Published in final edited form as:

Curr HIV/AIDS Rep. 2011 December ; 8(4): 288–296. doi:10.1007/s11904-011-0095-3.

HIV-Related Research in Correctional Populations: Now is the Time

Josiah D. Rich,

Brown University Medical School, Providence, RI, USA. The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906, USA. The Center for Prisoner Health and Human Rights, Providence, RI, USA

David A. Wohl,

University of North Carolina, Chapel Hill, NC, USA

Curt G. Beckwith,

Brown University Medical School, Providence, RI, USA. The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906, USA. The Center for Prisoner Health and Human Rights, Providence, RI, USA

Anne C. Spaulding,

Rollins School of Public Health, Emory University, Atlanta, GA, USA

Nathaniel E. Lepp,

New York Medical College, Valhalla, NY, USA

Jacques Baillargeon,

University of Texas Medical Branch, Galveston, TX, USA

Adrian Gardner,

The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906, USA

Ann Avery,

Case Western Reserve University, Cleveland, OH, USA. MetroHealth Medical Center, Cleveland, OH, USA

Frederick L. Altice, and

Yale University School of Medicine, New Haven, CT, USA

Sandra Springer

Yale University School of Medicine, New Haven, CT, USA

On behalf of the Centers for AIDS Research—Collaboration on HIV in Corrections (CFAR-CHIC) Working Group

Josiah D. Rich: jrich@lifespan.org

Abstract

The incarcerated population has increased to unprecedented levels following the 1970 US declaration of war on illicit drug use. A substantial proportion of people with or at risk for HIV infection, including those with substance use and mental health disorders, have become

© Springer Science+Business Media, LLC 2011

Correspondence to: Josiah D. Rich, jrich@lifespan.org.

Disclosure J. D. Rich: none; D. A. Wohl: none; C. G. Beckwith: none; A. Spaulding: none; N. E. Lepp: none; J. Baillargeon: expert testimony for UTMB/CMC; A. Gardner: none; A. Avery: none; F. L. Altice: speakers' bureau for BMS, Genentech, Tibotec, Simply Speaking, and ViralEd; S. Springer: none.

incarcerated. The overlapping epidemics of incarceration and HIV present a need for academic medical centers to collaborate with the criminal justice system to improve the health of incarcerated populations. With coordinated collaboration and new programmatic initiatives it is possible to reduce HIV-associated risk behaviors and the likelihood of acquisition and transmission of HIV. Centers for AIDS Research (CFAR), funded by the National Institutes of Health, have proactively responded to this need through Collaboration on HIV in Corrections (CHIC) to improve the diagnosis, treatment, linkage to care, and prevention of HIV. This collaboration serves as a model for aligning academic expertise with criminal justice to confront this challenge to individual and public health. This is especially relevant given recent evidence of the effectiveness of antiretroviral therapy in reducing HIV transmission

Keywords

HIV/AIDS; Corrections; Prison; Jail; Collaboration; Academic

Introduction

The United States is experiencing an epidemic of incarceration. More than 1 in every 100 adults is currently behind bars [2]. HIV and AIDS prevalence in correctional settings are three and four times higher, respectively, than in the general population [3]. Among certain subpopulations and geographical regions, this disparity is even more pronounced and exceeds levels observed in the general populations of several sub-Saharan nations [3–5]. Currently, 1 in 7 HIV-infected persons in the United States passes through a correctional facility annually [4] and most reenter their home communities within 3 years of incarceration. Many of the benefits gained through the provision of constitutionally mandated access to medical care, including treatment of HIV, are lost if infected people are not linked to and retained in care during community re-entry. This can lead to morbidity and mortality following release [6]. Further, recently released individuals often discontinue HIV medications [7, 8] and resume high-risk behaviors, a situation that can increase HIV transmission [9]. Therefore, addressing HIV prevention, treatment, and retention in care for correctional and transitioning populations holds considerable public health implications for the HIV epidemic beyond the walls of prisons and jails.

This paper highlights the potential for aligning academic researchers with the criminal justice system to 1) conduct HIV-related research in critical areas of need; 2) outline the challenges such collaborations face; and 3) describe the Centers for AIDS Research's (CFAR's) Collaboration on HIV in Corrections (CHIC) to advance HIV research in criminal justice settings.

Academic-Correctional Collaborations

The 150,000 Americans infected with HIV who are released from incarceration annually [4] present a mostly unrealized opportunity to provide HIV care and prevention, both during incarceration and in the community after release [10•]. Clinical HIV researchers, in collaboration with criminal justice partners, can facilitate opportunities for diagnosis, treatment, and linkage to HIV care and prevention.

Academic medical centers are well-positioned to address many of the medical needs of people in the criminal justice system because of their mission of providing care, education, research, and community service [11]. Indeed, many partnerships have existed for decades and have promoted positive health outcomes among incarcerated populations [11]. There is a critical need to expand and replicate these relationships.

Some states' criminal justice systems have created managed care arrangements with academic partners, including Texas (The University of Texas Medical Branch [UTMB] and Texas Tech), Georgia (Medical College of Georgia), Massachusetts (University of Massachusetts), and Connecticut (University of Connecticut). These arrangements vary in the degree to which they are business arrangements or actually incorporated into the academic educational mission. Several other states have academic-corrections collaborations that focus solely on HIV, including Connecticut (Yale University), North Carolina (University of North Carolina), Ohio (Ohio State), Illinois (University of Illinois at Chicago), and Rhode Island (Brown University). Overall, these collaborations have resulted in improved HIV testing strategies [12, 13], provision of clinical care [7, 8, 14], and the development and implementation of post-release interventions [12, 15]. For example, in North Carolina, a centralized system of care by academic clinicians has led to improved outcomes in HIV testing and treatment in a prison system of 40,000 inmates.

