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Results of a Pilot Study of Pre-release STD Testing and Inmates' Risk Behaviors in an Ohio Prison

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ABSTRACT *This study presents the results of a pilot study of mandatory pre-release testing for sexually transmitted disease (STD) and a behavioral risk survey for male inmates at an Ohio prison. Approximately 4–6 weeks prior to scheduled release, inmates took part in a mandatory blood test and optional genital swab and physical examination to test for STDs. At the time of testing, a voluntary behavioral and knowledge survey was administered to inmates. Pre-release testing identified 53 new cases of STDs among the 916 inmates (5.5%) scheduled for release during the pilot study period. Trichomoniasis and hepatitis C were the most common infections identified through pre-release testing. Nearly all inmates participated in the required blood test. Participation rates for the other testing methods averaged less than 45%. Inmates reported engaging in various risky behaviors during incarceration such as having sex (12.1%), tattooing (36.5%), and drug use (19.5%). Pre-release testing identified several new cases of STDs not identified through existing intake and for-cause testing procedures. Substantial useful information about the prevalence of STD risk behaviors can be obtained through a pre-release survey.*

KEYWORDS *HIV testing, Inmates, Behavioral risk, Pre-release testing*

Sexually transmitted disease (STD) among the incarcerated population is an important public health concern, both for inmates' health and for the health of the broader community. Research suggests that inmate populations are at a significant risk for STD infection while incarcerated. Some studies have estimated human immunodeficiency virus (HIV) infection rates among inmates, for example, to be as much as five times higher than among the general population.[1,2] Evidence suggests that more than one third of hepatitis C infections in the USA occur among incarcerated individuals.[3] A significant number of STD cases among prisoners go undetected.[4] The problem of higher incidence rates is compounded by behaviors that place previously uninfected individuals at risk. Studies show that as many as 50% of inmates reported risky sexual behaviors during incarceration and continued those behaviors after release.[5] Behaviors such as sexual activity and injection drug use that pose risks outside of prison present even greater risks while in prison because access to harm reduction methods, such as condoms and needle sterilization equipment, is limited.[6] Because of the increased risk and the prevalence of behaviors associated with STD infection among the incarcerated, the Centers for Disease Control and Prevention recommend STD testing, education, and prevention counseling for all inmates.[7]

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The risk of STD infection extends beyond the inmate population once the inmate is released into the community. In one study, more than 87% of men with a primary female partner had unprotected sex with that partner in the month after release from prison.[6] Previously incarcerated men also report a higher prevalence of multiple new sexual partners than men who are not incarcerated.[8] Community studies of injection drug users demonstrate that those who have been in prison are more likely to be HIV positive than those who have never been incarcerated.[9] Thus the topic of STD infection among inmates is a potentially broad-reaching one.

Inmates are generally able to receive medical care and counseling during incarceration, but access to treatment and preventive care may decline when they reenter the community.[10] Many states have introduced pre-release educational programs and counseling for inmates to enhance their ability to obtain appropriate treatment and prevention services after their discharge from prison. Research suggests that pre-release education and treatment interventions may be particularly beneficial because they take place at a time when inmates are thinking about reentry into the community and how their actions may affect others.[11] Because of the nature of incarceration, the inmate population represents an important and unique audience for STD prevention interventions.

States prison systems have tried a variety of efforts to enhance STD surveillance and prevention programs. As of 2008, the federal correction system and 24 states operate some form of mandatory STD testing program at the time of entry to prison, and an additional six offer voluntary testing to inmates at intake.[12] Ten states require mandatory STD testing upon release from prison. Almost all state prison systems have processes in place for testing inmates for STD in particular circumstances, for example, if there is an exposure incident, inmate request, evidence of high-risk behavior, or if otherwise deemed necessary. A variety of research studies have been conducted concerning STD testing programs for incarcerated populations, focusing predominantly on measuring STD prevalence rates, examining inmate behavior as it relates to STD infection, and assessing the cost-effectiveness of STD programs.

Although several studies have examined outcomes related to voluntary STD testing programs for prisoners, only a small number of studies have examined the results of mandatory programs.[13–15] This study, involving a pilot testing program at an Ohio prison, reports the results of Ohio's pilot program that involved mandatory pre-release STD testing program along with data about cases that were detected through for-cause testing.

