Published in final edited form as:

AIDS Care. 2010 March ; 22(3): 339–347. doi:10.1080/09540120903193633.

HIV COPING SELF EFFICACY: A KEY TO UNDERSTANDING STIGMA AND HIV TEST ACCEPTANCE AMONG INCARCERATED MEN IN JAMAICA

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Abstract

Although correctional centers have been noted as important venues for HIV testing, few studies have explored the factors within this context that may influence HIV test acceptance. Moreover, there is a dearth of research related to HIV and incarcerated populations in middle and low-income countries, where both the burden of HIV and the number of people incarcerated is higher compared to high-income countries. This study explores the relationship between HIV coping self efficacy, HIV-related stigma and HIV test acceptance in the largest correctional center in Jamaica. A random sample of inmates (n=298) recruited from an HIV testing demonstration project were asked to complete a cross sectional quantitative survey. Participants who reported high HIV coping self efficacy (AOR 1.86: 1.24–2.78, *P* value = .003), some perceived risk of HIV (AOR 2.51: 95% CI 1.57–4.01, *P* value = .000), and low HIV testing stigma (AOR 1.71 95% CI 1.05–2.79, *P* value = .032) were more likely to test for HIV. Correlates of HIV coping self efficacy included external and internal HIV stigma (AOR 1.28: 95% CI 1.25–1.32, *P* value=.000 and AOR 1.76: 95% CI 1.34–2.30, *P* value =.000, respectively) social support (AOR 2.09: 95% CI 1.19–3.68, *P* value = .010) and HIV knowledge (AOR 2.33: 95% CI 1.04–5.22 *P* value = .040). Policy and programs should focus on the interrelationships of these constructs to increase participation in HIV testing in correctional centers.

Keywords

HIV coping self efficacy; VCT; HIV test acceptance; correctional centers; Jamaica

Correctional centers are important venues for the provision of voluntary counseling and testing (VCT) services as the prevalence of HIV is consistently higher among incarcerated populations compared to the non-incarcerated population in countries worldwide (Jürgens 2005; UNAIDS 2006; Dolan, Kite, & Black, 2007). Provision of VCT services in correctional centers is particularly important in middle and low-income countries where the vast majority of the global incarcerated population is located (Walmsley 2006), and there is a higher burden of HIV

(UNAIDS 2008). Yet, HIV testing services in correctional centers in middle and low-income countries are severely limited (Dolan et al. 2007) as is research on factors important to the decision to test in this context.

The design and implementation of HIV testing services in correctional centers presents unique challenges compared to other testing venues. Testing while incarcerated may raise client concerns about confidentiality and ability to conceal an HIV-positive diagnosis. Inmates must also obtain medical treatment within the correctional center, thus their perception of the quality and confidentiality of medical services available may influence their decision to test. The experience of incarceration itself is stressful, and within this context inmates may feel overwhelmed by the additional burden of an HIV diagnosis (Bauserman, Ward, Eldred & Swetz 2001; Burchell, Calzavara, Myers et al. 2003).

Studies that quantitatively explore factors that influence HIV test acceptance in correctional centers are sorely lacking (Seal 2005), with more emphasis placed on the debate of mandatory or routine testing rather than on what might influence inmate choice (A. Amankwaa, L. Amankwaa & Ochie 1999; Basu Smith-Rohrberg, Hanck & Alticet al. 2005). This is the case even though the World Health Organization and United Nations currently recommend voluntary testing in correctional centers (WHO 2007; UNODC 2008). Studies of HIV testing uptake conducted in the US demonstrate a wide range in jail (46% to 95%) (Kendrick, Kroc, Coutoure & Weinstein 2004; Beckwith et al. 2007) and prison settings (38% to 84%) (Hoxie et al. 1990; Behrendt et al. 1994; Hoxie et al. 1997; Kassira et al. 2001; Liddicoat et al. 2006; MacGowan et al. 2006) indicating that contextual factors may influence inmate choice. Understanding these factors would aid in the development of programs that achieve higher test acceptance rates and are more effective in identifying HIV-positive inmates in need of treatment. Guidance on how to increase test acceptance would also assist in the discourse between the public health sector and correctional service agencies as they establish HIV testing policy.

HIV-related stigma has been noted as a significant barrier to test acceptance in many contexts (Nyamathi, Smith & Swanson 2000; Fortenberry et al., 2002; Kalichman & Simbayi, 2003; Babalola 2007). More recently, studies have also identified an individual's confidence in their ability to cope with HIV infection, including the social consequence of potential stigma as important to the testing decision (Nyamathi et al 2000; Maedoa, Haile, Lulseged & Belachew 2007). This construct may be particularly significant for inmates because of the added stress experienced during incarceration and the limited access to outside medical services. HIV coping self efficacy may also increase opportunities to address the impact of HIV-related stigma on testing through interventions at the individual level.

