

# HIV/AIDS Borne by US Correctional Releases: Share of Burden Declines, Numbers Don't

Anne C. Spaulding, MD, MPH (1); Ryan Seals, MPH (c) (1); Matthew J. Page, MPP (1); Amanda K. Matthews, MPH (1); William Rhodes, PhD (2); Theodore M. Hammett, PhD (2)

(1) Department of Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA  
(2) Abt Associates, Cambridge, MA



Abt Associates Inc.

**CONTACT INFORMATION**

Anne C. Spaulding:  
aspauld@sph.emory.edu  
Ryan Seals, MPH(c):  
rseals@sph.emory.edu  
Matthew J. Page, MPP:  
mjpage@sph.emory.edu  
Amanda K. Matthews, MPH:  
akmatth@sph.emory.edu

## BACKGROUND

### REVISED ABSTRACT

**Background:** Because those at high risk for HIV congregate in correctional facilities (CFs, i.e. jails, prisons), seroprevalence was high early in the epidemic (e.g. 18.4% of persons entering NYC jail in 1989). *Hypothesis:* Among the US cohort infected with HIV/AIDS, the share of the burden of HIV/AIDS borne by those passing through CFs has decreased between 1997 and 2005.

**Methods:** We have created a new model of population flow in and out of CFs to estimate the number of unique individuals released in 1997 and 2005. We obtained HIV/AIDS prevalence in CFs from the Bureau of Justice Statistics; an estimate of standard error was available for 1997 HIV estimates; HIV prevalence in 2005 represents a complete enumeration. Estimates of HIV prevalence in the entire US population used proportions from CDC's updated estimates for 2006, applied to the 2005 US populations. Estimates of US AIDS prevalence were taken from CDC annual surveillance reports. We calculated the 95% C.I. for estimated burden of HIV borne by releases in 1997 and compared it with the estimate of burden in 2005 releases and performed sensitivity analyses for various estimates of CF population flow. Burden for race and sex-specific subgroups were also estimated.

	1997	2005
Unique Releases	7.30 M	9.10 M
HIV seroprevalence/AIDS prevalence	2.1%/0.5%	1.7%/0.4%
HIV/AIDS in releases/total cases in US (% burden)	153,300/ 775 K (19.8%)	154,700/1.1M (14.1%)
AIDS in releases/ total cases in US (% burden)	36,500/247,032 (14.8%)	36,411/418,086 (8.7%)

At the start of the HAART era, 1 in 5 (95% CI 17.0-24.5%) of all HIV-infected persons in the US passed through a CF. Eight years later, only 1 in 7 infected Americans pass through, a 29% decline in the share of the overall HIV/AIDS burden borne by those released from CFs. Within demographic subgroups, such as minority males, the share of the burden borne by incarcerated populations in 2005 appears to be similar to the burden borne by the correctional population as a whole in 1997.

**Conclusions:** Decreasing HIV seroprevalence among those admitted to CFs, along with prolonged survival and aging of the US population with HIV/AIDS beyond the crime-prone years, could explain a declining concentration of the epidemic in CFs. We speculate that success with discharge planning programs targeting HIV-infected prisoners may also contribute to the decline. Meanwhile, the number of persons with HIV/AIDS leaving CFs remains virtually identical. *Limitation:* Exact enumeration of unique individuals passing through CF is unavailable, but sensitivity analyses show the general relationship is likely valid. The estimates may also be affected by misclassification bias of HIV status, race and ethnicity. *Implications:* CFs continue to be potent targets for public health interventions. The fluid nature of incarcerated populations ensures that effective interventions will be felt not only in CFs but in communities to which they return.

