais et al., 2009).

The strong evidence that syringe exchange reduced HIV infection among injection drug users led states to improve access to sterile syringes. In 2009, 184 syringe exchange programs operated in 36 states, Washington DC, and Puerto Rico (Guardino et al., 2010). Syringe exchange programs (n = 123) responding to a survey reported exchanging 29.1 million needles and a total annual budget of $21.3 million (Guardino et al., 2010). Services included referrals for drug treatment (89%), HIV counseling and testing (87%), and counseling and testing for hepatitis C virus (65%) (Guardino et al., 2010).

Syringe exchange programs are not a panacea. Many injection drug users continue to have limited access to sterile syringes, continue to reuse and share injection equipment (Wood et al., 2002), and engage in high risk sexual behavior. Syringe exchanges may not protect against hepatitis (B and C) infection (Hagan et al., 1999); although a more recent systematic review and meta-analysis reported protective effects (Hagan, Pouget, & Des Jarlais, 2011). Because of uneven progress toward suppressing HIV and hepatitis C infection, advocates promote more aggressive risk reduction interventions including “safer injection sites” for PWID.

Safer Injection Sites

Safer injection sites permit drugs to be injected or smoked under medical supervision. Only one legally authorized supervised injection site operates in North America. Insite opened in 2003 in Vancouver, British Columbia with an exemption from Canada's *Controlled Drugs and Substances Act* as a health facility under a three year pilot initiative with requirements for rigorous evaluation (Small, 2010; Wood et al., 2004). Modeled after programs in Europe and Australia, Insite provides alcohol swabs, clean water and sterile syringes; medical supervision teaches safer injection practices and responds to overdoses (Wood et al., 2004). Evaluation studies suggest that Insite contributed to reduced sharing of syringes (Kerr, Tyndall, Li, Montaner, & Wood, 2005), increased referrals to addiction counseling (Tyndall, Kerr, King, Montaner, & Wood, 2005; DeBeck et al., 2011), reduced overdoses (Kerr, Tyndall, Lai, Montaner, & Wood, 2006), reduced overdose mortality (Marshall, Milloy, Wood, Montaner, & Kerr, 2011), and increased cessation of drug use (DeBeck et al., 2011).

Despite evidence of positive impact on health, Canada's federal government declined to renew the waiver and moved to close Insite (Drucker, 2006; Small, 2010). Court proceedings delayed the closure. Ultimately, the Supreme Court of Canada ruled unanimously (September 30, 2011) that denial of the waiver would prevent “injection drug users from accessing the health services offered by Insite, threatening their health and indeed their lives” (p. 9). The court decision asserted that denial of the waiver “undermines the very purposes of the [*Controlled Drug and Substances Act*] – the protection of health and public safety” (p. 10). The ruling ordered the Minister of Health to grant an exemption to the *Controlled Drug and Substances Act* and allow Insite to continue to operate (Canada v. PHS Community Services Society, 2011). The controversy illustrates an ongoing tension between criminal justice and public health perspectives (i.e., drug use is illegal and cannot be “condoned” versus public health interventions can attenuate harms related to drug use). In this case, the Canadian Supreme Court decision supported a public health perspective.

Agonist Therapy

Participation in methadone maintenance substantially reduces the risk of HIV infection (Metzger et al., 1993) and is the current standard of care for opioid dependent HIV patients (Thompson et al. 2012). Agonist therapy (i.e., methadone maintenance and, more recently, buprenorphine/naloxone therapy) however, is not effective with all patients; some patients continue to use opioids and other drugs. A more controversial agonist, heroin assisted treatment, is available in some countries.

Heroin's reputation as the hardest drug and decades of efforts to eradicate production and use of heroin inhibit viewing diacetylmorphine as simply opioid agonist medication. Many citizens and public officials see an unacceptable legalization of drug use. A more nuanced assessment notes high rates of continued opioid use among some patients enrolled in agonist treatment, relatively rapid rates of treatment departure from agonist therapies, and women and men with treatment refractory histories. For individuals whose opioid use disorder is not responsive to current agonist therapies, diacetylmorphine might be an appropriate therapeutic option (Berridge, 2009; Kerr, Montaner, & Wood, 2010).

A Cochrane review of 8 trials of treatment with diacetylmorphine concluded that heroin assisted treatment for treatment refractory opioid users was associated with improved treatment retention, reduced illicit drug use, and less criminal activity (Ferri, Davoli, & Perucci, 2011). In England, diacetylmorphine has been available for patients non-responsive to methadone treatment (Berridge, 2009; Fischer et al., 2002). Switzerland implemented heroin-assisted treatment in 1994; a retrospective chart review found 1,969 individuals admitted to 21 clinics between January, 1994 and December, 2000 (Rehm et al., 2001). Heroin-assisted treatment is available in the Netherlands for individuals who continue to use heroin while enrolled in methadone treatment – methadone dosing continues and patients receive supervised heroin during the day. Dutch investigators assert that heroin assisted treatment leads to better health and lower criminal involvement (Blanken et al., 2010; van den Brink, Hendriks, & van Ree, 1999).

A Canadian trial (the North American Opiate Medication Initiative) completed in Montreal and Vancouver found improved 12 month treatment retention among 115 individuals receiving diacetylmorphine (88%) relative to 111 individuals randomized to methadone (54%); reductions in illicit drug use and illegal activity were more likely among participants receiving diacetylmorphine (67%) versus methadone (48%) (Oviedo-Joekes et al., 2009). At 12 months post-baseline, health related quality of life improved for most (55%) (study groups did not differ) through improved housing, fewer medical events, and reductions in use of illicit drugs (Nosyk et al., 2011). Adverse events, however, including overdose and seizures were more common among the diacetylmorphine study participants (Oviedo-Joekes et al., 2009). A cost-effectiveness analysis suggested that relative to methadone, diacetylmorphine treatment for treatment refractory patients was associated with reduced societal costs through reductions in criminality and improved duration and quality of life (Nosyk et al., 2012)

Access to ART

Antiretroviral therapy (ART) is the current standard of care for treating HIV infection in the U.S. and an emerging strategy for prevention of infection among sexual partners of individuals infected with HIV (Cohen et al., 2011). Historically, injection drug use reduced the probability of being treated with ART. HIV patients (n = 2,267) enrolled in the HIV Cost and Services Utilization Study (HCSUS) were assessed in 1996 and reassessed in 1998; access to ART increased from 37% to 71%, but compared to men who have sex with men, individuals who injected drugs had lower rates of ART (Cunningham et al., 2000). The