In 2006, the Ohio State Legislature passed House Bill 603 authorizing a two-year pilot test of pre-release STD testing among all inmates being released at a prison in Central Ohio. Two goals of this legislation were to document the rate of STD transmission during incarceration and to provide necessary treatment for those identified as having an STD prior to release. In this article, we report the results of this pilot study examining the rate of transmission of various STDs in that prison and documenting various STD-related risk behaviors during incarceration reported by inmates prior to their release. A potential advantage of conducting a behavioral risk survey shortly before the inmate's scheduled release date is that the inmate may be more willing to express his views accurately without fear of repercussion.

The setting for this study was a prison in Central Ohio that houses approximately 2,500 male prisoners, including (as of early 2010) 413 minimum security, 16 medium security, 2,037 close security, and five maximum security

inmates. Approximately 62.6% of the inmates are Black, 36.1% are White, and 1.3% are of other races.

Prior to implementation of this pilot program, the Ohio Department of Corrections and Rehabilitation (ODRC) already had intake and for-cause STD testing programs. Upon intake, all inmates are tested for HIV and syphilis. Testing for hepatitis C at intake is provided for inmates who indicate being at risk based on a screening questionnaire. In addition, for-cause testing is provided for inmates who are involved in risky activities, such as fights in which blood was drawn or other exposure to bodily fluids, or who request such testing. These procedures have been in place continually since the early 1990s, with enhancement to the programs made in 2003.

METHODS

In 2007, pre-release testing was introduced through pilot study legislation passed by the Ohio State Legislature. The primary goal of the pilot study was to gauge the extent to which inmates convert from a negative to positive HIV status during incarceration.

Pre-release testing

Pre-release testing consisted of a blood test for HIV; hepatitis A, B, and C; and syphilis, as well as a physical examination for herpes simplex virus (HSV) and human papillomavirus (HPV), and a genital swab to test for gonorrhea, chlamydia, and trichomoniasis. The blood test was mandatory. However, the physical exam and genital swab tests were voluntary. The decision to allow inmates to opt out of the physical exam and genital swab was made by the prison officials. Ohio legislation required mandatory pre-release testing for HIV but ODRC decided on a discretionary basis to include other STDs as optional for prisoners. Similarly, the ODRC had for years performed mandatory HIV testing at intake but did not test for other STDs upon intake because of cost and other considerations.

All pre-release testing was carried out by a medical doctor and registered nurse associated with an external medical vendor organization selected by prison officials and unaffiliated with the research team. All inmates were scheduled for testing approximately four–six weeks before their scheduled release date to allow time for treatment and counseling if an inmate tested positively for an STD. The medical doctor and nurse received the laboratory results and compared those results with information about prior infection contained in the inmate's medical record. The new testing results were also entered into the inmate's medical record. Once the testing and chart review results were finalized, a de-identified (coded) version of those results was provided to the research team. All data were provided to the research team identified only by a project identification number created for this study. The link between an inmate number and the coded project identification number was available only to the medical team and not to the research team or to prison officials.

Behavioral risk survey

In addition, a voluntary survey was administered to inmates at the time of pre-release testing to collect self-reported information concerning their risk behaviors and their knowledge about STD transmission. The survey questionnaire asked inmates to assess how frequently they engaged in various behaviors associated with increased risk for STDs including tattooing, sex, needle injections, and other drug

use, both prior to and during the current prison term. Survey items included sociodemographic and background information such as age, race/ethnicity, educational level, sexual preference, height and weight, number of times in prison, and duration of current prison term. Overall health, questions concerning the presence of tattoos, use of medical services, and knowledge of means of STD transmission were also included in the survey.

The survey was administered by the nurse from the medical team and completed surveys were placed in an envelope by the inmate, sealed, and given to the nurse. Responses were confidential. Versions of the survey questionnaire were available in English and Spanish. The survey was designed for a seventh-grade reading comprehension level. The staff nurse was available to administer the survey orally to those unable to read, but no inmates availed themselves of that option. Surveys were identified by the same project identification number as the testing results. Again in this case, the link between project identification number and inmate number was possessed only by the medical team. The paper copy of the completed surveys were delivered in the original sealed envelopes to the research team on a regular basis by the medical team and then manually entered into a password-protected Excel spreadsheet.