## Background

- An earlier paper, *The Burden of Infectious Disease Among Inmates of and Releases from US Correctional Facilities, 1997*, estimated the CF burden of HIV/AIDS by:
  - Multiplying HIV prevalence x estimates of numbers of releases from CFs, and
  - Dividing by number of HIV/AIDS cases nationally.
- The paper demonstrated that 1 in 5 people with HIV/AIDS had been incarcerated for at least part of the calendar year. (1)
- We sought to determine if CFs are still important targets for public health interventions.
  - If those in CFs bear a lower proportion of disease burden, intervening in CFs may have less of an impact on the general population and may be less cost-effective.
  - If those in CFs still bear a high proportion of the burden, the importance of public health interventions in CFs remains great.
- Since 1997,
  - HIV seroprevalence among CF admittees has declined.
  - The number of inmates behind bars is 33% higher. (2-4)
  - HAART has improved survival among infected inmates and the general population.
- Rapid diagnostic algorithms for HIV and brief behavioral interventions for primary, secondary and tertiary prevention of infectious disease have proven effective. Public health interventions are feasible if a substantial number of affected persons pass through CFs.

## Objectives

- Estimate the number of HIV-infected persons among releases.
- Estimate the proportional HIV/AIDS burden borne by releases.
- Estimate the differential burden among release subgroups.

## METHODS

To estimate the burden of HIV/AIDS in CF releases during 2005, we took data from the Bureau of Justice Statistics (BJS) to estimate the percentage of jail detainees and prisoners with HIV/AIDS. We applied these percentages to the number of persons released from CFs in 2005 (period prevalence). Dividing the period prevalence by the number of infected persons nationwide provided estimates of the proportion of the US burden of HIV/AIDS borne by releases.

### Data Sources

- 2005 admissions and releases
  - Data from BJS (5,6) and the National Corrections Reporting Program (NCRP) on the Inter-Consortium for Political and Social Research (ICPSR) website <http://www.icpsr.umich.edu/NACID/nrcrp/>
  - Demographic composition of prisoners taken from most recent inmate surveys (2004 Survey of State Inmates, results published in *Prisoners in 2004* (7)) and 2002 Survey of Jail Inmates, available at [www.icpsr.umich.edu/NACID/](http://www.icpsr.umich.edu/NACID/) and applied to respective populations.

### Number of Unique Jail Releases

- Number of unique persons admitted to jail in 2005
  - Beck estimated that 71.1% of the 12.6 million admissions were individuals admitted more than once, yielding approximately nine million unique persons admitted to jail. (8)
  - Implies an admission rate of about 1.41 admission per individual detainee per year, close to the previous estimate of 1.38. (1)
- Number of releases from jails in a one-year period
  - Calculated by subtracting the net yearly growth of the jail system (i.e., the balance between admissions and releases) from the approximately nine million unique admittees.

### Number of Unique Prison Releases

- We wanted to account for the growing number of persons admitted to prison who are parole violators; these were not considered in the prior paper.
- Data on prison releases who had more than one release in a single year were taken from the NCRP.
  - Data on all prison admissions from the 34 states reporting to NCRP were deduplicated (by DOB, race, and state) to identify how many unique individuals were released from prison.
  - To extrapolate for the 16 states not included in NCRP data, we calculated the percentage of how many BJS releases represented unique individuals from the 34 reporting states.
  - Data from the states with outlier proportions of unique releases were removed.
  - The ratio of unique individuals released to the total number of releases was applied to BJS data on the 16 non-reporting states to yield unique admissions.
- We examined the trend of state prison release data from 2000-2005 as reported by BJS to yield a yearly growth factor that would allow us to extend 2003 data to 2005.
- BJS statistics on admissions to Federal prisons (which have few persons released more than once in one year) were added to yield the number of unique admissions to prisons nationwide.
  - We used the same approach to derive unique admittees to prisons nationwide.

