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# Gender Differences in HIV Risk Behaviors of Inmates

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## Abstract

***Background:*** Incarcerated men and women differ in their views on HIV prevalence rates and susceptibility and their ability to prevent HIV infection. The objective of this study was to assess sex and gender differences in HIV risk behaviors of inmates in order to better support the consideration of gender in the development of HIV prevention interventions for the incarcerated population.
***Methods:*** A survey of 1819 inmates was conducted using a structured questionnaire. Self-reported HIV risk behaviors of 526 women and 1293 men during incarceration were compared. Bivariate analyses were done to identify gender differences in demographic characteristics and HIV risk behaviors. Logistic regression was used to determine factors associated with engaging in sexual intercourse in prison.
***Results:*** Mean age was higher for women than men ($p = 0.05$), and >50% of participants were African Americans. More women than men reported that they engaged in sexual intercourse ($p < 0.001$); however, men were more likely to report anal sex ($p < 0.001$). There were no sex differences in injection drug use. Women who identified as bisexual or lesbian, those who had been currently incarcerated for at least 1 year, and those who received tattoos in prison were more likely to report sexual intercourse. The only independent risk factor identified for men was being currently incarcerated for at least 7 years.
***Conclusions:*** There are gender differences in HIV risk behaviors of inmates during incarceration. The findings in this study suggest that inmates may benefit from gender-specific HIV interventions while incarcerated and in the community subsequent to release.

## Introduction

Incarcerated persons have higher prevalence rates of human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), hepatitis, and other sexually transmitted infections (STIs) compared with the general population in the United States.[1–4] The prevalence of HIV infection within the penal system has been estimated to be between 4 and 10 times higher than in the population at large.[5–7] This heightened HIV prevalence has been attributed to risk-taking behaviors prior to incarceration, such as higher frequencies of injection drug use,[8–10] unprotected sexual intercourse with multiple and high-risk partners, needle sharing, and substance use during sex.[11–15] Inmates also engage in similar high-risk activities during incarceration. Sexual intercourse,[5,16–18] use of drugs or alcohol,[12,19] and tattooing and body piercing using unsterile instruments[20,21] have been reported. Given that previous studies have reported the transmission of HIV and other infectious diseases in prison,[5,14,22,23] assessing the HIV risk behaviors of male and female inmates will provide information about the characteristics of inmates who engage in these behaviors and about their prevention needs. Such information can be used to inform interventions that will reduce HIV transmission within the prison population as well as in the community upon release from prison.

Gender differences in sexual behavior as well as other HIV-related risk behaviors have been reported in several populations.[24–30] Among offenders, it has been reported that men and women differ in their views about HIV susceptibility and about their ability to prevent HIV infection.[31] These differences suggest that gender be considered in the development of HIV prevention interventions. Hence, the objective of this study was to assess gender differences in HIV risk behaviors of inmates during incarceration and to evaluate predictors of these behaviors.

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Some gender-specific interventions have been developed for inmates and ex-offenders both within the prison and in the community[32–36]; however, these programs have mainly targeted preincarceration risk behaviors among men. Few studies have examined risk behaviors of inmates during incarceration,[16,19,31] and none has looked at differences between the behaviors of men and women. Hence, a study of HIV risk behaviors of inmates during incarceration defining differences between men and women is essential for the development of gender-specific interventions for this population.

In this paper, we report similarities and differences in HIV risk behaviors of male and female inmates during their current incarceration. We also discuss the implications of our findings for the development of HIV prevention interventions in this population. Data presented in this paper emanated from phase one of a three phase study commissioned under the Illinois African American HIV/AIDS Response Act P.L. 094-0629[37] to determine the link between incarceration and HIV.

## Materials and Methods

### *Study setting and design*

A cross-sectional survey with male and female inmates in selected Illinois correctional facilities was carried out between December 2006 and April 2007. A minimum sample size of 1025 was calculated using the Computer Programs for Epidemiologists version 4.0,[38] based on an estimate of the true proportion of condom use rate among adults in the United States of 36%,[39] a confidence level of 95%, and a maximum acceptable difference from the true proportion of 3%. Oversampling was done to adjust for nonparticipation resulting from inmate transfers, participation refusal, and unusable surveys; hence, 2000 inmates were finally selected.

