

# HIV/AIDS and Other Infectious Diseases Among Correctional Inmates: Transmission, Burden, and an Appropriate Response

Correctional inmates engage in drug-related and sexual risk behaviors, and the transmission of HIV, hepatitis, and sexually transmitted diseases occurs in correctional facilities. However, there is uncertainty about the extent of transmission, and hyperbolic descriptions of its extent may further stigmatize inmates and elicit punitive responses.

Whether infection was acquired within or outside correctional facilities, the prevalence of HIV and other infectious diseases is much higher among inmates than among those in the general community, and the burden of disease among inmates and releasees is disproportionately heavy. A comprehensive response is needed, including voluntary counseling and testing on request that is linked to high-quality treatment, disease prevention education, substance abuse treatment, and discharge planning and transitional programs for releasees. (*Am J Public Health*. 2006;96:974–978. doi:10.2105/AJPH.2005.066993)

Theodore M. Hammett, PhD

## CONDITIONS VARY WIDELY

between correctional facilities, and among these conditions are opportunities for inmates to engage in sexual activity and drug use. Despite the denials of many correctional administrators, sexual activity and illicit drug use do take place in prisons and jails. A survey of inmates in a southeastern state prison system estimated that, on average, 44% of the inmates had sexual contact with other inmates.<sup>1</sup> Studies of US correctional systems published between 1982 and 2002 found that anywhere from 2% to 65% of inmates had homosexual contact while incarcerated.<sup>1</sup> Studies of incoming, current, and former inmates in New York City, Illinois, Canada, Hungary, Thailand, and many other countries showed the prevalence and the riskiness of inmates' sexual and drug use behaviors.<sup>2–7</sup> Because of the general lack of condoms and sterile needles/syringes, such behavior may involve greater risk within correctional facilities than on the outside.<sup>8</sup>

Sexual activity among inmates is a complex phenomenon that occurs along a continuum, from the entirely consensual to the violently coerced. The *New York Times* detailed a gang-run system of sexual slavery in a Texas prison, where at least 1 gay inmate claimed he was bought and sold numerous times and “forced into oral sex and anal sex on a

daily basis.”<sup>9</sup> Recent federal legislation called for research into the prevalence and patterns of rape and other sexual victimization within correctional facilities to inform policy changes aimed at controlling these abuses.<sup>9</sup> A Human Rights Watch report presented accounts of sexual slavery from inmates in Texas, Illinois, Michigan, California, and Arkansas and asserted that sexual victimization threatens inmates' essential human rights.<sup>10</sup>

## DISEASE TRANSMISSION IN CORRECTIONAL FACILITIES

During the early years of the AIDS epidemic, prisons and jails were commonly called breeding grounds for AIDS. Such statements are still made today. A Google search on May 19, 2005, of the terms *breeding ground AND HIV AND prisons* yielded more than 800 entries from newspapers, United Nations agencies, AIDS activist groups, and human rights organizations around the world. However intended, such opinions imply that unprotected sex and the sharing of drug injection equipment are rampant in prisons and that these activities commonly result in the transmission of HIV, hepatitis, and sexually transmitted diseases (STDs).

Substantial research has been conducted on the transmission of HIV, hepatitis B (HBV) and C

(HCV), and STDs among correctional inmates. These studies fall into 1 of 2 groups: (1) those that were based on indirect, statistical evidence from retrospective or cross-sectional surveys, and (2) those that were based on direct evidence of inmate seroconversions during incarceration from prospective or retrospective data.

In the first group, several Thai studies used multiple logistic regression techniques to attribute HIV acquisition to risk behaviors during incarceration. These studies concluded that intrafacility HIV transmission is a major problem.<sup>11,12</sup> An Australian study used multiple regression analysis and found that prevalent HCV infection among inmates was associated with previous incarceration and with drug injection during a previous incarceration.<sup>13</sup> Another study associated HCV positivity with drug injection and tattooing during the current incarceration.<sup>14</sup> An Irish study also used multiple regression analysis to show that there were higher rates of HIV, HBV, and HCV infection among injection drug users (IDUs) who had been in prison than among those who had not.<sup>15</sup> Dolan et al. used a mathematical model of injection-related HIV transmission within prisons to estimate that between 38 and 152 New South Wales inmates were infected during 1993 after sharing contaminated drug injection equipment.<sup>16</sup>

