

Linkage to Care for HIV-Infected Heterosexual Men in the United States

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In the United States, the human immunodeficiency virus (HIV) epidemic among heterosexual men disproportionately affects individuals involved with the criminal justice system, injection drug and other substance users, and racial and ethnic minorities. These overlapping populations confront similar social and structural disparities that contribute to HIV risk and limit access to HIV testing, treatment, and care. In this review, we discuss barriers to linkage to comprehensive HIV care for specific subpopulations of heterosexual men and examine approaches for enhancing linkage to care for this diverse population.

In 1997, 78% of all AIDS cases in the United States were among men [1]. A decade later, the human immunodeficiency virus (HIV)/AIDS epidemic remains disproportionately concentrated among men, who represent nearly three-fourths of all HIV/AIDS cases and new HIV infections among adults and adolescents [2]. HIV-infected men are also more likely to receive a diagnosis late in the course of infection [3] and have lower CD4 cell counts when care is initiated [4]. In 2007, 46% of men infected through heterosexual contact progressed to AIDS within 12 months, compared with 36% of the total HIV-infected population [2]. Significant racial and ethnic disparities in HIV infection persist. In 2007, black and Hispanic men comprised 57% of all HIV/AIDS diagnoses among men, and black men experienced the highest rate of new HIV infections of any demographic group (115.7/100,000 population) [2]. Racial and ethnic minorities are also disproportionately represented among late diagnoses and are significantly more likely to experience delayed linkage to care [5–11].

Modes of HIV transmission among men have changed during the last decade [1, 2]. Male-to-male sexual contact remains the primary mode of transmission among men in the United States; however, 16% of HIV-positive men were infected through heterosexual sex and 12% through injection drug use (IDU) in 2007 [2]. Whereas the number of new HIV/AIDS cases among men resulting from IDU has declined during the past 2 decades and stabilized since 2004, infections attributable to heterosexual sex have increased [2]. Increasing rates of heterosexual HIV transmission underscore the potential for a more generalized heterosexual HIV epidemic, and studies in Washington, DC, and Baltimore, Maryland, have identified this trajectory in marginalized urban communities [12, 13]. Figure 1 depicts the proportion of heterosexual men among the total number of persons with HIV infection in the United States between 2000 and 2007 [2, 14–20].

In the United States, the HIV epidemic among heterosexual men disproportionately affects individuals involved with the criminal justice system, injection drug users (IDUs), other substance users, and racial and ethnic minorities. These overlapping populations confront similar social and structural disparities that contribute to HIV risk and limit access to HIV testing, treatment, and care. In describing these disparities and risks, clinicians and researchers need to be particularly cautious about protecting sensitive health information, such as drug use and sexual risk-taking behaviors. Some

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Table 1. Linkage to Care among Heterosexual Men with Human Immunodeficiency Virus Infection: Barriers and Facilitators

Barriers or Challenges	Successful Strategies
Incarceration	Communication between correctional and community providers; comprehensive discharge planning and case management; availability of substance use treatment within and outside correctional facilities
Substance dependence	Directly administered antiretroviral therapy; integrated opiate replacement and antiretroviral therapy; case management; integration or colocation of medical care and supportive services
Stigma and distrust	Peer engagement and outreach; sustained engagement with target population
Structural or environmental barriers	Case management and colocation of services; linkage to health insurance; access to stable housing; job training and placement programs

researchers have used peer-based interventions and employed research staff of the same race and/or cultural background as the study participants to enhance participants' comfort with the research and to bolster the quality of data collected [21, 22]. Other studies have used technology such as audio computer-assisted self-interviews to improve rates of reporting of sensitive behaviors and to reduce socially desirable responding [23–26]. In this review, we discuss barriers to linking specific subpopulations of heterosexual men to comprehensive HIV care and examine approaches for enhancing the linkage to care for this diverse population.

