

Patterns and Trends of Newly Diagnosed HIV Infections Among Adults and Adolescents in Correctional and Noncorrectional Facilities, United States, 2008–2011

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Objectives. We aimed to determine whether the patterns and trends of HIV infections newly diagnosed within correctional and noncorrectional facilities differ.

Methods. We classified persons newly diagnosed with HIV infection in the United States between 2008 and 2011 ($n = 181\,710$) by correctional and noncorrectional facilities where diagnoses were first made, and stratified by sex, age group, race/ethnicity, transmission category, and diagnosis year.

Results. An estimated 9187 persons were newly diagnosed with HIV infection in 2008 to 2011 while incarcerated, representing approximately 5.1% of the 181 710 HIV infections diagnosed in the United States during this period. Of these incarcerated persons, 84% were male, 30% were aged 30 to 39 years, 59% were Black/African American, and 51% of the men had been exposed through male-to-male sexual contact. Yearly numbers of diagnoses declined by 9.9% in correctional versus 0.3% in noncorrectional facilities. The percentage with a late HIV diagnosis was significantly lower in correctional than in noncorrectional facilities (prevalence ratio = 0.52; 95% confidence interval = 0.49, 0.55).

Conclusions. Initial HIV diagnosis occurred sooner after HIV infection onset in correctional than in noncorrectional settings, pointing to the need for efficient referral systems after release. (*Am J Public Health.* 2016;106:103–109. doi:10.2105/AJPH.2015.302868)

At the end of 2010, approximately 1.5% of state and federal prisoners had a diagnosis of HIV infection.¹ Although the rates of HIV infection and AIDS-related death among prisoners have declined since 2001, in 2010, this population had a burden of HIV infection (146 cases per 10 000) approximately 5.2 times the estimated prevalence of HIV in the general US population (282.2 cases per 100 000).^{1,2} Not only were imprisonment rates higher among Blacks/African Americans and Hispanics or Latinos, but also these race/ethnicity groups were disproportionately affected by HIV.^{2,3}

In 2011, Black/African American men aged 20 to 64 years were imprisoned at rates that ranged between 5 and 7 times the rates of White men, and Hispanic or Latino men had

imprisonment rates of 2 to 3 times the rates of White men.³ Black women had imprisonment rates between 2 and 3 times the rates of White women, and Hispanic or Latina women were imprisoned at rates between 1 and 3 times the rates of White women. In the same year, the Centers for Disease Control and Prevention (CDC) estimated 49 273 new diagnoses of HIV among individuals of all ages²; nearly half (47%) of those newly

diagnosed infections were among Blacks/African Americans, who accounted for only 12% of the US population.⁴ National HIV surveillance data indicated that Blacks/African Americans and Hispanics or Latinos had an increased risk of HIV infection compared with Whites; in 2011 the rate of new diagnosis among Blacks/African Americans was 9 times the rate of Whites, and the rate for Hispanics or Latinos was approximately 3 times the rate of Whites.² Factors including higher rates of sexually transmitted infections, greater numbers of undiagnosed cases of HIV infection, less access to health care services, and less use of antiretroviral therapy may account for the greater burden among Black/African American men who have sex with men (MSM).⁵

The CDC has recommended routine HIV testing for adults and adolescents in all clinical settings, including correctional health care facilities.⁶ Correctional venues provide an opportunity for HIV testing to subpopulations at high risk for infection.⁷ However, HIV testing policies within correctional facilities are determined by state and federal statutes, which vary widely. Circumstances under which inmates may be tested for HIV include entry, release, random selection, belonging to a high-risk group, court order, clinical indication, potential exposure, and inmate request. Some states require testing of all prisoners upon entry,

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while in custody, or upon release.⁸ HIV-positive results from tests performed within correctional facilities are reported to CDC via state health departments.

It is important to describe the demographic and behavioral characteristics, as well as trends of new diagnoses of HIV infection, among incarcerated populations, who may face challenges accessing testing and treatment opportunities elsewhere. This information is useful for targeting prevention messages and intervention strategies. We described the demographic and behavioral characteristics of individuals whose HIV infections were newly diagnosed within correctional facilities and compared them with the characteristics of persons diagnosed in noncorrectional facilities. We examined trends over the time period of 2008 to 2011, and assessed the characteristics associated with a diagnosis of stage 3 (AIDS) received within 3 months after the date of diagnosis of HIV infection.