Such partnerships have several advantages. Academic centers can address HIV in corrections through multiple disciplines including epidemiology, sociology, criminology, health behavior, and biomedicine and can provide data collection and analytic expertise that may be lacking within the criminal justice system. Ideally, university researchers should collaborate with those working in prisons, jails, and other criminal justice settings who often have a deep experiential understanding of the criminal justice apparatus and populations.

The Ethics of HIV Research in Corrections

Prisoners are a uniquely vulnerable research population. The legal and ethical issues specific to HIV-related research and prisoners have been explored previously [16]. Federal regulations stipulate that each Institutional Review Board must appoint one board member dedicated to the protection of prisoners as research subjects. These protections, however, have not completely eliminated the challenge of balancing the right of prisoners to make informed decisions regarding their own participation in research with the potential risk of being subject to harm, coercion, and abuse.

In 2006, the Office of Human Research Protections (OHRP) of the US Department of Health and Human Services (DHHS) commissioned the Institute of Medicine (IOM) to review ethical considerations of conducting research among prisoners. The IOM report presented two principles to guide prisoner research. First, the design, implementation, and supervision of research among prisoners must include appropriate stakeholders (eg, prisoners, correctional officers, prisoner advocates, and correctional administrators). Second, any incarcerated subject must realize a potential benefit from the research that outweighs the risks of participation. Adherence to these principles will protect incarcerated research subjects while improving our understanding of the HIV epidemic within our most marginalized populations. Collaboration between academic and criminal justice institutions may facilitate the enhanced dissemination of these rigorous ethical practices.

Critical Areas of Research

Federal guidance dictates that prisoners must be disproportionately affected by a certain disease or condition to be considered for participation in research. We therefore describe a number of morbidities that are over-represented among prisoners.

Conditions Comorbid with HIV/AIDS

Prisoners living with HIV/AIDS face an enormous burden of co-occurring disorders including mental illness, addiction, viral hepatitis, tuberculosis (TB), and sexually transmitted infections (STIs) [17], each of which complicates HIV care and management

[18••]. Many incarcerated persons with HIV infection are also socially marginalized and experience chronic homelessness, poverty, and unstable living circumstances [18••], all of which can exacerbate co-occurring conditions. Therefore, addressing HIV among prisoners requires an understanding of both the clinical and social forces that contribute to the spread of these diseases.

Tuberculosis—Rates of active and latent tuberculosis in correctional institutions remain considerably higher than those in the general population, in part due to close living conditions, poor ventilation, and overcrowding [18••, 19]. The number of individuals with HIV also provides a large population of individuals at high risk for reactivation of latent TB.

Substance Use—The higher concentration of HIV in prisons stems, in large part, from the incarceration of people who use illicit drugs. Half of the correctional population meets standard diagnostic criteria for drug dependence or abuse [20]. Opioid dependence is most effectively treated with medication-assisted therapy, including methadone or buprenorphine [21]. Opioid dependent, HIV-infected prisoners transitioning to the community are at high risk for multiple negative health consequences, including opioid relapse (up to 85% within 1 year), discontinuity from care, overdose, and death [22, 23]. Among HIV-seronegative opioid-dependent prisoners, treatment with methadone has resulted in increased retention in care, decreased time to opioid relapse, and decreased days of opioid use [24] and has been the standard of care in New York City's jail for over 20 years. Pilot data from a study of the use of buprenorphine among released HIV-infected state prisoners in Connecticut also revealed this intervention to be safe and effective at both reducing relapse to opioid use and maintaining CD4 lymphocyte levels and suppressed HIV RNA levels over the first 3 months after release [15]. Unfortunately, despite multiple evidence-based interventions confirming the effectiveness of opioid agonist treatment within the community, such interventions have generally not been implemented in correctional settings.

Hepatitis C—Drug use via injection also carries with it the risk of hepatitis C infection (HCV), which has a prevalence of approximately 30% in most correctional settings. Treatment for HCV is very limited, and yet for people with HIV/HCV co-infection, HCV-related liver disease is a leading cause of morbidity and mortality.

Alcohol—Alcohol use disorders are also prevalent among incarcerated populations and inmates are usually ineffectively treated or remain untreated during incarceration. Relapse to alcohol use occurs in 75%–85% of released prisoners, which contributes to poor follow-up to care. In 2002, almost 50% of US jail inmates reported symptoms of alcohol abuse or dependence prior to incarceration [25] and almost 60% of state and federal prisoners reported drinking alcohol at the time of their offense [26]. Heavy alcohol use is associated with poor adherence to antiretroviral therapy for HIV-infected persons, as well as increased HIV risk-taking behaviors [27]. Furthermore, alcohol use disorders are associated with decreased likelihood of having suppressed HIV-1 RNA levels [28]. Despite the high relapse rates for alcohol use disorders after release from correctional settings and the availability of effective medication-assisted treatments, including the use of extended release naltrexone, these evidence-based treatments are seldom if available at all for released prisoners.

