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Assessing Need for Medication-Assisted Treatment for Opiate-Dependent Prison Inmates

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ABSTRACT. Individuals with a history of heroin dependence are overrepresented in American correctional facilities and 75% of inmates with a drug use disorder do not receive treatment during incarceration or after release. Medication-assisted treatment (MAT) with opiate agonists, such as methadone or buprenorphine, constitutes standard of care; to guide planning for an expansion of drug treatment services in correctional facilities, a needs assessment was conducted at the Department of Correction and Rehabilitation (DCR) of Puerto Rico (PR). The authors report on the research process, the findings that informed their recommendations for the DCR to expand MAT for eligible inmates, and lessons learned.

KEYWORDS. Inmates, prisons, drug abuse treatment, needs assessment, medication assisted treatment

INTRODUCTION

Individuals with a history of heroin dependence are overrepresented in American correctional facilities. Nearly 15% of American prisoners have a history of heroin addiction compared to an estimated lifetime prevalence of heroin use of 1.5% among adults in the general US population (1). In spite of this disparity, 75% of inmates with a drug use disorder in US correctional facilities do not receive treatment during incarceration or after release (2–6). Medication-assisted treatment (MAT) with opiate agonists, such as methadone or buprenorphine, constitutes the standard of care for opiate dependence (2–7). MAT in correctional institutions is

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encouraged by the World Health Organization (3) and has successfully been adopted by Australia, most Western European nations, and an increasing number of nations in Eastern Europe (8). In spite of these trends, MAT has rarely been implemented in jails and prisons within the United States and its territories (8).

In 2002, the Department of Correction and Rehabilitation (DCR) of Puerto Rico (PR), a US territory, initiated a pilot MAT program with methadone for 44 opiate-dependent inmates with remaining sentences of less than 2 years. The program was structured as a medication unit of the public methadone program in the city where the institution was located. An evaluation after 1 year found a significant reduction in participants' heroin use when compared to a nontreated group of inmates. The program was acceptable to participants as well as to providers and security staff (9). The agency recognized that nearly two thirds of all inmates in the system reported a history of illegal drug use on admission, that illegal drugs were being consumed within prison, that two thirds of the population had been previously incarcerated, and that the cost of incarceration far outweighed the cost of treatment (10). Faced with the need for information to guide planning for an expansion of drug treatment services, the DCR contracted with the authors to conduct a needs assessment for drug treatment for the sentenced inmate population.

Two broad approaches are used to inform treatment planning. Needs assessments apply research methods to determine the magnitude of unmet need by identifying the number of individuals in need of treatment and comparing this value to the number of individuals already in treatment. Another approach requires existing data that can demonstrate a demand for care, obtained from waiting lists and referrals of individuals actively seeking care, and subtracting from that the treatment capacity, which is based on the number of occupied and unoccupied treatment slots (11). Closing the gap between the demand and the available treatment also requires consideration of the existing funding and the willingness of a particular community to endorse interventions such as MAT. Input must be sought from stakeholders who have the ability to facilitate or impede resource allocation required to maintain or expand treatment capacity (12). As initially raised by Rush, both approaches focus on the quantity of treatment required and may fail to identify what types of treatment should be provided to address the diversity of client needs (13). Additional information is needed to match comprehensive services to patients' needs, particularly with high-needs patients, since there is evidence that matching the level of need with the appropriate treatment improves retention and outcomes (14).

Several perspectives inform this study. Addiction is conceptualized as a chronic condition characterized by relapse and remissions (7) that will require long-term, continuous care. Following principles of strategic needs assessment, our recommendations take into account the evidence supporting the effectiveness of responsive interventions, the resources needed for their implementation, and the indicators required to monitor their performance. The perspective of potential participants regarding prior treatment experiences and their readiness for treatment also informs treatment planning; such perspectives differentiate demand from need and are also important predictors of treatment entry and retention (15). Recommendations to the PR DCR must consider the impact of proposed interventions on the health and well-being of the population as well as the individual (16). Addressing the health disparities encountered in criminal justice populations require assessing the co-occurring mental and physical health conditions with public health impact that bear upon treatment planning and allocation of resources (17).

Although the scope of this needs assessment was broad, the current article focuses on how the results were used to formulate recommendations to the PR DCR for MAT expansion for eligible inmates. We report on the research process, the methodology utilized, and those findings that informed recommendations for services planning. We also share important lessons learned and their implications for conducting needs assessments for drug treatment within correctional facilities.