METHODS

Our study included new diagnoses of HIV infection among adults and adolescents aged 13 years and older for the period of 2008 to 2011, regardless of when that infection was acquired, that were reported to the CDC's National HIV Surveillance System through June 2012 by the 50 states and the District of Columbia. All jurisdictions included in the analysis had confidential, name-based HIV infection reporting since at least January 2008, which allowed time to calculate reporting-delay estimates and to determine reliable trends. We categorized cases based on the facility where HIV was first diagnosed (i.e., correctional or noncorrectional facility). We excluded cases for which facility of diagnosis was unknown (5.6%).

We defined an incarcerated person newly diagnosed with HIV as one who received a new diagnosis of HIV infection within a correctional facility or whose source of initial HIV report to the health department was a correctional facility. Correctional facilities include federal and state prisons, as well as jails, city or county correctional centers, and juvenile centers. These can include special facilities such as medical treatment or release centers, halfway houses, work farms, and temporary holding or lockup facilities if the

source of reporting is identified as a correctional facility. Noncorrectional facilities encompass all other reported facilities of diagnosis.

Analysis of Cohort Demographic and Behavioral Characteristics

We stratified newly HIV-diagnosed incarcerated persons by sex, age group, race/ethnicity, transmission category, and year of diagnosis. We based sex designations on the individual's biological sex at birth. Race and ethnicity were self-reported and abstracted from medical charts. We captured race data as American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, and White. Multiple races could be reported. The individual's ethnicity was classified as Hispanic or Latino or not Hispanic or Latino. In this study, we combined race and ethnicity such that an individual whose ethnicity was Hispanic or Latino was classified as Hispanic or Latino, regardless of race, in our race/ethnicity variable. We categorized individuals whose ethnicity was not Hispanic or Latino as a single race or "multiple races" if more than 1 race was reported, in our combined race/ethnicity variable.

We used transmission category to summarize an individual's single risk factor most likely responsible for HIV transmission from a presumed hierarchical order of probability described elsewhere.² We used a multiple imputation procedure to assign a risk factor for the 27.9% of diagnosed cases reported without an identified risk factor.⁹ The model included the covariates sex, age group, race/ethnicity, year of diagnosis, and facility type. We adjusted the number of reported diagnoses of HIV infection for reporting delay based on estimates of reporting-delay distributions calculated by using a modified semiparametric life-table statistical table.¹⁰ We calculated the percentage of new diagnoses for a demographic or transmission category by dividing the estimated number of new diagnoses for that category by the estimated total number of new diagnoses for that category within correctional and noncorrectional facilities. We obtained prevalence ratios by using a univariate logistic regression model that was adjusted for reporting delay and undetermined transmission categories but not for other covariates.

Analysis of Trends in Diagnosis of HIV Infection

We analyzed the trends in diagnosis of HIV infection among persons first diagnosed within a correctional facility during 2008 to 2011 by using Poisson regression to calculate the estimated annual percentage change (EAPC) as the average percentage by which HIV diagnoses increased or decreased per year during the 4-year period by sex, age group, race/ethnicity, and transmission category. We conducted analyses for those diagnosed within noncorrectional facilities for comparison. We determined the significance of a trend by whether the associated 95% confidence intervals (CIs) for the EAPC included 0.

We used the Cochran–Armitage Test to assess a hypothesized decreasing trend in the percentage of all new diagnoses that were reported from correctional facilities during 2008 to 2011; data from all 4 years contributed to the test statistic.

Analysis of Stage 3 (AIDS) Within 3 Months After HIV Diagnosis

We examined the number of persons for whom a diagnosis of stage 3 (AIDS) was received within 3 months after the date of diagnosis of HIV infection among adults and adolescents newly diagnosed within a correctional facility and all other sources during the period 2008 to 2010. We excluded data from the most recent year to allow at least 18 months for stage 3 (AIDS) to be reported.

We did not adjust the number of reported diagnoses of HIV infection for reporting delay for this analysis. We calculated unadjusted prevalence ratios (PRs) to explore associations of stage 3 (AIDS) diagnosis within 3 months after diagnosis of HIV infection and demographic (sex, age, and race/ethnicity). We excluded persons whose month of diagnosis of HIV infection was unknown from the analysis. We considered differences significant if the 95% CI for the PR did not include 1.