### *Participants*

To be eligible to participate in the study, inmates had to be ≥18 years of age, had to have been incarcerated in the correctional facility for at least 6 months, and had to be able to speak and write English. Random samples of participants were selected from the most current inmate list of each facility.

Study participants were selected through a multistage sampling technique from 47 correctional facilities. Six of these facilities (13%) were maximum security, 13 (28%) were medium security, and 20 (43%) were minimum security facilities. The remaining 8 (17%) facilities were transitional. Seventeen facilities were randomly selected, of which 15 were male and 2 were female facilities. Of the male facilities, 3 (20%) were maximum security, 7 (47%) were medium security, and 5 (33%) were minimum security facilities. Both female facilities selected were medium-level facilities. A list of eligible participants for each facility was created from the current inmate list provided by the Illinois Department of Corrections (IDOC), and the required number of participants per facility was selected from the list. The actual number of inmates selected from each prison depended on the overall number of inmates in the prison.

All study protocols, informed consent processes, research instruments, and recruitment and data collection procedures were reviewed and approved by the Institutional Review Board (IRB) at Chicago State University to ensure the protection of the participants, who represent a vulnerable population as defined in the protection of human subjects' Code of Federal Regulations.[40]

### *Participant recruitment and data collection*

Study personnel consisted of four research assistants (RA), a research coordinator, and the principal investigators (PIs). All study personnel attended a training session at the IDOC headquarters prior to data collection to learn about prison rules and procedures.

During data collection, the members of the research team were assisted by the IDOC Office of Health Service and HIV/AIDS Peer Education Program. A member of the research team read a recruitment script that informed all potential respondents of the purpose of the study, eligibility for participation, and potential risks of participating in the study. Participants who refused participation were required by prison personnel to leave the room before data collection could continue. For inmates who agreed to participate in the study, an informed consent script approved by the IRB that allowed a waiver of documentation[40] was read to obtain verbal informed consent.

Systematic and administrative procedures were employed to protect the confidentiality of the information collected. No personal identifying information was included in the survey questionnaire. Facilities were identified using codes, and individual questionnaires were numbered. Information collected from the survey was not shared with prison staff, law enforcement, or court systems. The questionnaires were locked in a file cabinet at the Institute and will be destroyed after 5 years as required by Human Subject Protection and IRB guidelines, as well as state laws on awards maintenance. Only the PIs and authorized study personnel had access to the data.

### *Data collection instrument*

A structured questionnaire was designed by the research team to answer survey questions. Guided by the literature on HIV risk behavior in prisons, we adapted concepts from related published papers.[5,21,41] The final survey questionnaire had sections on demographic characteristics, incarceration history, and HIV risk behaviors prior to and during the current incarceration. The HIV risk behaviors included injection drug use, sharing injection equipment, and sexual practices. Although not a proven means of HIV transmission, information about tattooing and body piercing was collected for several reasons: (1) the instruments used for these procedures are sharp, (2) very few of these instruments may be available in prison because they are contraband and, hence, are likely to be shared, (3) cleaning agents are not readily available in prison, and, therefore, the instruments are not sterilized, and (4) tattooing and body piercing have been considered as HIV risk behaviors in prison in previous studies.[20,21,42,43] Questions about behaviors during the current incarceration generally began with "While in prison . . . "

### *Independent and dependent variables*

The independent variable was the gender of the study participants. The dependent variables were injection drug use,

sexual intercourse, sharing injection equipment, and getting a tattoo during the current incarceration.