METHODS

The study used a cross-sectional design and surveyed a probabilistic, anonymous sample of sentenced inmates. Data collection was carried

out over 8 months. Input from DCR staff was obtained throughout all study phases. The project was approved by the institutional review board (IRB) of the University of Puerto Rico Medical Sciences Campus. A certificate of confidentiality was not required, since the interviews were anonymous.

Sample Design

The population for the study consisted of 10,849 sentenced inmates in mid-year of 2004, determined from statistical data provided by the DCR. The sample consisted of 1331 randomly selected, sentenced inmates from 26 out of the 39 penal institutions in the Puerto Rican prison system, representing 13% of the total sentenced inmate population. A complex probabilistic, multistage sampling design was developed based on 4 sampling stages. The first stage consisted of stratifying by type of institution (adult men, juvenile males tried as adults, and women). For the second stage, institutions were stratified based on the prevalence of positive urine toxicology reported by the prison authorities that were obtained through mandatory, anonymous sampling of inmates to assess the use of drugs within the institution. These were grouped in 4 categories (very high, 26%–50%; high, 15%–25%; normal, 1%–14%; and unknown) using as reference the prevalence of illicit drug use in the general population of Puerto Rico (18). For the third stage, institutions were further stratified by security level (Maximum, Medium, Minimum, and Admission Center). If there were more than 2 institutions at a given security level, 2 were randomly selected, with probability of selection proportional to the institutions' population. Finally, for each of the 26 institutions selected and depending on their size, a random sample was obtained comprising 5% to 39% of the inmate population.

Recruitment

The directors of social services or their delegates served as the contact people for each institution and worked with project staff to coordinate fieldwork activities. A security staff was assigned to facilitate custody of inmates to the orientation activities and the interviews. The following procedure was used for subject selection: 2 days prior to the interviews, a sampling frame was obtained from the social services director of each institution, consisting of a sequence of numbers from 1 to *n*, without identifiers, corresponding to the number of inmates in the census for that day. The computer selected a random sample of numbers that were then returned to the same staff person to match with the name of the inmate to which it corresponded. A letter of invitation to attend a group orientation conducted by project staff was delivered to the inmate by a prison staff member. All potential participants willing to return for an interview were given an appointment card with a date and time of meeting to obtain informed consent and, if consenting, to conduct the interview. Participants were not offered incentives. Interviews were scheduled to avoid interfering with work, meal and visit times, recreation, or other activities, such as census count, required by the prison. Interview facilities that assured privacy were identified. Informed consent was obtained verbally.

Interviewer training spanned 3 weeks and covered topics such as prison regulations, interviewing techniques, conducting research with vulnerable populations, strategies to develop empathy and rapport, confidentiality, conflict and emergency management, stigma, understanding the survey, use of the computer, and practice in administration of the computerized instruments.

Measures

A paper version of the survey instrument was piloted for ease of administration and comprehension with a sample of inmates in transitional facilities located near the researchers' work site. Two interview modalities were used. The computer-assisted personal interview (CAPI) included sociodemographic characteristics, living arrangements at time of imprisonment and those under consideration upon release, problematic drug use among nuclear family members, previous incarcerations, perceived possession of vocational skills, and physical and mental health conditions. Participants were also asked if they had ever experienced an overdose event. The University of Michigan version of the Composite International Diagnostic Interview (CIDI), which has been used in epidemiologic studies

with Puerto Ricans (19), was used to diagnose drug abuse/dependence, general anxiety, and depression. A lifetime prevalence of drug dependence to heroin or cocaine, jointly with report of heroin use either in or out of prison, was used to calculate need for MAT given the chronic nature of the condition and difficulties of fulfilling dependence criteria in prison (20). Symptom scales were used to assess high symptom counts for posttraumatic stress disorder (PTSD) using the Spanish version of the Davidson Trauma Scale purchased from Multi-Health System (21), and for adult attention-deficit hyperactivity disorder (ADHD) using the validated Spanish version of the Wender Utah Rating Scale (22). Cutoffs selected for symptom counts that predict a clinical diagnosis corresponded to those recommended by the scales' authors. Questions were included to assess drug treatment history, drug treatment preferences, and treatment readiness measured with the Spanish version of the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES), which exhibits psychometric properties comparable to the English version (23). Participants ready to take action and rating high in the action stage were defined as ready for treatment. The audio computer-assisted self-interview (ACASI) included questions regarding past and current illicit drug and alcohol use, risky drug use behaviors, and frequency and route of administration of drugs used in prison.