## METHODS (continued)

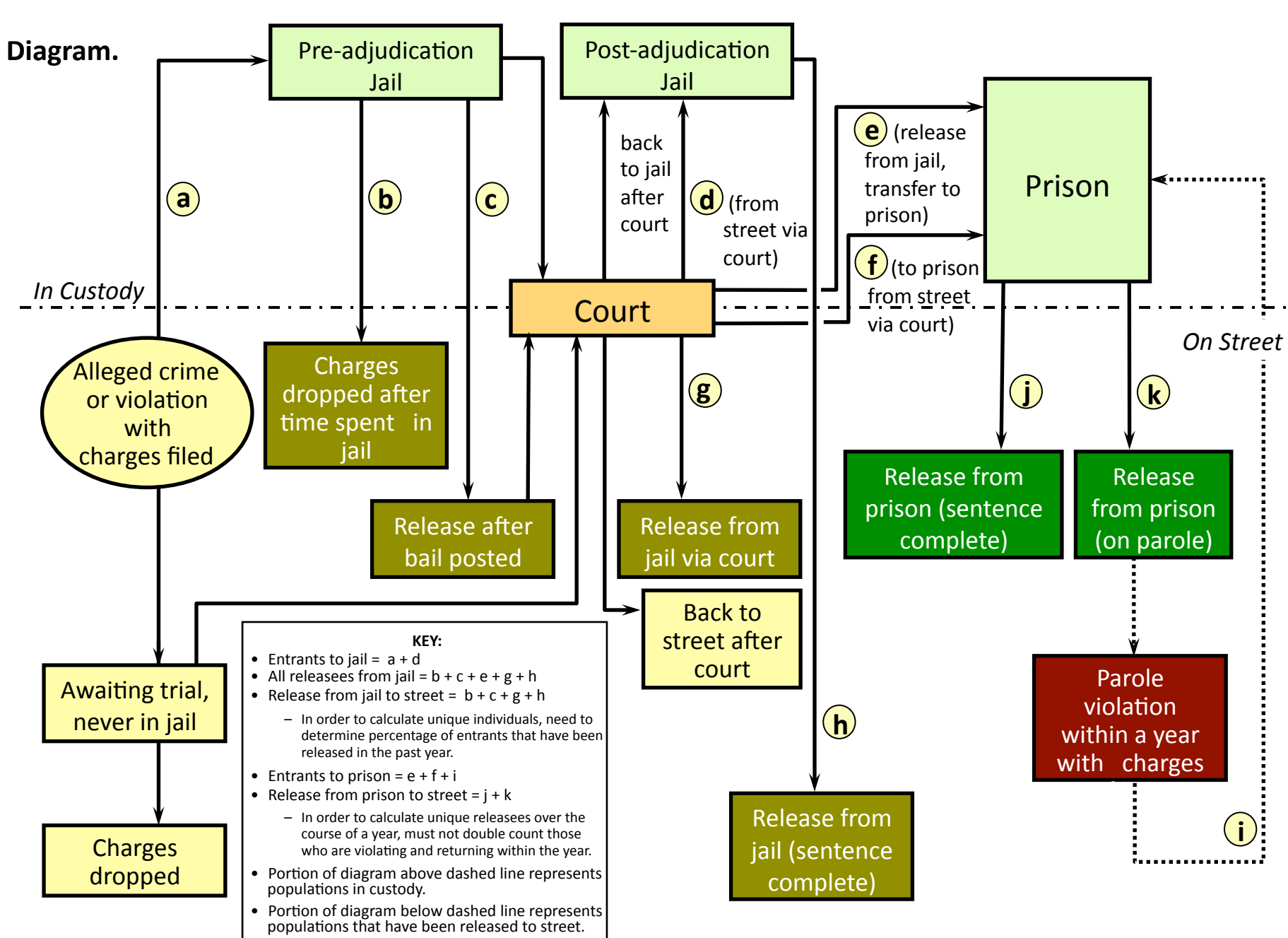
### Total Number of Releases into the Community

- Data from the NCRP on the ICPSR website provided an estimate of the proportion of individuals sentenced to prison who were detained pretrial.
- This group of prison admissions was subtracted from jail releases to obtain the number of jail releases released to the community rather than to prison.
- In order to compare the 2005 and 1997 estimates, we recalculated the 1997 estimates using the new approach.
- Because a complete enumeration does not exist for 1997, we retained the earlier estimate and 95% CI of unique jail releases.