In 2006 the Jamaican Department of Correctional Services (DCS) and Ministry of Health (MOH) facilitated a 7-month demonstration project to provide HIV testing and treatment services to inmates. This program provided the opportunity to explore HIV test acceptance among inmates in a middle-income country in the Caribbean. The adult HIV infection rate in the Caribbean is second only to sub-Saharan Africa (UNAIDS 2008). The adult HIV prevalence rate in Jamaica is 1.6% and there are an estimated 27,000 persons living with HIV, over half of which are unaware of their HIV status (Figueroa et al. 2008). Approximately 3,883 persons are incarcerated in Jamaica (DCS 2006). Prior to the demonstration project the MOH and local NGOs worked with the DCS to provide HIV education to inmates on a limited basis. Challenges to increasing HIV services included stigma against male homosexuality and a history of prison riots associated with discussions about condom distribution in prison.

Through the demonstration project rapid on-site HIV testing was implemented in the largest correctional center in Jamaica. This institution houses 50% of all inmates and is one of two all

male maximum security intake institutions. A total of 2,057 inmates were incarcerated in this institution during the demonstration project period and 1,560 participated in the program. Of these, 1,017 tested for HIV and 24 or 3.3% were found to be HIV-infected (see Andrinopoulos et al 2009 for details of the testing program). This is twice the prevalence rate estimated for the general population (MOH 2006). Since completion of the demonstration project, HIV testing, treatment, and peer education services have continued at this institution and through outreach to all other correctional centers in Jamaica. This paper reports on the findings of a survey administered to a sample of inmates from the demonstration project to determine the relationships between HIV-related stigma, HIV coping self efficacy and HIV testing uptake. Measures of perceived risk for HIV, HIV knowledge, social support and stigma related to taking the HIV test regardless of result were also employed.

METHODS

A sample of inmates from the demonstration program was invited to participate in a 45 minute social and behavioral survey prior to pre-test counseling. Participation in the larger demonstration program was systematic by the section of the institution where inmate cells are located. A lottery system was used to select a random sample of inmates from the demonstration program to participate in the research study. This resulted in a stratified random sample of participants for the research study by section of the institution.

Eligibility was restricted to inmates who were 18 years of age and older, HIV negative, offered voluntary testing, and mentally able to provide informed consent. Based on DCS policy, the demonstration project offered voluntary HIV testing to inmates incarcerated longer than 6 months, and mandatory HIV testing to new admissions and mentally ill patients unable to provide consent for medical care. This excluded 330 inmates who were offered mandatory testing from the study. An additional 2 inmates were HIV-infected and were not eligible for participation. HIV-infected inmates completed the survey in the same manner as other participants. A question related to HIV status was included on the questionnaire and surveys were later excluded from analysis.

A total of 339 randomly selected inmates were eligible and invited to participate in the study, of whom 89% (n=304) participated. Four surveys were dropped due to missing data resulting in total of 298 completed surveys employed in analysis. The sample size was calculated to allow for detection of a 15% difference in stigma between those who tested versus declined, and to compensate for the potential effect of clustering for inmates who lived on the same section.

Interviews were conducted in a private research area. Oral informed consent was obtained prior to the survey. Interview questions were read aloud and the participant's response was recorded by the interviewer on a computer using Questionnaire Development System version 2.4TM software (Nova Research Company, Baltimore, Maryland). All interviews were conducted with the assistance of a trained interviewer. In addition to daily testing, a 3-day health fair was conducted. During the fair written surveys were used to facilitate interviews and the data later transferred to computers. Participants were assigned a study number used to link interviews with program data that indicated a participant's test decision and result. Ethics approval was obtained from the Johns Hopkins School of Medicine Internal Review Board and the Jamaican Committee on Medical and Ethical Affairs. In accordance with federal regulations, a prisoner representative was present at the ethical review of study.

Table 1 describes the measures used to capture latent constructs. The survey was pre-tested with 20 inmates including medical orderlies and HIV peer educators. Factor analysis using principle components method with varimax rotation was conducted for each aggregate measure

using the statistical software SPSS version 11.0© (SPSS, Inc. Chicago, Illinois). A mean score was calculated and the mean value of items was used to impute missing data for cases who responded to 75% of items included in the aggregate measure (Schafer & Graham, 2002).

STATA Intercooled Version 8 software (StataCorp. LP. College Station, TX) was used for analysis of the relationship between variables. Non-linear variables were categorized on the basis of distribution at the median. Perceived risk of HIV was dichotomized to create two categories, those who reported no risk versus some risk for HIV. Social support was normally distributed and was employed in analysis as a continuous variable.