In the absence of funds to conduct serologic testing, self-reported infection was used to estimate contagion with human immunodeficiency virus (HIV), hepatitis C virus (HCV), and hepatitis B virus (HBV). HIV infection, when measured by self-report in epidemiological and intervention studies, has been found to be reliable (22–26). Although inmates are tested for HIV and informed of results upon admission, the anonymous nature of the study precluded linking the interview to clinical records. The DCR conducted serologic tests for HCV in nearly all inmates in 2003 and informed them of results. Based on average sentence lengths, the majority of inmates in the system at the time of the study had been tested for HCV.

Remaining duration of sentence, coded in years, was computed from self-reported data by subtracting the number of months served at the time of the interview from the length of imposed sentence. The cutoff for MAT eligibility adopted was "less than two years remaining of sentence," since bonus points accumulated during incarceration and applied to reduce sentence length, in the absence of a structured system of transitional care, might affect the process of stabilizing the individual in treatment prior to release. Since there is also a high burden of co-occurring mental and physical health conditions as well as social risks affecting inmates with a substance use disorder, setting the cutoff at a remaining sentence of greater than 2 years should permit completion of the acute phase of MAT and entry and progression into the rehabilitative phase, in which participants begin coping with major life problems that affect their likelihood of successful reintegration into the community (24).

Analysis

The Questionnaire Development System (QDS) (Nova Research Co. 2006. QDS: Version 2.1 for Windows; Bethesda, MD) was used to program the computerized questionnaires. Data were transported using the Statistical Analysis System (SAS) version 9.1 (SAS, SAS Institute, Cary, NC). All analysis was carried out using SPSS version 16 (SPSS Inc., Chicago, IL). Frequencies and proportions are presented for the variables of interest. The analysis conducted to determine the number of MAT-ready inmates in the system used the *split file* command to sequentially divide the data file containing all inmates fulfilling the criteria for lifetime drug dependence into subgroups. Subgroups were formed based on the following hierarchical criteria: readiness for treatment, history of opiate use, history of 1 or more of infection with a blood-borne pathogen, overdose events (lifetime), and injecting drug use (ever). The last division was based on years of sentence remaining coded as less than 2 years and 2 years or more. At each level the results are also reported by sex.

RESULTS

A total of 1179 individuals participated in the study for an 89% response rate. Diagnostic criteria for dependence to an illicit drug ever was

TABLE 1. Prevalence of a Lifetime Drug Dependence Diagnosis in a Randomly Selected Sample of Sentenced Inmates in the Puerto Rico Prison System in 2005

		Number of inmates with lifetime diagnosis of drug dependence ($N = 390$)		
Security level	Drug prevalence strata	Males ($n = 281$) n (%)*	Young males ($n = 20$) n (%)*	Females ($n = 89$) n (%)*
Maximum	High			1 (12)
	Normal	25 (23)		
Medium	Very high	50 (44)		
	High	24 (25)		17 (46)
	Normal	23 (26)		3 (18)
	Unknown	15 (21)	16 (21)	
Minimum	Very high	28 (30)		
	High	36 (43)		
	Normal	17 (55)		55 (40)
	Unknown	19 (21)		13 (68)
Admission center	Very high			
	High	44 (48)	4 (67)	
	Unknown			

Note. Data reported for males, young adults, and females in each drug prevalence strata and by security level ($N = 1, 179$).
*Analysis was conducted separately for young adults, female, and adult males. Within each of these categories, prevalence is estimated using as the denominator the total number of inmates housed in the institutions that comprised each strata.

fulfilled in 301 (31%) of male and 89 (40%) of female inmates in the sample. Table 1 presents the estimates of lifetime drug dependence for any illicit drug by sampling strata, which ranged from 21% to 55% for adult males and from 12% to 68% among women.

Table 2 describes the distribution by gender of variables characterizing the study subpopulation comprised only of those inmates with drug dependence. Sociodemographic characteristics reveal that 73% of males and 62% of females were under 35 years of age; 89% of males and 86% of females had a high school education or less; nearly half of both men and women were married or living in a consensual relationship at the time of incarceration; and 22% of males and 40% of females indicated that they did not possess vocational skills. In response to the question assessing whether nuclear family members had a drug problem, 77% of females and 39% of males responded affirmatively. Regarding living arrangements upon release, 12% of female inmates and 5% of males indicated they had plans to share living arrangements with a drug user. Only 11% of males and 13% of females could not identify a place to live upon release.

