

**HIV-Positive Inmates Released from Nevada's Prisons in 2001: Results from Matching Health Division and Corrections' Databases**

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**Abstract**

It is estimated that about one quarter of all HIV-infected individuals in the United States are released from a correctional facility each year. To better understand the needs of inmates with HIV exiting the prison system, a partnership with the Nevada State Health Division (NSHD), the Nevada Department of Corrections (DOC), and the University of Nevada, Reno School of Public Health was formed to examine this population using information contained in existing databases. An analysis of DOC data matched with the data from the HIV/AIDS Reporting System (HARS) maintained by the NSHD identified 2,802 HIV-negative inmates (2,451 males and 350 females) and 44 HIV-positive inmates (33 males and 11 females) who exited prison in 2001. Results showed that HIV-positive inmates released in Nevada were more likely than HIV-negative inmates to be African American, have a prior felony, and be re-incarcerated in a three-year follow-up period. For male and female participants living with AIDS, almost one-third had never received antiretroviral therapy. The cyclical pattern of re-incarceration among HIV-positive inmates in Nevada provides an opportunity to reach this population with medical care, infectious disease prevention, and social services. Future analyses with more complete data hold even more promise for understanding the needs of incarcerated individuals living with HIV in Nevada and directing public health interventions.

**Key words:** HIV, Incarceration, Academic-Practitioner Collaboration

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**Background**

Inmates in the United States share a disproportionate burden of infectious diseases including HIV/AIDS (Hammett, Harmen & Roades, 2002). In 2001, the AIDS case rate was more than three times higher among prison inmates than the general population (Maruschak, 2004) and it is estimated that about one quarter of all HIV-infected individuals in the U.S. are released from a correctional facility each year (Hammett et al., 2002). Understanding the needs of recently released HIV-infected individuals is essential for public health planning, but the challenges that inmates face re-integrating to society are also barriers to research follow-up. Unstable housing, unemployment, substance abuse, and mental disorders are common characteristics of ex-offenders (Freudenberg, 2001; Spaulding, Stephenson, Macalino, Ruby, Clarke, & Flanigan, 2002) and post-release research requires considerable time and resources (McKenzie, Tulsy, Long, Chesney, & Moss, 1999; Menendez, White, & Tulsy, 2001).

Given the difficulties of primary data collection with recently released HIV-infected inmates, it is often necessary to use existing data sources to describe this vulnerable population. To better understand the needs of recently released HIV-infected inmates in the state of Nevada, a partnership was formed between the Nevada State Health Division (NSHD), the Nevada Department of Corrections (DOC), and the University of Nevada,

Reno School of Public Health. We matched DOC data on inmates released in 2001 with HIV/AIDS Reporting System (HARS) data maintained by the NSHD. This report provides a description of HIV-positive inmates released to Nevada's communities in 2001 and provides a foundation for future post-release research using both primary and secondary data sources.

## **Methods**

### Subjects

The State of Nevada tests every prison inmate for HIV infection upon intake and again at release. This data is maintained by the DOC and information on HIV-infected inmates is routinely reported to NSHD through the HARS system. HARS is a national reporting system developed by the Centers for Disease Control and Prevention (CDC) to track the AIDS epidemic (Lee, Lehman, Bindman, & Fleming, 2003). Under the State's mandatory reporting law, any individual in Nevada who tests positive for HIV or is diagnosed with AIDS must be reported to the Health Division. In addition, descriptive HIV and AIDS data is routinely reported to the Bureau of Justice Statistics.

The DOC collects additional data on all inmates during intake, operations, and discharge procedures in prison facilities statewide. For this project, a DOC data analyst linked data stored in multiple databases by unique participant identification numbers. A database including demographics, incarceration history, and some health-related information on all inmates released from prison in 2001 was subsequently created. These data were submitted to the Health Division and a Health Resource Analyst from the Bureau of Health Planning and Statistics matched the DOC data with the HIV/AIDS Reporting System (HARS) database to confirm the HIV/AIDS classification reported by DOC.

### Procedure for matching DOC and HARS data

According to the DOC data, 3,306 male and female adult inmates were released from the Nevada State Prison System between January 1 and December 31, 2001. For this analysis, the sample was restricted to 2,845 inmates who were Nevada residents upon intake (86% of all the inmates released during 2001). The sample was restricted to Nevada residents because post-release information is not readily available for inmates outside of Nevada. Of the 2,845 Nevada residents released from prison in 2001, 101 females and 37 males (138 total) were flagged as HIV-positive by the Department of Corrections.