Predictors of HIV test acceptance and HIV coping self efficacy were explored using bivariate and multivariate logistic regression. Variables significant at p -value $<.05$ in the bivariate models were included in the multivariate models as well as a variable to control for participation in the daily testing versus the health fair. Standard errors were adjusted for the potential clustering effect of section using robust variance estimates (Rogers 1993). Models were produced that included and excluded cases with missing variables. Including missing cases did not significantly change results, thus 37 cases containing missing data were excluded from the multivariate model with the dependent variable HIV test acceptance, and 17 cases were excluded from the multivariate model with the dependent variable HIV coping self efficacy.

RESULTS

The median age of participants was 30 years (range 18–68 years). Twenty-five percent completed primary school, 66% attended some or completed secondary school, and 10% reported post-secondary training. Sixteen percent of participants were serving a life sentence or a sentence of an unspecified amount of time under the Governor General's Pleasure. Twenty percent of inmates were appealing their case or awaiting trial. The remaining 64% were serving time sentences, the median length of which was 10 years (range 1.5–30 years). The median time served for the current conviction was 3 years (range 6 months – 33 years). Thirty-two percent of participants were recidivists, and the median number of lifetime convictions for recidivists was 2 (range 1–6).

Although 41% reported a previous STI diagnosis, only 30% of participants had ever had an HIV test. Marijuana use was high, with 54% reporting daily or nearly daily use in the last 3 months. Only 16% of participants reported any alcohol consumption in the past 3 months. Notably, no participant reported ever using a needle to inject drugs. No participants reported sex in the last 3 months. The median number of lifetime sex partners was 20 (range 1–300).

The majority of study participants (60%) chose to test for HIV, and one participant was infected. Testing uptake in the study population matches closely with that observed in the demonstration project (63%) from which participants were recruited. The number of HIV-positive inmates in the study population was slightly lower compared to the demonstration project because new admissions were not part of the study sample and HIV prevalence was higher among this group.

The bivariate relationships between sociodemographic, HIV risk behavior variables, and HIV test acceptance are shown in Table 2. Inmates who reported a previous diagnosis of an STI (Odds Ratio (OR) 1.86: 95% Confidence interval (CI) 1.67–2.07, P value = .000), those with a tattoo (OR 1.43: 95% CI 1.05–1.94, P value = .022), and recidivists (OR 1.63: 95% CI 1.02–2.60, P value = .042) were more likely to accept HIV testing. Table 3 describes the bivariate relationship between latent constructs and the dependent variable, HIV test acceptance. Results from the model adjusted for significant variables (p -value $<.05$) in Tables 2 and 3 indicate that HIV coping self efficacy was positively associated with HIV test acceptance (OR: 1.86: 95% CI 1.24–2.78, P value = .003). The majority of participants (81%) reported no perceived risk for HIV. However, participants who reported any risk for HIV versus no risk at all were 2.51

times more likely to accept testing for HIV (95% CI 1.57–4.01, P value = .000). Participants who reported low versus high HIV testing stigma were 1.71 times more likely to accept HIV testing (95% CI 1.04–2.79, P value = .032). External HIV stigma, internal HIV stigma, social support, and HIV knowledge were not significantly associated with HIV test acceptance.

Table 4 reports the relationship between variables in Table 3 and the dependent variable HIV coping self efficacy, controlling for significant sociodemographic variables. Participants who reported low versus high external HIV stigma (OR 1.28; 95% CI 1.25–1.32, p -value = .000) and internal HIV stigma (OR 1.76; 95% CI 1.34–2.30, p -value = .000) were more likely to report high HIV coping self efficacy. There was a positive association between social support and HIV coping self efficacy so that the odds of reporting high HIV coping self efficacy was 2.09 times more likely for each unit increase in social support (95% CI 1.19–3.68, P value = .010). Finally, persons with high versus low HIV knowledge were 2.33 times more likely to report high HIV coping self efficacy (95% CI 1.04–5.22, P value = .040).

DISCUSSION

The findings from this research suggest that HIV coping self efficacy, perceived risk for HIV, and HIV testing stigma are important factors related to inmates' decision to test for HIV while incarcerated. External and internal stigma did not show a direct relationship with test acceptance, although these constructs, along with social support and HIV knowledge, were correlated with HIV coping self efficacy and thus are important to address in HIV testing programs in correctional centers.