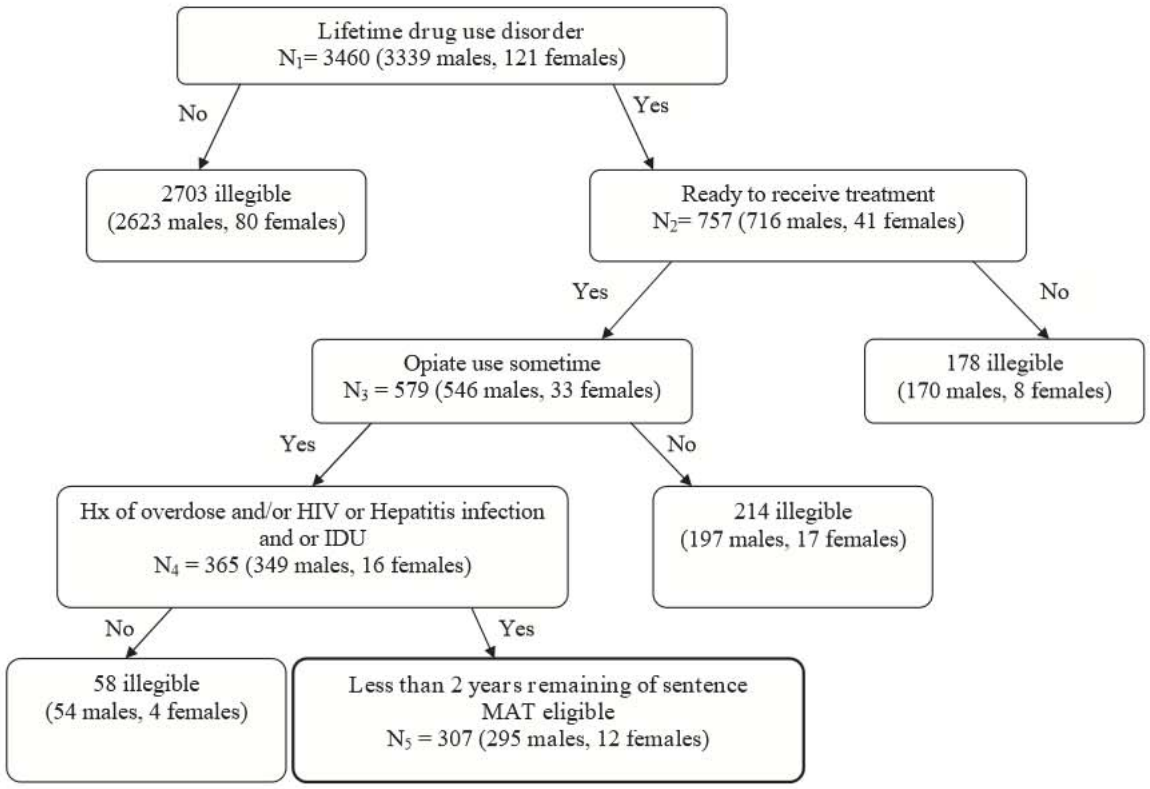
Psychiatric conditions co-occurring with drug dependence include a lifetime diagnosis of major depression, which was found in 43% of males and 61% of females, likelihood of adult ADHD found in 23% of males and 28% of females, and likelihood of PTSD found in 17% of males and 18% of females. Nearly a quarter (26%) of females and 11% of males reported at least 1 suicide attempt in their lifetime. Contagion with at least 2 blood-borne pathogens was reported by 22% of males and 26% of females. HCV prevalence was reported by 23% of males and 17% of females, and HIV incidence was reported by 2% of males and 7% of females. Almost all respondents used an illegal drug the year prior to the current incarceration (99% of males and females), and nearly three quarters had used opiates in their lifetime (males 79%, females 75%). Injection drug use in prison was reported by 38% of males and 12% of females. A drug overdose was ever experienced by 24% of males and 33% of females. Use of any illegal drug in prison was reported by 63% of males and 47% of females. In response to the treatment readiness scale, 27% of males and 34% of females scored high on readiness.