### Methods for Deriving HIV/AIDS Burden

- Data derived from the BJS 2002 Survey of Jail Inmates were used to estimate the HIV prevalence among jail detainees who have been tested for HIV. (9,10, and archived data on ICPSR)
  - Additional information was taken from CDC data on HIV prevalence obtained among routine opt-out testing of previously untested jail entrants. (11)
- Data on HIV prevalence among state prisoners were taken from 2004 Survey of State Prisoners data on the ICPSR website.
- Estimates of HIV prevalence in the general population were based on CDC's updated estimates.
  - Percentages of the population that were HIV-positive in 2006 (based on CDC's updated calculation method) (12) were then applied to the 2005 estimates of the total US population, including race/sex subgroups.
- Estimate of AIDS prevalence in the general population was from 2005 CDC surveillance reports. (13)

Figure 1. Flow Diagram.



## RESULTS

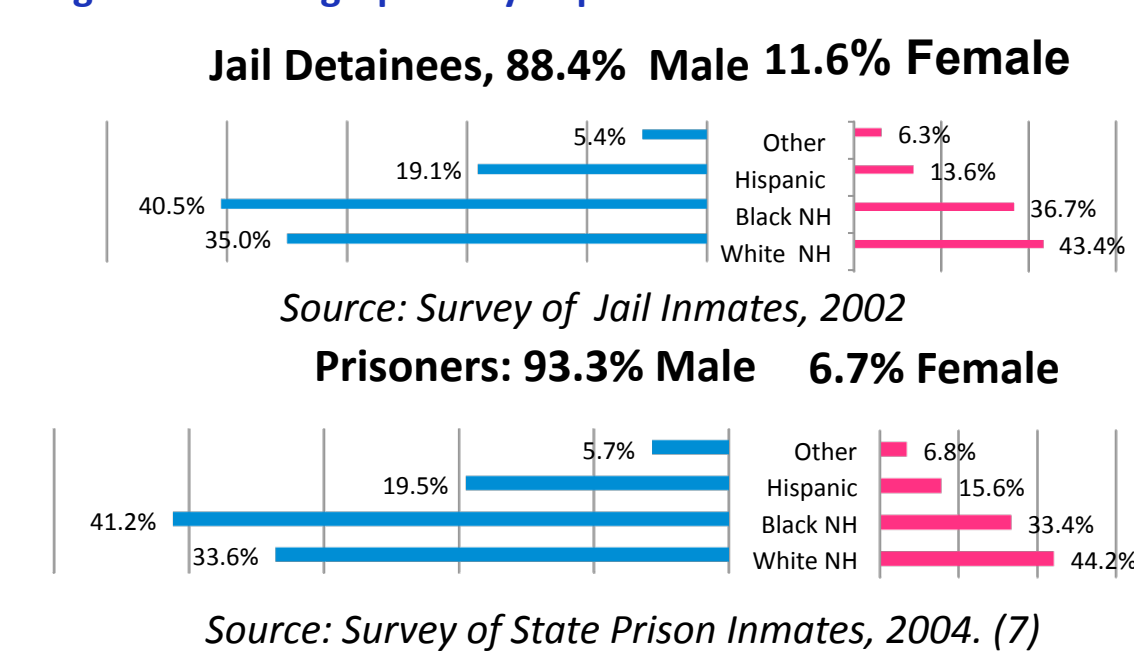
Table 1a. Persons Released from a US Jail or Prison in 2005.

Variable	Flow Chart in Fig. 1	Unique Persons	Percentage
Releases from jail to street	b+c+g	8,617,343	95%
Unique releases from prison	j+k	485,410	5%
<b>Number released to community</b>		<b>9,102,753</b>	<b>100%</b>

Table 1b. Race and Sex of Cohort Released from All Facilities.

	Men		Women		Total Persons
	Total		Total		
Total	8,070,619		1,032,134		9,102,753
White	2,818,320		448,215		
Black	3,271,828		377,721		
Hispanic	1,543,215		141,024		
Other*	437,257		65,175		

Figure 2. Demographics by Population.