The association between HIV coping self efficacy and HIV test acceptance supports research in other contexts (Nyamathi et al. 2000; Maedot 2007). HIV knowledge was positively associated with HIV coping self efficacy, thus, efforts to increase HIV knowledge should continue. The correctional system in Jamaica includes a program for HIV peer education, which has been successful in increasing knowledge about HIV and may be utilized in efforts to reduce HIV stigma. Secondary analysis of the data also showed a positive correlation between previous HIV test and HIV knowledge, suggesting that the MOH counseling and testing protocol may be effective in increasing HIV knowledge. Social support also had a positive relationship with HIV coping self efficacy, and has been shown in other research to be important to inmate adjustment and rehabilitation (Jiang & Winfree, 2006). This association complements the findings of studies of persons infected with HIV that link social support and ability to cope with HIV (Cox 2002; Simbayi et al. 2007; Vyavaharkar et al. 2007), and self efficacy for medication adherence (Reynolds et al. 2004). As in many correctional facilities worldwide, inmates in Jamaica depend on outside family members to supplement the resources provided by the institution including medical care. Linkages to persons on the outside also provide emotional support. Programs that promote social interaction between inmates and support from the outside community are thus important.

We were initially surprised by the lack of direct statistical association between both external and internal HIV-related stigma and test acceptance. What this may indicate is that inmates are more concerned with immediate threats as a result of the stress and potential day-to-day violence during incarceration. This would explain why HIV testing stigma (what others think about someone who tests) was associated with HIV test acceptance although perceptions of future external and internal stigma if HIV-infected were not. Further, HIV testing stigma may be a more salient concern for persons who have a low level of perceived risk of HIV infection. The association between HIV testing stigma and HIV test acceptance underscores the importance of confidentiality of health services in the correctional center context.

It should also be noted that, while not directly associated with HIV test acceptance, external and internal HIV stigma were correlated with HIV coping self efficacy. These findings are similar to those of a recent study of HIV medication adherence, where HIV stigma was linked to self efficacy, but not directly to adherence (DiIorio et al. 2007). Self efficacy is a more proximate determinant of behavior, and may be more readily captured through quantitative analysis. Interestingly, internal stigma showed a stronger relationship with HIV coping self efficacy than external stigma. Both internal HIV stigma and HIV coping self efficacy are individual level psychological constructs, thus the internalization of stigma may play a more important role in HIV coping self efficacy.

As in other studies conducted in correctional centers, perceived HIV risk was low (Kacanek et al. 2007), but correlated with HIV test acceptance (Behrendt et al. 1994; Burchell et al. 2003; Beckwith et al. 2007). Many participants were unclear about disease course, the window period for detection, and the ability to have conceived a non-infected baby if they were HIV-positive. Conversely, participants who reported tattooing, as well as those who reported a previous STI were more likely to test for HIV. Programs to increase knowledge and pre-test counseling sessions should be geared to aid inmates in developing a more realistic perception of risk. Focusing on inmates at higher risk for transmission including men who have sex with men and commercial sex workers may also be a more effective means of identifying those who are HIV-infected. However, the potential increased stigma that could result from targeting these groups should also be noted.

The cross-sectional nature of the data limits our ability to draw causal relationships. Our focus on incarcerated men may limit generalizability of findings. Data was based on self report and may reflect recall bias. The sensitive nature of questions related to sex and homosexual behavior may affect the validity of responses. Results were available only for inmates who chose to test, thus we are unable to determine if HIV-infected inmates were less likely to accept testing. Finally, only participants in the demonstration project were available for recruitment. Most inmates participated in the program. However, those who declined participation in the demonstration program altogether may have been more likely to also decline HIV testing. Nevertheless, these findings contribute to our understanding of HIV test acceptance within correctional centers, and offer new directions for programs and HIV testing policy in Jamaica and other similar contexts.

REFERENCES

- Amankwaa A, Amankwaa L, Ochie C. Revisiting the debate of voluntary versus mandatory HIV/AIDS testing in US prisons. *Journal of Health and Human Services Administration* 1999;22(2):220–236. [PubMed: 10947535]
- Andrinopoulos K, Kerrigan D, Figueroa JP, Reese R, Gaydos C, Bennet L, et al. Establishment of an HIV/STD testing program and prevalence of HIV/STD among incarcerated men in Jamaica. *International Journal of STD and AIDS*. 2009 Under Review.
- Babalola S. Readiness for HIV Testing among Young People in Northern Nigeria: The Role of Social Norms and Perceived Stigma. *AIDS and Behavior* September;2007 11(5):759–769. [PubMed: 17191141]
- Basu S, Smith-Rohrberg D, Hanck S, Altice FL. HIV Testing in Correctional Institutions: Evaluating Existing Strategies, Setting New Standards. *AIDS and Public Policy Journal* 2005;20(1/2):3–24. [PubMed: 17260566]
- Bauserman R, Ward M, Eldred L, Swetz A. Increasing Voluntary HIV Testing by Offering Oral Tests in Incarcerated Populations. *American Journal of Public Health* August;2001 91(8):1226–1229. [PubMed: 11499108]
- Beckwith C, Atunah-Jay S, Cohen J, Macalino G, Poshkus M, Rich SD, Flanigan TP, Lally MA. Feasibility and Acceptability of Rapid HIV Testing in Jail. *AIDS Patient Care and STDs* 2007;21(1): 41–47. [PubMed: 17263656]