### *Data analyses*

The data were entered and analyzed using the SPSS software version 15 for Windows (SPSS, Chicago, IL). Raw data were cross-checked for accuracy prior to analyses. Data were analyzed using descriptive and inferential statistics. The Student's *t* test was used to ascertain differences in the mean ages of women and men. We used the chi-square test and the Fischer's exact test to compare sexual behavior, injection drug use, needle sharing, and tattooing and body piercing during incarceration among men and women. We used logistic regression to examine the relationships of predictor variables with having sexual intercourse during incarceration, the most common behavior identified. The predictor variables are age, ethnicity, marital status, sexual orientation, number of years of current incarceration, number of times incarcerated, and whether or not participants got a tattoo in prison. We used binary logistic regressions to examine the relationship of each predictor variable separately. Variables associated with sexual intercourse during incarceration in univariate analyses ($p \leq 0.05$) were entered into separate logistic regression models for men and women to examine the simultaneous contribution of all predictors. Hosmer-Lemeshow goodness-of-fit test revealed a $p$ of 0.583 for the women's model and a $p$ of 0.637 for the men's model.

## Results

### *Participants*

Of the 2000 randomly selected participants, 1819, comprising 1293 men (71.1%) and 526 women (28.9%), consented to participate and completed the survey, giving a response rate of 91%. The overall average response rate to survey questions was 96%; however, the number of participants who responded to each question varied. We could not collect any information from participants who refused participation because of the peculiar security nature of correctional facilities; inmates who were not participating had to be moved out of the room promptly before data collection commenced.

Sample characteristics by gender are shown in Table 1. About one third (35.6%) of the participants were 30–39 years of age, with women being significantly older than men (mean age 36.4 ± 9.7 years and 35.3 ± 10.1 years, respectively, $p = 0.04$); about half of the participants had never been married. Over half of the participants were African Americans; there were more whites among women (39%) than among men (27%). Over 75% of the participants had been incarcerated less than four times. Overall, men had been incarcerated more times than women ($p < 0.001$). During the present incarceration, most participants had been in prison for <4 years; however, more men than women had spent ≥4 years in prison ($p < 0.001$). The majority of the participants had taken an HIV test on at least one occasion.

Table 1. Sociodemographic Characteristics of Study Population

| *Characteristic* | *Women (%)* n = *526* | *Men (%)* n = *1293* | p *value* |
|---|---|---|---|
| Mean age, years ± SD | 36.4 ± 9.7 | 35.3 ± 10.1 | 0.04[a] |
| Age group, years | | | |
| <20 | 11 (2.2) | 20 (1.6) | |
| 20–29 | 120 (23.5) | 387 (31.7) | |
| 30–39 | 186 (36.5) | 435 (35.6) | 0.002 |
| 40–49 | 149 (29.2) | 267 (21.8) | |
| ≥50 | 44 (8.6) | 113 (9.3) | |
| Marital status | | | |
| Never been married | 261 (50.1) | 703 (56.1) | |
| Married/cohabitant | 114 (21.9) | 247 (19.7) | 0.07 |
| Separated/divorced/widowed | 146 (28.0) | 304 (24.2) | |
| Ethnicity | | | |
| White | 203 (39.1) | 327 (26.6) | |
| African American | 266 (51.3) | 704 (57.2) | |
| Hispanic/Latinos | 24 (4.6) | 136 (11.0) | <0.001 |
| Others (e.g., Native American, Asian American) | 26 (5.0) | 64 (5.2) | |
| Number of times incarcerated | | | |
| 1–3 | 431 (83.5) | 944 (77.6) | |
| 4–6 | 75 (14.5) | 210 (17.3) | |
| ≥7 | 10 (1.9) | 62 (5.1) | |
| Number of years spent in prison during current incarceration | | | |
| <1 | 200 (38.4) | 260 (20.9) | |
| 1–3 | 165 (31.7) | 377 (29.8) | |
| 4–6 | 58 (11.1) | 208 (16.7) | <0.001 |
| ≥7 | 98 (18.8) | 398 (32.0) | |
| Ever had HIV testing | | | |
| Yes | 471 (91.1) | 1038 (84.5) | |
| No | 46 (8.9) | 191 (15.5) | <0.001 |

[a]Student's *t* test used. Chi-square used for all other variables.

