

Methadone maintenance in prison: Evaluation of a pilot program in Puerto Rico

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Abstract

Objectives: To describe and evaluate a pilot methadone maintenance program for heroin-dependent inmates of Las Malvinas men's prison in San Juan, Puerto Rico.

Methods: Data from self-report of inmates' drug use before and during incarceration, attitudes about drug treatment in general and methadone maintenance in particular, and expectations about behaviors upon release from prison and from testing inmates' urine were analyzed comparing program patients ($n=20$) and inmates selected at random from the prison population ($n=40$). Qualitative data obtained by interviewing program staff, the correctional officers and superintendent, and commonwealth officials responsible for establishing and operating the program were analyzed to identify attitudes about methadone and program effectiveness.

Results: Heroin use among prisoners not in treatment was common; 58% reported any use while incarcerated and 38% reported use in past 30 days. All patients in the treatment program had used heroin in prison in the 30 days prior to enrolling in treatment. While in treatment, the percentage of patients not using heroin was reduced, according to both self-report and urine testing, to one in 18 (94% reduction) and one in 20 (95% reduction), respectively. Participation in treatment was associated with an increased acceptance of methadone maintenance. Prison personnel and commonwealth officials were supportive of the program.

Conclusions: The program appears to be a success, and prison officials have begun an expansion from the current ceiling of 24 inmates to treat 300 or more inmates.

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1. Introduction

In mid-2002, there were more than two million Americans incarcerated with more than 1.2 million inmates in state prisons (Harrison and Karberg, 2003). A report from the National Center on Addiction and Substance Abuse concluded that three quarters of inmates in state prison need some form of substance abuse treatment but less than one in five are receiving any (Belenko et al., 1998). One in five state inmates committed crimes to obtain money for drugs, and more than one in four of those incarcerated

for property crimes did so (Mumola and Beck, 1997). About one-quarter of all inmates in state prisons have a history of heroin abuse, one in seven used heroin regularly, and one in 12 were using regularly in the month prior to their arrest (Beck et al., 1993; Mumola and Beck, 1997).

Heroin use does not stop at the prison gates and many studies have documented widespread and persistent heroin use among prison populations (Dolan et al., 1996; van Haastrecht et al., 1998; Boys et al., 2002; Calzavara et al., 2003; Cravioto et al., 2003). Even though methadone maintenance has been shown to be the most effective form of treatment for opioid addiction, its use in correctional settings is very limited. Recently, the use of methadone maintenance therapy in prisons has been increasing outside the United States, most notably in eastern

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Europe, Canada, and Iran (Kerr and Jurgens, 2004; Catania, 2004; Sefatian et al., 2005). Such programs have been shown to reduce mortality, reincarceration, and infection with blood-borne viruses (Levasseur et al., 2002; Dolan et al., 2003, 2005).

In the U.S., no domestic prison currently provides methadone maintenance for sentenced inmates. Two programs have provided methadone maintenance to incarcerated individuals, one in Baltimore and one in New York. However, neither program provided opioid substitution therapy to sentenced inmates in traditional prison settings.

The pilot program in Baltimore provided levo-alpha-acetylmethadol (LAAM) to inmates with a history of heroin dependence at a pre-release facility beginning 3 months prior to their release (Kinlock et al., 2002). In this study, 36 inmates were started on LAAM therapy, 28 completed the prison phase of the study, and 22 entered a maintenance therapy program following release.

Opioid maintenance is more common in pre-trial facilities including jails and detention centers. The most extensive of these programs, KEEP at the Riker's Island has operated since 1987 providing methadone to offenders who have committed misdemeanors or low grade felonies, were sentenced for 1 year or less, and have been diagnosed as opioid dependent (Tomasino et al., 2001). Treatment is provided during short periods of incarceration, on average 35 days prior to release and transition to maintenance programs in the community (American Association for the Treatment of Opioid Dependence, 2004). The program has demonstrated that four-fifths of those released while still enrolled in the program successfully began maintenance therapy in the community after release and that patients maintained on doses of 60 mg or greater were less likely to be reincarcerated than patients maintained on 30 mg of methadone (Bellin et al., 1999; Tomasino et al., 2001). However, no information has been published on the effectiveness of the KEEP program in curtailing heroin use while patients were incarcerated.

In Puerto Rico, as elsewhere, drugs have been shown to play a major role in crime, arrest, and imprisonment, and heroin use continues among inmates (Oficina Control Drogas, 2001). The establishment in the year 2000 of an Office for the Control of Drugs for the Commonwealth under the direction of retired judge Osvaldo Rivera Cianchini signaled a renewed commitment by the Puerto Rican government to understand and address the problems of substance abuse and addiction and yielded a comprehensive plan to tackle these problems. During the data collection phase that preceded the writing of the plan, urine samples from 9807 inmates were tested for the presence of illegal drugs (Oficina Control Drogas, 2001). Testing detected more than 2000 positive individuals with 1392 (14.2%) testing positive for heroin. More unsettling were findings compiled by the Corrections Administration. A profile of the 12,659 inmates in the custody of the Department of Corrections was released in June 2000 and revealed that 71.4% of inmates reported illicit drug use. There followed a system-wide screening of samples of inmates, testing their urines for the presence of illicit drugs that revealed that approximately half of the random sample had urines testing positive for heroin.