In fact, neither multiple regression results—which identified incarceration, or specific behaviors during incarceration, as statistically associated with infection—nor model-based estimates of transmission can prove that any specific infections were acquired while individuals were incarcerated. Engaging in risk behaviors during incarceration may increase the likelihood of acquiring or transmitting infection, but correlation studies fail to distinguish the causal (e.g., specific behaviors during incarceration resulted in specific individuals being infected) from the coincident (e.g., risk behaviors may lead both to incarceration and transmission/acquisition of disease). Indeed, a Scottish study found a slightly higher HCV prevalence among inmates who reported injection drug use while incarcerated than among those who did not, but the study concluded that this higher prevalence could not be attributed to injection drug use while incarcerated.<sup>17</sup>

A second group of studies was based on direct evidence of seroconversions during incarceration. A study in Rhode Island by Macalino et al. identified 587 inmates who had been continuously incarcerated for 12 months, 76% of whom agreed to be tested for HIV antibodies.<sup>18</sup> All of these inmates had been HIV negative at baseline, and none seroconverted during the 12-month observation period. Annual incidence of HBV among this group was estimated at 2.7%; HCV incidence was estimated at 0.4% per year.<sup>18</sup> A Scottish inmate cohort study found a 3.3% annual HCV incidence rate on the basis of 5 seroconverters during 6 months, with incidence much higher among those who reported

sharing drug injection equipment while in prison.<sup>19</sup> Earlier studies in Nevada, Maryland, and Illinois prospectively observed inmate cohorts and found estimated annual HIV incidence rates of between 0.17% and 0.4%.<sup>20–22</sup> Some of these studies had design flaws, including failure to adjust for the time between actual infection and the appearance of a level of antibodies detectable on screening tests.

A Scottish study used evidence from sequential test results and took into account the window period and the entry date to identify specific IDU inmates who appeared to have seroconverted to HIV as a result of sharing drug injection equipment while in prison.<sup>23</sup> An Australian study used interview data and concluded that 4 of 13 inmates who were HIV positive were likely infected as a result of sharing drug injection equipment while incarcerated.<sup>24</sup> Another Australian study followed 104 potential needle/syringe-sharing contacts of 2 inmates who were infected with HIV, HBV, and HCV and found 4 seroconversions to HCV but none to HBV or HIV.<sup>25</sup> These results confirm that HCV is more easily transmitted by par-enteral contact than HIV or HBV are. A third Australian study examined 4 cases of inmates who acquired HCV infection while in prison and used data from medical records to conclude that 2 of these cases were the result of sharing of drug injection equipment, and the other 2 cases were probably the result of lacerations suffered during a haircut and a fight.<sup>26</sup> The Centers for Disease Control and Prevention reported an outbreak of HBV in a US state prison, where self-reported data showed that 20% of the cases

were the result of sexual contact among inmates.<sup>27</sup>

Wolfe et al. conducted a study of 39 cases of early syphilis in 3 Alabama prisons, and their conclusions associated infection with recent exposure while in jails and prisons, concurrent sexual partnerships, and sexual networks among inmates.<sup>28</sup> Van Hoeven et al. used biologic testing to identify 27 inmates in New York City jails who had culture-proven gonorrhea that necessarily (because of diagnostic timing) resulted from sexual contact within the correctional facilities.<sup>29</sup>

Several US studies were based on a retrospective examination of HIV status among inmates who had been continuously incarcerated since before the appearance of HIV. A Florida study by Mutter et al. of 556 such continuously incarcerated inmates found that 21% (18 of 87 tested) were HIV positive, which indicates that they had been infected while in prison.<sup>30</sup> However, this study misleadingly used the denominator of 87 inmates who had volunteered for testing without acknowledging the self-selected and possibly biased character of this sample. It is not known how many of the other continuously incarcerated inmates would have been HIV positive if they had been tested, but the results would almost certainly reduce the percentage from 21%.

Krebs and Simmons revisited intraprisson HIV transmission in Florida and used somewhat different data sources—and they reached somewhat different conclusions.<sup>31</sup> They matched a dataset of 5265 male inmates who had been continuously incarcerated since 1978 with a state registry of reported HIV cases; they found that 271 of

these inmates had tested HIV positive. This study found that 33, or 0.63%, of these continuously incarcerated inmates had tested HIV positive while they were in prison, a much smaller proportion and a more appropriate denominator than used in the Mutter study. Krebs and Simmons rightly pointed out that they also used a convenience sample of those who were voluntarily tested. Furthermore, some unknown proportion of the remaining HIV-positive individuals may have been infected while incarcerated, even though they were not tested until they were released. An Illinois study replicated this methodology and found that only 1 of 140 inmates who had been continuously incarcerated since 1977 was HIV positive on the basis of previous voluntary testing or testing conducted for the study (J. Coe and H.I. Shuman, unpublished data, 1995).