EMERGING SUBPOPULATIONS AT RISK

IDU Populations

During the past 2 decades, there has been a significant decline in IDU-related HIV infections [27–29], probably in part because of increases in HIV prevention programs targeted to IDUs, including syringe exchange programs [30, 31]. Despite these declines, IDU-related HIV transmission continues to affect racial and ethnic minorities at disproportionate rates, particularly African American men [32]. Recent data from the Centers for Disease Control and Prevention indicate that between 2004 and 2007, 62% of incident IDU-associated HIV infections were among men and 58% of those infected through IDU were black [32]. In addition, 40% of HIV-infected IDUs received late HIV diagnoses, defined as receiving an AIDS diagnosis within 12 months of HIV diagnosis [32]. Among African Americans in high-risk communities in Houston, Texas, Risser et al found that individuals reporting both IDU and heterosexual anal intercourse had 6.2 times the odds of being HIV infected [33]. In a sample of 3555 drug users and neighborhood controls, McCoy et al found that IDUs and those reporting both IDU and crack cocaine smoking were 9.8 and 5.27 times, respectively, more likely to be HIV infected [34]. These findings demonstrate the need for coordinated efforts between researchers, policymakers, and outreach and community-based organizations to address late HIV diagnoses among IDUs and to target interventions to the needs of specific IDU subpopulations.

Nonparenteral Substance Users

Despite the overall decline in IDU-related HIV infections, the association between nonparenteral substance use and HIV infection has been increasingly demonstrated. In some areas of the United States, HIV prevalence among crack cocaine smokers may be comparable to or greater than among IDUs [35]. Booth et al found that crack cocaine smokers and crack cocaine-smoking IDUs were more likely to report having multiple sexual partners and exchanging sex for drugs or money than those who only injected [36]. McCoy et al found that, compared with neighborhood controls, crack cocaine smokers were 2.2 times more likely to be infected with HIV [34]. Adimora et al also found a statistically significant association between sexual concurrency and crack cocaine smoking in a sample of rural African Americans with recent heterosexually acquired HIV infection [37]. Alcohol use has also been shown to be an important mediator of high-risk sexual behavior among men [38, 39], with

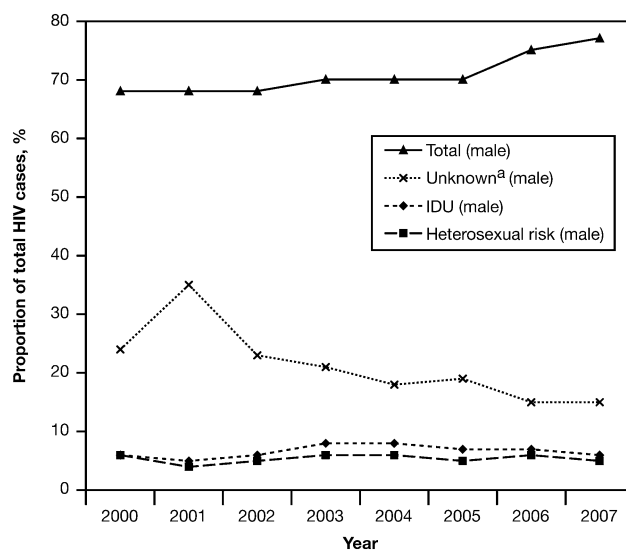


Figure 1. Estimated proportion of human immunodeficiency virus (HIV) infection among males in the United States, by transmission category, 2000–2007. Source: Centers for Disease Control and Prevention annual HIV/AIDS surveillance reports [2,14–20]. ^aUnknown indicates other or risk factor not reported or identified.

additional studies finding strong associations between alcohol use and HIV incidence [40, 41]. Methamphetamine use is yet another emerging risk factor for HIV infection among heterosexual men [42, 43].

Men Who Have Sex With Men and Women

Understanding risk factors among men who have sex with men and women (MSMW) and adapting effective prevention interventions should be priorities, given the potential of MSMW to bridge the epidemics between sexes. Lichtenstein found that bisexual activity is often unprotected among black MSMW [44], and Williams et al identified high rates of IDU and crack use among MSMW [45]. In a sample of mostly low-income, unemployed, minority MSMW, Gorbach et al found that sexual and drug use networks were highly interconnected [46].