RESULTS

During 2008 to 2011, an estimated 192 567 adults and adolescents were diagnosed with HIV infection in the United States (50 states and DC), and among these,

181 710 (94.4%) had an identified facility of HIV diagnosis (i.e., correctional or non-correctional facility).

Demographic and Behavioral Characteristics

In the United States during 2008 to 2011, an estimated 9187 adults and adolescents were diagnosed with HIV infection while incarcerated, representing approximately 5.1% of all cases with an identified facility of diagnosis (Table 1). In both groups, by sex, the majority of HIV diagnoses were among men (corrections 84.3%; noncorrections 77.2%), and by age, those aged 30 to 39 years (corrections 29.6%; noncorrections 24.3%) and those aged 20 to 29 years (corrections 29.4%; noncorrections 30.0%) were predominant.

By race/ethnicity, Blacks/African Americans accounted for 58.5% of diagnoses of HIV infection among incarcerated individuals, followed by Hispanics or Latinos (21.0%), Whites (18.1%), those of multiple races (1.7%), and other races (American Indian/Alaska Native, Asian, and Native Hawaiian/other Pacific Islander), which accounted for less than 1% each. Among nonincarcerated persons, Blacks/African Americans also accounted for the most HIV infections (47.0%), followed by Whites (28.8%), and Hispanics or Latinos (20.0%). Among the incarcerated, the percentage of Blacks/African Americans diagnosed with HIV was 3.2 times that of Whites, but among the nonincarcerated population, the percentage of Blacks/African Americans was 1.6 times that of Whites.

Among incarcerated men, the majority of HIV infections was attributed to male-to-male sexual contact (50.6%), followed by heterosexual contact (22.6%), injection drug use (19.1%), and male-to-male sexual contact and injection drug use (7.6%). Among nonincarcerated men, the majority of HIV infections was also attributed to male-to-male sexual contact (77.9%), but this majority was considerably larger. Among incarcerated women, the majority of HIV infections was attributed to heterosexual contact (64.1%), followed by injection drug use (35.8%). Among nonincarcerated women, the majority of HIV infections was also attributed to heterosexual contact (85.4%), but similar to males, this majority was considerably larger.

Among newly diagnosed men who inject drugs, 15.7% were diagnosed within correctional facilities. This percentage was greater than that for newly diagnosed MSM who inject drugs (10.2%), men exposed through heterosexual contact (9.8%), and MSM (3.6%). Likewise, among newly diagnosed women who inject drugs, 8.3% were diagnosed within correctional facilities, which was higher than that for women exposed through heterosexual contact (2.7%).

Trends in Diagnosis of HIV Infection

During 2008 to 2011 in the United States, the average annual number of diagnoses of HIV infection decreased significantly among persons diagnosed while incarcerated (EAPC = -9.9%; 95% CI = -12.1%, -7.5%). We observed no change among those diagnosed in noncorrectional settings (-0.3%; 95% CI = -0.9%, 0.3%; Table 2).

The average annual number of diagnoses of HIV infection decreased among incarcerated men (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>). By contrast, we observed a significant increase in HIV diagnoses among men diagnosed in noncorrectional facilities. The annual number of HIV diagnoses decreased significantly among women in both groups.

The number of HIV infection diagnoses decreased significantly across all age groups of incarcerated persons (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>). However, among nonincarcerated persons, we observed a significant increase among those aged 20 to 29 years. Decreases were significant among persons aged 30 to 39 years and 40 to 49 years. We observed no significant changes among those aged 13 to 19 years and those aged 50 years and older.

There was a nonsignificant decrease in the number of HIV diagnoses among incarcerated MSM (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>). By contrast, we observed a significant increase in HIV diagnoses among MSM diagnosed in noncorrectional facilities. There was a significant decrease in the annual number of diagnoses of HIV infection among men whose infections

were attributed to injection drug use among those diagnosed within correctional facilities and within noncorrectional facilities. Likewise, there was a significant decrease in the annual number of diagnoses of HIV infection among women whose infections were attributed to injection drug use in both groups.