HCSUS analysis also reported that non-Hispanic Blacks were less likely to receive ART; unfortunately the interaction between injection drug use and race/ethnicity was not reported. Within a cohort of 565 HIV infected injection drug users living in Baltimore (94% non-Hispanic Black), about one in three individuals eligible for ART never received it, and among those who continued to inject drugs there was a 50% reduction in the probability of initiating ART. Participation in methadone treatment improved the likelihood of initiating ART to 68% (Celentano et al., 2001). In the Baltimore analysis, hazard ratios suggested that non-Hispanic Blacks were 17% more likely to receive ART. Two additional analyses found that injection drug users enrolled in treatment for drug use disorders had increased odds of receiving antiretroviral therapy (Celentano et al., 1998; Strathdee et al., 1998). Analyses in British Columbia, however, reported that the odds of not receiving antiretroviral therapy were 2.5 times greater among women who injected drugs (Strathdee et al., 1998).

Data from the HIV Research Network suggest that the disparities in access to ART persist; non-Hispanic Black and injection drug users had lower odds of receiving ART (Gebo et al., 2005). In theory, ART should be equally effective for all racial/ethnic groups of drug injectors. The HIV Research Network also reported that adherence to ART was lower among current drug users (60% were adherent) compared to former users (68%) and never users (77%) (Hicks et al., 2007). Most of the analyses did not report interactions between race/ethnicity, injection drug use and the receipt of ART.

The current treatment guidelines for HIV care recommend ART for patients with substance use disorders, agonist therapy for patients using heroin and other opioids, and combined use of ART and agonist therapy (Thompson et al., 2012). An assessment of practitioners and their willingness to begin antiretroviral therapy with PWID, however, found many prescribers reluctant to initiate antiretroviral therapy with HIV infected individuals who inject drugs (Westergaard, Ambrose, Mehta, & Kirk, 2012). These findings raise concern about the ability of PWID to access quality HIV services.

Access to Quality HIV Care

Quality of HIV care appears to be lower among PWID. HIV mortality rates, for example, were 50% higher among injection drug users in an analysis of AIDS cases reported to the CDC between 1996 and 2002 (Hall, McDavid, Ling, & Sloggett, 2006). Following the introduction of ART, injection drug user survival rates improved (Galai et al., 2005). A British Columbia analysis, moreover, reported no difference in survival rates between injection drug users and non-drug users when treated with ART (Wood et al., 2008). HIV quality of care indicators and health related quality of life scores improved among patients receiving buprenorphine in the Buprenorphine and HIV Evaluation and Support Demonstration (BHIVES) (Korthuis et al., 2011; Korthuis et al., 2011). When drug users are engaged in HIV treatment, quality of care and outcomes appear to be comparable with other patient populations. Race/ethnicity was not examined in the quality of care analyses.

Seek, Test, Treat and Retain

Modeling studies suggest substantial potential for reductions in the spread of HIV if individuals begin ART early in the course of HIV infection (Blower, Gershengorn, & Grant, 2000). Analyses from San Francisco (Das et al., 2010) and Vancouver (Montaner et al., 2010) noted that increased utilization of ART was associated with reductions in HIV community viral load and reductions in new HIV diagnoses. These studies support the value of expanding access to HIV testing and treatment among groups at highest risk for HIV infection. As a result of the research, Nora Volkow, Director of the National Institute on Drug Abuse, and Julio Montaner, Director of the British Columbia Centre for Excellence in HIV/AIDS, advocated for more aggressive HIV testing and treatment among women and

men with substance use disorders using a model of care that seeks, tests, treats, and retains substance users in HIV treatment (Volkow & Montaner, 2010; Volkow & Montaner, 2011). The "Seek, Test, Treat and Retain" model of care promotes aggressive outreach (seek) and routine testing for HIV infection (test) among individuals at risk of HIV infection. Current studies examine assertive HIV treatment strategies (treat) and methods to retain infected patients in care (retain). Effective interventions among populations of individuals with drug use disorders may help identify methods and strategies that also enhance treatment effectiveness among HIV-infected patients without histories of drug use disorders.

Treatment for Drug Use Disorders

Active drug use increases risk for HIV infection. Access to addiction treatment services, however, can be difficult. Nationwide, about 22 million individuals aged 12 years and older meet criteria for a diagnosis of substance abuse or dependence including 7 million abusing or dependent on illicit drugs; each year about 2 to 4 million individuals enter treatment for a substance use disorder (Substance Abuse and Mental Health Services Administration, 2012). Most (95%) of the untreated individuals reported "they did not need treatment" (Substance Abuse and Mental Health Services Administration, 2012). Among those seeking treatment, barriers to care include waiting lists and services that are not integrated with primary care.

Waiting Lists

Three-quarters of the addiction treatment services in the United States are financed through public resources (e.g., Medicaid, State and County appropriations, and the Substance Abuse Prevention and Treatment Block Grant) (Mark et al., 2007; Mark, Levit, Vandivort-Warren, Buck, & Coffey, 2011). These resources are limited and delays in accessing addiction treatment services are common. The Substance Abuse Prevention and Treatment Block Grant (the primary federal allocation for substance abuse prevention and treatment services) prioritizes access to treatment for injection drug users to reduce HIV risks. Other patients, however, may encounter waits for treatment admission. Secondary analyses of the 2005 National Survey of Substance Abuse Treatment Services suggested that program cultural sensitivity, specifically managers' beliefs about cultural sensitivity, was associated with reductions in wait time and improvements in retention among racial and ethnic minorities; these beliefs may be critical to reductions in wait time and enhanced retention in care within programs that treat Hispanic and non-Hispanic Black patients (Guerrero & Andrews, 2011).

Process improvement strategies reduced days to admission by 40% in two cohorts of publicly-funded addiction treatment centers (Hoffman, Ford, Choi, Gustafson, & McCarty, 2008; McCarty et al., 2007). Improved access to care was also associated with enhanced retention in care (Hoffman, Ford, Tillotson, Choi, & McCarty, 2011). Widespread application of process improvement strategies could be associated with substantial reductions in wait times and enhanced retention in care (McCarty, Capoccia, Gustafson, & Cotter, 2009; McCarty, Capoccia, & Gustafson, 2009).