- Behrendt C, Kendig N, Dambita C, Horman J, Lawlor J, Vhalov D. Voluntary testing for human immunodeficiency virus (HIV) in a prison population with a high prevalence of HIV. *American Journal of Epidemiology* May;1994 139(9):918–926. [PubMed: 8166142]
- Boshamer CB, Bruse KE. A Scale to Measure Attitudes about HIV-Antibody Testing: Development and Psychometric Validation. *AIDS Education and Prevention* 1999;11(5):400–413. [PubMed: 10555624]
- Burchell A, Calzavara L, Myers T, Schlossberg J, Millson M, Escobar M, Wallace E, Major C. Voluntary HIV Testing Among Inmates: Sociodemographic, Behavioral Risk, and Attitudinal Correlates. *JAIDS* 2003;32:534–541. [PubMed: 12679706]
- Chesney MA, Chambers D, Taylor J, Johnson LM, Folkman S. Coping Effectiveness Training for Men Living with HIV: Results from a randomized clinical trial testing group-based intervention. *Psychosomatic Medicine* 2003;65:1038–1046. [PubMed: 14645783]
- Cox LE. Social support, medication compliance, and HIV/AIDS. *Social Work Health Care* 2002;35:425–460.
- Department of Correctional Services, Ministry of National Security, Jamaica (DCS). 2006 (Jan–Dec) Custodial Statistics. Kingston, Jamaica: 2006 [Accessed: December 19, 2008]. Available from URL: <http://www.dcsj.net/p/stats.htm>
- DiIorio C, McCarty F, DePadilla L, Resnicow K, McDonnell Holstad M, Yeager K, Sharma SM, Morisky DE, Lundberg B. Adherence to Antiretroviral Medication Regimens: A Test of a Psychosocial Model. *AIDS Behavior*. 2007 Epublication DOI 10.2007/s10461-007-9318-4. Retrieved March 3, 2008.
- Dolan K, Kite B, Black E. HIV in prison in low-income and middle-income countries. *Lancet Infectious Disease* 2007;7:32–41.
- Family Health International (FHI). Behavioral Surveillance survey. 2000. Available from URL: <http://www.cpc.unc.edu/measure/publications/unaid-00.17e/tools/fhifsw.pdf>. Retrieved: August 5, 2007
- Fife BL. The role of constructed meaning in the adaptation to the onset of life-threatening illness. *Social Science and Medicine* November;2005 61(10):2132–2143. [PubMed: 16026913]
- Figueroa JP, Duncan J, Byfield K, Harvey K, Gebre Y, Hylton-Kong T, Hamer F, Willimas E, Carrington D, Braithwaite AR. A Comprehensive Response to the HIV/AIDS Epidemic in Jamaica: A Review of the Past 20 Years. *West Indian Medical Journal* 2008;57(3):195–203. [PubMed: 19583117]
- Fortenberry JD, MacFarlane M, Bleakely A, Bull S, Fishbein M, Grimley DM, Malotte CK, Stoner BP. Relationship of stigma and shame to gonorrhea and HIV Screening. *American Journal of Public Health March*;2002 92(3):378–381. [PubMed: 11867314]
- Hoxie NJ, Vergeront JM, Frisby HR, Pfister JR, Golubjatnikov R, Davis JP. HIV Seroprevalence and the Acceptance of Voluntary HIV Testing among Newly Incarcerated Male Prison Inmates in Wisconsin. *American Journal of Public Health* 1990;80:1129–1131. [PubMed: 2382757]
- Hoxie NJ, Chen M, Prieve A, Haase B, Pfister J, Vergeront JM. HIV seroprevalence among male prison inmates in the Wisconsin Correctional System. *Wisconsin Medical Journal* May;1997 97(5):28–31. [PubMed: 9617305]
- Huba, GJ.; Melchior, LA.; Staff of the Measurement Groups. HRSA/HAB's SPNS Cooperative Agreement Steering Committee. Module 65: Acceptance of Disease Scale. 1996a. Available from URL: www.TheMeasurementGroup.com. Retrieved: August 5, 2007
- Huba, GJ.; Melchior, LA.; Staff of the Measurement Groups. HRSA/HAB's SPNS Cooperative Agreement Steering Committee. Module 46: Social Supports Form. 1996b. Available from URL: www.TheMeasurementGroup.com. Retrieved: August 5, 2007
- Jiang S, Winfree LT. Social Support, Gender, and Inmate Adjustment to Prison Life: Insights from a National Sample. *The Prison Journal* 2006;86(1):32–55.
- Joint United Nations Program on HIV/AIDS (UNAIDS). 2006 Report on the Global AIDS Epidemic. Chapter 5: At Risk and Neglected: Four Key Populations. 2006. p. 104–122. Available from URL: http://www.unaids.org/en/HIV_data/2006GlobalReport/default.asp. Retrieved: September 21, 2007
- Joint United Nations Programme on HIV/AIDS (UNAIDS). 2008 Report on the Global Epidemic. Chapter 2: Status of the global HIV epidemic. 2008 [Accessed: June 16, 2009]. Available from URL: http://data.unaids.org/pub/GlobalReport/2008/jc1510_2008_global_report_pp29_62_en.pdf
- Jürgens, R. HIV /AIDS and HCV in Prisons A Select Annotated Bibliography. International Affairs Directorate, Health Canada; 2005. Available at URL:

