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Voluntary Rapid Human Immunodeficiency Virus (HIV) Testing in Jails

ROBIN MACGOWAN, MPH,* ANDREW MARGOLIS, MPH,* APRIL RICHARDSON-MOORE, RN, MPH,† TERRY WANG, MSPH,* MARLENE LALOTA, MPH,‡ P. TYLER FRENCH, MPH,§ JAMES STODOLA, BSW,‖ JENNIFER MCKEEVER, MPH, MSW,¶ JACK CARREL, MPH,¶ JOLENE MULLINS, MPH,# MICHELLE LLANAS, BA,‖ AND SEAN DAVID GRIFFITHS, MPH*; FOR THE RAPID TESTING IN CORRECTIONS (RTIC) TEAM

Objectives: **To provide human immunodeficiency virus (HIV) rapid testing to persons in jails, identify previously undiagnosed cases of HIV infection, and refer HIV-infected inmates to care, treatment, and prevention services.**

Design: **Four state health departments (Florida, Louisiana, New York, and Wisconsin) collaborated with jails to implement stand-alone voluntary rapid HIV testing programs. Inmates requested or were referred by medical staff for rapid HIV testing. HIV testing was provided by the health department, correctional facility, or a community-based organization. Inmates whose rapid test was reactive were offered confirmatory testing, medical evaluation, prevention services, and discharge planning.**

Results: **From December 2003 through May 2006, rapid HIV testing was provided to 33,211 inmates, more than 99.9% of whom received their test results. Most of the inmates tested were male (79%), black (58%), and less than 35 years of age (60%). A total of 440 (1.3%) rapid HIV tests were reactive, and 409 (1.2%) of the results were confirmed positive. The testing programs identified 269 (0.8%) previously undiagnosed cases of HIV infection. In the multivariate analyses, new HIV diagnoses were associated with race/ethnicity, report of risky behaviors, and with no report of HIV risk behavior. Almost 40% of diagnoses were for inmates whose only reported risk was heterosexual contact.**

Conclusions: **Rapid HIV testing in jails identified a considerable number of previously undiagnosed cases of HIV infection. Rapid HIV testing should be available to all inmates, regardless of whether inmates reported HIV risky behaviors.**

*From the *Division of HIV/AIDS Prevention, National Center for HIV, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia; †New York State Department of Health, Bureau of Direct Program Operations, Albany, New York; ‡Florida Department of Health, Bureau of HIV/AIDS, Tallahassee, Florida; §New York State Department of Health, AIDS Institute, Menands, New York; ‖Division of Public Health, Wisconsin Department of Health and Family Services, Madison, Wisconsin; ¶Louisiana Office of Public Health, New Orleans, Louisiana; and #Broward County Health Department, Fort Lauderdale, Florida*

THE CENTERS FOR DISEASE Control and Prevention (CDC) has estimated that approximately 1.1 million people in the United States are human immunodeficiency virus (HIV)-seropositive and that 252,000 to 312,000 are unaware that they are infected.[1] Annually, 40,000 new HIV infections occur: of those, 27,000 (68%) are acquired from sex or drug-use partners who are unaware of their infection.[2] High rates of HIV infection have been documented among persons of minority races/ethnicities and among persons in correctional facilities.[3–5] In 2004, the rate of HIV diagnosis among blacks was 8.4 times the rate among whites in the United States, and similarly higher rates of HIV infection have been documented among black men, compared with white men, in prisons.[6] In 2003, 1.9% of federal and state prison inmates were known to be HIV infected, and the prevalence of acquired immune deficiency syndrome (AIDS) among prison populations was 3 times that among the general US population (0.51% vs. 0.15%). In a 2002 survey, 1.3% of jail inmates reported having tested positive for HIV.[5]

In mid 2005, 2.2 million people were incarcerated in the United States, 1.5 million in federal and state prisons and 750,000 in jails.[7] In federal and state prison systems, inmates are typically detained for felony convictions for which the sentence is 1 year or more; in jails, inmates are typically awaiting adjudication or are serving sentences of less than 1 year. Providing HIV testing services in correctional facilities may help increase the use of HIV prevention services among populations of minority races and ethnicities for whom the rate of incarceration is higher[7] and subsequently reduce the HIV/AIDS health disparities experienced by these populations. Many prison systems have instituted broader HIV testing programs than have jails, largely because prisons detain inmates longer, resulting in a population that is more accessible for medical evaluation.[8] In a 2002 survey of jail inmates, only 21.6% reported receiving an HIV test after admission,[9] which suggests that most of the persons in jails are not offered HIV testing.