### *HIV risk behaviors during incarceration*

Generally, very few participants reported that they engaged in the risk behaviors we sought (Table 2). Five percent of 98 women compared with 30% of 60 men who reported sexual intercourse in prison had had anal sex ($p < 0.001$); 34% of the women and 55% of the men had had vaginal sex ($p = 0.008$). Others had had oral sex (not shown in Table 2). Sexual intercourse was mostly consensual; more men (8%) than women (3%) reported being forced to have sexual intercourse ($p = 0.02$).

Among participants who had ever injected drugs, more men (7.4%) than women (3.8%) reported that they had injected drugs in prison. All the women who reported injecting illegal drugs also reported sharing needles, whereas >50% of the men who reported injection drug use shared needles. Among participants who had tattoos, more men (28.9%) than women (13.3%) reported getting tattoos in prison ($p < 0.001$). Body piercing was largely uncommon.

### *Univariate and multivariate odds of any sexual behavior during incarceration*

The univariate and multivariate odds of reporting any sexual intercourse by women and men are shown in Table 3. Among women, the univariate odds of reporting any sexual intercourse were significantly lower for those who were married, separated, divorced, or widowed compared with women who had never been married. The odds were higher for women who had been incarcerated four times or more compared with women who had been incarcerated less than four times. The odds were significantly higher for women who were younger, who identified as bisexual or lesbian, who had been incarcerated for at least 1 year during the current incarceration, and who got tattoos in prison (Table 3). In the multivariate analysis, four of the univariate correlates remained significant. The odds of reporting any sexual intercourse were significantly higher for women who identified as bisexual (AOR = 10.01, 95% CI 3.77-26.54, $p < 0.001$) and lesbian (AOR = 4.56, 95% CI 1.28-16.16, $p < 0.05$) than for those who identified as heterosexual and for those who had spent ≥1 year during the present incarceration compared with those who had spent <1 year. Women who reported that they had received tattoos during the present incarceration were also more likely to report sexual intercourse (AOR = 3.22, 95% CI 1.16-9.09, $p < 0.05$). The odds were significantly lower for married women (AOR = 0.16, 95% CI 0.03-0.92, $p < 0.05$) compared with women who had never been married.

Similar to women, the univariate odds of reporting any sexual intercourse were significantly higher for men who had been incarcerated for ≥7 years and for those who received tattoos in prison. It was significantly lower for men who had been incarcerated four times or more compared with men who had been incarcerated less than four times. Unlike women, age and marital status were not predictors of in-prison sexual activity among men (Table 3). Sexual orientation was not included as a possible predictor variable for men because of very small numbers. In the multivariate analysis, only one univariate correlate remained significant for men, with the odds of reporting any sexual intercourse significantly higher for men who had been incarcerated for ≥7 years compared with men who had been incarcerated for less than 7 years (AOR = 17.72, 95% CI 2.31-131.18, $p < 0.01$).

## Discussion

This study of randomly selected inmates in Illinois prisons suggests that inmates engage in high-risk HIV transmission behaviors, such as sexual intercourse and injection drug use, during incarceration. Self-reports of risk behaviors were relatively low among our study participants; there may have been underreporting even though the survey was anonymous and participants were assured of confidentiality. Despite the seemingly low prevalence of risk behaviors found in our study, it is plausible for inmates engaging in these behaviors to transmit or acquire HIV and other bloodborne infections because agents for prevention, such as condoms and clean needles, are not permitted in Illinois correctional facilities. Of greater public health importance is the possible transmission of HIV from infected inmates to their

Table 2. HIV Risk Behaviors of Study Population during Incarceration by Gender

| | *Women* | | | *Men* | | | |
|---|---|---|---|---|---|---|---|
| | *Total sample* n | *No. reporting behaviors* | *%* | *Total sample* n | *No. reporting behaviors* | *%* | p *value* |
| Sexual intercourse | 521 | 98 | 18.8 | 1250 | 60 | 4.8 | <0.001 |
| Type of sexual intercourse | 98 | | | 60 | | | |
| Anal | | 5 | 5.1 | | 18 | 30.0 | <0.001 |
| Vaginal | | 33 | 33.7 | | 33 | 55.0 | 0.008 |
| Forced to have sexual intercourse[a] | 98 | 3 | 3.1 | 60 | 8 | 13.3 | 0.02 |
| Injection drug use[a,b] | 106 | 4 | 3.8 | 149 | 11 | 7.4 | NS[c] |
| Needle sharing[a,b] | 106 | 4 | 3.8 | 149 | 6 | 4.0 | NS |
| Tattooing[d] | 346 | 46 | 13.3 | 862 | 249 | 28.9 | <0.001 |
| Body piercing[d] | 396 | 10 | 2.5 | 550 | 14 | 2.5 | NS |