The NSHD Health Resource Analyst used eight matching algorithms to attempt to link the 138 individuals identified as HIV positive by DOC with

individuals registered in the HARS database. These algorithms combined personal identifiers (last name, first name, birthdate, social security number, HIV flag) and required either exact matches or probabilistic matches.

Using last name, first name, date of birth and HIV-positive flag, the first algorithm identified 43 HIV-positive individuals (12 females and 31 males) in the DOC data who were also registered in the HARS database. One woman matched with the third algorithm using last name, first name and HIV. However, according to HARS data the matched case was deceased and upon examination by the NSHD, it was determined that the person identified by DOC was not HIV positive.

Of the 101 females flagged as HIV-positive according to DOC, 90 were not HIV-positive using the HARS match as the gold standard. To verify that there were not any HIV-positive females unregistered in HARS or not identified during the matching process, a manual review of 72 (80%) of the 90 DOC medical records for females flagged as HIV positive and not in HARS was conducted. Only 1 of the 72 cases was found to be HIV-positive according to DOC medical records. However, this case was not in the HARS registry and therefore is not included as an HIV-positive person for these analyses. Per DOC personnel, the discrepancy in HIV infection numbers between DOC and HARS data was most likely due to data entry errors.

Of the 37 males flagged as HIV-positive by DOC, 4 were not HIV-positive using the HARS match as the gold standard. However, 1 male flagged as HIV-positive by DOC was identified through a manual search of HARS. It was determined that data entry errors accounted for the remaining 3 males identified by DOC as HIV positive. It was also determined that the seroconversion for another male was post-release. Therefore, this case did not meet the inclusion criteria of being HIV-positive upon release and he was categorized according to his status upon release (HIV-negative). As a result, the final sample size is 2,845 which consists of 2,801 HIV-negative inmates (2,451 males and 350 females) and 44 HIV-positive inmates (33 males and 11 females).

### Measures

Data collected by DOC included in this analysis were: 1) race/ethnicity; 2) age at incarceration; 3) current offense group; 4) prior felonies; 5) sentencing information; and 6) whether the inmate was re-incarcerated in the period after their 2001 release through December 2003. DOC did collect some health data including presence of sexually transmitted diseases (STDs), medical classification, mental health classification, and substance use. However, after reviewing these data

with DOC, it was determined that the information was not consistently collected for every inmate and most of the variables have little clinical meaning. For example, testing for STDs occurs following a critical incident, (e.g., when an inmate spits on someone or when blood-to-blood contact occurs) and therefore, data are collected just for those inmates involved and do not provide an estimate of proportion. Other data like medical and mental health classifications are used to make housing and work decisions, but are not actual medical and mental health diagnoses or symptoms. Due to these issues, these data are not presented.

HARS measures used in this study were: 1) AIDS diagnosis; 2) age at first positive HIV test; 3) age at AIDS diagnosis; 4) receipt of antiretroviral treatment; 5) CD4 counts; 6) mode of exposure to HIV; and 7) mortality.

Analysis

Pearson Chi-square analyses were conducted to identify significant group differences for comparison of categorical data. In those cases where expected cell sizes were less than 5, Fisher’s exact tests were used. Independent t-tests were used to identify group differences for measures of continuous data. Significant differences ( $p \leq .05$ ) in analyses are reported with their corresponding p-values

**Results**

Corrections Data

Confirming HIV proportion estimates for Nevada’s prisons from the Bureau of Justice Statistics (Maruschak, 2004), 1.5% of the Nevada residents released from Prison in 2001 were HIV positive. Although females only made up 13% of the population released, they represented 25% of the HIV positive participants in this sample. Female inmates living with HIV were significantly older than female inmates without HIV (Mean = 42.9 years vs. 37.6 yrs;  $t = -2.02, p < .05$ ). There were no significant age differences for the males, although males with HIV were slightly older on average compared to males without HIV (39.4 years of age vs. 36.1 years, respectively;  $t = -1.87$ , nonsignificant). Sociodemographic and incarceration information for the study sample is presented in Table 1.

Table 1  
Sociodemographic and Incarceration Profile of Male and Female Inmates by HIV Status

	Female		Male	
	HIV + (n = 11)	HIV - (n = 350)	HIV + (n = 33)	HIV - (n = 2,451)
Demographics				
Mean age years	42.9	37.6*	39.4	36.1
<u>Race/Ethnicity</u>				
Caucasian	27%	66%*	36%	55%*
African-American	73%	26%	48%	25%
Hispanic	0%	4%	15%	17%
Other	0%	3%	0%	3%
<u>Current Offense</u>				
Drug offense	27%	48%***	24%	33%
Property offense	18%	32%	33%	29%
Sex offense	55%	1%	9%	5%
Violent offense	0%	9%	30%	22%
Other	0%	9%	3%	10%
Prior felony	100%	43%***	73%	52%*
Re-incarceration in 3-year follow- up	55%	11%***	39%	25%

Note. DUI accounted for the majority of other offenses. \* $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$  for differences between HIV status by gender.