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Other members of the RTIC Team: Monique Hosein, Neil Hoxie, Dan O'Connell, Mara San Antonio-Gaddy, Carol Sheppard, Dale Stratford, Jocelyn Patterson, James Vergeront, HIV counseling and testing staff (Broward County Health Department, Family Services of Greater Baton Rouge, Milwaukee House of Corrections, New York State Department of Health, Orleans Parrish Prison, Rock County Jail), and Department of Corrections staff (Broward County, Milwaukee House of Corrections, NY county jails, Orleans Parrish Prison, Rock County Jail).

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

Correspondence: Robin MacGowan, MPH LCDR, US PHS Centers for Disease Control and Prevention, 1600 Clifton Rd., MS E-37, Atlanta, GA 30333. E-mail: rmacgowan@cdc.gov.

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Providing jail inmates with the standard HIV enzyme immunoassay (EIA) has been challenging because many inmates are released before they receive their test results. In 2003, rapid HIV tests became available in the United States for use in point-of-care HIV screening. Rapid HIV testing allows programs to provide results within 20 minutes. For persons with a reactive rapid test, confirmatory testing can be immediately initiated, and the referral process for care, treatment, and prevention services can begin.

In 2003, CDC implemented the Advancing HIV Prevention Initiative consisting of 4 key strategies, 1 of which was to implement new models for diagnosing HIV infection outside traditional medical settings.[10] Routine HIV testing is recommended for incarcerated populations[11]; therefore, providing rapid HIV testing to incarcerated populations was a central component of this strategy. In 2003, CDC provided funds to state health departments in Florida, Louisiana, New York, and Wisconsin to provide rapid HIV testing to jail inmates. In this article, we summarize the implementation of the rapid HIV testing programs, report factors associated with a newly diagnosed case of HIV infection, and provide recommendations for jail-based rapid HIV testing.

Materials and Methods

In September 2003, the participating health departments collaborated with jails in their jurisdictions to develop and implement voluntary rapid HIV testing programs to replace or augment HIV testing services. Jails began providing rapid HIV testing to inmates in December 2003, with the goal of conducting 39,000 HIV tests during the next 2 years: Florida, 10,000; Louisiana, 12,000; New York, 8750; and Wisconsin, 8000. Depending upon the site, rapid HIV testing was performed by personnel from the corrections department, health department, or a community-based organization.

Descriptions of Rapid HIV Testing Programs

Rapid HIV testing programs were provided in jails in Florida, Louisiana, upstate New York, and Wisconsin. The programs began to provide services in late December 2003 or early January 2004, 1 to 5 days per week in the jails. In most jails, inmates detained for more than 24 hours were eligible for testing. In one Louisiana jail—Orleans Parish Prison—inmates had to be detained for more than 72 hours, and services were discontinued for several months after Hurricane Katrina necessitated the evacuation of the facility.

HIV Testing Process

Several approaches were used to advertise the availability of free voluntary rapid HIV testing. These included posters, brochures, request forms in orientation packages, word-of-mouth from inmates and jail staff, and referrals by the medical staff when medically indicated (e.g., positive result from a tuberculin skin test or diagnosis of other sexually or parentally transmitted infections). Testing was usually provided in the medical area or private counseling rooms. At the beginning of a session, the testing staff provided information about the rapid HIV test and obtained an inmate's consent. During the session, HIV prevention counseling was provided. In New York and Wisconsin, inmates remained with the counselor while the specimen was being tested. In Florida and Louisiana, after the rapid test was administered, the inmate returned to the waiting area while the specimen was being tested. During this time, the rapid test was administered to another inmate. This procedure allowed the testing staff to conduct 2 tests concurrently.