Mental Illness—Fifty percent to 65% of state and federal prisoners and jail inmates have a diagnosis of mental illness [29]. HIV-infected prisoners, in particular, have a high burden of comorbid mental illness that is often undiagnosed or undertreated, particularly mood disorders [18••]. Poorly treated mental illness is associated with poor adherence to antiretroviral therapy and higher morbidity and mortality among people with HIV infection [30]. Mental health diversion programs are an effective alternative to criminal sanctions for

persons with severe psychiatric illness who enter the criminal justice system [31]. Active treatment for mental illness has been shown to improve adherence to antiretroviral therapy [30]. Improved mental health treatment during incarceration may improve health outcomes during and after incarceration among HIV-infected persons.

In summary, HIV-infected inmates have a higher burden of co-occurring disease compared to their HIV-negative counterparts or their non-incarcerated HIV-infected counterparts [18••]. Greater consequences ensue when these comorbid conditions are untreated. Greater commitment by correctional policy makers, practitioners, and researchers is essential to understand the interplay between HIV, other transmissible infections, mental health disorders, and addiction among incarcerated populations.

HIV Infection in Various Components of the Criminal Justice System

While much HIV-related research has been focused on the closed settings of jails and prisons, these settings represent the smallest components of the criminal justice system. One challenge is selecting the right intervention for each population. For instance, HIV-related interventions that require time to implement (eg, provision of antiretroviral therapy, multi-session behavioral interventions, etc.) are best suited for prison settings, where the duration of incarceration is longer and the release date more predictable. Parole and probation-based or re-entry interventions, which require community support and advance planning, can be effectively implemented after prolonged imprisonment. Jails, however, have rapid turnover, and, thus, interventions must be brief, but have the advantage of being able to reach large numbers of individuals. Community resources, including collaborations across a myriad of community treatment and justice agencies and engaging prisoners' family and other social support networks, should be leveraged to have a sustained impact. Lastly, little work has been done on HIV prevention and treatment at the entry point to criminal justice—the police or pre-trial phase. To date, community-based policing has failed to focus on getting drug users into treatment, relying instead on arrests, which have been associated with poor HIV treatment outcomes at the population level [32]. Implementation research that realigns police interventions with public health policy may significantly impact HIV treatment among drug users in community settings.

HIV-Related Health Disparities

The HIV epidemic has intrinsic demographic inequalities. Nearly half of the 1.2 million HIV-positive individuals in the US are non-Hispanic blacks [5], and inequalities in US incarceration practices compound inequalities in HIV behind bars. Blacks are incarcerated at rates six times higher than whites. In a given year, an estimated 22%–28% of HIV-infected black men pass through prisons or jails, compared to an estimated 11%–17% of HIV-infected white men [4]. Sociologists estimate that 61% of blacks without a high school diploma will become incarcerated during their lifetime [33]. High rates of incarceration within black communities have resulted in 1 of 9 black men between the age of 20 and 29 being behind bars at any given time [17]. Incarceration rates among women reveal similar racial and ethnic disparities. Black women (with an incarceration rate of 349 per 100,000) are two times more likely than Hispanic women (147 per 100,000) and over 3.5 times more likely than white women (93 per 100,000) to have been incarcerated [2]. In recent years, heterosexual black women have become one of the fastest-growing groups of people with HIV. Poverty and lack of education clearly are contributing factors to these disparities and should be investigated further, especially as such inequities impact HIV transmission and control. Complex social and structural factors contribute to both the HIV/AIDS epidemic and the mass incarceration of African American men. These factors are not yet well understood and should be important public policy and research priorities.

Medically underserved communities are over-represented among the 2.3 million people in prisons and jails and the more than 7 million people on probation or parole. Prison-based services may be an inmate's first and only opportunity to receive HIV testing and treatment. In comparison to levels of antiretroviral adherence typically observed, disadvantaged populations including those with mental illness, substance use disorders, and minority women have all been shown to exhibit lower adherence to antiretroviral regimens.

Opportunity to Reduce HIV Incidence

Incarceration represents a critical opportunity to reduce HIV incidence by diagnosing and treating HIV in an underserved population of high-risk individuals [34]. Although some HIV seroconversion occurring during incarceration has been documented in correctional systems throughout the world [35–37], including the US [36], it has not been shown to be a significant public health threat [38]. Research has not demonstrated that prisoners are at an increased risk of acquiring a new HIV infection within a correctional facility [36, 38].

Inmates leaving correctional facilities pose a risk of transmitting HIV in the community. This risk is highest among those untreated and undiagnosed and among those who discontinue antiretroviral treatment after release from prison [39]. There is evidence that HIV-related risk behaviors are markedly reduced after the diagnosis of HIV [39], though no risk reduction has been noted for those who test negative. A major issue is that health care is often not sustained after release from incarceration [7, 40]. This may be due to relapses to drug and alcohol use (85% within the first year) [41], lack of access to appropriate medical care [42], under-treated mental illness, social instability from homelessness and other problems, as well as loss of medical entitlements [14].

The Impact of HIV in Criminal Justice Settings on HIV in the Community

Compatible with findings that incarceration itself is detrimental to individual and public health [43], evidence suggests that incarceration plays a role in the spread of HIV in the US. As described above, release from prison of HIV-infected men and women has been associated with a return to HIV transmission risk behaviors with previous and new sexual and drug-using partners. This situation often coincides with a loss of virologic suppression in the immediate post-release period due to interruption in antiretroviral adherence, which can further enhance the risk of HIV transmission. Incarceration can also be socially disruptive in ways that can indirectly propagate HIV infection. The dissolution of stable relationships during incarceration can place both the prisoner and the partner left behind at risk if new or concurrent partnerships are formed in communities where HIV and other STIs are prevalent [44]. In addition, though routine opt-out testing, as recommended by the CDC, has resulted in many HIV infections being diagnosed within prisons and jails [13], HIV is all too often not detected in criminal justice settings where recommended testing is not done. Correctional settings are also likely to be important in identifying individuals who already know their HIV status but who have been estranged from care and thus represent missed opportunities to re-engage HIV-positive individuals in care.