Integration with Primary Care

The 2010 Affordable Care Act and the 2008 Mental Health Parity and Addiction Equity Act are stimulating system reforms that support integration of addiction treatment into primary care settings and better align financial incentives to deliver evidence-based addiction treatments (Barry & Huskamp, 2011; Buck, 2011). Integrating care for drug and alcohol use disorders into primary care may improve the quality and effectiveness of care (Samet, Friedmann, & Saitz, 2001). The Office of National Drug Control Policy (ONDCP) promotes the integration of addiction treatment into mainstream health care and directs the Health Resources and Services Administration and the Indian Health Service to expand the capacity

of more than 9,000 federally qualified health centers and rural health centers to treat addiction (Office of National Drug Control Policy, 2010; 2011). The ONDCP initiatives reflect a substantive change in federal policy – the allocation of drug abuse treatment resources to primary care rather than to specialty addiction treatment. It remains to be demonstrated if this transfer in treatment point-of-care will improve treatment access and adherence for minorities currently underserved by HIV treatment programs.

The shape of the future addiction treatment system is to some extent dependent on the future of healthcare reform. System reformulations may vary by state. Oregon, for example, has moved Medicaid recipients into Coordinated Care Organizations – patient centered primary care medical homes. The Coordinated Care Organizations alter the organization and financing of care by integrating physical and behavioral health care in a single point of accountability to increase access to care, control healthcare costs, and improve health outcomes using global budgets and shared savings to promote quality of care rather than quantity of care. While healthcare transformation may enhance access to primary care, the future of specialty addiction treatment centers is uncertain and access to specialty treatment for alcohol and drug use disorders could be reduced. Research should monitor utilization of treatment services for alcohol and drug use disorders and assess both anticipated and unanticipated consequences of reforms in healthcare, and who is most negatively affected.

If improved access to addiction and HIV services is fully implemented in HIV primary care, it may narrow the gap in HIV infection and treatment rates among individuals with histories of alcohol and drug use disorders. The time is right for a renewed investment in eliminating barriers to access and encouraging full participation in treatment for co-occurring HIV and drug addictions. As in many areas of health disparities such as heart disease and diabetes, improving prevention and treatment outcomes enhanced access to screening and treatment and lowered population rates of disease-specific mortality; gaps between majority and minority groups, however, persisted (Institute of Medicine, 2003). Continued research is required to better understand the persistence of health disparities if healthcare reform enhances access to insurance coverage.

Discussion

Data on the prevalence of HIV infection highlight both race/ethnic differences in rates and disparities in acceptance and use of interventions among persons who inject drugs – in the U.S. and internationally. In general, PWID who belong to racial/ethnic minority groups are twice as likely to be HIV seropositive as PWID who belong to majority groups, notwithstanding variability in estimates among the studies. Most importantly, many of the individual studies did not examine potential racial/ethnic differences in the study outcomes. The review of interventions and services identified evidence-based HIV prevention and treatment services that reduce the spread of HIV infection. The lack of data on the interaction of race and ethnicity with the effectiveness and utilization of the services is disappointing and highlights a need for more analyses of the associations between race/ethnicity,injection drug use, and possible explanations of differences.

HIV treatments and services for PWID struggle with challenges of reaching underserved groups in America and elsewhere. The problem, succinctly captured within “Seek, Test, Treat, and Retain” models of care, challenges health care systems to establish relations of trust and empathy and mitigate adverse effects of cultural isolation and structural factors. Health disparities in the U.S. are affected by race, ethnicity, sex, and social class as “dominant” social categories linked to social disadvantage. Limitations in current intervention approaches leave investigators at an impasse with unresolved concerns: PWID continue to engage in behaviors that endanger their health and they evade and avoid well

intentioned efforts and opportunities to access clean needles, use condoms, and get tested, counseled and treated in spite of presumably well-designed policies and programs.

Most persons who inject drugs are vulnerable, live in disempowered communities, and often distrust mainstream services and care. Effective research and practices acknowledge the nuance and complexity within and among ethnic groups in their response to interventions, reflecting the current movement in translational science toward evidenced-based protocols in systems of care, and adapt interventions to increase consumer acceptance and adherence. Ultimately, the challenge for treatment providers is, as always, identification of individual client/consumer variability in response to interventions.

Distribution Networks May Contribute to Disparities

Developing possible explanations for the disparities requires examining more distal psychological, social network, sociological and economic influences that contribute to more frequent sharing, more sharing with HIV seropositive injecting partners or both.

The elevated summary odds ratios for the US and China found in the meta-analysis of international data on HIV prevalence (Des Jarlais et al., 2012) suggest that drug distribution networks may contribute to ethnic minority group members being more likely to share injecting equipment with HIV seropositive partners. Illicit drug distribution frequently occurs in highly segregated ethnic minority communities of concentrated poverty. Historically, drug distribution in the US has been situated within inner city ethnic minority neighborhoods (Courtwright, Joseph, & Des Jarlais, 1989). Drug distribution routes in southern China (and Southeast Asia as a whole), similarly, pass through ethic minority communities (Beyrer, Razak, Lisam, Chen, & Lui, 2000; Stimson, 1994). HIV tends to spread along drug distribution routes (Beyrer et al., 2000; D'Aquila, Peterson, Williams, & William, 1989; Stimson, 1994) and would likely be introduced into ethnic minority neighborhoods first as a consequence.

Most people inject in the neighborhoods where they reside with others living in the same neighborhoods. Thus HIV may spread first among ethnic minority groups and then later to ethnic majority groups living in other neighborhoods. The social networks of ethnic minority drug users in drug distribution/high drug use neighborhoods may also be particularly large (many members) and particularly dense (with many members connected to each other) (Friedman, Curtis, Neaigus, Jose, & Des Jarlais, 1999; Friedman et al., 1990). Drug injectors living in these neighborhoods may have more opportunity to inject with and share syringes with other drug injectors. Persons in the acute stage of HIV infection (very recently infected), moreover, have greater potential for HIV transmission than persons in later stages of HIV infection (Miller, Rosenberg, Rutstein, & Powers, 2010). The social network structure within drug distribution neighborhoods and the increased infectiousness associated with acute infection may interact to greatly increase the rapidity of HIV transmission after HIV is introduced into neighborhoods where drug distribution is concentrated.