The 4 testing programs used 3 rapid HIV tests: OraQuick, OraQuick Advance, and Uni-Gold Recombigen, all of which have sensitivities and specificities of more than 99.3%.[12] Inmates whose rapid test was nonreactive were told that they were HIV-negative. Inmates whose rapid test was reactive were informed that their results were preliminarily positive and that confirmatory testing was necessary for a definitive diagnosis. HIV testing staff referred persons with a reactive rapid test for medical evaluation and other prevention services. Discharge planning was provided to persons with a confirmed positive test result.

Confirmatory HIV testing comprised the collection of a specimen—blood or oral fluid—and an EIA followed by a Western blot or an immunoflourescent assay. Confirmatory HIV test results were available within 10 business days. In Florida, Louisiana, and Wisconsin, health department disease intervention specialists assisted with providing results to persons who had been released from custody. Inmates with a reactive rapid test were referred to the jail medical unit and to HIV prevention services in the facility.

Data Collection and Analyses

Testing staff used standardized state HIV counseling and testing (CT) forms to record inmates' responses to questions about demographic characteristics (age, race, and gender), most recent HIV test result, and HIV risk behaviors. Questions about HIV risky behaviors included the following topics: gender of sex partners; injection drug use (IDU); sex in exchange for drugs, money, or other items; history of a sexually transmitted disease (STD); having been sexually assaulted; and sex with a partner who injects drugs, is HIV-positive, or is a man who has sex with other men. Data were entered according to the procedures of each state health department, and all monitoring and evaluation data were transmitted to CDC through a secure data network.

For data analysis, we assigned each person to a mutually exclusive, hierarchical HIV transmission category on the basis of their gender and the behavioral risk factors. Inmates reporting multiple behaviors were assigned to their highest hierarchal risk group. Men were assigned to transmission categories in the following order: male-to-male sexual contact and IDU; IDU; male-to-male sexual contact; sex with an at-risk partner (one who injected drugs or was HIV infected); sex in exchange for money, drugs, or other items; having a prior STD diagnosis; having been sexually assaulted; heterosexual risk only; and no reported HIV risk factors. Women were assigned as follows: IDU; sex with an at-risk partner (one who injected drugs, was HIV infected, or was a man who had sex with other men); sex in exchange for money, drugs, or other items; having a prior STD diagnosis; having been sexually assaulted; heterosexual risk only; and no reported HIV risk factors.

For the logistic regression analyses, we used SAS software, version 9.1.3 (SAS Institute, Inc, Cary, NC). A new HIV diagnosis was based upon an a priori algorithm that included a reactive rapid test, a positive result from a confirmatory HIV test, and previous lack of awareness of their infection. For the regression analyses, the reference group for behavioral risk factors was inmates who reported only heterosexual contact. Multivariate logistic regression analyses were conducted to assess demographic characteristics and risk groups independently associated with a confirmed new HIV diagnosis. The demographic characteristics and the risk behaviors included in the bivariate analyses were included in the multivariate logistic regression analyses. Inmates who already had a confirmed HIV diagnosis were excluded from the regression analyses.

Results

Collectively, the jails booked approximately 550,000 persons during the project period. From December 2003 through May 2006, project staff performed 33,211 voluntary rapid HIV tests with jail inmates, representing approximately 6% of all bookings into the jails (Table 1). More than 99.9% of inmates received their

TABLE 1. Characteristics and Rates of Reactive Tests and Confirmed New HIV Diagnoses Among Jail Inmates Requesting Rapid HIV Testing, 4 States, United States, December 2003–May 2006, (N = 33,211)