Opportunities to Improve Quality of HIV Care in Correctional Settings

The benefits of potent combination antiretroviral therapy in prison mirror those observed in the community. Between 1995 and 2006, the US witnessed a sharp decrease in AIDS-related mortality as a percentage of total death in state prisons, from 34% to 5% [3, 45]. Moreover, the initiation of HIV therapy in correctional settings suppresses viral load to levels that are similar to those reported in community-based settings [7]. However, there has been very little evaluation of the extent and quality of HIV care delivered to prisoners.

Opportunities and Challenges in Linkage to Care after Release

Despite successful implementation of antiretroviral therapy within many correctional systems including Connecticut [7], North Carolina [8], Rhode Island [46], and Texas [42••], the benefits of antiretroviral therapy are often lost after release. Academic collaboration should facilitate improved continuity of care after release. Successful approaches to HIV care for incarcerated populations are multifaceted and utilize both correctional and community-based care providers. Comprehensive care that addresses both co-occurring diseases as well as the considerable social challenges experienced upon community re-entry is essential.

Release from incarceration is typically chaotic and disruptive. Releasees encounter a number of social, medical, and economic challenges, such as securing housing and employment, reestablishing social and economic entitlements, reconnecting with families and friends, and coping with psychiatric and substance use disorders [47]. Within 2 weeks of release from incarceration in Washington state, there was a 13-fold elevated risk of all-cause mortality [22]. Drug overdose was the leading cause of death, highlighting the need for medication-assisted therapy during re-entry, but heart disease and other medical conditions were also common factors.

In several states, inmates lose health insurance benefits during the period of incarceration and face significant challenges and delays when reinstating benefits [48]. Though lack of benefits may explain some of the challenges facing HIV-infected prisoners upon release, a study of over 2000 inmates released from Texas prisons found that only 5% of inmates on antiretroviral therapy who were eligible for free medications through the Ryan White–funded AIDS Drug Assistance Program (ADAP) filled their prescription within the 10-day window for which they were provided a free supply [42••]. These studies confirm the chaotic period post-release. Interventions to overcome the challenges of re-entry are urgently needed.

Without community-based health care, inmates face interrupted antiretroviral therapy and may return to high-risk activities, both of which negate health gains and increase the risk of HIV transmission within the community. Failure to access care in the community has been correlated with relapse to injection drug use among those released from incarceration in San Francisco [46, 47]. Conversely, linkage to HIV care after release is widely postulated to improve a number of related outcomes, including access to and receipt of treatment for other co-morbidities (eg, mental illness, substance abuse treatment, HCV treatment, etc.) and reduce recidivism. Until evidence for these relationships is available, it is incumbent on researchers to explore these associations and create effective community-based interventions that span the period of re-entry.

Mental illness is also a significant reason that released prisoners do not stay in care. Almost 60% of state prisoners, 45% of federal prisoners, and 64% of jail inmates report mental illness. A national survey of inmates with a psychiatric condition, however, found that only approximately 25% received psychiatric medications. Untreated mental illness is associated with poor drug adherence, interrupted care on release, and high rates of recidivism. These observations suggest that comprehensive treatment of mental illness during and after incarceration could have widespread positive consequences on the individual patient and the community at-large.

International Opportunities

The US has the highest incarceration rates in the world, but HIV in virtually all international settings is disproportionately higher among prisoners than among those in community settings. This appears to be true even in sub-Saharan Africa, where community prevalence is

high and data on prison HIV rates are limited. Psychiatric comorbidity contributes greatly to HIV risk, above and beyond injection drug use [49] in many parts of the world and, similar to the US, those at risk for HIV infection often experience social and economic conditions that place them at increased risk of incarceration. TB is the most common opportunistic infection among people with HIV in Eastern Europe and Africa, and the high prevalence of HIV and TB in Eastern European and African prisons results in high mortality rates. In Eastern Europe, overlapping epidemics of HIV and drug-resistant TB in prisons continue to fuel one another [50, 51].

CFAR-CHIC

The Centers for AIDS Research (CFAR) is a program collaboratively funded by seven Institutes and Centers of the National Institutes of Health that is designed to enhance the field of HIV/AIDS research domestically and internationally by coordinating research endeavors at 21 centers around the country. The CFARs have established collaborations between research in basic sciences, clinical sciences, social sciences, translational sciences, and other academic disciplines.

A growing number of clinical researchers are studying HIV infection in the criminal justice setting, including a national network of researchers at five sites that are conducting substance abuse treatment research in criminal justice settings (Criminal Justice—Drug Abuse Treatment Studies, CJ-DATS). Between 2000 and 2009, the number of NIH awards related to HIV and corrections increased by 350%, while NIH awards in the field of HIV as a whole increased by 30%. Moreover, the number of HIV and corrections publications found in the PubMed index increased by over 100% in the same period (Fig. 1). However, despite these advances, the overall proportion of funding and publications relative to the magnitude of HIV/AIDS in criminal justice-involved populations remains very small.