There are, of course, many social factors that could lead to drug distribution being concentrated in ethnic minority areas, including racism and stigmatization, social isolation, poverty and lack of employment opportunities in legal occupations. New York City, for example, has a pattern of ethnic succession in drug distribution, with street-level distribution of illicit narcotics first controlled by Jewish, then Italian and then African-American criminal organizations (Courtwright et al., 1989). Involvement in illicit narcotics distribution was not a function of the characteristics of the ethnic minority group per se, but rather the minority group's position in successive waves of immigration (including internal immigration) into the city and the residential concentration of ethnic groups in certain areas.

Changing Drug Use Behavior

In summary, analyses of time series data from New York City finds persistent declines in self-reported HIV risk behaviors among injection drug users and suggests that increased access to HIV risk reduction programs contributes to reductions in risk behavior (Des Jarlais et al., 2000) and the incidence of HIV infection among drug users (Des Jarlais et al., 2000; Des Jarlais et al., 2005). The World Health Organization's study of behavior change among injection drug users in 11 international communities found consistent self-reported declines in HIV risk behaviors (Des Jarlais, Friedmann, Hagan, & Friedman, 1996). Similarly, the system of progressive risk reduction services and aggressive treatment for HIV-infected injection drug users in Vancouver, British Columbia appears to contribute to reduced community viral loads and declines in new HIV infections (Montaner et al., 2010).

The observed reductions in HIV risk behaviors in different communities and countries suggest that the culture and norms of injection drug use have changed to increase the prevention of HIV infection and transmission. Drug users can become very competent in understanding HIV transmission, reducing HIV risk behavior and protecting themselves and others from HIV risks (Booth, Des Jarlais, & Friedman, 2009). Communities can use assertive services to improve community health and reduce the contribution of injection drug use to HIV infection and disproportionate impacts on racial and ethnic minorities.

State of Knowledge/State of Action

At present, our understanding of racial/ethnic disparities in HIV infection among PWID is far from satisfactory. We know that such disparities exist in many countries and that there is great variation in the size of the disparities—with many instances of no significant differences between majority/minority groups, and a few instances where majority group members had significantly higher HIV prevalence. The concentration of drug distribution networks in minority neighborhoods in many cities is one likely cause for racial/ethnic disparities, but there are undoubtedly other important contribution factors to the disparities. The factors that perpetuate racial/ethnic disparities in HIV infection are also not necessarily the same as the factors that initially generate the disparities in addiction rates. Incomplete data are a major concern in trying to understand health disparities more generally. As noted throughout this paper, many studies simply did not report on possible racial/ethnic differences. Despite the limits of our understanding of racial/ethnic disparities in HIV infection among PWID, the various interventions reviewed above are sufficiently effective that we should be making full public health efforts to eliminate HIV transmission through sharing injection equipment among all PWID, both ethnic majority and ethnic minority group members. This will require that evidence-based programs be targeted to all groups of PWID, and implemented in a culturally appropriate, “user-friendly” manner.

Failures of Leadership

Disappointed with reluctance to adopt evidence-based practices that reduce HIV risk behaviors (e.g., syringe exchange, safer injection sites, and heroin-assisted treatment), participants at the XVII International AIDS Conference (2010) in Vienna endorsed *The Vienna Declaration* calling for drug policy based on evidence, not ideology and stigma (Wood et al., 2010). The Declaration asserts that barriers to accessing sterile syringes and to opioid substitution treatment perpetuate HIV epidemics among persons who inject drugs. Criminalization of drug use forces drug users into clandestine activity and inhibits use of HIV prevention services. The position statement calls for a transparent review of current drug control policies, implementation of science-based public health interventions to address harms associated with the use of illicit drugs, decriminalization of possession for personal use, support for a comprehensive set of HIV prevention and treatment interventions, and

inclusion of the affected communities in the development of services and policies (Wood et al., 2010).

A strong argument can be made that HIV transmission among persons who inject drugs, and particularly among ethnic minority persons who inject drugs, remains unnecessarily elevated not because drug users fail to utilize prevention and treatment programs, but because communities neglect to implement evidence-based programs. Services that combine evidence-based programs, including needle/syringe access programs, treatment for drug dependence, HIV counseling and testing, and anti-retroviral treatment, and adequate cultural and linguistic adapatations may be sufficient to virtually eliminate injecting-related HIV transmission among both ethnic majority and ethnic minority drug injectors (Des Jarlais et al., 2010). Large-scale implementation of evidence-based programming, however, both in the US and world-wide, is typically inadequate (Degenhardt et al., 2010; Mathers et al., 2010). The failure to implement evidence-based programs can include complete failure to implement programs or failure to implement programs at an adequate scale. The challenge is to implement effective interventions within a framework that assures accessibility to and effectiveness among racial/ethnic minority PWID. We almost certainly have the tools to reduce HIV transmission among both racial/ethnic minority and majority PWID to near zero (Institute of Medicine, 2006). It is now a matter of summoning the will to apply those tools within a framework of social justice and human rights (Des Jarlais, Arasteh, & Gwadz, 2010).

Acknowledgments

Preparation of this manuscript was supported in part by awards from the National Institute on Drug Abuse (U10 DA015815, R01 DA029716) and R01 DA003574).

References

Barry CL, Huskamp HA. Moving beyond parity -- mental health and addiction care under the ACA. New England Journal of Medicine. 2011; 365:973–975. [PubMed: 21848453]

Berridge V. Heroin prescription and history. New England Journal of Medicine. 2009; 361:820–821. [PubMed: 19692694]

Beyrer C, Razak MH, Lisam K, Chen J, Lui W. Overland heroin trafficking routes and HIV-1 spread in South and Southeast Asia. AIDS. 2000; 17:75–83. [PubMed: 10714570]

Blanken P, van den Brink W, Hendriks VM, Huijsman IA, Klous MG, Rook EJ, Van Ree JM. Heroin-assisted treatmetn in the Netherlands: Histroy, findings, and international context. European Neuropsychopharmacology. 2010; 20:S105–S158. [PubMed: 20362236]

Blower SM, Gershengorn HB, Grant RM. A tale of two futures: HIV and antiretroviral therapy in San Francisco. Science. 2000; 287:650–654. [PubMed: 10649998]

Booth RE, Crowley TJ, Zhang Z. Substance abuse treatment entry, retention and effectiveness: Out-of-treatment opiate injection drug users. Drug and Alcohol Dependence. 1996; 42:11–20. [PubMed: 8889399]

Booth RE, Des Jarlais DC, Friedman SR. Reflections on 25 years of HIV and AIDS research among drug abusers. Journal of Drug Issues. 2009; 39:209–222.