## RESULTS (continued)

Figure 3. Percentage of HIV Epidemic Burden Borne by Releases, 2005

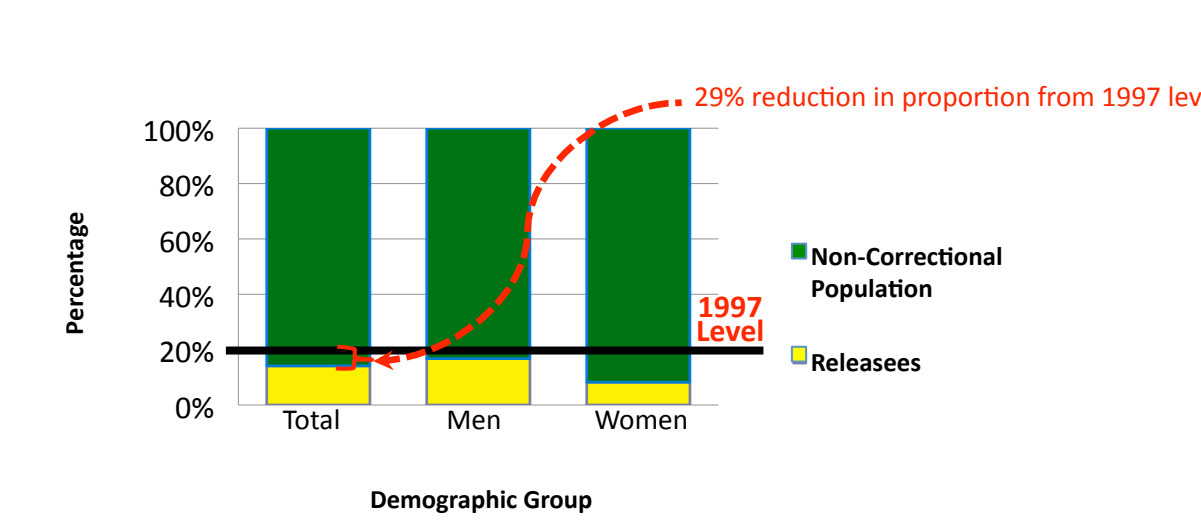
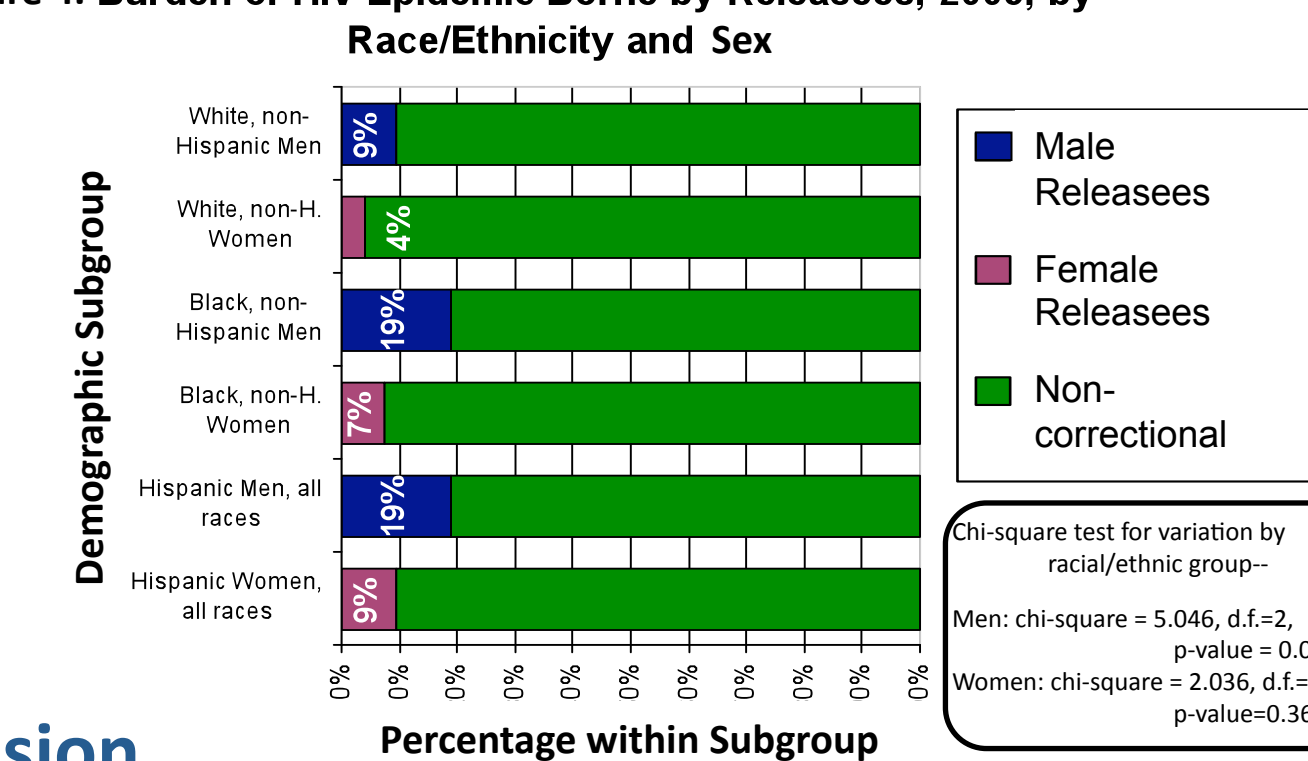