In 2009, the CFAR Collaboration on HIV in Corrections (CFAR-CHIC) was created to support multidisciplinary interactions among investigators to enhance research on the prevention, diagnosis, and treatment of HIV (including linkage to care after release) and associated conditions for incarcerated individuals (www.niaid.nih.gov/LabsAndResources/resources/cfar/Pages/collaborations.aspx#cfarcfar). The CFAR-CHIC is developing strategies to stimulate research, encourage involvement, and mentor the next generation of researchers to address the many complex challenges of HIV and associated conditions among prisoners. While this group was founded in the CFAR network, participation is not restricted to CFAR-funded researchers.

As part of a major effort to address HIV research in criminal justice settings, the National Institute on Drug Abuse (NIDA), the National Institute of Mental Health (NIMH), and the National Institute of Allergy and Infectious Diseases (NIAID) jointly funded *-DA-10-017: Seek, Test, and Treat: Addressing HIV in the Criminal Justice System (R01)*. This initiative began with the recognition that interacting with the criminal justice system is crucial in order to curb the HIV epidemic in the US. HIV testing strategies among jail detainees and prisoners can identify new HIV infections and re-engage known HIV-infected patients back into care. Nationwide, the dramatic drop in HIV/AIDS mortality seen with the introduction of potent antiretroviral therapy in the mid-1990s was mirrored by a similar drop in HIV/AIDS mortality among prisoners. This trend suggests that HIV treatment of prisoners has achieved parity with community norms. With the limited data currently available, however, it seems that HIV diagnostics in prisons and jails is insufficient and treatment outcomes after release from these settings overall are suboptimal at best, leaving a great need to both engage former prisoners in care and to improve their retention in care and adherence to antiretroviral therapy.

Calls to Action

The following are an incomplete listing of important areas that need to be addressed:

- Develop and implement a national strategy for implementation of evidence-based HIV prevention and HIV testing, treatment, and linkage to care programs for all justice-involved populations including prison, jail, probation, and parole as well as alternative programs. These strategies should maximize the potential benefits to this population of health care reform. Such strategies also hold the potential to have wide applicability to other disease states such as hepatitis C, hypertension, and diabetes.
- More precisely define the HIV epidemic among populations involved in the criminal justice system.
- Explore ways to provide maximally cost-effective HIV education, confidential counseling and screening interventions in criminal justice settings, and effectively identify persons who need treatment interventions at the earliest possible stage of disease.
- Explore how to optimize, fund, and implement widespread HIV testing in the criminal justice system to identify and offer high-quality treatment to infected individuals at the earliest possible stage of disease.
- Evaluate how best to address comorbid conditions, medical and social entitlements, and social support among a challenging population that faces numerous stigmatizing factors including HIV, HCV, incarceration, poverty, mental illness, and/or addiction.
- Expand ways to provide treatment for substance use disorders that affect HIV risk behaviors.
- Provide support for community transition programs to establish medical and mental health care for released prisoners with HIV infection so that the gains achieved during incarceration are maintained.
- Explore opportunities to capitalize on new technologies as they emerge, including diagnostics (rapid HIV, HCV, and STI testing), improved therapeutics (including for HIV, HCV, and STIs), and prevention (improved counseling and behavioral technologies, partner notification and education, and therapeutic and preventive vaccines) and interventions that use modern technology (eg, cell phones, computers) to effectively engage and retain HIV-infected persons in care after release.
- Identify leaders in correctional HIV research and clinical care and establish scientific meetings to stimulate research and interventions aimed at improving HIV prevention, treatment, and quality of life for prison and jail inmates living with HIV.
- Develop new and improve existing collaborations between academic medical centers and correctional institutions.

Conclusions

The HIV research and public health communities have increasingly recognized the direct and indirect contributions of incarceration to the expansion of the HIV epidemic. Academic medical centers and HIV researchers can play a crucial role in capitalizing on the tremendous opportunities for interventions and more effective strategies to identify, treat,

link to care after release, and prevent HIV within the criminal justice system. Through the development of partnerships between academics and criminal justice professionals, meaningful research can be designed and implemented that can benefit both incarcerated persons and society as a whole.

Acknowledgments

This manuscript was supported by the Centers for AIDS Research (grants P30AI027757, P30AI027763, P30AI036211, P30AI028697, P30AI060354, P30AI050409, P30AI036219, P30AI027742, P30AI027767, P30AI064518, P30AI051519, P30AI045008, P30AI087714, P30AI082151, P30AI042853, P30AI054999, P30AI078498, P30AI050410, P30AI073961, P30AI036214, P30AI042845), as well as grants K24DA022112, K23DA029381, K24DA017072, R01DA025943, R01DA25932, R01DA017059, R01DA029910, R01DA030762, R01DA030768, R01DA030762, R01DA18641, R01DA030778, R01DA027211, and R01DA027211 from the National Institute on Drug Abuse, National Institutes of Health, and R01AA018944 from the National Institute on Alcohol Abuse and Alcoholism at the National Institutes of Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.