Booth RE, Kwiatkowski CF, Stephens RC. Effectiveness of HIV/AIDS interventions on drug use and needle risk rehaviors for out-of-treatment injection drug users. Journal of Psychoactive Drugs. 1998; 30:269–278. [PubMed: 9798793]

Bowen EA. Clean needles and bad blood: Needle exchange as morality policy. Journal of Sociology & Social Welfare. 2012; 39:121–141.

Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, Clark JE. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. Morbidity and Mortality Weekly Report. 2006; 55:1–17. [PubMed: 16410759]

Brown LS, Kritz SA, Goldsmith RJ, Bini EJ, Robinson J, Alderson D, Rotrosen J. Health services for HIV/AIDS, Hepatitis C virus, and sexually transmitted infections in substance abuse treatment programs. Public Health Reports. 2007; 122:441–451. [PubMed: 17639646]

Buck JA. The looming expansion and transformation of public substance abuse treatment under the Affordable Care Act. Health Affairs. 2011; 30:1402–1410. [PubMed: 21821557]

Canada v. PHS Community Services Society, Supreme Court of Canada 44, Docket 33556. 2011. http://scc.lexum.org/decisia-scc-csc/scc-csc/scc-csc/en/7960/1/document.do

Carlson RG, Singer M, Stephens RC, Sterk CE. Reflections on 40 years of ethnographic drug abuse research: Implications for the future. Journal of Drug Issues. 2009; 39:57–70.

Celentano DD, Galai N, Sethi AK, Shah NG, Strathdee SA, Vlahov D, Gallant JE. Time to initiating highly active antiretroviral therapy among HIV-infected injection drug users. AIDS. 2001; 15:1707–1715. [PubMed: 11546947]

Celentano DD, Vlahov D, Cohn S, Shadle VM, Obasanjo O, Moore RD. Self-reported antiretroviral therapy in injection drug users. Journal of the American Medical Association. 1998; 280:544–546. [PubMed: 9707145]

Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, Fleming TR. Prevention of HIV-1 infection with early antiretroviral therapy. New England Journal of Medicine. 2011; 365:493–505. [PubMed: 21767103]

Cooper, H.; Hedges, LV.; Valentine, JC. The Handbook of Research Synthesis and Meta-Analysis. Russell Sage Foundation; New York: 2009.

Cooper HL, Des Jarlais DC, Tempalski B, Bossak B, Ross Z, Friedman SR. Drug-related arrests rates and spatial access to syringe exchange programs in New York City health districts: Combined effects on the risk of injection-related infections among injectors. Health and Place. 2012; 18:218–228. [PubMed: 22047790]

Cooper HLF, Des Jarlais DC, Ross Z, Tempalski B, Bossak B, Friedman SR. Spatial access to syringe exchange programs and pharmacies selling over-the-counter syringes as predictors of drug injector' use of sterile syringes. American Journal of Public Health. 2011; 101:1118–1125. [PubMed: 21088267]

Courtwright, D.; Joseph, H.; Des Jarlais, D. Addicts Who Survived: An Oral History of Narcotic Use in America, 1923-1965. The University of Tennessee Press; Knoxville, TN: 1989.

Coyle, SL. The NIDA HIV Counseling and Education Intervention Model: Intervention Manual. National Institute on Drug Abuse; Rockville, MD: 1993. vols. NIH Publication No. 93-3580

Cunningham WE, Markson LE, Andersen RM, Crystal SH, Fleishman JA, Golin C, Wenger NS. Prevalence and predictors of highly active antiretroviral therapy use in patient with HIV infection in the United States. Journal of Acquired Immune Deficiency Syndromes. 2000; 25:123.

D'Aquila R, Peterson L, Williams A, William A. Race/ethnicity as a risk factor for HIV-1 infection among Connecticut intravenous drug users. Journal of Acquired Immune Deficiency Syndromes. 1989; 2:513.

Das M, Chu PL, Santos G-M, Scheer S, Vittinghoff E, McFarland W, Colfax GN. Decreases in community viral load are accompanied by reductions in new HIV infections in San Francisco. PLOS One. 2010; 5:1–9.

DeBeck K, Kerr T, Bird L, Zhang R, Marsh D, Tyndall MW, Wood E. Injection drug use cessation and use of North America's first medically supervised safer injecting facility. Drug and Alcohol Dependence. 2011; 113:172–178. [PubMed: 20800976]

Degenhardt L, Mathers B, Vickerman P, Rhodes T, Latkin C, Hickman M. Prevention of HIV infection for people who inject drugs: Why individual, structural, and combination approaches are needed. Lancet. 2010; 376:285–301. [PubMed: 20650522]

Des Jarlais DC, Arasteh K, Gwadz M. Increasing HIV prevention and care for injecting drug users. Lancet. 2010; 375:961–963. [PubMed: 20189639]

Des Jarlais DC, Arasteh K, Hagan H, McKnight C, Perlman DC, Friedman SR. Persistence and change in disparities in HIV infection among injection drug users in New York City after large-scale syringe exchange programs. American Journal of Public Health. 2009; 99:S445–S451. [PubMed: 19797757]

Des Jarlais DC, Arasteh K, McKnight C, Hagan H, Perlman DC, Torian L, Friedman SR. HIV infection during limited versus combined HIV prevention programs for IDUs in New Yourk City: The importance of transmission behaviors. Drug and Alcohol Dependence. 2010; 109:154–160. [PubMed: 20163922]

Des Jarlais DC, Cooper H, Bramson H, Deren S, Hatzakis A, Hagan H. Racial and ethnic disparities and implications for the prevention of HIV among persons who inject drugs. Current Opinion in HIV and AIDS. 2012; 7:354–361. [PubMed: 22498481]

Des Jarlais DC, Friedmann P, Hagan H, Friedman SR. The protective effect of AIDS-related behavioral change among injection drug users: A cross-national study. American Journal of Public Health. 1996; 86:1780–1785. [PubMed: 9003137]