Newer testing methodologies, such as the detuned assay and BED (HIV subtypes B, E, and D) antigen capture, make it possible to develop more conclusive biologic evidence of HIV transmission while in prison, thereby avoiding the limitations of relying on statistical association and the need to adjust for window period infections. Diaz et al. used detuned assay results and estimated a 2% annual HIV incidence among prison inmates in São Paulo, Brazil.<sup>32</sup>

## INTERPRETING TRANSMISSION STUDIES

Overall, there are uncertainties about the extent and the nature of infectious disease transmission within correctional facilities. Some of the aforementioned studies reached qualitative

conclusions about the extent of transmission that are not supported by their analyses. Moreover, even when studies estimated the annual incidence of infection among inmates, the meaning and significance of such figures are not clear. On its face, an annual incidence rate of 0.5% seems low. Yet, if such rates are applied to the total prison population, or even to that proportion of prisoners who engage in high-risk sexual or drug use behaviors, they may translate into substantial numbers of infections. However, even such numbers do not justify the use of metaphors such as “breeding ground” to characterize correctional facilities. Although some inmates are clearly being infected as a result of drug-related and sexual risk behaviors while incarcerated, the vast majority of cases among inmates probably are the result of exposure while in the general community.

Use of hyperbolic descriptions may stigmatize inmates further and encourage more punitive responses. Instead, appropriately measured but comprehensive interventions are needed. Although the precise amount of disease transmission that occurs within correctional facilities may be unknown, it is indisputable that the prevalence of infectious disease is much higher among inmates than among the population at large,<sup>33–36</sup> and the burden of infectious disease among correctional inmates and releasees is disproportionately heavy. It has been estimated that in a given year, about 25% of all people in the United States who have HIV disease, about 33% who have HCV infection, and more than 40% who have tuberculosis disease will pass through a correctional facility that same year.<sup>37</sup>

This means that prisons and jails must be among the primary settings for interventions to prevent and treat infectious disease.

### AN APPROPRIATE RESPONSE

Elements of an appropriate and comprehensive approach to HIV and other infectious diseases within correctional facilities include widely available testing and diagnostic programs that are linked with high-quality treatment, primary disease prevention, substance abuse treatment, and discharge planning and other programs to help releasees make healthier transitions to the community.

The correctional response to HIV and other infectious diseases has improved over time. During the early years of the HIV epidemic, correctional systems were far more likely to impose mandatory HIV testing of inmates and to segregate inmates who had HIV.<sup>38</sup> Currently, about 18 state prison systems, but no large city/county jail systems, make testing of inmates mandatory, and only 2 state systems still segregate inmates who have HIV.<sup>39</sup> Before the advent of effective antiretroviral treatment, mandatory HIV testing and segregation were adopted primarily to prevent HIV transmission, although there were serious shortcomings in this regard, including the harmful effects of stigma, discrimination, and mistreatment.

Today, mandatory testing is usually justified as a means of identifying inmates who need HIV treatment. This is the basis of a routine testing policy in Rhode Island, where few inmates refuse the testing.<sup>40</sup> Braithwaite and Arriola argued for mandatory

HIV testing as a way of overcoming racist withholding of medical care from inmate populations dominated by Blacks and Hispanics.<sup>41</sup> Nevertheless, the ethical problems and potential detriments of mandatory testing seem to outweigh the advantages. As articulated in the World Health Organization (WHO) guidelines and elsewhere, correctional practices should reflect as much as possible those followed in the general community.<sup>42,43</sup> People in the general community are not subjected to mandatory testing, and inmates should have the right to make their own informed choices. Creating a distinction on the basis of being incarcerated further stigmatizes inmates and undermines the important principle that correctional facilities are in fact part of the general community.

Within correctional facilities, the best policy is to offer and make readily available voluntary counseling and testing, with assurances that the results will remain confidential. Additionally, voluntary counseling and testing should be “marketed” to encourage people who have risk factors to take advantage of the service. However, uptake of voluntary counseling and testing may be a challenge because of concerns about confidentiality and discrimination<sup>44</sup> and administrative and staffing problems.<sup>45</sup>

All testing and diagnostic programs for HIV, hepatitis, and STDs should result in appropriate treatment.<sup>36,46–49</sup> State-of-the-art treatment for inmates is available in some US jurisdictions and in some other countries. However, despite the progress that has occurred, there is substantial room for improvement. In 2005, the *New York Times* documented very serious abuses in facilities

where the for-profit organization Prison Health Services had contracts.<sup>50</sup> This finding has renewed calls for correctional health services to be placed under the control of public health departments. Many factors beyond fiscal resources and the moral commitment of correctional departments (or lack thereof) influence treatment, including the quality and training of staff and restrictions on activities imposed by the correctional environment itself.