References

Papers of particular interest, published recently, have been highlighted as:

•• Of major importance

1. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011; 365(6):493–505. [PubMed: 21767103]
2. Pew Center on the States. One in 31: The Long Reach of American Corrections. Washington, DC: 2009.
3. Maruschak LM, et al. Pandemic influenza and jail facilities and populations. *Am J Public Health*. 2009; 99 (Suppl 2):S339–44. [PubMed: 19797746]
4. Spaulding AC, et al. HIV/AIDS among inmates of and releasees from US correctional facilities, 2006: declining share of epidemic but persistent public health opportunity. *PLoS One*. 2009; 4(11):e7558. [PubMed: 19907649]
5. El-Sadr WM, Mayer KH, Hodder SL. AIDS in America—forgotten but not gone. *N Engl J Med*. 2010; 362(11):967–70. [PubMed: 20147707]
6. Springer SA, Azar MM, Altice FL. HIV, alcohol dependence, and the criminal justice system: a review and call for evidence-based treatment for released prisoners. *Am J Drug Alcohol Abuse*. 2011; 37(1):12–21. [PubMed: 21171933]
7. Springer SA, et al. Effectiveness of antiretroviral therapy among HIV-infected prisoners: reincarceration and the lack of sustained benefit after release to the community. *Clin Infect Dis*. 2004; 38 (12):1754–60. [PubMed: 15227623]
8. Stephenson BL, et al. Effect of release from prison and re-incarceration on the viral loads of HIV-infected individuals. *Public Health Rep*. 2005; 120(1):84–8. [PubMed: 15736336]
9. Stephenson BL, et al. Sexual behaviours of HIV-seropositive men and women following release from prison. *Int J STD AIDS*. 2006; 17(2):103–8. [PubMed: 16464271]
- 10••. Rich JD, Wakeman SE, Dickman SL. Medicine and the epidemic of incarceration in the United States. *N Engl J Med*. 2011; 364:22–3. A disproportionate amount of incarceration in the US has been caused by the failed war on drugs and a failure to provide treatment to those with mental illnesses and addictions. While the medical and public health communities should capitalize on the opportunity to provide treatment to the largely uninsured, low-income, and minority population cycling through the criminal justice system, they also have the responsibility of advocating for alternatives to incarceration that address the health needs of underserved communities. [PubMed: 21208106]
11. Raimer BG, Stobo JD. Health care delivery in the Texas prison system: the role of academic medicine. *JAMA*. 2004; 292(4):485–9. [PubMed: 15280346]

12. Beckwith CG, et al. Feasibility and acceptability of rapid HIV testing in jail. *AIDS Patient Care STDS*. 2007; 21(1):41–7. [PubMed: 17263656]
13. Kavasery R, et al. A prospective controlled trial of routine opt-out HIV testing in a men's jail. *PLoS One*. 2009; 4(11):e8056. [PubMed: 19946371]
14. Springer SA, et al. Antiretroviral treatment regimen outcomes among HIV-infected prisoners. *HIV Clin Trials*. 2007; 8(4):205–12. [PubMed: 17720660]
15. Springer SA, Chen S, Altice FL. Improved HIV and substance abuse treatment outcomes for released HIV-infected prisoners: the impact of buprenorphine treatment. *J Urban Health*. 2010; 87(4):592–602. [PubMed: 20177974]
16. Lazzarini Z, Altice FL. A review of the legal and ethical issues for the conduct of HIV-related research in prisons. *AIDS Public Policy J*. 2000; 15(3–4):105–35. [PubMed: 12189712]
17. Sabol, WJ.; Minton, TD.; Harrison, PM. Prison and jail inmates at midyear, 2006. U.S. Department of Justice; 2007. Document NCJ 217675
- 18•. Altice FL, et al. Treatment of medical, psychiatric, and substance-use comorbidities in people infected with HIV who use drugs. *Lancet*. 2010; 376(9738):367–87. This study provides an overview of comorbidities among HIV-positive people who use drugs and reviews treatment complications for those multiple conditions, particularly pharmacokinetic drug interactions and adherence problems. [PubMed: 20650518]
19. Lobato MN, Leary LS, Simone PM. Treatment for latent TB in correctional facilities: a challenge for TB elimination. *Am J Prev Med*. 2003; 24(3):249–53. [PubMed: 12657343]
20. Mumola, CJ.; Karberg, JC. Drug use and dependence, state and federal prisons, 2004. U.S. Department of Justice; 2006. Document NCJ 213530
21. Mattick RP, et al. Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev*. 2008; (2):CD002207. [PubMed: 18425880]
22. Binswanger IA, et al. Release from prison—a high risk of death for former inmates. *N Engl J Med*. 2007; 356(2):157–65. [PubMed: 17215533]
23. Palepu A, et al. Uptake and adherence to highly active antiretroviral therapy among HIV-infected people with alcohol and other substance use problems: the impact of substance abuse treatment. *Addiction*. 2004; 99(3):361–8. [PubMed: 14982549]
24. Kinlock TW, et al. A randomized clinical trial of methadone maintenance for prisoners: results at 12 months postrelease. *J Subst Abuse Treat*. 2009; 37(3):277–85. [PubMed: 19339140]
25. Karberg, J.; James, D. Substance dependence, abuse, and treatment of jail inmates, 2002. Washington, D.C: 2005.
26. Mumola, C. Substance abuse and treatment, state and federal prisoners, 1997. Justice UDo; 1999. p. 1-16.
27. Hendershot CS, et al. Alcohol use and antiretroviral adherence: review and meta-analysis. *J Acquir Immune Defic Syndr*. 2009; 52 (2):180–202. [PubMed: 19668086]
28. Palepu A, et al. Alcohol use and incarceration adversely affect HIV-1 RNA suppression among injection drug users starting antiretroviral therapy. *J Urban Health*. 2003; 80(4):667–75. [PubMed: 14709714]
29. James, DJ.; Glaze, LE. Mental health problems of prison and jail inmates. Bureau of Justice Statistics; 2006.
30. Cook JA, et al. Depressive symptoms and AIDS-related mortality among a multisite cohort of HIV-positive women. *Am J Public Health*. 2004; 94(7):1133–40. [PubMed: 15226133]
31. Rivas-Vazquez RA, et al. A relationship-based care model for jail diversion. *Psychiatr Serv*. 2009; 60(6):766–71. [PubMed: 19487345]
32. Blankenship KM, Koester S. Criminal law, policing policy, and HIV risk in female street sex workers and injection drug users. *J Law Med Ethics*. 2002; 30(4):548–59. [PubMed: 12561263]
33. Pettitt W, Western B. Mass imprisonment and the life course: race and class inequality in U.S. incarceration. *Am Soc Rev*. 2004; 69:151–69.
34. Hammett TM, Harmon MP, Rhodes W. The burden of infectious disease among inmates of and releasees from US correctional facilities, 1997. *Am J Public Health*. 2002; 92(11):1789–94. [PubMed: 12406810]