Des Jarlais DC, Marmor M, Friedmann P, Titus S, Aviles E, Deren S, Monterroso E. HIV incidence among injection drug users in New Yourk City, 1992 – 1997: Evidence for a declining epidemic. American Journal of Public Health. 2000; 90:352–359. [PubMed: 10705851]

Des Jarlais DC, Marmor M, Paone D, Titus S, Shi Q, Perlis T, Friedman SR. HIV incidence among injecting drug users in New York City syringe-exchange programmes. Lancet. 1996; 348:987–991. [PubMed: 8855855]

Des Jarlais DC, Perlis T, Arasteh K, Torian LV, Beatrice S, Milliken J, Friedman SR. HIV incidence among injection drug users in New York City, 1990 to 2002: Use of serologic test algorithm to assess expansion of HIV prevention services. American Journal of Public Health. 2005; 95:1439–1444. [PubMed: 15985649]

Des Jarlais DC, Perlis T, Friedman SR, Chapman T, Kwok J, Rockwell R, Monterroso E. Behavioral risk reduction in a declining HIV epidemic: Injection drug users in New York City, 1990 – 1997. American Journal of Public Health. 2000; 90:1112–1116. [PubMed: 10897190]

Drucker E. Insite: Canada's landmark safe injecting program at risk. Harm Reduction Journal. 2006; 3:1–3. [PubMed: 16403229]

Ferri M, Davoli M, Perucci CA. Heroin maintenance for chronic heroi-dependent individuals. The Cochrane Library. 2011; 2011

Fischer B, Rehm J, Kirst M, Casas M, Hall W, Krausz M, van Rhee JM. Heroin-assisted treatment as a response to the public health problem of opiate dependence. European Journal of Public Health. 2002; 12:228–234. [PubMed: 12232964]

Friedman, SR.; Curtis, R.; Neaigus, A.; Jose, B.; Des Jarlais, DC. Social Network, Drug Injector Lives and HIV/AIDS. Kluwer Academic; New York: 1999.

Friedman SR, Des Jarlais DC, Sterk CE. AIDS and the social relations of intravenous drug users. Milbank Quarterly. 1990; 68:85–110. [PubMed: 2381380]

Galai N, Vlahov D, Bareta JC, Wang C, Cohn S, Sterling TR. Prognostic factors for survival differe according to CD4 cell count among HIV infected injection drug users: Pre-HAART and HAART eras. Journal of Acquired Immune Deficiency Syndromes. 2005; 38:74–81. [PubMed: 15608529]

Gebo KA, Fleishman JA, Conviser R, Reilly E, Korthuis PT, Moore R, Christopher MW. Racial and gender disparities in recepit f highly active antiretroviral therapy persist in a multistate sample of HIV patients in 2001. Journal of Acquired Immune Deficiency Syndromes. 2005; 38:96–103. [PubMed: 15608532]

Guardino V, Des Jarlais DC, Arasteh K, Johnston R, Purchase D, Solberg A, Lentine D. Syringe exchange programs -- United States, 2008. Morbidity and Mortality Weekly Report. 2010; 59:1488–1491. [PubMed: 21085091]

Guerrero E, Andrews CM. Cultural competence in outpatient substance abuse treatment: Measurement and relationship to wait time and retention. Drug and Alcohol Dependence. 2011; 119:e13–e22. [PubMed: 21680111]

Guerrero EG, Cederbaum JA. Adoption and utilization of sexually trnsmitted infections testing in outpatient substance abuse treatment facilities serving high risk populations in the U.S. International Journal of Drug Policy. 2011; 22:41–48. [PubMed: 20970314]

Hagan H, Des Jarlais DC, Purchase D, Reid T, Friedman SR. The Tacoma syringe exchange. Journal of Addictive Diseases. 1991; 10:81–88. [PubMed: 1777501]

Hagan H, McGough JP, Thiede H, Weiss NS, Hopkins S, Alexander ER. Syringe exchange and risk of infection with hepatitis B and C viruses. American Journal of Epidemiology. 1999; 149:203–213. [PubMed: 9927214]

Hagan H, Pouget ER, Des Jarlais DC. A systematic review and meta-analysis of interventions to prevent hepatitis C virus infection in people who inject drugs. Journal of Infectious Diseases. 2011; 204:74–83. [PubMed: 21628661]

Hall HI, McDavid K, Ling Q, Sloggett A. Determinants of progression to AIDS or death after HIV diagnosis, United States, 1996 to 2001. Annals of Epidemiology. 2006; 16:824–833. [PubMed: 17067817]

Hallfors DD, Iritani BJ, Miller WC, Bauer DJ. Sexual and drug behavior patterns and HIV and STD racial disparities: The need for new directions. American Journal of Public Health. 2007; 97:125–132. [PubMed: 17138921]

Heimer R, Kaplan EH, Khoshnood K, Jarlwala R, Cadman EC. Needle exchane decreases the prevalence of HIV-1 proviral DNA in returned syringes in New Haven, Connecticut. The American Journal of Medicine. 1993; 95:214–220. [PubMed: 8356986]

Hicks PL, Mulvey KP, Chander G, Fleishman JA, Josephs JS, Korthuis PT, et al. The impact of illicit drug use and substance abuse treatment on adherence to HAART. AIDS Care. 2007; 19:1134–1140. [PubMed: 18058397]

Hoffman K, Ford JH, Choi D, Gustafson D, McCarty D. Replication and sustainability of improved access and retention within the Network for the Improvement of Addiction Treatment. Drug and Alcohol Dependence. 2008; 98:63–69. [PubMed: 18565693]

Hoffman KA, Ford JH, Tillotson CJ, Choi D, McCarty D. Days to treatment and early retention among patients in treatment for alcohol and drug disorders. Addictive Behaviors. 2011; 36:643–647. [PubMed: 21324608]

Institute of Medicine. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. National Academies Press; Washington, DC: 2003.

Institute of Medicine. Preventing HIV Infection among Injecting Drug Users in High Risk Countries. National Academies Press; Washington, DC: 2006.

Kerr T, Montaner JSG, Wood E. Science and politics of heroin prescription. Lancet. 2010; 375:1849–1850. [PubMed: 20511000]

Kerr T, Tyndall MW, Lai C, Montaner JSG, Wood E. Drug-related overdoses within a medically supervised safer injection facility. International Journal of Drug Policy. 2006; 17:436–441.