[a]Fisher's exact test used. Chi-square used for all other variables.
[b]Total sample = No. of participants who had ever injected drugs.
[c]NS, not significant.
[d]Total sample = No. of participants who had tattoos or body piercing.

TABLE 3. BIVARIATE AND MULTIVARIATE CORRELATES OF REPORTING SEXUAL INTERCOURSE DURING INCARCERATION

| | *Women* | | *Men* | |
|---|---|---|---|---|
| | *Bivariate models OR (95% CI)* | *Multivariate adjusted OR (95% CI)* | *Bivariate models OR (95% CI)* | *Multivariate models adjusted OR (95% CI)* |
| Age, median (SD) | 1.06 (1.03-1.09)*** | 0.96 (0.90-1.02) | 1.02 (0.99-1.04) | |
| Ethnicity | | | | |
| White | 1 | | 1 | |
| African American | 1.10 (0.68-1.78) | | 1.58 (0.79-3.14) | |
| Latino | 0.91 (0.30-2.82) | | 0.88 (0.28-2.83) | |
| Others (e.g., Native Americans) | 0.42 (0.09-1.86) | | 2.46 (0.82-7.35) | |
| Marital status | | | | |
| Never been married | 1 | 1 | 1 | |
| Married/living with someone as married | 0.28 (0.13-0.59)** | 0.16 (0.03-0.92)* | 0.93 (0.46-1.87) | |
| Separated/divorced/widowed | 0.42 (0.24-0.75)** | 0.85 (0.29-2.52) | 0.70 (0.34-1.44) | |
| Sexual orientation | | | | |
| Heterosexual | 1 | 1 | | |
| Bisexual | 11.08 (6.09-20.18)*** | 10.01 (3.77-26.54)*** | | |
| Homosexual | 10.29 (4.73-22.35)*** | 4.56 (1.28-16.16)* | | |
| Years in prison during current incarceration | | | | |
| <1 | 1 | 1 | 1 | 1 |
| 1–3 | 3.86 (1.58-9.41)** | 4.52 (1.31-15.62)* | 0.86 (0.23-3.24) | 1.42 (0.13-15.83) |
| 4–6 | 12.38 (4.83-31.75)** | 6.00 (1.45-24.85)* | 2.22 (0.64-7.69) | 8.17 (0.99-67.71) |
| ≥7 | 28.64 (12.21-67.19)*** | 42.79 (10.47-174.98)*** | 7.22 (2.55-20.42)*** | 17.72 (2.31-131.18)** |
| No. of times incarcerated | | | | |
| 1–3 | 1 | 1 | 1 | 1 |
| ≥4 | 0.16 (0.05-0.54)** | 0.89 (0.20-3.89) | 0.42 (0.18-0.98)* | 0.57 (0.19-1.69) |
| Got tattoo in prison | | | | |
| No | 1 | 1 | 1 | 1 |
| Yes | 11.10 (5.26-20.10)*** | 3.22 (1.16-9.09)* | 2.56 (1.39-4.76)** | 1.72 (0.88-3.33) |

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

sexual and drug-injecting partners in the community upon release. Hence, HIV risk behaviors of inmates are public health issues that deserve attention.

The men and women surveyed in this study differed in their self-reported risk behaviors. Men were more likely to report sexual violence and anal and vaginal intercourse, whereas women were more likely to engage in oral sex. Therefore, although a greater proportion of women than men reported engaging in sexual intercourse, the men in our study engaged in riskier sexual practices that are more likely to be unsafe, given that condoms are contraband in the prisons surveyed. In an earlier study of preincarceration HIV risk behaviors conducted among new entrants in some of the prisons we surveyed, it was reported that male inmates were more likely to belong to higher-risk groups than were female inmates.[31] Hence, the higher risk taking among incarcerated men may reflect a similar level of risk taking prior to incarceration. Injection drug use and needle sharing were reported by very few men and women in our study, and no gender differences were seen. However, needle sharing was prevalent among self-reported injection drug users. This is not a surprising finding, as needles are contraband and are not readily available in Illinois prisons.