35. Jurgens R, et al. Panel: rights of people in prison to HIV prevention, treatment and care. *HIV AIDS Policy Law Rev.* 2009; 14(2):84–92. [PubMed: 20225527]
36. Jafa K, et al. HIV transmission in a state prison system, 1988–2005. *PLoS One.* 2009; 4(5):e5416. [PubMed: 19412547]
37. Dolan K, Larney S. A review of HIV in prisons in Nepal. *Kathmandu Univ Med J (KUMJ).* 2009; 7(28):351–4. [PubMed: 20502073]
38. Hammett TM. HIV/AIDS and other infectious diseases among correctional inmates: transmission, burden, and an appropriate response. *Am J Public Health.* 2006; 96(6):974–8. [PubMed: 16449578]
39. Marks G, et al. Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States: implications for HIV prevention programs. *J Acquir Immune Defic Syndr.* 2005; 39(4):446–53. [PubMed: 16010168]
40. Small W, et al. The impact of incarceration upon adherence to HIV treatment among HIV-positive injection drug users: a qualitative study. *AIDS Care.* 2009; 21(6):708–14. [PubMed: 19806487]
41. Kinlock TW, et al. A study of methadone maintenance for male prisoners: 3 month post-release outcomes. *Crim Justice Behav.* 2008; 35(1):34–47. [PubMed: 18612373]
42. Baillargeon J, et al. Accessing antiretroviral therapy following release from prison. *JAMA.* 2009; 301(8):848–57. This study of 2115 HIV-positive inmates in Texas found significant interruptions in ART following release from prison, with only 5% of subjects filling a subsidized prescription within 10 days of release and 30% filling it within 60 days of release. This interruption in treatment creates heightened risks for adverse clinical outcomes, reservoirs of drug-resistant HIV, and greater infectiousness. [PubMed: 19244192]
43. Maru DS, Basu S, Altice FL. HIV control efforts should directly address incarceration. *Lancet Infect Dis.* 2007; 7(9):568–9. [PubMed: 17714668]
44. Khan MR, et al. Dissolution of primary intimate relationships during incarceration and associations with post-release STI/HIV risk behavior in a Southeastern City. *Sex Transm Dis.* 2010
45. Maruschak, L. US Department of Justice. HIV in prisons, 2006. *BoJS*; 2007.
46. Dixon PS, et al. Infection with the human immunodeficiency virus in prisoners: meeting the health care challenge. *Am J Med.* 1993; 95(6):629–35. [PubMed: 8259780]
47. Baillargeon J, et al. Psychiatric disorders and suicide in the nation's largest state prison system. *J Am Acad Psychiatry Law.* 2009; 37 (2):188–93. [PubMed: 19535556]
48. Wakeman SE, McKinney ME, Rich JD. Filling the gap: the importance of Medicaid continuity for former inmates. *J Gen Intern Med.* 2009; 24(7):860–2. [PubMed: 19381728]
49. Zahari MM, et al. Psychiatric and substance abuse comorbidity among HIV seropositive and HIV seronegative prisoners in Malaysia. *Am J Drug Alcohol Abuse.* 2010; 36(1):31–8. [PubMed: 20141394]
50. Stuckler D, et al. Mass incarceration can explain population increases in TB and multidrug-resistant TB in European and central Asian countries. *Proc Natl Acad Sci U S A.* 2008; 105(36):13280–5. [PubMed: 18728189]
51. Podlekareva DN, et al. Mortality from HIV and TB coinfections is higher in Eastern Europe than in Western Europe and Argentina. *AIDS.* 2009; 23(18):2485–95. [PubMed: 19898216]

CFAR-CHIC working group members and affiliations

Judith Aberg, MD (NYU), Julie Adams (Duke), Frances Aunon (Duke), Sameena Azhar, MSW, MPH (UCSF), David Bebinger, MD (UMass), Kim Blankenship, PhD (Duke), Amy Boutwell, MD (Harvard), Brad Brockmann, JD (Brown), Laurence Brown, MD (Brown), Douglas Bruce, MD, MA, MSc (Yale), Christopher Cannon, MPH (Yale), Holly Cassell, MPH (Vanderbilt), Charles Carpenter, MD (Brown), Jennifer Clarke, MD (Brown), Myron Cohen, MD (UNC), Megan Comfort, PhD (UCSF), Karen Cropsey, PsyD (UAB), Michael Costa (Abt Associates), Gabriel Culbert, RN, BSN (UIC), William Cunningham, MD, MPH (UCLA), Jennifer Daly, MD (UMass), Richard D'Aquila, MD (Vanderbilt), Raul Davaro, MD (UMass), Nancy DeSousa, MPH (Emory), Andrew Desruisseau, MD (Meharry Medical