The percentage of new diagnoses of HIV infection that were made within correctional facilities declined significantly from 5.8% in 2008 to 4.4% in 2011 (Table 2). By sex, the percentage of newly diagnosed men reported from a correctional facility declined significantly from 6.3% to 4.9%, and the percentage of women declined significantly from 4.4% to 2.6% (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>). We observed significant declines in the percentage of newly diagnosed men who inject drugs, MSM who inject drugs, and MSM reported from correctional facilities, but we observed no trend in men exposed through heterosexual contact. We also observed significant declines in the percentage of newly diagnosed women who inject drugs and women exposed through heterosexual contact. The percentage of newly diagnosed persons in each race/ethnicity category—Black/African American, Hispanic or Latino, White, and other races—as well as in each age group category—13 to 19, 20 to 29, 30 to 39, 40 to 49, and 50 or more years—reported from a correctional facility declined significantly.

Stage 3 (AIDS) Within 3 Months After HIV Infection Diagnosis

During 2008 to 2010, approximately 13% of the reported (not estimated) 6886 persons diagnosed with HIV infection while incarcerated throughout the United States received a stage 3 (AIDS) diagnosis within 3 months of the initial diagnosis. The prevalence of stage 3 (AIDS) diagnosis within 3 months of the initial diagnosis was significantly lower in correctional facilities than in noncorrectional facilities (PR = 0.52; 95% CI = 0.49, 0.55; Table 3).

Among those diagnosed with HIV infection within a correctional setting, the percentage with a stage 3 (AIDS) diagnosis within 3 months of the initial diagnosis was higher for men (14.2%) than for women (8.8%); the percentage was lowest in the

TABLE 1—Estimated Diagnoses of HIV Infection Among Adults and Adolescents in Correctional Versus Noncorrectional Facilities: United States, 2008–2011

Characteristics	Total, Est. No. ^a (% ^b)	Correctional Facilities, Est. No. ^a (% ^b)	Noncorrectional Facilities, Est. No. ^a (% ^b)	PR Est. (95% CI)
Sex				
Female	40 827 (22.5)	1 438 (15.7)	39 389 (22.8)	0.64 (0.61, 0.68)
Male	140 883 (77.5)	7 749 (84.3)	133 134 (77.2)	...
Age at diagnosis, y				
13–19	8 626 (4.7)	244 (2.7)	8 382 (4.9)	...
20–29	54 389 (29.9)	2 705 (29.4)	51 684 (30.0)	1.76 (1.55, 2.00)
30–39	44 606 (24.5)	2 716 (29.6)	41 891 (24.3)	2.15 (1.89, 2.45)
40–49	43 763 (24.1)	2 518 (27.4)	41 245 (23.9)	2.03 (1.79, 2.32)
≥ 50	30 326 (16.7)	1 004 (10.9)	29 322 (17.0)	1.17 (1.02, 1.34)
Race/ethnicity				
American Indian/Alaska Native	820 (0.5)	17 (0.2)	803 (0.5)	0.64 (0.40, 1.03)
Asian	3 139 (1.7)	34 (0.4)	3 105 (1.8)	0.33 (0.24, 0.47)
Black/African American	86 454 (47.6)	5 378 (58.5)	81 076 (47.0)	1.92 (1.82, 2.03)
Hispanic or Latino ^c	36 352 (20.0)	1 930 (21.0)	34 422 (20.0)	1.64 (1.54, 1.75)
Multiple races	3 339 (1.8)	159 (1.7)	3 180 (1.8)	1.47 (1.25, 1.72)
Native Hawaiian/other Pacific Islander	279 (0.2)	5 (0.1)	274 (0.2)	0.57 (0.24, 1.34)
White	51 327 (28.2)	1 664 (18.1)	49 663 (28.8)	...
Transmission category: male				
Adult other ^d	151 (0.1)	3 (0.0)	148 (0.1)	0.46 (0.13, 1.56)
Heterosexual contact ^e	17 848 (12.7)	1 754 (22.6)	16 095 (12.1)	2.70 (2.56, 2.85)
Injection drug use	9 446 (6.7)	1 482 (19.1)	7 964 (6.0)	4.31 (4.07, 4.56)
Male-to-male sexual contact	107 632 (76.4)	3 921 (50.6)	103 710 (77.9)	...
Male-to-male sexual contact and injection drug use	5 806 (4.1)	589 (7.6)	5 217 (3.9)	2.79 (2.57, 3.03)
Transmission category: female				
Adult other ^d	82 (0.2)	2 (0.1)	80 (0.2)	0.97 (0.26, 3.66)
Heterosexual contact ^e	34 544 (84.6)	921 (64.1)	33 623 (85.4)	...
Injection drug use	6 201 (15.2)	515 (35.8)	5 686 (14.4)	3.11 (2.80, 3.45)
Year of diagnosis				
2008	46 857 (25.8)	2 734 (29.8)	44 123 (25.6)	...
2009	44 066 (24.3)	2 256 (24.6)	41 811 (24.2)	...
2010	43 868 (24.1)	2 126 (23.1)	41 742 (24.2)	...
2011	46 919 (25.8)	2 072 (22.6)	44 847 (26.0)	...
Total^f	181 710 (100)	9 187 (100)	172 523 (100)	...