African Americans were significantly more likely to be infected with HIV compared to other racial/ethnic groups. Among females, the proportion of HIV was 73% for African Americans and only 27% for Caucasians (Fisher’s exact test,  $p = .02$ ). For males, almost half of the African Americans were HIV-positive compared to 36% of Caucasians and 15% of Hispanics (Fisher’s exact test,  $p = .03$ ).

Females with HIV were significantly more likely to currently have a sex offense, primarily due to engaging in prostitution with HIV/AIDS (Fisher’s exact test,  $p < .001$ ). There were no significant differences in current offense by HIV status for males. There were no differences by HIV status for sentence length. For all inmates, the average length for the minimum prison sentence was 1 year. In addition, the majority of participants (87%) had a maximum sentence length of five years or less.

For both genders, having HIV was associated with a significantly higher proportion of having a prior felony. Every female inmate with HIV had a prior felony compared with 43% of females without HIV (Fisher’s exact test,  $p < .001$ ). The difference for males was not as striking, but was still significant (males with HIV = 73% vs. males without HIV = 52%;  $\chi^2 = 5.64, p = .018$ ).

As shown in Table 1, HIV-positive females were significantly more likely to be re-incarcerated in the three-year study follow-up period than HIV-

negative females (55% vs. 11%; Fisher's exact test,  $p = .001$ ). Among males, this relationship was not as strong, but it was still statistically significant (39% vs. 25%;  $\chi^2 = 3.80$ ,  $p = .05$ ).

To ensure that the relationship between HIV status and re-incarceration was not a result of racial/ethnic status (African American), release status (parole vs. discharge), or having a history of prior felonies, we controlled for these variables in stratified analyses. The significant relationship between HIV and re-incarceration remained and could not be explained by these factors. However, we did find that inmates who were African American and HIV-positive were more likely than all other groups to be re-incarcerated.

#### HARS Data: HIV Exposure and Health Information

Examination of the HARS database allowed for the development of a more complete health profile of the inmates with HIV/AIDS. For females living with HIV, the primary mode of HIV exposure was injection drug use (64%;  $n = 7$ ), followed by heterosexual sex (9%). However, the mode of exposure was unknown for three females (27%). For males, the primary modes of HIV exposure were having sex with other men (30%;  $n = 10$ ), injection drug use (30%), heterosexual sex (18%); only one male was classified as risk unknown.

There were no gender differences for diagnosis of AIDS ( $\chi^2 = 1.09$ , nonsignificant). Just under half (45%;  $n = 15$ ) of the males and about two thirds (64%;  $n = 7$ ) of females had a CDC-defined AIDS diagnosis. For both males and females, the average age that they first tested positive for HIV infection was 33 years ( $t = -.02$ , nonsignificant). The mean age at which males and females were diagnosed with AIDS was 39 years ( $t = -.09$ , nonsignificant).

Low levels of antiretroviral use among those with an AIDS diagnosis were found. Only 57% of females and 67% of males living with AIDS ( $\chi^2 = 2.68$ , nonsignificant for differences by gender) had documentation of ever receiving antiretroviral therapy (antiretroviral use was not known for one female and one male living with AIDS). For 8 of the inmates (15% of the males;  $n = 5$  and 27% of the females;  $n = 3$ ), their most recent CD4 test occurred before 2000 (3 males did not have any information recorded about CD4 testing).

Although active surveillance matching mortality data with HARS is not routinely conducted, two males and two females with HIV died during the three-year follow-up period according to HARS.

#### **Discussion and Recommendations**

In 2001, 35% of all HIV-positive inmates in Nevada were released (Maruschak, 2004; Nevada Department of Corrections, 2004). We found that

released HIV-positive inmates were more likely than HIV-negative inmates to be African American, have a prior felony, and be re-incarcerated in a three-year follow-up period. Higher prevalence of HIV-infection among African Americans inmates is not surprising as it mirrors epidemiologic community trends. In 2004, the rate of AIDS diagnoses for African American adults and adolescents was 10 times the rate for whites and almost 3 times the rate for Hispanics (CDC, 2005). However, the reasons for higher rates of past incarceration and re-incarceration among HIV-infected remain unclear. It has been argued that HIV infected individuals may seek incarceration to obtain medical care (Warren, Bellin, Zoloth, & Safyer, 1994), but it is also possible that the behaviors associated with HIV acquisition are also the behaviors that lead to repeat incarceration. Regardless of underlying reasons for the cyclical pattern of incarceration among HIV-infected inmates, it is evident that there are multiple opportunities to reach this population with medical care, infectious disease prevention, and social services. Higher re-incarceration rates among HIV-positive individuals also underscores the need for strong relationships between community and correctional health.