All inmates scheduled for release between November 2007 and November 2009 received a letter from the prison warden approximately six weeks before their scheduled release date describing the STD testing process and telling them when to report to the medical clinic for the blood draw and physical examination. Inmates also received a separate letter from the research team inviting them to take the survey and explaining that their participation in the survey was entirely voluntary. The ORDC and Ohio State University Human Subjects Institutional Review Boards both approved the study protocol prior to implementation.

Completed de-identified data from the survey and the testing results were transferred to members of the research team for analysis. Descriptive statistical summary analyses were conducted using SAS software, version 9.1.

RESULTS

A total of 916 inmates were scheduled for release during the pilot period. Blood testing information was available for all but one of these inmates (for whom the doctor was not able to draw blood for medical reasons), for a participation rate of 99.9%. The physical examination and genital swab were optional and participation was lower for these tests at 44.7% and 37.6%, respectively. A total of 744 inmates completed the behavioral risk survey, a response rate of 81.2%. Inmates refusing to complete the survey were asked to indicate their reasons for refusal from a checklist of options. The most common reasons for refusal were “I just don’t want to” (58.6%), “I don’t think I’m sick” (11.1%), and “I don’t want to talk about my sex life” (7.4%).

Sample description

Demographic data were not provided to researchers as part of the mandatory blood test protocol and therefore such data are available only for the 744 inmates who completed the behavioral risk survey. Of these inmates, the majority of participants were Black (56.5%), had 12 or fewer years of education (71.0%), and described their sexual preference as straight (95.4%). Inmates who took part in the behavioral

survey were fairly evenly distributed with respect to number of times in prison and length of current prison term.

STD risk behaviors

Regarding STD risk behaviors, among survey respondents, 12.1% reported having sex during the present prison term. Among those having sex, the majority (85.7%) reported having more than one sex partner. Common forms of reported sex included vaginal (7.4%), oral (8.8%), anal (3.9%), and "other" (0.8%). Overall, 15.4% reported using a condom during sex. More than one third of the inmates reported getting tattoos during their current term (36.5%). Of those getting tattoos, only 40.2% reported cleaning the needles. During this prison term, 19.5% of inmates at release reported having used marijuana and 4.3% reported using cocaine.

Questions concerning tobacco, alcohol, and recreational use during incarceration were also included in the behavioral risk survey. Approximately 14.5% of inmates reported having at least two drinks of alcohol per week and 31% reported smoking at least one pack of cigarettes per day. Drug use reported included use of marijuana (19.5% of inmates), heroin (1.6%), cocaine (4.3%), and methamphetamine (1.2%).

Additionally, inmates were asked about their knowledge of how HIV and other STDs are transmitted. While almost all survey respondents knew that HIV can be spread by having sex, 5–10% fewer inmates were aware that HIV can be contracted by needle use, tattooing, or contact with contaminated blood. When asked for their views about how to reduce the risk of contracting STDs in prison, several strategies were mentioned by inmates including separating homosexuals (mentioned by 19.4% of respondents), distributing condoms (12.9%), and better enforcement of rules by prison officials (8.0%).

STD infections identified

Table 1 shows the number of STD cases that were identified during the current prison term, for the 916 prisoners released during the study period, stratified by whether the infection was identified through intake, for-cause, or pre-release testing. While the main focus of this study was on the results of pre-release testing mandated by Ohio law, Table 1 also includes information about STD cases identified through

TABLE 1 Identified cases of STDs

STD	Intake	For-cause	Pre-release
HIV	13	1	1[a]
HepA	10	8	0[a]
HepB	2	1	5[a]
HepC	119	18	16[a]
Gonorrhea	4	1	0
Syphilis	9	1	1[a]
Chlamydia	1	2	2
Trichomoniasis	0	0	19
HPV	0	15	9
HSV	0	4	0
Total	158	51	53
% of total cases	60.3%	19.5%	20.3%

[a]Indicates a case indentified through mandatory pre-release testing

other testing procedures for comparison. These data indicate the situation in which the inmate was tested, but they do indicate when the inmate was infected. Pre-release testing identified a total of 53 cases of sexually transmitted diseases among 50 inmates; a prevalence rate of 5.5% (of the 916 prisoners released during the study). The most common infections identified through pre-release testing were trichomoniasis (19 new cases) and hepatitis C (16 new infection cases).