Note. CI = confidence interval; PR = prevalence ratio. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis.

^aEstimated numbers resulted from statistical adjustment that accounted for reporting delays and missing transmission category, but not for incomplete reporting. Rounded to nearest whole number.

^bDerived from unrounded estimated number of cases.

^cHispanics or Latinos can be of any race.

^dIncludes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

^eHeterosexual contact with a person known to have, or to be at high risk for, HIV infection.

^fBecause column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

youngest age group and generally increased by age (Table B, available as a supplement to the online version of this article at <http://www.ajph.org>). By race/ethnicity, the percentage with a stage 3 (AIDS) diagnosis within 3 months of the initial diagnosis of HIV

infection for incarcerated Hispanics or Latinos (17.9%) was significantly higher than that for incarcerated Whites (11.1%). Among incarcerated men, by transmission category, the highest percentage with a stage 3 (AIDS) diagnosis within 3 months of the initial

diagnosis was among those whose HIV infections were attributed to injection drug use (18.3%), followed, in decreasing order, by male-to-male sexual contact and injection drug use (15.3%), heterosexual contact (14.7%), and male-to-male sexual contact

TABLE 2—Estimated Number of and Annual Percentage Change in New Diagnoses of HIV Infection Among Adults and Adolescents in Correctional and Noncorrectional Facilities: United States, 2008–2011

Facility	2008, Est. No. ^a (% ^b)	2011, Est. No. ^a (% ^b)	EAPC (95% CI)
Correctional	2 734 (5.8)	2 072 (4.4)	-9.9 (-12.1, -7.5)
Noncorrectional	44 123 (94.2)	44 847 (95.6)	-0.3 (-0.9, 0.3)
Total ^c	46 857 (100)	46 919 (100)	

Note. CI = confidence interval; EAPC = estimated annual percentage change. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. The Cochran–Armitage Test was used to assess a hypothesized decreasing trend in the percentage of all new diagnoses that were reported from correctional facilities during 2008–2011; data from all 4 years contributed to the test statistic, as well as the EAPC.

^aEstimated number of cases rounded to nearest whole number.

^bDerived from unrounded estimated number of cases.

^cBecause column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.

(12.1%). Among incarcerated women, the percentage with a stage 3 (AIDS) diagnosis within 3 months of the initial diagnosis was higher for those whose HIV infections were attributed to injection drug use (10.9%) than for those whose infections were attributed to heterosexual contact (7.6%).

DISCUSSION

In the United States, from 2008 through 2011, approximately 5.1% of adults and adolescents diagnosed with HIV infection were initially diagnosed within a correctional facility. Among the incarcerated, the highest percentage of persons diagnosed with HIV infection were male, Black/African American, and aged 30 to 39 years. These were the same 3 most-affected groups previously identified among persons diagnosed with stage 3 (AIDS) within correctional facilities during 1994 to 1996.¹¹ Among incarcerated men first diagnosed with HIV during 2008 to 2011, male-to-male sexual contact was the

predominant transmission category, and heterosexual contact was predominant among incarcerated women; however, a higher percentage of incarcerated men and women diagnosed with HIV had their infections attributed to injection drug use than did nonincarcerated men and women. During the study period, there was a decline in the annual number and percentage of persons newly diagnosed with HIV infection within correctional facilities. A lower percentage of those diagnosed with HIV infection within a correctional setting was also diagnosed with stage 3 (AIDS) within 3 months compared with those diagnosed in noncorrectional settings.