Foreign-born Populations

Another characteristic of the changing HIV epidemic among heterosexual males in the United States is the increasing number of HIV-infected persons who are foreign born [47]. This includes legal and illegal immigrants as well as refugees and asylum seekers. The regulatory change in 2009 that removed HIV infection from the list of communicable diseases of public health significance among foreign immigrants may affect the proportion of foreign-born HIV-infected persons in the United States in the coming years [48]. Before this change, HIV-infected immigrants were inadmissible to the country without a government waiver. Heterosexual risk is the predominant mode of HIV transmission among many foreign-born populations [49, 50]; however, relatively little is known about the epidemiology of HIV infection in these populations and the extent to which these individuals engage in HIV care after arrival in the United States.

LINKAGE TO CARE

Correctional Populations

Large numbers of HIV-infected individuals pass through correctional facilities each year. In 2006, 1 in 7 HIV-positive individuals in the United States were incarcerated [51]. Access and adherence to antiretroviral treatment can often be most difficult in the period immediately after release from incarceration. Recently released individuals are at elevated risk for relapse to drug use and sexual and drug-related risk behaviors [52–58] and have difficulty securing stable housing and employment [59–61]. These stressors during community reentry may disrupt engagement in care and lead to worsened virologic outcomes as well as increase the risk of secondary HIV transmission [62–64]. Newly released African American and Latino inmates in particular have difficulty accessing antiretroviral treatment (ART) in the community [65].

The majority of correctional facilities provide some type of discharge planning for HIV-positive inmates (T. M. Hammett,

S. Kennedy, S. Kuck, unpublished data, 2007), and studies have found that inmates who receive such assistance are more likely to engage in HIV treatment and care in the community [61, 66]. However, Grinstead et al found that staff responsible for discharge planning may not be informed of inmates' HIV status or have knowledge of HIV-related services in the community [67], indicating that education of discharge planning staff and coordination with community providers could probably be improved.

Because recently released HIV-infected inmates confront a multitude of challenges during community reentry, initiating and remaining engaged in community-based care often requires intensive and sustained assistance that addresses barriers such as substance dependence, mental illness, unstable housing, unemployment, and lack of health insurance. Intensive case management can be successful in engaging recently released HIV-infected prisoners into medical care and providing linkage to social services [63]. Newly released HIV-infected individuals are also more likely to fill a prescription for ART within 10, 30, or 60 days of release if they receive assistance from a community caseworker in completing the AIDS Drug Assistance Program application [65]. However, fewer than half of state and federal correctional facilities and only 39% of city and county systems provide referrals to case management services for HIV-infected inmates during discharge planning (T. M. Hammett, S. Kennedy, S. Kuck, unpublished data, 2007). Organized discharge planning and intensive case management are critical to facilitating successful linkage to and retention in care within this population and should be implemented on a wide scale.

Substance-Using Populations

Substance use frequently undermines the medical management of HIV among HIV-infected substance users [68], who are also more likely to experience high levels of socioeconomic instability and have limited health care access and utilization [68–70]. In a systematic review of 41 studies examining the relationship between substance use and adherence to ART, Malta et al found that active substance use was widely associated with poor ART adherence [71]. In turn, these associations may create reluctance among physicians to initiate combination ART in active substance users [72].

Involvement with the criminal justice system further complicates the provision of HIV care for substance users. Kerr et al found that incarceration was the strongest predictor for discontinuation of ART among HIV-infected IDUs, with individuals reporting recent incarceration having 5-fold higher odds of discontinuing highly active ART (95% confidence interval [CI], 1.2–18.7) [73]. Furthermore, because of the limited provision of substance-dependence treatment such as opiate replacement therapy (ORT) in correctional facilities [74], substance-dependent individuals undergoing treatment with

buprenorphine or methadone in the community may not be able to continue treatment while incarcerated [75]. As a result, they may undergo withdrawal and be less inclined to reinstate treatment after release [75], which may increase their risk of relapse to drug use and significantly affect their ability to engage in HIV treatment and care. Recently, studies in several cities have demonstrated the feasibility and effectiveness of linking prisoners to ART during incarceration and after release [76–84].