Only one case of HIV newly identified during incarceration was identified through pre-release testing in this pilot study. This represents one individual who had tested negative at intake and subsequently tested positive at pre-release testing. Comparatively, 13 cases of HIV were identified at intake and one additional case was identified through for-cause testing. The rate of newly identified HIV cases among the 916 released prisoners was thus 0.2% (one identified by for-cause plus one by pre-release). With respect to all STDs, intake testing identified 60.3% of the STD infections, for-cause testing identified 19.5% of cases, and 20% of all STD cases were identified through the pre-release testing program.

Additional analyses were performed to see if the likelihood of testing positive for an STD at pre-release testing was related to duration of the prison term. The data indicated that inmates testing positive for STDs were more likely have been in prison at least three times than were inmates not identified as having an STD (53.9% vs. 33.3%). Similarly, inmates with STDs were more likely to be serving current terms of at least five years than were inmates without STDs (23.7% vs. 18.4%).

Table 2 compares survey results of inmates who were tested positive at pre-release testing with those who did not test positive at pre-release. Inmates whose STD was identified at pre-release testing were more likely to be Black, have less than a high school education, and have a normal or low body mass index. Somewhat surprisingly, those with infections identified through pre-release testing were slightly less likely to report using drugs, getting a tattoo, having sex, and not using a condom than were inmates without newly identified infections. However, because of the low number of inmates ($n=50$) identified through pre-release testing, these differences were not statistically significant at a level of $p<0.05$. Differences with respect to number of terms in prison ($p=0.067$), body mass index ($p=0.147$), and sharing of needles ($p=0.143$) were significant at a level of $p<0.15$.

DISCUSSION

The mandatory pre-release pilot program identified 53 new cases of STDs not identified through intake or for-cause testing, representing 5.5% of inmates released during this period. Of those cases identified in pre-release testing, most involved trichomoniasis and hepatitis C infections. Only one case of HIV acquired during incarceration was detected through pre-release testing. The majority (79.8%) of STD cases were identified through intake and for-cause testing. However, this means that slightly more than 20% of STD cases were identified only through prerelease testing and would have been missed by existing protocols.

The prerelease testing procedures utilized in this study were limited to inmates scheduled for release. By contrast, inmates can be tested for-cause at any time during their incarceration, for example, if they had taken part in behaviors involving the potential exchange of bodily fluids, or had voluntarily received testing at the prison clinic.

The rate of HIV infection identified either through pre-release, intake or for-cause testing indicates that the total prevalence of HIV infection upon release was about

TABLE 2 Comparison of inmates testing positive at pre-release with those not testing positive

		Testing positive ($N=50$)	Not testing positive ($N=866$)
Length of prison term	Average (years)	3.0	3.4
Number of terms in prison	Average	2.1	2.8
Race/ethnicity	% Black	60.5	56.2
Education	% Less than high school	59.1	50.4
Body mass index	% Normal or underweight	42.9	33.7
Sexual preference	% Straight	93.2	95.6
Has tattoo	% With tattoo	62.8	70.0
Had previous STD	% Had previous STD	18.0	19.0
Overall health	% Poor or bad	2.3	3.3
Used drugs this term	% Used drugs	12.0	18.2
Shared needles this term	% Shared needles	2.4	0.3
Got tattoo this term	% Got tattoo	31.7	36.9
Cleaned needles when tattooed	% Did not clean needles	33.3	32.1
Had sex this term	% Had sex	11.1	12.2
Had non-consensual sex this term	% Had non-consensual sex	0.0	0.5
Used condom this term	% Did not use condom	81.3	84.8
Used other protection this term	% Did not use other protection	28.9	31.3

1.6%, which is consistent with studies performed in other prison settings.[9,16–18] In addition, the rate of inmates with positive HIV seroconversion after initial intake in this study was 0.22%, nearly identical to the rate of 0.20% found in a study conducted within the Georgia prison system in 2005.[13] Continued efforts to document infection rates, both prior to and during incarceration, can present an informative picture of the risk faced by inmates and their partners upon release.