	Rapid HIV Tests Conducted		Reactive Rapid HIV Tests		Confirmed New HIV Diagnoses*	
	No.	Proportion (%)	No.	Rate (%)	No.	Rate (%)
Total	33,211	100	440	1.3	269	0.8
Site						
Florida	13,420	40.4	260	1.9	139	1.0
Louisiana	6,316	19.0	109	1.7	80	1.3
New York	9,058	27.3	59	0.7	43	0.5
Wisconsin	4,417	13.3	12	0.3	7	0.2
Gender						
Male	26,294	79.2	344	1.3	199	0.8
Female	6,916	20.8	96	1.4	70	1.0
Age group (range 18–86 yr)						
<25	10,394	31.3	58	0.6	43	0.4
25–34	9,531	28.7	106	1.1	75	0.8
≥35	13,286	40.0	276	2.1	151	1.1
Race/ethnicity						
White, not Hispanic	8,814	26.5	75	0.9	36	0.4
Black, not Hispanic	19,099	57.5	321	1.7	207	1.1
Hispanic	4,030	12.1	36	0.9	19	0.5
Other†	1,268	3.8	8	0.6	7	0.6
Most recent HIV test result						
No prior test	11,181	33.7	131	1.2	114	1.0
Positive	191	0.6	145	75.9	—	—
Negative	20,511	61.8	131	0.6	124	0.6
Indeterminate/did not know	989	3.0	16	1.6	15	1.5
No response	339	1.0	17	5.0	16	4.7
HIV risk groups						
MSM and IDU	198	0.6	11	5.6	4	2.0
IDU	3,940	11.9	54	1.4	32	0.8
MSM	782	2.4	58	7.4	29	3.7
Sex with at-risk partner‡	1,853	5.6	73	3.9	34	1.8
Sex for drugs, money, etc.	1,899	5.7	23	1.2	18	0.9
STD§	4,156	12.5	31	0.8	23	0.6
Sexual assault‖	663	2.0	6	0.9	5	0.8
Heterosexual behavior	18,638	56.1	151	0.8	105	0.6
No reported risk behaviors¶	1,082	3.3	33	3.1	19	1.8

*Of the 440 people with reactive HIV rapid tests, 18 declined confirmatory testing.
†American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, not specified.
‡For men—sex partner was an injection drug user or was HIV infected; for women—sex partner was a man who had sex with men, an injection drug user, or was HIV infected.
§Florida reported STD during past 12 mo: Louisiana, New York, and Wisconsin reported STD since 1978.
‖Information not obtained in Louisiana.
¶Inmates who did not report any of the listed HIV risk behaviors.
IDU indicates injection drug user; STD, sexually transmitted disease.

rapid test results. Most of the inmates tested were male (79%), black (58%), and younger than 35 years of age (60%). Few (15%) reported behaviors that would suggest that they were at very high risk (e.g., male-to-male sexual contact, IDU, or both) of acquiring HIV infection; most reported heterosexual contact as their only HIV risk factor, and 3% did not report any risk behaviors. More than half (65%) had previously been tested for HIV.

Overall, 440 persons (1.3%) had reactive rapid HIV tests; the highest rates were in Florida (1.9%) and Louisiana (1.7%) jails. The highest proportion of reactive rapid tests were among inmates with the following demographic or behavioral characteristics: age of more than 34 years (2.1%), black (1.7%), male-to-male sexual contact (7.4%), male-to-male sexual contact and IDU (5.6%), and sex with an at-risk partner (3.9%) (Table 1). In addition, 5.0% of inmates who did not report information on prior HIV testing had a reactive rapid test.

The demographic and risk profiles of persons with a newly diagnosed case were similar to those with a reactive rapid HIV test (Table 1). Confirmatory HIV testing was accepted by 422 (96%) of the 440 inmates with a reactive rapid test. According to the final disposition of the 422 confirmatory testing results, 409 inmates were HIV positive (97%), 8 were HIV negative (2%), and 5 (1%) had indeterminate results. HIV testing program staff or disease intervention specialists provided confirmatory HIV test results to 325 inmates (77%). Anecdotally, most of the persons tested received their confirmatory test results while incarcerated. Of the 409 inmates confirmed as HIV positive, 269 (64%) had newly diagnosed cases of HIV infection. The percent of newly HIV-diagnosed infections varied across the sites from 0.2% to 1.3%. Almost half (n = 124; 46%) of the inmates with a newly diagnosed infection reported heterosexual contact or did not report HIV risk behaviors.

Several demographic and behavioral characteristics were independently associated with a new diagnosis of HIV infection (Table 2).