http://www.hc-sc.gc.ca/ahc-asc/activit/strateg/inactivit/aids-sida/hiv-aids-vihsida-pubs_e.html. Retrieved: July 1, 2007

- Kacanek D, Eldridge G, Nealey-Moore J, MacGowan RJ, Binson D, Flanigan TP, Fitzgerald CC, Sosman JM, The Project START Study Group. Young Incarcerated Men's Perception of and Experience with HIV Testing. *American Journal of Public Health* 2007;97(7):1–7.
- Kalichman SC, Simbayi LC. HIV testing attitudes, AIDS stigma, and voluntary HIV counseling and testing in a black township in Cape Town, South Africa. *Sexually Transmitted Infections* 2003;79:442–447. [PubMed: 14663117]
- Kalichman SC, Simbayi LC, Jooste S, Toefy Y, Cain D, Cherry C, Kagee A. Development of a brief scale to measure AIDS-related stigmas in South Africa. *AIDS and Behavior* 2005;9:135–143. [PubMed: 15933833]
- Kassira E, Bauserman R, Tomoyasu N, Caldeira E, Swetz A, Solomon L. HIV and AIDS Surveillance Among Inmates in Maryland Prisons. *Journal of Urban Health* 2001;78(20):256–263. [PubMed: 11419579]
- Kendrick SR, Kroc K, Coutoure E, Weinstein RA. Comparison of point-of-care rapid HIV testing in three clinical venues. *AIDS* 2004;18(16):2208–2210. [PubMed: 15577658]
- Maedot P, Haile A, Lulseged S, Belachew A. Determinants of VCT uptake among pregnant women attending two clinics in Addis Ababa City: Unmated case control study. *Ethiopian Medical Journal* 2007;45(4):335–342. [PubMed: 18326343]
- Ministry of Health Jamaica (MOH). National HIV/STI Prevention and Control Program Facts and Figures: HIV/AIDS Epidemic Update January to June 2006. 2006. Available from URL: http://www.jamaica-nap.org/AIDS_DATA_Jan-June_06final.pdf. Retrieved: April 16, 2007
- Nyamathi A, Stein J, Swanson J. Personal, Cognitive, and Demographic Predictors of HIV Testing and STDs in Homeless Women. *Journal of Behavioral Medicine* 2000;23(2):123–147. [PubMed: 10833676]
- Project Accept: A Phase III Randomized control Trial of Community Mobilization, Mobile Testing, Same-Day Results, and Post-test Support for HIV in Sub-Saharan Africa and Thailand. Stigma Pilot, May–June 2004. Funded by the National Institutes of Mental health
- Reynolds NR, Testa MA, Marc LG, Chesney MA, Neidig JL, Smith SR, Vella S, Robbins GK, The Protocol Teams for ACTG 384, ACTG 731, and A5031s. Factors Influencing Medication Adherence Beliefs and Self-Efficacy in Persons Naïve to Antiretroviral Therapy: A Multicenter, Cross-Sectional Study. *AIDS and Behavior* 2004;8(2):141–150. [PubMed: 15187476]
- Rogers WH. Regression standard errors in clustered samples. *Stata Technical Bulletin* 1993;13:19–21. Reprinted in *Stata Technical Bulletin Reprints*, 3:88–94.
- Royston P. Sg3.4 and an improved D'Agostino test. *Stata Technical Bulletin* 3:9 1991;1:110–112.
- Schafer J, Graham J. Missing Data: Our View of the State of the Art. *Psychological Methods* 2002;7(2):147–177. [PubMed: 12090408]
- Seal DW. HIV-related issues and concerns for imprisoned persons throughout the world. *Current Opinion in Psychiatry* 2005;18:530–535. [PubMed: 16639113]
- Simbayi LC, Kalichman SC, Strebel A, Cloete A, Henda N, Mqeketo A. Internalized stigma, discrimination, and depression among men and women living with HIV/AIDS in Cape Town, South Africa. *Social Science and Medicine* 2007;64:1823–1831. [PubMed: 17337318]
- Stall R, Hoff C, Coates TJ, Paul J, Phillip KA, Ekstrand M, Kegeles S, Catania J, Daigle D. Decision to Get HIV Tested and to Accept Antiretroviral Therapies among Gay/Bisexual Men: Implications for Secondary Prevention Efforts. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology* 1996;11:151–160. [PubMed: 8556397]
- United Nations Office on Drugs and Crime (UNODC). HIV and AIDS in Places of Detention. 2008 [Accessed: June 16, 2009]. Available from URL: <http://www.unodc.org/documents/hiv-aids/V0855768.pdf>
- Voluntary HIV-1 Counselling and Testing Efficacy Study Group, The. Efficacy of voluntary HIV-1 counseling and testing in individuals and couples in Kenya, Tanzania, and Trinidad: a randomized trial. *Lancet* 2000;356:103–112. Scale available from URL: <http://www.caps.ucsf.edu/tools/surveys/pdf/baseline%20C&T.pdf>. Retrieved: August 5, 2007. [PubMed: 10963246]