TABLE 2. Characteristics of a Random Sample of Sentenced Inmates in 2005 from the Department of Corrections of Puerto Rico with a Lifetime Diagnosis of Opiate Dependence by Sex ($N = 390$)

Variables	Male ($n = 301$) *n* (%)	Female ($n = 89$) *n* (%)
Sociodemographic characteristics		
Age		
18 to 24 years old	57 (19)	11 (12)
25 to 35 years old	163 (54)	44 (49)
36 years or more	81 (27)	34 (38)
Education		
9th grade or less	124 (41)	35 (39)
10th to 12th grade	143 (47)	42 (47)
More than 12th grade	34 (11)	12 (13)
Civil status		
Married or living together	175 (58)	55 (62)
Widow, divorced, or separated	83 (28)	24 (27)
Never married	43 (14)	10 (11)
Lack vocational skills	65 (22)	36 (40)
Problem drug use in nuclear family	118 (39)	69 (77)
Unable to identify living arrangements upon release	32 (11)	12 (13)
Plans to share housing on release with known drug users	15 (5)	11 (12)
Health history		
Co-occurring mental condition		
Depression	131 (43)	54 (61)
Generalized anxiety	9 (3)	3 (3)
PTSD symptoms	50 (17)	16 (18)
ADHD symptoms	68 (23)	25 (28)
Suicide attempt ever	32 (11)	23 (26)
Self-reported co-occurring infections		
HIV only	5 (2)	6 (7)
HCV only	70 (23)	15 (17)
HBV only	11 (4)	3 (3)
Two or more	67 (22)	23 (26)
Drug use history		
Use of any illegal drug year prior to incarceration	298 (99)	88 (99)
Use of any illegal drug during incarceration	189 (63)	42 (47)
History of opiate use		
Ever	238 (79)	67 (75)
In prison	132 (44)	17 (19)
Injecting drug use ever	182 (60)	43 (48)
Injecting drugs in prison	114 (38)	11 (12)
Ever experienced overdose	71 (24)	29 (33)
Number of treatment admissions (exclude detox)	164 (54)	53 (60)
Times admitted to detox services		
None	33 (11)	13 (15)
1 to 2	80 (27)	19 (21)
3 or more	83 (28)	30 (34)
Treatment readiness		
High	80 (27)	30 (34)
Medium	53 (18)	18 (20)
Low	163 (54)	39 (44)

Figure 1 presents the analysis conducted to determine the number of inmates in the total population eligible for MAT based on the adopted hierarchical criteria. The numbers used represent the projection of sample estimates to the total inmate population. Based on the estimated prevalence of a lifetime drug dependence diagnosis, 3460 inmates entered the analysis (3339 males, 121 females). Of these, 757 (716 males, 41 females) scored high on treatment readiness.

FIGURE 1. Estimated number of inmates in total prison population eligible for MAT. $N = 10{,}849$ (10,550 males, 299 females).



Of these, 579 (546 males, 33 females) had a history of opiate use. The next step involved selecting those opiate users that reported 1 or more of the following: overdose event, injection drug use, and infection with 1 or more of HIV, HBC, and HCV. This step identified 365 inmates (349 males, 16 females). The final step, which involved selection based on the length of sentence remaining, identified 307 inmates (295 males, 12 females) eligible for MAT.

DISCUSSION

This study was commissioned to provide the PR DCR with the data required to strategically address the gap in drug treatment services for opiate-addicted, sentenced inmates in their system. Its relevance to the agency and the development of a collaborative coordinating group were essential to conducting the study properly, for its timely completion, and for the utilization of its findings.

The estimates for the prevalence of a lifetime diagnosis of a drug use disorder, regardless of security level or gender of the prison population, are between 10 to 20 times greater than the 1.9% prevalence estimated for the general island population of Puerto Rico in 2002, the most recent data available at the time of the study (18). Using sample proportions to project need for MAT in the total prison population identified 308 inmates of both sexes who were ready for treatment. The existing program in the agency could only accommodate 44 male participants, a limitation that became an obstacle for treatment expansion when coupled with restrictions on the number of slots that could be authorized by the Center for Substance Abuse Treatment (CSAT) for the establishment of medication units. In light of this, it was recommended that the DCR obtain a license for an accredited self-standing methadone maintenance program that could be established in one of the institutions with adequate facilities, including a dispensary, and that they solicit

accreditation from the National Commission on Correctional Health Care (NCCHC). The recommendation was adopted and an additional 300 slots were authorized.