Kerr T, Tyndall MW, Li K, Montaner J, Wood E. Safer injection facility use and syringe sharing in injection drug users. Lancet. 2005; 366:316–318. [PubMed: 16039335]

Koblin B, McCusker J, Lewis B, Sullivan J. Racial/Ethnic differences in HIV-1 seroprevalence and risky behaviors among intravenous drug users in a multisite study. American Journal of Epidemiology. 1990; 132:837–846. [PubMed: 2239898]

Korthuis PT, Fiellin DA, Fu R, Lum PJ, Altice FL, Sohler N, McCarty D. Improving adherence to HIV quality of care indicators in persons with opioid dependence: The role of buprenorphine. Journal of Acquired Immune Deficiency Syndromes. 2011; 56:S83–S90. [PubMed: 21317600]

Korthuis PT, Tozzi MJ, Nandi V, Fiellin DA, Weiss L, Egan JE, Altice FL. Improved quality of life for opioid-dependent patients: Receiving buprenorphine treatment in HIV clinics. Journal of Acquired Immune Deficiency Syndromes. 2011; (Supplement 1):S45.

Lambert, EY.; Wiebel, WW. Introduction. In: Lambert, EY., editor. The Collection and Interpretation of Data from Hidden Populations. National Institute on Drug Abuse; Rockville, MD: 1990. DHHS Publication Number (ADM)90-1678 ed., pp. 1-3

Mark, TL.; Levit, KR.; Coffey, RM.; McKusick, D.; Harwood, HJ.; King, E., et al. National Expenditures for Mental Health Services and Substance Abuse Treatment: 1993 – 2003. Aubstance Abuse and Mental Health Services Administration; Rockville, MD: 2007. SAMHSA Publication No. SMA 07-4227 ed.

Mark TL, Levit KR, Vandivort-Warren R, Buck JA, Coffey RM. Changes in US spending on mental health and substance abuse treatment, 1986 – 2005, and implications for policy. Health Affairs. 2011; 30:284–292. [PubMed: 21289350]

Marshall BDL, Milloy MJ, Wood E, Montaner JSG, Kerr T. Reduction in overdose mortality after the opening of North America's first medically supervised safer injecting facility: A retrospective population-based study. Lancet. 2011; 377:23–29.

Mathers BM, Degenhardt L, Ali H, Wiessing L, Hickman M, Mattick RP, Strathee SA. HIV prevention, treatment and care services for people who inject drugs: A systematic review of global, regional, and national coverage. Lancet. 2010; 375:1014–1028. [PubMed: 20189638]

McCarty, D.; Capoccia, VA.; Gustafson, D. Quality Improvement for Addiction Treatment. In: Ries, R.; Fiellin, D.; Miller, S.; Saitz, R., editors. Principles of Addiction Medicine: Fourth Edition. Lippencott, Williams & Wilkins; New York: 2009. In Richard Ries, David Fiellin, Shannon Miller and Richard Saitz (Eds.) ed., pp. 433-440

McCarty D, Capoccia VA, Gustafson D, Cotter F. Improving care for the treatment of alcohol and drug disorders. Journal of Behavioral Health Services & Research. 2009; 36:52–60. [PubMed: 18259871]

McCarty D, Gustafson DH, Wisdom JP, Ford J, Choi D, Molfenter T, Cotter F. The Network for the Improvement of Addiction Treatment (NIATx): Enhancing access and retention. Drug and Alcohol Dependence. 2007; 88:138–145. [PubMed: 17129680]

Mellins CA, Dolezal C, Brckis-Cott E, Nicholson O, Warne P, Meyer-Bahlburg HFL. Predicting the onset of sexual and drug risk behaviors in HIV-negative youths with HIV-positive mothers: The role of contextual, self-regulation, and social-interaction factors. Journal of Youth and Adolescence. 2007; 36:265–278.

Metsch LR, Feaster DJ, Gooden L, Matheson T, Mandler RN, Haynes L, Colfax GN. Implementing rapid HIV testing with or without risk-reduction counseling in drug treatment centers: Results of a randomized trial. American Journal of Public Health. 2012; 102:1160–1167. [PubMed: 22515871]

Metzger DS, Woody GE, McLellan AT, O'Brien CP, Druley P, Navaline H, Abrutyn E. Human Immunodeficiency Virus seroconversion among intravenous drug users in- and out-of-treatment: An 18 month prospective follow-up. Journal of Acquired Immune Deficiency Syndromes. 1993; 6:1049–1056. [PubMed: 8340896]

Miller W, Rosenberg N, Rutstein S, Powers K. The role of acute and early HIV infection in the sexual transmission of HIV. Current Opinion in HIV and AIDS. 2010; 5:277–282. [PubMed: 20543601]

Montaner JSG, Lima VD, Barrios R, Yip B, Wood E, Kerr T, Kendall P. Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in Breitish Columbia, Canada: A population-based study. Lancet. 2010; 376:532–539. [PubMed: 20638713]

National Institute on Drug Abuse. National Institute on Drug Abuse Community-Based HIV Prevention Research. National Institute on Drug Abuse; Rockville, MD: 1996.

National Research Council and Institute of Medicine. Preventing HIV Transmission: The Role of Sterile Needles and Bleach. National Academy Press; Washington, DC: 1995.

Needle R, Coyle S, Normand J, Lambert E, Cesari H. HIV prevention with drug-using populations -- current status and future prospects: Introduction and overview. Public Health Reports. 1998; 113:4–18. [PubMed: 9722806]

Nosyk B, Guh DP, Bansback NJ, Oviedo-Joekes E, Brissette S, Marsh DC, Anis AH. Cost-effectiveness of diacetylmorphine versus methadone for chronic opioid dependence refractory to treatment. Canadian Medical Association Journal, on-line in advance of print. 2012

Nosyk B, Guh DP, un H, Oviedo-Joekes E, Brissette S, Marsh DC, Anis AH. Health related quality of life trajectories of patients in opioid substitution treatment. Drug and Alcohol Dependence. 2011; 118:259–264. [PubMed: 21546173]

Office of National Drug Control Policy. National Drug Control Strategy 2010. Office of National Drug Control Policy; Washington, DC: 2010.

Office of National Drug Control Policy. National Drug Control Strategy 2011. Office of National Drug Control Policy; Washington, DC: 2011.