The risk behavior most often reported in our study was sexual intercourse; hence, we looked for independent factors associated with engaging in this behavior among study participants. For both men and women, the odds of reporting sexual intercourse were higher for those who had been incarcerated for ≥1 year during the current incarceration. Clarke et al.[11] suggested that increased length of time in prison leads to increased exposure, which in turn may increase the probability of substance abuse behavior while incarcerated. A similar explanation may suffice for the association of length of prison stay with odds of sexual behavior. This finding has programmatic implications; we recommend that HIV prevention programs commence as soon as new entrants are admitted into prison.

In our study, inmates who engaged in sexual intercourse were more likely to have received tattoos in prison. The HIV transmission study conducted by the Centers for Disease Control and Prevention (CDC) in Georgia prisons[42] showed an independent relationship between getting a tattoo in prison and HIV seroconversion. Although that association may not be causal, it appears that persons who get tattoos in prison exhibit multiple risk-taking behaviors. Hence, getting a tattoo in prison may be used as a marker for identifying inmates who may engage in behaviors that would put them at risk.

Among women, those who were younger, who had never been married, or who identified as bisexual or lesbian were more likely to engage in sexual intercourse. The association of younger women and various HIV-related sexual risk behaviors was previously reported in a study of women inmates' risky behavior and drug use.[44] That study suggested physiological aging as a possible explanation for this finding. More studies need to be conducted to confirm these as-

sociations, with attention given to them in the design and implementation of prevention programs. Marital status and sexual orientation were not associated with sexual intercourse among men. Although our study found no association between age and sexual intercourse among incarcerated men, age is a significant factor to be considered in HIV prevention programs, as it has been reported that 35% of men in United States prisons were younger than 30 years old.[45] Wolitski et al.[34] and others[35,36,46] have implemented and evaluated effective HIV prevention interventions for young men.

### *Study limitations*

Our study has several limitations. Given that we used a self-reported questionnaire, bias due to the social desirability phenomenon cannot be ruled out. Also, participants did not respond to every question in the survey; hence, results presented for each variable do not represent the entire number of inmates who participated in the study. This nonresponse may be a potential source of bias, as inmates who did not answer certain questions may differ significantly from those who answered those questions. Caution should, therefore, be exercised when applying the findings of this study to the general Illinois prison inmate population.

Although participants were assured of confidentiality and the survey was anonymous, there may have been underreporting of the behaviors sought in this study. The small numbers of inmates reporting high-risk HIV risk behaviors in prison prevented the identification of independent risk factors for some behaviors. Inmates who were selected but who refused to participate in the study may differ significantly from those who participated. This may affect the prevalence of the risk behaviors reported.

## Conclusions

Our study revealed that incarcerated men and women engage in HIV risk behaviors during incarceration, and gender-specific similarities and differences were seen in some of the behaviors. The factors associated with HIV risk behaviors should be considered in prevention interventions for this population. Length of stay in prison appears to be significantly associated with risk behaviors for both men and women. Interventions need to commence as soon as possible after entry into prison. Given that younger unmarried women were more likely to engage in sexual intercourse in prison, we recommend interventions be developed specific to young incarcerated women, similar to those implemented for young men. In our study, tattooing was related to sexual intercourse in prison; more research is required to determine if tattooing in prison should be considered a marker of high HIV risk behaviors and to assess if inmates can and do acquire HIV through tattooing. Similarly, further studies are needed to identify other markers that may be useful in targeting HIV prevention efforts. Finally, future research is needed to understand the context within which these risk behaviors occur and the perceived gender-specific HIV prevention needs of incarcerated persons.

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## Disclosure Statement

The authors have no conflicts of interest to report.

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