These findings on the extent of heroin use in prison led Director Cianchini to promote a pilot methadone maintenance program, fostering cooperation of five agencies of the government of the Commonwealth: the Correctional Health Services, the Corrections and Rehabilitation Administration, the Mental Health and Addiction Services Administration (ASSMCA), Vocational Health, and the Office of Control of Drugs as well as the Substance Abuse and Mental Health Services Administration of the U.S. Government (Oficina Control Drogas, 2001). Planning for a pilot program, Acuerdo de Superacion ("Agreement to Overcome"), to be housed within the men's prison San Juan 504 (also known as "Las Malvinas") began in May 2001. Within 6 months, a full-scale protocol was completed, submitted and approved (Guzman, 2001). Construction within Las Malvinas was necessary to create a cellblock and adjacent space for the provision of clinical, psychological, and social services for the prisoners who would be participating as patients in the pilot. The new cellblock was designed by Correctional Health Services to house up to 24 patients.

2. Methods

2.1. Program operations

Based upon the finalized protocol, Acuerdo de Superacion was opened to inmates with documented heroin addiction and 2 years remaining in their sentence in August 2002 (Guzman, 2001). The latter requirement was imposed to assure that patients would be fully stabilized on their medication before their release. The protocol set inmate eligibility requirements, induction and maintenance treatment regimens, levels of interaction with psychological and social service staff, and criteria for dismissal of patients from maintenance therapy.

Potential patients were recruited from among approximately 500 inmates who were housed in the low or medium security part of the prison. Orientation meetings were organized by prison officials to describe the treatment program to potential participants, who came voluntarily to these orientations and subsequently requested entry. Individuals in this self selected group who had a history of opioid dependence, had 2 years remaining in their sentence, agreed to be separated from the general prison population during the induction period, were at least 21 years old, and provided voluntary and informed consent were eligible for placement into Acuerdo de Superacion. Inmates needing to be hospitalized for any medical condition besides heroin addiction were excluded from participating. Potential patients were screened by an interdisciplinary diagnostic and treatment team assembled by ASSMCA and the Vocational Health Service. Those who exhibited a DSM IV diagnosis of heroin dependence were offered placement into Acuerdo de Superacion on a first-come, first-served basis until all 24 slots were filled. Inmates were not offered any incentives in return for participating in treatment.

Acuerdo de Superacion was designed as a comprehensive program providing both pharmacological and non-pharmacological treatment for opioid dependence. Methadone dosing began at 30 mg per day and escalated until patients were

stabilized. This period was deemed to last from 2 to 3 months, and during this period patients were sequestered from the general inmate population. The majority of patients was stabilized on daily doses of methadone between 80 and 120 mg, which was designed to be somewhat higher than the 40–100 mg range seen among patients in methadone maintenance programs on the island outside of the prisons (Guzman, 2001). The higher dosing level was explained by the high injection frequencies reached by many of the inmates before their incarceration. Non-pharmacological aspects of the program include psychotherapy, engagement with the project social worker, and vocational rehabilitation. After the stabilization period, patients were allowed to resume normal activities within the prison, including attending classes and work.

2.2. Evaluation overview

During the summer of 2003, an independent team consisting of the authors of this report undertook a process evaluation of Acuerdo de Superacion. The study protocol was approved by the Yale Human Investigation Committee once prison authorities certified that the interview data and urine test results would remain unknown to them and that neither refusal to participate nor any disclosures about past illegal activity would influence the prisoner's circumstances during his stay in prison or his chances for parole. To protect the anonymity of all participating inmates, no personal identifiers were used. Interviewers were obliged to divulge to prison authorities information obtained from the inmates only if it concerned potential violent actions; no events occurred necessitating such action.

The evaluation included three components. First, the patients in the program and a random sample of the inmates of Las Malvinas not enrolled in the program were interviewed in Spanish to collect quantitative data. Second, urine samples were collected from interviewed inmates to conduct a biochemical analysis of heroin and methadone metabolites. A preliminary report of these first two components is described elsewhere (Heimer et al., *in press*). The third component of the evaluation consisted of open-ended interviews conducted with senior officials from the five cooperating agencies, Acuerdo de Superacion patients and staff, correctional officers and the warden, and other stakeholders. Interviews were conducted in English with all officials except for the interviews of the correctional officers, which were conducted in Spanish.

2.3. Study participants

All patients of Acuerdo de Superacion were given the opportunity to participate in the study. At the time of the study 20 of 24 places were filled. Four places could not be used because of repairs to several of the cells. A sample of sentenced inmates from among non-patients incarcerated in medium or low security portions was selected at random by matching an alphabetical list of inmates to a table of random numbers. If the matching inmate had not yet been sentenced or was among the small number of sentences inmates held in the high security wing, he was not eligible to participate. Recruitment of inmates from the general

population continued until we interviewed two inmates for each patient interviewed.