The community methadone programs in Puerto Rico are only available in 7 municipalities with capacity limited to approximately 7,000 participants. Data from a needs assessment in 2002 revealed total occupation (18). It was not anticipated that capacity in community programs would increase in the near future, limiting availability of referral sources for inmates reentering their communities. To address this, it was proposed that the DCR explore the feasibility of also initiating treatment with buprenorphine-naloxone. This option required assuring continuity of treatment upon release with community-based physicians certified to prescribe by CSAT. In addition, this required the coordination of adequate referral to other agencies for mental health and social services, including the Medicaid Managed Behavioral Health Organizations. Initiating treatment with buprenorphine-naloxone would also facilitate additional capacity for those inmates fulfilling criteria for MAT, initially not yet ready to seek care, who progressed through the stages of change while in prison. The DCR authorized a National Institute on Drug Abuse (NIDA)-funded feasibility study to assess the acceptability, ease of administration, treatment adherence, and outcomes at 1 month post release of treatment with buprenorphine-naloxone, the results of which have been published (25). As a result, the agency eventually committed funds for buprenorphine-naloxone treatment expansion. These findings underscore the importance of assessing community treatment availability to adequately plan transition to MAT services upon release.

Women constitute a smaller proportion of the total inmate population and, therefore, of those eligible for MAT. The treatment needs of opiate-dependent women cannot be met within the existing methadone maintenance program located in an all male institution. There is evidence of greater effectiveness of MAT for women when treatments are tailored to address problems more common to women with a substance use disorder (26). At the time of writing, the DCR had not addressed the issue of providing gender-sensitive MAT for female inmates. Consideration should be given to provision of treatment with buprenorphine-naloxone and access to ancillary services responsive to gender needs, since it is an option compatible with the existing health services infrastructure within the prison system.

Nearly a quarter of female and one fifth of male inmates report concurrent infection with 2 or more of HIV, HBV, or HCV. Methadone is well tolerated among patients with active and chronic HCV (27). In the case of HIV, clinically significant drug interactions between methadone and antiretroviral medications are documented (28). The prison health authorities should carefully evaluate the interactions between antiretroviral drugs maintained in their formulary and methadone to inform which pharmacotherapy—methadone maintenance or buprenorphine-naloxone—is best suited for the patient concurrently treated for HIV/acquired immunodeficiency syndrome (AIDS). Appropriate treatment placement criteria should be disseminated accordingly among providers.

The data also reveal that inmates with a diagnosis of drug dependence are burdened with other mental health conditions, particularly depression and adult ADHD, which can affect treatment retention and outcomes (29). The CSAT guidelines for MAT recommend that services to alleviate or stabilize co-occurring disorders should be provided before patients move beyond the rehabilitative phase of MAT (24). Vocational and educational needs, as well as family issues, also need to be addressed in this phase of treatment and inform reentry planning.

Several of the methodological approaches adopted in this study may be useful for assessments conducted in other settings. Although not reported, additional information was obtained through the interviews to identify other cultural factors requiring attention in planning recruitment and services for inmates. These factors include knowledge and beliefs about methadone, religious affiliations, the degree to which it is an important resource to the individual, and the ease with which the respondents are able to use written materials. In prison systems housing more diverse racial or ethnic populations, the diversity of languages spoken must also be considered

when planning for services. Computer use for interviews was nearly unanimously accepted by study participants. When asked which of the interview modalities they preferred, 42% of participants preferred CAPI, 20% preferred ACASI, and 37% endorsed both. These findings suggest that use of computer-assisted interviews is unlikely to be an obstacle for surveys conducted with prison inmates. Our sampling design, consisting of 3 levels of stratification, allowed us to obtain precise estimates for the parameters of interest. In particular, the use of the percent of positive urine tests per institution as a stratification variable for the estimation of lifetime drug dependence and current drug use resulted in an approximately 65% reduction in the estimated standard error for the population proportion (data not shown). In prison systems of similar size where these data may not be available, not stratifying by this variable will require a larger sample size to obtain comparable precision.

A limitation of this study is the reliance on self-report to assess the prevalence of contagion with blood-borne pathogens. Caution should be applied in interpreting prevalence estimates, since the true prevalence of infection is likely underestimated. In sites considering use of needs assessment methodologies where HIV or HCV testing is not carried out, an alternative that reduces cost is to obtain linked data from a subsample of the larger study.

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