Oviedo-Joekes E, Brissette S, Marsh DC, Lauzon P, Guh D, Anis A, Schechter MT. Diacetylmorphine versus methadone for the treatment of opioid addiction. New England Journal of Medicine. 2009; 361:777–786. [PubMed: 19692689]

Pollack HA, D'Aunno T. HIV testing and counseling in the nation's outpatient substance abuse treatment system, 1995 – 2005. Journal of Substance Abuse Treatment. 2010; 38:307–316. [PubMed: 20171038]

Prejean J, Satcher AJ, Durant T, Hu X, Lee LM. Racial/ethnic disparities in diagnoses of HIV/AIDS -- 33 states, 2001 – 2004. Morbidity and Mortality Weekly Report. 2006; 55:121–125. [PubMed: 16467777]

Ramos, R. Chicano intravenous drug users. In: Lambert, EY., editor. The Collection and Interpretation of Data from Hidden Populations. National Institute on Drug Abuse; Rockville, MD: 1990. DHHS Publication Number (ADM)90-1678 ed., pp. 128-145

Rehm J, Gschwend P, Steffen T, Gutzwiller F, Dobler-Mikola A, Uchtenhagen A. Feasibility, safety, and efficacy of injectable heroin prescription for refractory opioid addicts: A follow-up study. Lancet. 2001; 358:1417–1420. [PubMed: 11705488]

Rhodes, F. The Behavioral Counseling Model for Injection Drug Users: Intervention Manual. National Institute on Drug Abuse; Rockville, MD: 1993. vols. NIH Publication No. 93-3579

Rosenbaum, M.; Murphy, S. Women and addiction: Process, treatment and outcome. In: Lambert, EY., editor. The Collection and Interpretation of Data from Hidden Populations. National Institute on Drug Abuse; Rockville: 1990. DHHS Publication Number (ADM)90-1678 ed., pp. 120-127

Samet JM, Friedmann PD, Saitz R. Benefits of linking primary medical care and substance abuse services. Archives of Internal Medicine. 2001; 161:85–91. [PubMed: 11146702]

Small D. An appeal to humanity: Legal victory in favour of North America's only supervised injection facility: Insite. Harm Reduction Journal. 2010; 7:1–3. [PubMed: 20047690]

Stimson GV. Reconstruction of subregional diffusion of HIV infection among injecting drug users in Southeast Asia: Implications for early intervention. AIDS. 1994; 8:1630–1632. [PubMed: 7848607]

Strathdee SA, Palepu A, Cornelisse PGA, Yip B, O'Shaughnessy MV, Montaner JSG, Hogg RS. Barriers to use of free antiretroviral therapy in injection drug users. Journal of the American Medical Association. 1998; 280:547–549. [PubMed: 9707146]

Substance Abuse and Mental Health Services Administration. Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2012. NSDUH Series H-44, HHS Publication No. SMA 12-4713

Thompson MA, Mugavero MJ, Amico KR, Cargill VA, Chang LW, Gross R, Nachega JB. Guidelines for improving entry into and retention in care and antiretroviral adherence for persons with HIV: Evidence-based recommendations from an international association of physicians in AIDS care panel. Annals of Internal Medicine. 2012; 156:817–833. [PubMed: 22393036]

Tyndall MW, Kerr T, King E, Montaner JSG, Wood E. Attendance, drug use patterns, and referrals made from North America's first supervised injection facility. Drug and Alcohol Dependence. 2005; 83:193–198. [PubMed: 16356659]

van den Brink W, Hendriks VM, van Ree JM. Medical co-prescription of heroin to chronic, treatment-resistant methadone patients in the Netherlands. Journal of Drug Issues. 1999; 29:587–608.

Volkow ND, Montaner J. Enhanced HIV testing, treatment, and support for HIV-infected substance users. Journal of the American Medical Association. 2010; 303:1423–1424. [PubMed: 20388900]

Volkow ND, Montaner J. The urgency of providing comprehensive and integrated treatment for substance abusers with HIV. Health Affairs. 2011; 30:1411–1419. [PubMed: 21821558]

Watters JK, Estilo MJ, Clark GL, Lorvick K. Syringe and needle exchange as HIV/AIDS prevention for injection drug users. Journal of the American Medical Association. 1994; 271:115–120. [PubMed: 8264065]

Wechsberg WM. Adapting HIV interventions for women substance abusers in international settings: Lessons for the future. Journal of Drug Issues. 2009; 39:237–243.

Westergaard RP, Ambrose BK, Mehta SH, Kirk GD. Provider and clinic-level correlates of deferring antiretroviral therapy for people who inject drugs: A survey of North American HIV providers. Journal of the International Aids Society. 2012; 15:1–10.

Wiebel, W. The Indigenous Leader Outreach Model: Intervention Manual. National Institute on Drug Abuse; Rockville, MD: 1993. vols. NIH Publication No. 93-3581

Wiebel, WW. Identifying and gaining access to hidden populations. In: Lambert, EY., editor. The Collection and Interpretation of Data from Hidden Populations. National Institute on Drug Abuse; Rockville, MD: 1990. DHHS Publication Number (ADM)90-1678 ed., pp. 4-11

Wodak A, Cooney A. Do needle syringe programs reduce HIV infection among injecting drug users : A comprehensive review of the international evidence. Substance Use & Misue. 2006; 41:777–813.

Wood E, Hogg RS, Dias Lima V, Kerr T, Yip B, Marshall BDL, Montaner JSG. Highly Active Antiretroviral therapy and survival in HIV-infected injection drug users. Journal of the American Medical Association. 2008; 300:550–554. [PubMed: 18677027]

Wood E, Kerr T, Lloyd-Smith E, Buchner C, Marsh DC, Montaner JSG, Tyndall MW. Methodology for evaluating Insite: Canada's first medically supervised safer injection facility for injection drug users. Harm Reduction Journal. 2004; 1:1–5. [PubMed: 15169546]

Wood E, Tyndall MW, Spittal PM, Li K, Hogg RS, O'Shaughnessy MV, Schechter MT. Needle exchange and difficulty with needle access during an ongoing HIV epidemic. International Journal of Drug Policy. 2002; 13:95–102.

Wood E, Werb D, Kazatchkine M, Kerr T, Hankins C, Gorna R, Montaner J. Vienna Declaration: A call for evidence-baed drug policies. Lancet. 2010; 376:310–312. [PubMed: 20650517]