- Vyavaharkar M, Moneyham L, Tavakoli A, Phillips KD, Murdaugh C, Jackson K, Meding G. Social Support, Coping, and Medication Adherence Among HIV-Positive Women with Depression Living in Rural Areas of the Southeastern United States. *AIDS Patient and Care and STDs* 2007;21(9):667–680.
- Walmsley, R. World Prison Population List. sixth edition. King's College London, International Centre for Prison Studies; 2006 [Accessed October 9, 2008]. Available at URL: <http://www.kcl.ac.uk/deposta/rel/icps/world-prison-populations-list-2005.pdf>
- World Health Organization (WHO). Evidence for Action Technical Papers. 2007 [Accessed: June 16, 2009]. Effectiveness of Interventions to Address HIV in Prisons. Available from URL: <http://www.who.int/hiv/topics/idu/prisons/en/index.html>

Table 1

Description of measures for latent constructs.

Construct	Source/Description	Measurement	Cronbach's alpha
HIV Coping Self Efficacy	<ul style="list-style-type: none"> Seven item measure of a participant's perception of his ability to cope with physical and social challenges if HIV-infected Examples include: <i>If I had HIV...</i> "I would keep from getting discouraged," "I would overcome any rejection I may face," Developed from scales of problem-focused and emotion-focused coping, and literature related to HIV acceptance and adjustment (Huba et al. 1996a; Chesney, Chambers, Taylor, Johnson & Folkman 2003; Fife 2005) 	4-point likert scale	0.86
External Stigma	<ul style="list-style-type: none"> Nine item measure of participant's perception of what other people would think about him if he was infected with HIV. Examples include: <i>If I had HIV...</i> "People would think I am a bad person," "People would think I was homosexual," and "People would be afraid to be around me." Developed from items included in the NIMH Project Accept survey and the Family Health International (FHI) Behavioral Surveillance Survey (FHI 2000; Project Accept 2004) 	4-point likert scale	0.83
Internal Stigma	<ul style="list-style-type: none"> Four item measure of participant's perception of how he would feel about himself if HIV-infected Examples include: <i>If I had HIV...</i> "I would feel ashamed of myself," and "I would lose respect for myself." Developed from an existing measure shame and STI testing (Fortenberry et al. 2002) 	4-point likert scale	0.84
HIV Testing Stigma	<ul style="list-style-type: none"> Six item measure of participant's perception of what other people would think about him if he tested for HIV Example items include: "It would hurt my reputation if I test for HIV," and "People might think I have had sex with men if I test for HIV." Adapted from Attitudes towards HIV Testing scale (Boshamer & Bruse, 1999) 	4-point likert scale	0.74
Perceived Risk for HIV	<ul style="list-style-type: none"> One item response to "How likely is it that you have HIV now?" 	5- point likert scale	----
Social Support	<ul style="list-style-type: none"> Seventeen items measured participant's perception of emotional, informational, affectionate and instrumental social support Example items include: <i>During the last 3 months there has been...</i> "someone to listen to you when you need to talk," "someone to loan you \$300," and "someone you trust." Adapted measure used in the Medical Outcomes Study by The Measurement Group (Huba et al. 1996b) 	4-point likert scale	0.92
HIV Knowledge	<ul style="list-style-type: none"> Thirteen item index of participant's knowledge about HIV transmission, prevention and disease course Examples include: "Is there a cure for HIV?" and "Is HIV a disease only homosexuals should worry about?" Adapted from AIDSCAP HIV Counseling and Testing Efficacy Study baseline questionnaire (Voluntary HIV-1 Counseling and Testing study Group, 2000), and the FHI Behavioral Surveillance Survey (FHI 2000) 	"Yes/No" response	0.68

Table 2

Unadjusted odds ratios of HIV test acceptance by demographic characteristics and risk factors for HIV infection.