College), Stephen Dewhurst, PhD (University of Rochester), Samuel Dickman, AB (Brown), Ralph Diclemente, PhD (Emory), Geri Donenberg, PhD (UIC), Jeff Draine, PhD (University of Pennsylvania), Dora Dumont, PhD, MPH (Brown), Warren Ferguson, MD (UMass), Michael Fine, MD (RI DOC), Margaret Fischl, MD (University of Miami), Patrick Flynn, PhD (TCU), Peter Friedmann, MD, MPH (Brown), Becky Genberg, PhD (Brown), Toorjo Ghose, MSW, PhD (UPenn), Thomas P. Giordano, MD, MPH (Baylor), Carol Golin, MD (UNC), Michael Gordon, DPH (Friends Research), Traci Green, PhD (Brown), Richard M. Grimes, PhD (Baylor/UT Houston), Kimberly Hagen, MeD, EdD (Emory), Connie Haley, MD, MPH (Vanderbilt), Theodore Hammett, PhD (Abt Associates), Clemens Hong, MD (Harvard), Diana Huang, PhD (Rush), Martin Iguchi, PhD (UCLA/RAND), Michael Keefer, MD (University of Rochester), Arthur Kim, MD (Harvard), Seijoung Kim, PhD (UIC), Timothy Kinlock, PhD (Friends Research), Kevin Knight, PhD (TCU), P. Todd Korthuis, MD, MPH (OHSU), Christopher Krebs, PhD (RTI International), Alexander Kral, PhD (UCSF), Sonali Kulkarni, MD, MPH (UCLA), Irene Kuo, MPH, PhD (George Washington), Ann Kurth, PhD, CNM (NYU), Teaniese Latham, MPH, (Emory), Daniel Lee, MD (UCSD), Joshua Lee, MD, MSc (NYU), Jennifer Lorvick, MPH (RTI International), Paula Lum, MD, MPH (UCSF), Karen Lyda, LCSW, MS, NP (University of Colorado Denver), Thomas Lyons, PhD (UIC), Mark Malek, MD, MPH (LASD), Eileen Martin, PhD (UIC), Rosemarie Martin, PhD (Brown), Christopher Mathews, MD, MSPH (UCSD), Barbara McGovern, MD (Tufts), Michelle McKenzie, MPH (Brown), Jennifer McNeely, MD, MS (NYU), Gerald Melnick, PhD (NDRI), Lisa Metsch, PhD (University of Miami), Jennifer Mitty, MD, MPH (Harvard), Brian Montague, DO (Brown), Michael Mugavero, MD, MHSc (UAB), Janet Myers, PhD, MPH (UCSF), Ank Nijhawan, MD, MPH (Harvard), Amy Nunn, ScD (Brown), David Ostrow, MD, PhD (University of Chicago), Lawrence Ouellet, PhD (UIC), David Paar, MD (UTMB), Wilson R. Palacios, PhD (University of South Florida), James Peterson, PhD (GWU), Steven Pinkerton, MD (MCW), Robin Pollini, PhD, MPH (UCSD), Michael Puisis, DO (Cermak Health Services), Hanzhu Qian, MD, PhD (Vanderbilt), Vu Minh Quan, MD (Johns Hopkins), David Rosen, PhD (UNC), Michael W. Ross, PhD, MA, MS (University of Texas), Monica Ruiz, PhD, MPH (GWU), Jennifer Sayles, MD, MPH (LA County Department of Public Health), Joseph Schumacher, PhD (UAB), David Wyatt Seal, PhD (Medical College of Wisconsin), Jane Simoni, PhD (UW), Liza Solomon, PhD (Abt Associates), James Sosman, MD (University of Wisconsin), Lara Strick, MD, MSc (University of Washington), David Stone, MD (Tufts), Patrick Sullivan, PhD (Emory), Faye Taxman, PhD (George Mason), Lynn E. Taylor, MD (Brown), Marina Tolou-Shams, PhD (Brown), Jacqueline Tulskey, MD (UCSF), Homer Venters, MD, MS (NYU), Sten Vermund, PhD (Vanderbilt), Sarah Wakeman, MD (Harvard), Emily Wang, MD, MAS (Yale), Carolyn Wester, MD, MPH (Tennessee Department of Health), Ryan Westergaard, MD (Johns Hopkins), Becky L. White, MD, MPH (UNC), Chyvette Williams, PhD (UIC), Gina Wingood (Emory), Samantha Yard (UW), Jeremy D. Young, MD, MPH (UIC), Barry Zack, MPH (Bridging Group), Nickolas Zaller, PhD (Brown), Chad Zawitz, MD (Cook County Jail)

Fig. 1.

Data on total HIV publications and HIV in corrections publications were obtained by searching each year from 2000 to 2009 in the US National Library of Medicine PubMed database for all English-language entries with the terms “HIV” and “HIV AND prison,” respectively. Data on total HIV NIH awards and HIV in corrections NIH awards were obtained by searching each year from 2000 to 2009 in the NIH Research Portfolio Online Reporting Tools RePORTER for the terms “HIV” and “HIV” AND “prison,” “jail,” “criminal justice,” “parole,” “probation,” “incarceration,” respectively