TABLE 2. Bivariate and Multivariate Logistic Regression Analyses for New HIV Diagnoses Among Jail Inmates Receiving Reactive Rapid HIV Tests With Confirmatory Testing, 4 States, United States, December 2003–May 2006, (N = 33,070)

	Male (N = 26,171)				Female (N = 6,899)			
	Bivariate Analysis		Multivariate Analysis		Bivariate Analysis		Multivariate Analysis	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age (range 18–86 yr)								
<25	Reference	—	Reference	—	Reference	—	Reference	—
25–34	2.13*	1.38–3.28	2.00*	1.29–3.10	1.21	0.57–2.57	1.11	0.52–2.37
≥35	3.13*	2.11–4.65	2.71*	1.81–4.05	1.67	0.86–3.27	1.40	0.71–2.77
Race/ethnicity								
White, not Hispanic	Reference	—	Reference	—	Reference	—	Reference	—
Black, not Hispanic	3.44*	2.11–5.61	4.61*	2.79–7.60	2.21*	1.28–3.80	2.42*	1.37–4.28
Hispanic	1.57	0.80–3.09	2.11*	1.07–4.17	0.79	0.23–2.68	0.88	0.26–3.03
Other†	2.14	0.85–5.41	2.56*	1.01–6.51	0.47	0.06–3.52	0.51	0.07–3.84
HIV risk groups								
Heterosexual behavior	Reference	—	Reference	—	Reference	—	Reference	—
MSM and IDU	4.13*	1.50–11.37	5.58*	1.99–15.61	—	—	—	—
IDU	1.71‡	1.08–2.71	1.99*	1.24–3.20	0.70	0.32–1.55	0.99	0.43–2.27
MSM	7.77*	5.06–11.91	7.88*	5.11–12.15	—	—	—	—
Sex with at-risk partner§	3.34*	1.98–5.64	3.08*	1.81–5.25	2.14‡	1.12–4.10	2.44*	1.25–4.74
Sex exchanged for drugs, money	1.03	0.38–2.82	0.80	0.29–2.19	1.24	0.63–2.47	1.25	0.63–2.50
STD‖	1.14	0.70–1.86	0.97	0.60–1.59	0.41	0.12–1.39	0.42	0.12–1.40
Sexual assault¶	1.69	0.41–6.90	1.91	0.46–7.82	0.70	0.21–2.37	0.86	0.25–2.93
No reported risk behaviors#	5.04*	2.89–8.78	4.11*	2.35–7.18	0.84	0.28–2.46	0.83	0.28–2.45

*P <0.01.
†American Indian/Alaska Native, Asian, Native Hawaiian/Pacific Islander, not specified.
‡P <0.05.
§For men—sex partner was an injection drug user or was HIV infected; for women—sex partner was a man who had sex with men, an injection drug user, or was HIV infected.
‖Florida reported STD during past 12 mo: Louisiana, New York, and Wisconsin reported STD since 1978.
¶Information not obtained in Louisiana.
#Inmates who did not report any of the listed HIV risk behaviors.
OR indicates odds ratio; CI, confidence interval; IDU, injection drug user; STD, sexually transmitted disease.

Male inmates were more likely to receive a new diagnosis of HIV infection if they were older [25–34 years old, odds ratio (OR) = 2.0, P <0.01; 35 years age or older, OR = 2.7, P <0.01] compared with those under 25 years of age; and if they were black (OR = 4.6, P <0.01), Hispanic, (OR = 2.1, P <0.01), or other race/ethnicity (OR = 2.6, P <0.01) compared with white. Male inmates whose risk factors were male-to-male sexual contact (OR = 7.9, P <0.01), male-to-male sexual contact and IDU, (OR = 5.6, P <0.01), IDU, (OR = 2.0, P <0.01), or sex with at-risk partner, (OR = 3.1, P <0.01) were significantly more likely to receive a new diagnosis of HIV infection compared with male inmates whose only reported risk factor was heterosexual contact. In addition, male inmates who did not report HIV risk behaviors were more likely (OR = 4.1, P <0.01) to have a newly diagnosed case of HIV infection than were men whose only reported risk was heterosexual contact. Among women, the only demographic characteristic independently associated with a new HIV diagnosis was race/ethnicity. Black women were more likely (OR = 2.4, P <0.01) than white women to have a new diagnosis of HIV infection. The only behavioral risk factor for a new diagnosis for women was sex with an at-risk partner (OR = 2.4, P <0.01), compared with women whose only risk factor was heterosexual contact.

Discussion

These programs successfully provided voluntary rapid HIV testing to jail inmates and identified previously undiagnosed cases of HIV infection. The 4 rapid HIV testing programs conducted 33,211 tests, referred 440 persons with a reactive rapid test to care, treatment, and prevention services, and identified 269 previously undiagnosed cases of HIV. Many persons infected with HIV did not report high-risk behaviors.