The most common STDs identified through pre-release testing in this study were trichomoniasis and hepatitis C. Currently, the Ohio prison system does not conduct intake testing for trichomoniasis and only tests for hepatitis C upon intake for inmates identified as at-risk through a screening questionnaire. Trichomoniasis can be treated simply and inexpensively with an antibacterial medication costing approximately $30.[19] Hepatitis C is much more complicated to treat with costs ranging from $9,500 to $16,000 depending on the patient's condition.[20,21] Routine intake testing to identify cases of trichomoniasis and hepatitis C thus might facilitate earlier treatment and control of secondary infections with associated cost savings.[11] However, savings might be offset by higher treatment costs related to identifying additional cases of these diseases.

The behavioral survey found that a relatively sizable proportion of the inmate population engages in sex, tattooing, and other behaviors that potentially raises

their risk of STD transmission. The level of 12.1% of inmates reporting having sex with a partner during the current term appears to be lower than has been reported in other studies, although accurate estimates on the prevalence of sex in prison are difficult to obtain.

Inmates appeared to be relatively open to reporting health-related behaviors during the survey process. Many admitted to engaging in risky and prohibited behaviors during incarceration. A significant portion reported having sex, using drugs, and getting tattoos during the present prison term. Presumably, timing the behavioral risk survey to occur shortly before release from prison encourages inmates to provide more accurate and useful information, since their discharge is imminent. The information thus obtained can be used by prison officials to better target and control sources of risk behaviors.

Rates of inmate participation in STD testing and the risk behavior survey were relatively constant throughout the project. The researchers worked closely with the medical team to encourage inmate participation in all methods of STD testing as well as completion of the risk behavior survey. Inmates were informed that the blood test was mandatory but were not required to accept the physical examination or the genital swab. We found that providing inmates with flexibility regarding the sequence in which inmates could complete the survey and physical exam helped to increase participation. The medical team also offered several opportunities for testing throughout the process so that inmates who initially refused could change their minds.

There are several limitations to this study. First, all data regarding risky behaviors is self-reported. Although we believe administering the survey shortly before release encouraged greater honesty, some inmates may have been hesitant to report behaviors that are prohibited in prison. However, even with possible underreporting, the results from the behavioral survey still indicate areas on which prison administration officials can focus.

Additionally, because inmates could refuse the genital swab and physical exam, some infections may not have been detected. Rates of acceptance of these procedures were moderate, with slightly less than 50% of inmates agreeing to physical examinations and genital swabs. As a result, the actual rates of infection for chlamydia, gonorrhea, trichomoniasis, HPV and HSV may be higher than detected through this study. The most common reasons provided by inmates for refusing to engage in the physical examination and genital swab testing were "I just don't want to" and "I don't think I'm sick." The medical team worked hard to educate inmates on the importance of testing for disease even in the absence of symptoms. Motivating inmates to accept these voluntary measures may prove to be challenging.

Finally, these data only indicate an inmate's STD infection status at the time of testing. It was not possible to determine how the inmate became infected or when. An inmate who tested negative at intake and subsequently tested positive (either at for-cause or pre-release testing) may have been infected prior to incarceration but not yet seroconverted, or may have been infected during incarceration. These data cannot distinguish between these two results.

State prison systems currently vary in the nature of their testing procedures. Only about ten states currently conduct pre-release testing. Results of this pilot study suggest that if intake and for-cause testing is conducted, then the marginal benefit of additional pre-release testing may be limited. However, pre-release behavioral risk assessment appears to be potentially valuable as a way of elicited relatively reliable information about the nature of risk behaviors existing in the facility. As more US

prison systems explore various methods of testing, a better understanding of what motivates inmates to accept STD tests can be achieved.

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