Despite the challenges to engaging and retaining this population in care, a number of different treatment interventions targeted to HIV-infected substance users have achieved favorable clinical outcomes. Smith-Rohrberg et al conducted a randomized, controlled trial of directly administered ART for IDUs and found improved virologic and immunologic outcomes as well as improved adherence [85]. Integrating substance dependence and HIV treatment is an approach to engaging substance users in care that directly addresses substance use and its associated complications. The efficacy of integrating ART and HIV treatment has been increasingly examined and models that integrate treatment with buprenorphine-naloxone into HIV primary care have recently been successfully piloted [68, 86–89]. Medication-assisted treatment is also available for individuals dependent on cocaine, methamphetamine, or alcohol, although more work is needed to explore the potential for integrating these therapies with ART and HIV care [90].

Case management and collocation of services can also enhance linkage to care for substance users [91], although interventions using case management alone may be less effective than direct linkage to substance-dependence treatment in this population [92]. In their study, Smith-Rohrberg et al assessed the impact of colocated medical, case management, and referral to substance abuse services among drug users undergoing directly administered ART and found that greater utilization of onsite medical and case management services was independently associated with improved virologic outcomes [85]. The impact of case management on engagement and retention in care has also been demonstrated among substance-using homeless populations [93, 94]. Broadhead et al confirmed the feasibility of using peer health advocates to engage HIV-infected drug users in care and described this social support structure as a more accessible alternative in the context of limited access to integrated substance-dependence treatment and HIV care. The intervention involved weekly provision of peer support and counseling and the provision of nominal monetary rewards to health advocates for successfully promoting their peers' engagement in care [95].

African-American and Latino Populations

HIV-infected African American and Latino persons are significantly more likely than HIV-infected white persons to be diagnosed and initiated on treatment late in the course of HIV infection. In a modeling analysis using data from the national

HIV Research Network to describe HIV survival disparities among specific racial and ethnic groups, Losina et al found that late initiation and early discontinuation of ART were most pronounced among Hispanic subjects, with an additional 3.9 years of life lost from late initiation and early discontinuation of ART compared with 3.5 years of life lost for the entire study population [96]. In a retrospective cohort study, Ulett et al found 2.45 higher odds (95% CI, 1.60–3.74) of delayed linkage to HIV care among African American patients at an HIV/AIDS clinic [97]. Racial and ethnic minorities experience greater marginalization from the health care system and are more likely than their white counterparts to receive lower quality medical care [7, 9, 10, 98–104]. Distrust of the health care system can pose an additional barrier to engaging HIV-infected African American and Latino persons in treatment and care [105–107].

The complex interplay between social, cultural, and economic barriers to care among African American and Latino populations is not fully understood. However, socially and culturally sensitive linkage interventions have been developed in a manner consistent with the adaptation of culturally sensitive and client-centered HIV prevention interventions [108, 109]. Peer and outreach-based interventions that address structural barriers to care have demonstrated effectiveness in linking marginalized racial and ethnic minorities to treatment. The California Bridge Project used peer-based staff in outreach to locate out-of-treatment HIV-infected individuals [110]. Nearly a third of the 325 predominantly African American and Latino clients who reported no history of HIV treatment were linked to care. African American and Latino clients had 2.3 and 3.7 greater odds, respectively, of being linked to care than did white clients; the authors hypothesized that this difference was probably due to the use of outreach staff who reflected the client population demographically. An average of 15.4 contacts were reported among those who were successfully linked compared with 7.1 among those who were not, demonstrating the sustained effort required to engage marginalized individuals in care [110]. Rajabiun et al conducted qualitative interviews with predominantly underserved African American and Latino HIV-positive individuals at 7 sites of the Health Resources and Services Administration–funded Outreach Initiative to identify components of outreach programs that contributed to engagement and retention in HIV care by these populations [111]. Outreach staff improved access to care through locating physicians and clinics, linking clients to health insurance, accompanying them to medical appointments, and facilitating communication with providers. Staff support enhanced clients' self-efficacy and capacity to cope with the HIV diagnosis, and participants were provided with services such as transportation, food, and housing that addressed structural barriers to care. Forty-five percent of participants achieved undetectable viral loads by 12 months [112]. In another analysis of this multisite study, Cabral et al