Whereas Blacks/African Americans represented approximately 12% of the US population in 2011,⁴ they accounted for 47% of diagnoses of HIV that year.² At the end of 2010, there were an estimated 872 990 people living with diagnosed HIV in the United States, of whom 44% were Black/African American. Black/African American MSM may be more vulnerable to HIV infection than

White MSM because of higher rates of sexually transmitted infections, greater numbers of undiagnosed cases of HIV infection, less access to health care services, and less use of antiretroviral therapy.⁵ Our data also showed disproportionate numbers of HIV diagnoses among those incarcerated. The percentage of Blacks/African Americans diagnosed with HIV in correctional facilities (58.5%) was disproportionately high compared with the population of Blacks/African Americans in prison (38%) at year-end 2011,³ and represented 1.24 times the percentage of Blacks/African Americans diagnosed in noncorrectional facilities. This finding could be caused by challenges and barriers minorities face in accessing health care; the greater percentage of diagnoses among Blacks/African Americans reported from correctional facilities could represent those who were unable to access testing in noncorrectional settings.^{12,13}

Among those diagnosed with HIV infection within correctional facilities, the percentages of men and persons aged 30 to 39 years were slightly higher than the percentages of those diagnosed in noncorrectional settings. However, these results resembled trends in the general US population with the highest rates of diagnosis observed among men and persons aged 20 to 29 years.² Overall, men and persons aged 25 to 34 years accounted for the greatest numbers of the prison population; in 2011 men were imprisoned at a rate 14 times that of women, and both men and women aged 25 to 34 years had the highest imprisonment rates.³

There has been an overall decline in HIV infection diagnoses among people who inject drugs; however, injection drug use continues to represent a substantial route of transmission.² The percentages of men and women who inject drugs were higher among those diagnosed with HIV infection within correctional settings than other settings (3.2 and 2.5 times the percentages, respectively). This finding may be explained by the higher use of illicit drugs among the arrestee population compared with the general US population.^{14,15} In 2002, 1.5% of jail inmates reporting previous drug use were HIV-positive; 3.2% of those reporting injection drug use were HIV-positive; and 7.5% of those reporting sharing a needle were HIV-positive.¹⁶ People who inject drugs may also experience challenges in accessing

TABLE 3—Stage 3 (AIDS) Diagnosis Within 3 Months of a New Diagnosis of HIV Infection in Correctional and Noncorrectional Facilities: United States, 2008–2010

Facility	Stage 3 (AIDS) at HIV Diagnosis, ^a No. (%)	Total New HIV Diagnoses, No. (%)	Est. PR (95% CI)
Correctional	914 (13.3)	6 886 (100)	0.52 (0.49, 0.55)
Noncorrectional	31 263 (25.6)	122 051 (100)	(Ref)

Note. CI = confidence interval; Est. = point estimate; PR = prevalence ratio. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis.

^aBased on first CD4 test performed or documentation of an AIDS-defining condition ≤ 3 months after a diagnosis of HIV infection.

testing services in noncorrectional settings.¹³

The number and percentage of federal and state prisoners with HIV infection declined from 2008 through 2010.¹ The number of cases decreased from 21 611 to 20 093, and the rate decreased from approximately 160 to 146 cases per 10 000 inmates. Our finding of a decreasing trend in the number of new diagnoses within correctional facilities may be explained by a decline in the prison population during the study period, changes in HIV testing policies within correctional facilities, lower incidence of HIV infection among persons who become incarcerated, or a proportional increase in the number of people diagnosed in noncorrectional facilities. During 2008 to 2011, declines in HIV diagnoses among persons incarcerated were higher than declines in the prison population. New HIV diagnoses within correctional facilities decreased 9.9% per year, but for the same time period, the prison population decreased only by an average of 0.2% from year to year,³ and the total correctional population decreased by an average of 1.5% from year to year.¹⁷

Because practices involving mandatory HIV testing of prison inmates varied from state to state and year to year (Laura Maruschak, e-mail communication, April 2, 2013), it is possible that fewer prisoners were tested each year from 2008 through 2011. This hypothetical decline in the number of prisoners tested could have contributed to a decline in the number of HIV diagnoses. The greatest reduction in the number of new diagnoses among the incarcerated occurred among men and Blacks/African Americans. Because Blacks/African Americans were disproportionately incarcerated and affected by HIV infection, changes in trend among this demographic would have had the greatest impact on the overall trend. During the study period 2008 to 2011, the rate of new diagnoses among Blacks/African Americans decreased,² and the proportion of incarcerated Blacks/African Americans declined slightly relative to other races (E. Ann Carson, e-mail communication, November 4, 2013).