Programs for the primary prevention of HIV and other infectious diseases should include education, peer-based programs, and access to the means of prevention, another key element of the WHO guidelines for addressing HIV/AIDS in correctional facilities.<sup>42</sup> Only a handful of correctional systems in the United States make condoms available to inmates,<sup>51,52</sup> but this is standard practice in many other parts of the world, where the results have been positive.<sup>53</sup> In a Canadian survey, inmates and correctional officers both expressed support for condom availability and reported few problems with such programs.<sup>54</sup> In Washington, DC, a survey of more than 300 inmates and 100 correctional officers found that the condom program was acceptable, caused no security problems, and was replicable in other facilities.<sup>55</sup> Condom availability within correctional facilities would address not only disease transmission among inmates but also transmission from inmates to their sexual partners in the general community. This is a particularly salient issue because of the prevalence of same-sex contact among inmates who continue to self-identify as heterosexual and return to heterosexual relations after they are released.<sup>52</sup>

Although they are in fact separate issues that call for independent responses, sexual victimization and HIV transmission have been linked, and the responses to them have been blurred together. In fact, the way to address HIV transmission within correctional facilities is to implement the types of comprehensive programs I have outlined. By contrast, the problems of rape and sexual victimization must be addressed by better prevention strategies, including prisoner classification and housing segregation, better detection of incidents, and enforcement of laws and regulations against such crimes. The prevention of HIV transmission is, generally speaking, a public health issue, and sexual victimization is essentially a human rights and legal issue.

Needle exchange programs within prisons or jails are highly controversial but should be explored. There are no such programs in the United States, but there are programs in some 50 correctional facilities in Europe and elsewhere.<sup>8</sup> Evaluations of needle exchange programs within correctional facilities have been uniformly positive—drug use remained stable, sharing of injection equipment declined, no new cases of HIV transmission were reported, and there were no reports of security problems.<sup>6,56,57</sup> Two other prevention strategies that have shown promise within correctional settings—HBV vaccination<sup>58,59</sup> and postexposure prophylaxis for HIV<sup>25</sup>—should be considered for inclusion in comprehensive programs.

Because so much HIV and HCV infection among inmates is due to injection drug use, and because IDUs and other drug users compose substantial proportions of correctional populations in

many countries, substance abuse treatment is another critical element of a comprehensive response. A range of treatment modalities can be offered, including methadone maintenance, therapeutic community programs with aftercare components,<sup>60,61</sup> and intensive counseling. Regrettably, there is a serious shortage of substance abuse treatment within correctional facilities.<sup>62</sup> Despite evidence of its effectiveness in reducing recidivism and HIV risk, methadone maintenance is available only to inmates in a few correctional systems, including New York City.<sup>63–66</sup>

Finally, in keeping with the principle that correctional facilities are part of the general community, discharge planning, transitional services, and continuity of care programs are essential for the vast majority of inmates who are released and return home.<sup>67–70</sup> Such programs may be particularly important for inmates who have HIV/AIDS. A recent North Carolina study of inmates who had received HIV treatment while in prison and then were released but were reincarcerated found that they came back to prison with much higher viral loads and lower CD4 counts than when they were released.<sup>48</sup>

## CONCLUSIONS

The development and implementation of appropriate and comprehensive approaches to HIV and other infectious diseases among correctional inmates and releasees require collaborations among correctional systems, public health agencies, and community-based organizations.<sup>71</sup> Correctional health markedly affects public health, and health policy for correctional

facilities and the general community should be determined on the basis of sound evidence rather than on misinformation or political pressure.<sup>72,73</sup> Ultimately, it is only through such broader approaches that the opportunity to align correctional health and public health in policy, practice, and outcome will be fully and finally realized. ■

## About the Author

Theodore M. Hammett is with Abt Associates Inc, Cambridge, Mass.

Requests for reprints should be sent to Theodore M. Hammett, PhD, Abt Associates Inc, 55 Wheeler St, Cambridge, MA 02138–1168 (email: ted\_hammett@abtassoc.com).

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