Research suggests that many persons are not accessing HIV testing until late in the course of infection: in 2001, 39% of all HIV infections diagnosed in the United States progressed to AIDS within 12 months.[13] Knowledge of one's HIV serostatus earlier in the course of HIV infection is a crucial first step in the ability to seek and access medical and prevention services, which can result in improved quality of life[14] and the prevention of HIV transmission to others through lower infectivity and reduced risk.[15] These jail-based rapid HIV testing programs provided inmates with an opportunity to be tested for HIV and learn their serostatus. HIV infection in many inmates might have remained undiagnosed for years had these persons not been tested for HIV while in jail. Therefore, providing rapid HIV testing and linkage to services to jail inmates can be a valuable public health service for the inmate, their sex- and drug-use partners, and to society at large.

A critical component of HIV testing is the receipt of test results. Data from publicly funded testing sites that perform EIAs, which typically require a turnaround of 7 to 14 days and a return visit to obtain results, have indicated that 48% to 84% of persons are notified of their HIV test results.[16] However, rapid HIV testing allows results to be provided in as little as 20 minutes and significantly increases the proportion of people who receive their test results. In this project, almost all inmates received their rapid HIV test results. Inmates who did not receive their rapid test results

were returned to their cells before the results were available, and they were released before returning to see the HIV counselor. Although a small proportion of the inmates with a reactive rapid HIV test declined confirmatory testing, most inmates who accepted confirmatory HIV testing received their confirmatory test result. Most of those who did not receive their confirmatory test result were released before the result was available.

Research studies of HIV testing in correctional facilities have reported lower prevalence among those who voluntarily seek testing when compared with masked studies among the incarcerated population, suggesting that some HIV-infected persons opt out of testing.[6,17–19] In these programs, inmates may have been unwilling to disclose their drug-use behaviors, and this may account for the large proportion of individuals in the "no-risk" category. If the rapid testing programs had only provided rapid testing to inmates who reported risky behaviors, almost half of the newly diagnosed cases of HIV infection would have remained undiagnosed. Therefore, the decision to offer rapid testing to jail inmates should not be based solely on an assessment of reported behavioral risk factors.

In the United States, members of minority races and ethnicities access HIV testing services later in the course of infection than whites.[20] Our findings support the national surveillance data that indicate a disproportionate number of newly diagnosed infections among populations of minority races and ethnicities[3] and may suggest that discrepancies in access to HIV testing services persist among these populations. Providing rapid HIV testing in jails may help reduce the discrepancy in access to HIV testing services, increase early diagnosis of infection, and prevent future cases of HIV infection.

Our findings have several limitations. The programs only collected HIV CT data on inmates who were referred by medical staff or who requested voluntary rapid HIV testing, therefore, the results apply to opt-in testing programs only. Administrative changes at the Orleans Parish Prison in New Orleans, followed by the extensive damage and evacuation after Hurricane Katrina, significantly reduced the number of inmates booked and eligible for testing at this facility. The programs only collected data available on the State HIV CT forms; therefore, programs did not obtain data explaining why some inmates declined confirmatory testing or on data concerning reasons for arrest. Finally, we know the HIV infection status of inmates who opted to test and not the status of other inmates who passed through the jails and did not test with these programs.

Several critical factors should be considered when developing a rapid HIV testing program. The design and scope of the program should be based on the prevalence of HIV infection among inmates, the number of inmates booked, the availability of testing staff, the confirmatory test process, and the resources available. Facilities where the HIV prevalence is unknown or is 0.1% or more should consider routinely providing HIV testing during the intake medical evaluation.

Many people change their behaviors to prevent HIV transmission to their partners after they learn that they are HIV infected.[21] Therefore, jails should collaborate with health departments and community-based organizations to implement HIV testing and referral programs. A variety of program models should be explored because it may not be feasible to provide routine HIV testing to all inmates (e.g., limited resources or the volume of inmates). Potential approaches are targeted testing during the intake medical evaluation, a targeted stand-alone program, or a combination of these. Further programmatic evaluation is needed to determine which models are most feasible, cost-effective, and capable of identifying the greatest number of newly diagnosed cases of HIV infections.

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