Furthermore, we found a decreasing trend in the percentage of new HIV diagnoses that was reported from correctional facilities. Although this finding is encouraging, and another survey conducted in 1 state detected

relatively few new cases of HIV by testing nearly all prison entrants for approximately 1 year,¹⁸ it should not be interpreted as an indication to reduce the amount of testing within a correctional facility because of lower yields. Although only 5% of all new HIV diagnoses were reported from correctional facilities during the study period, 16% of new diagnoses among men who inject drugs were from correctional facilities. HIV testing is an important strategy to reduce the number of new HIV infections within the United States, and CDC recommends a routine opt-out testing policy for correctional facilities.⁶ Although practices involving mandatory testing of prison inmates vary by jurisdiction, most states and the federal system tested prisoners upon clinical indication or request (Laura Maruschak, e-mail communication, April 2, 2013). Testing within correctional facilities may identify cases that would otherwise remain undiagnosed because of persons' inability to access health care.¹²

Diagnosis of stage 3 (AIDS) within 3 months of HIV diagnosis is a sign of a long time lapse between HIV infection and initial diagnosis; it may reflect limited access to health care or HIV testing opportunities. Our finding of a lower percentage with a late diagnosis of HIV infection among those diagnosed within a correctional facility may reflect the mandatory testing policies in some jurisdictions and the easier access to testing overall. Another study found a longer time to a stage 3 (AIDS) diagnosis among women without criminal justice involvement,¹⁹ but our study took into account only if the HIV diagnosis was made in a correctional setting, as opposed to if the person living with HIV was involved with the criminal justice system. Racial minorities and people who inject drugs are incarcerated at higher rates and tend to face more barriers to accessing health care.¹³ Populations that become incarcerated also tend to face challenges in accessing health care¹²; perhaps those of similar demographics and risk behaviors who do not become incarcerated are diagnosed with HIV later during the course of infection because they cannot access health care. For this reason, it is ever more important to identify cases of HIV in this population because incarcerated persons are entitled to receive medically necessary health care. Upon release, it is critical to link persons living with HIV to

care so that their medical treatment is not interrupted.^{20–22}

This study had several limitations. Not all correctional facilities test for HIV, and it is likely that not all cases were reported. Testing regulations and practices (mandatory vs voluntary) varied among facilities; although data obtained from facilities where testing was mandatory could be considered complete, those who declined testing in facilities where testing was voluntary could have influenced the demographic and behavioral profiles and temporal trends observed in this study. The data available for this project did not allow us to determine when or where infection occurred. Some disparities may reflect differences in testing behavior, access to testing services, and populations targeted for testing. Facility of diagnosis was missing for approximately 5% of cases. Data were collected across many jurisdictions whose surveillance practices vary. We did not present data on transgender individuals because information on gender identity was not collected consistently.

Notwithstanding these limitations, our findings suggest a few strategies for reducing the burden of HIV within correctional facilities. Drug treatment programs should be made more available. Access to HIV services should be improved for populations with high incarceration rates, especially those found by this study to have higher percentages of correctional facility diagnoses, including Blacks/African Americans and people who inject drugs. HIV testing should continue to be made available to incarcerated populations, as the correctional setting may be the only opportunity for some populations to receive HIV testing and be linked to medical care. **AJPH**

CONTRIBUTORS

A. Hernandez and A. E. Barskey originated the study. A. Surendera Babu performed the analysis. A. Hernandez, A. E. Barskey, and A. Surendera Babu wrote and prepared the article. L. Espinoza supervised the study and reviewed the article. All authors participated in article revision.

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Note. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

HUMAN PARTICIPANT PROTECTION

This study analyzes public health surveillance data collected by law as routine case reporting. A determination has been made that institutional review board review is not required.

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