Innovative health service and prevention programs are urgently needed to improve health outcomes of HIV-infected inmates and decrease community transmission of infectious diseases. Although Nevada's prisoners receive basic medical care during incarceration, almost one-third of male and female participants with AIDS in our sample had never received antiretroviral therapy. This finding highlights the need to coordinate correctional health care, discharge planning, and community services to ensure appropriate antiretroviral use and adherence. A continuum of services post-release is particularly important because the majority of inmates in our sample had a maximum sentence of less than five years. The elevated proportion of HIV among females and African-Americans in our study also highlights the importance of culturally appropriate prevention programs to decrease sexual and drug risk taking and facilitate post-release service use.

#### Limitations

Our analyses were limited by the small sample size of HIV-positive inmates, particularly females. Our results should be confirmed with larger samples (possibly taking a sample of inmates released in a two-year period, rather than a one-year period). Nationally, female prisoners are more likely to be infected with HIV (Maruschak, 2004) and this gender difference is very striking in Nevada where females only comprise approximately 8% of the state's 2001 prison population, but 27% of the

inmates living with HIV (Maruschak, 2004; Nevada Department of Prisons, n.d.).

The secondary data on health characteristics were very limited and therefore, a comprehensive health profile could not be developed. We recommend that more extensive health data be collected and reported by prison health officials. Standard data collection instruments should be used upon intake and all individuals collecting and entering data should be trained to ensure consistency across facilities. Data should be reported to the Center for Health Data and Research at the NSHD. Medical data on HIV-positive inmates such as viral loads and t-cell count results should be routinely reported to the Health Division's HARS analysts.

While HARS is considered the national gold standard for documenting HIV/AIDS in the United States, there were some limitations to this data such as missing values and inconsistent categorization of HIV versus AIDS diagnosis. These limitations are partially due to incomplete reporting of information and the inherent difficulties associated with updating a historical database with new information and changing circumstances (e.g., AIDS diagnosis, viral loads, moving within or out of the state). Conducting regular quality assurance activities (such as reconciling inconsistencies in HIV and AIDS status) should improve these data.

#### Future research

Routine data collection describing the HIV risk behaviors (behavioral surveillance) of all inmates will facilitate screening of at-risk populations who are in need of HIV/STD risk reduction programs. As the DOC is unlikely to have funding for personnel to conduct such risk assessments, this would be an ideal project for the NSHD and could be coordinated with HIV testing and counseling activities.

When available, data from other relevant sources should be used to supplement the DOC and NSHD information. For example, the Northern Nevada HIV Outpatient Program, Education and Services (HOPES) conducts discharge-planning programs for inmates with HIV during which health histories and assessments of service need are obtained.

Future matched analyses could be conducted with other secondary public health data such as HIV counseling and testing, substance use, mental health, and TB and STD registries. Such analyses would provide a more comprehensive picture of co-morbidity and post-release service use. However, the use of secondary data for research purposes is always limited because the data were collected for programmatic and reporting reasons.

We recommend following up secondary analyses with primary data collection activities such

as epidemiologic, behavioral, and program evaluation studies with incarcerated and recently released inmates. For example, in 2001, 451 new inmates were enrolled in a Hepatitis study conducted by the Health Division (Chen, Salcido, Whitley, & Forero, 2002). This study provided a much more accurate estimate of Hepatitis proportion than the Department of Corrections data because inmates are not routinely tested for Hepatitis. Another example is the recent study conducted by researchers at UNR's School of Public Health in which a random sample of 247 women from the Southern Nevada Women's Correctional facility completed face-to-face interviews to determine the prevalence and predictors of HIV risk behaviors (Clements-Nolle, et al., 2005).

#### **Conclusion**

In summary, this analysis represents the first attempt at matching NSHD and DOC data to better understand the health issues of inmates living with HIV. Although the information available in the current databases is not comprehensive, the results demonstrate distinct characteristics of female and male inmates with HIV compared with other inmates released from Nevada's prisons. It is encouraging that with even a first look at these databases, conclusions can be drawn about policy and programmatic directions for both DOC and the NSHD. Despite the limitations, we view this analysis as a good first step in better understanding the health of HIV-positive inmates in Nevada. Future analyses with more complete data hold even more promise for understanding the needs of incarcerated individuals living with HIV in Nevada and directing public health interventions.

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