Figure 4. Burden of HIV Epidemic Borne by Releases, 2005, by Race/Ethnicity and Sex



- We suggest three hypotheses that could explain the diminishing proportion of HIV and especially AIDS borne by the populations moving through CF. The following three factors could be contributing either alone or in combination:
  - With increased life expectancy for persons with HIV, infected persons are aging out of the crime prone years (age under 30 years).
  - New HIV infections are being diagnosed in populations which are less likely to be incarcerated (e.g., women, and perhaps MSM).
  - Considerable effort has been made by prison systems, and some jails, to enhance discharge planning for HIV-infected persons to decrease their risk of recidivism.

## Discussion

- We are uncertain about how many individuals entered correctional facilities repeatedly and, for those who entered more than once, how many were admitted multiple times.
  - Sensitivity analyses were run to address this uncertainty.

- Extrapolations on prison numbers: both from the 34 states to the 16 non-reporting, and from 2003 data to 2005.
- Potential selection bias in that there may be some error in terms of who was chosen for the inmate surveys.
- Potential misclassification bias of race and sex:
  - Inmate race and sex are based on self-report.
  - While there were some non-responders and people who described themselves as "other", we focused on those in a defined category.
  - Social desirability could affect the self report of race, ethnicity (and possibly gender).
  - We assumed that the race and sex composition of the 2005 prison and jail populations is essentially unchanged from the composition of 2004 prison and 2002 jail populations.
- Potential misclassification of cohort's HIV status:
  - The true prevalence may be different. While we estimated that 1.7% of inmates are infected, fewer inmates reported themselves as such.
  - We are assuming that the seroprevalence of HIV among prisoners was similar to that among jail inmates.
  - We have not factored into the calculations that prevalence among inmates in the Federal prison system is lower than that in state prisons.
- Potential misclassification of HIV status in subgroup analysis by sex and race/ethnicity was based on 2002 and 2004 surveys of inmates.
  - We assume that the race and sex distribution of infection among those who are aware of their status was similar to those who were unaware of status, but this may not be true. We have not included those who responded other or refrained from responding to questions about race, sex, and HIV status.

## Limitations

## CONCLUSIONS AND IMPLICATIONS

- The share of the US HIV epidemic proportionally borne by releases from jails and prisons has declined 29% since 1997.
- In 2005, 1 in 7 HIV-infected persons in the US left a CF.
- The high number of those infected who pass through CFs (~ 150,000 persons/year) has not changed substantially.
- Using the correctional setting as a venue for diagnosing and treating HIV/AIDS could benefit those passing through CFs as well as the community at large.
- Primary, secondary, and tertiary prevention to reduce the high burden of HIV/AIDS borne by incarcerated persons could help reduce the overall national prevalence, especially among communities of color, because of the practice of disproportionate minority confinement in the US.

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