found that participants reporting ≥ 9 contacts with outreach staff were half as likely as those with fewer contacts to have substantial gaps in primary care during a 12-month period [113]. Randomized, controlled trials are needed to assess the effect of outreach-based interventions on initiating and retaining disadvantaged minority populations in care [108]. The feasibility of integrating outreach interventions with substance-dependence treatment should also be explored [70, 108, 112].

Interventions that incorporate case management have also been successful in enhancing linkage to care among racial and ethnic minorities. The Antiretroviral Treatment Access Study (ARTAS) was a brief strengths-based case management intervention implemented in health departments and community-based organizations that involved client identification of strengths and abilities and the development of a personalized plan to acquire needed resources. ARTAS successfully linked 79% of recently diagnosed participants (497/626) to a primary HIV care provider within 6 months. Hispanic subjects were more likely to be engaged in HIV care than other racial and ethnic groups (odds ratio, 2.14; 95% CI, 1.03–4.43) [114]. Gardner et al conducted a randomized controlled trial of ARTAS in 4 states, comparing the efficacy of passive referral to a case management intervention in linking persons recently diagnosed to care. Individuals receiving the strengths-based case management intervention were 41% more likely to see a medical provider in consecutive 6-month intervals than those receiving passive referral to care (relative risk, 1.41; 95% CI, 1.1–1.6). The intervention had a stronger impact on Hispanic participants (relative risk, 2.16; 95% CI, 1.40–3.35) than on participants of other ethnicities [115].

Colocation of medical care and other support services has also been shown to be an important factor in engaging marginalized racial and ethnic minorities in care. Individuals who participated in the ARTAS intervention at a site collocated with HIV medical care providers were more likely to be linked to care [115]. In a program designed to facilitate HIV health care utilization among mostly minority populations in Bronx, New York, through collocation of case management, support groups, mental health, and harm reduction services, Cunningham et al found that case management and HIV support group visits were associated with 1.9 and 2.3 greater odds, respectively, of quarterly medical visits among participants [116].

CONCLUSION

In summary, factors such as substance use, poverty, unemployment, lack of educational opportunities, and marginalization from the health care system constitute multilevel barriers to care for vulnerable subpopulations of HIV-infected heterosexual men. Consequently, interventions that address social and structural barriers to care through case management, collocation

of services, and outreach have been shown to enhance linkage to care across these subpopulations. Despite the broad efficacy of these interventions, those involved with the criminal justice system, substance users, and disadvantaged racial and ethnic minorities face distinct challenges to accessing care that also require more targeted strategies. Correctional facilities have the capacity to improve the health of HIV-infected individuals beyond incarceration, where they are arguably most vulnerable, by providing organized and coordinated discharge planning and linkage to intensive case management after release. Although substance-dependent populations are especially challenging to link to and retain in care, the emergence of integrated substance use and HIV treatment offers new possibilities to engage this population. The efficacy of peer- and outreach-based interventions in linking racial and ethnic minorities to care demonstrates the importance of socially and culturally sensitive interventions that foster trust in providers and provide means of overcoming structural barriers to care.

Future work is urgently needed to scale up successful models of linkage to care and to adapt these models to local contexts. This will require additional resources, but, most importantly, it will require collaboration across agencies and institutions and the innovative use of existing resources and capacities. Integration of services is an important example of improving efficiency in delivering comprehensive HIV care. The challenge and complexity of linking HIV-infected heterosexual men to care require renewed efforts to adapt interventions to the needs of diverse subpopulations.

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