	No.	Tested (%)	Odds Ratio _{unadj} ^b (95% CI)	p-value
Total	298 ^a	60%	--	--
Demographics				
Age				
<=30 years	150	55%	referent	
>30 years	148	66%	1.54 (0.96–2.45)	.073
Education				
primary	73	55%	referent	
secondary	194	63%	1.43 (0.91–2.24)	.119
more than secondary	29	55%	1.02 (.39–2.62)	.975
Sentence length/type				
<= 10 years	112	62%	referent	
>10 years	79	58%	0.87 (0.43–1.75)	.693
Life & GG's Pleasure	47	62%	1.00 (0.50–2.00)	.991
Appellant & Awaiting trial	60	60%	0.93 (0.69–1.26)	.657
Recidivist				
No previous arrest	206	57%	referent	
Previous arrest	91	68%	1.63 (1.02–2.60)	.042*
Time incarcerated at interview				
6–36 months	143	57%	referent	
> 36 months	151	62%	1.23 (0.65–2.33)	.533
Previous STI				
No	174	55%	referent	
Yes	123	69%	1.86 (1.67–2.07)	.000**
HIV risk factors				
Lifetime sex partners				
1–20	150	56%	referent	
>20	102	67%	1.57 (0.98–2.53)	.063
Tattoo				
No	236	59%	referent	
Yes	61	67%	1.43 (1.05–1.94)	.022*
Previous HIV test				
No	207	61%	referent	
Yes	86	61%	0.98 (0.92–1.05)	.614

^aNumbers do not always add to 298 due to missing data.^bStandard errors corrected to control for the clustering effect of section.

*
 P value < .05

**
 P value < .001

Table 3

Unadjusted and adjusted odds ratios of HIV test acceptance by latent constructs

	No.	Tested (%)	Odds ratio _{unadj} ^b (95% CI)	p-value	Odds ratio _{adj} ^{b,c} (95% CI)	p-value
Total	298 ^a	60%	--	--		
HIV coping self efficacy (SE)						
Low coping SE	126	52%	referent			
High coping SE	156	69%	2.05 (1.43–2.93)	.000**	1.86 (1.24–2.78)	.003**
External HIV stigma						
High stigma	136	61%	referent			
Low stigma	141	62%	1.03 (0.67–1.59)	.898	--	--
Internal HIV stigma						
High stigma	144	59%	referent			
Low stigma	144	61%	1.09 (.084–1.41)	.511	--	--
HIV testing stigma						
High stigma	150	56%	referent			
Low stigma	129	68%	1.69 (1.17–2.44)	.006**	1.71 (1.05–2.79)	.032*
Perceived Risk for HIV						
No risk	235	58%	referent			
Some risk	55	73%	1.94 (1.27–2.97)	.002**	2.51 (1.57–4.01)	.000**
Social Support	293	61%	1.11 (0.83–1.49)	.466	--	--
HIV knowledge						
Low knowledge	153	58%	referent			
High knowledge	145	63%	1.21 (0.92–1.60)	.175	--	--

^aNumbers do not always add to 298 due to missing data.

^bStandard errors corrected to control for the clustering effect of section.

^cAdjusted model includes variables significant at P value $< .05$ in bivariate analysis with dependent variable, HIV test acceptance. Interview method was also used as a control variable. $N = 261$.

* P value $< .05$

** P value $< .01$

Table 4

Unadjusted and adjusted odds ratio of HIV coping self efficacy by external HIV stigma, internal HIV stigma, social support, and HIV knowledge

	Odds ratio _{unadj} ^{a,b,c} (95% CI)	p-value	Odds ratio _{adj} ^{a,b,c} (95% CI)	p-value
External stigma				
High stigma	referent		referent	
Low stigma	1.81 (1.45–2.26)	.000**	1.28 (1.25–1.32)	.000**
Internal stigma				
High stigma	referent		referent	
Low stigma	1.60 (1.52–1.68)	.000**	1.76 (1.34–2.30)	.000**
Social support	1.73 (1.13–2.65)	.012*	2.09 (1.19–3.68)	.010**
HIV Knowledge				
Low knowledge	referent		referent	
High knowledge	2.53 (1.84–3.48)	.000**	2.33 (1.04–5.22)	.040**

^aStandard errors corrected to control for the clustering effect of section.

^bThe following were significant in bivariate analysis at P value < .05 and included in the adjusted model: age, sentence length and type, previous STI, lifetime number of sex partners, and tattoo. Interview method was controlled. External stigma, internal stigma, and social support were significant in bivariate analysis and included in the multivariate model.

* P value < .01,

** P value < .001