Potential participants were first approached by prison staff and offered the opportunity to participate. If they agreed, they were read the informed consent document in Spanish describing the study objectives and methods, the stipulation that they were consenting to be interviewed and provide a urine specimen, the protections for anonymity, and the guarantees that neither participation nor refusal to participate would in any way affect their status within prison. To further protect anonymity, consent was given orally and the interviewer signed the written consent form indicating that consent had been granted.

2.4. Quantitative data collection

The interview with patients and other inmates included questions covering heroin use in prison, the perception of its use as health and safety problems, the scope of illicit opiate use prior to incarceration, attitudes about the program, methadone maintenance in general, substance abuse treatment in prison and prior to incarceration, and willingness to seek treatment upon release from prison. Patients of Acuerdo de Superacion were asked to rate their satisfaction with the program and make suggestions for its improvement. Questions and wording were borrowed from our own past questionnaires for interviewing active injection drug users and from questionnaires used in prison-based methadone studies conducted by Dr. Kate Dolan in Australia (Dolan et al., 1995, 1996, 1998; Heimer et al., 2002b, 2002a). Questions were translated into Spanish appropriate for Puerto Rico and back translated into English to assure accuracy.

2.5. Urine testing

Urine samples were obtained from each consenting interviewee at the time of the interview. Samples were tested in the Chemical Forensic Laboratory at the Recintos de Ciencias Medicas of the University of Puerto Rico, Rio Piedras for the presence of methadone or heroin using the Enzyme Multiplied Immunoassay Technique (EMIT[®], Dade-Behring, San Jose, CA) at standard cut-off concentrations of 300 ng/ml for methadone and 2000 ng/ml for heroin and related opiates. The presence of heroin was confirmed by gas chromatographic separation on a fused-silica capillary column followed by mass spectrometry by comparison to standards of 6-acetylmorphine. Specimens with a concentration of 6-acetylmorphine greater than 10 ng/ml were declared positive.

2.6. Quantitative data analysis

Quantitative interview data and urine test results were entered into an access database and analyzed using either SPSS v.10 or Statistica for Macintosh. Comparison of categorical variables was undertaken using Chi-square tests. Comparison of continuous variables was undertaken using the Mann–Whitney *U*-test, which can have greater power to reject the null hypothesis than *t* tests especially when, as is the case here, the data are not normally distributed (Whitney, 1948; Rosner and Grove, 1999).

Agreement between self-report and urine testing was determined using the kappa statistic (Kelsey et al., 1996).

2.7. Qualitative data collection and analysis

Interviews were scheduled with the leadership of all five Commonwealth agencies participating in the establishment and operations of Acuerdo de Superacion. Four of five agency heads kept their interview appointments. In addition, interviews were conducted with the current and former directors of the Office for the Control of Drugs, Dr. Aida Guzman, who developed the Acuerdo de Superacion protocol, Jaime Ruiz, the medical director of Acuerdo de Superacion, two staff attorneys with the Corporacion de Accion Civil y Education, which has litigated to improve inmate conditions, and William Vasquez Marchena, the Superintendent of Las Malvinas. These interviews were open-ended, with few prompts beyond determining the role played by the interviewees in establishing or operating the program, their attitudes towards methadone maintenance in general and Acuerdo de Superacion specifically, and their vision for the future of the program.

Interviews with correctional officers focused on their beliefs about methadone, the usefulness of the current program and any positive or negative effects the program might be having. These interviews were conducted in Spanish by native Spanish speaking members of the project staff. Interview notes were taken in Spanish and transcribed and translated simultaneously.

To analyze the qualitative data, transcribed interview notes were read to identify salient issues and themes that were repeatedly mentioned. For those repeated items that could be dichotomized, responses were categorized as supportive or critical of the program.

3. Results

3.1. Demographics and drug use history

All 20 patients of Acuerdo de Superacion at the time of the evaluation consented to participate. They had been in the program between 11 months (since its beginning) and 12 days. A random sample of 40 inmates consented to participate. All 60

individuals were interviewed and provided urine samples. Information was collected on age and the duration of current prison sentence. There were no significant differences between the two groups vis-à-vis these variables (Table 1).

Drug use histories prior to incarceration were compared (Table 1). Heroin use was higher among Acuerdo de Superacion patients than among non-patients (95% versus 62.5%, $p < 0.01$). For all 60 participants, using heroin outside of prison was significantly associated with having been incarcerated more than once ($p < 0.001$). Thirty-seven of the 44 reporting heroin use outside of prison had been in prison before their current sentence more than once, whereas, only six of the 16 not reporting heroin use had been incarcerated more than once. These 44 had been incarcerated an average of 3.0 times prior to their current sentence (range 0–20, standard deviation 3.5), and there was no significant difference between the 19 patients and the 25 non-patients. However, current patients were more likely than non-patients to have been in treatment in the community (78.9% versus 32%, $p < 0.01$) and their mean time in treatment was longer, but not significantly so (11.7 months versus 4.5 months, $p = 0.093$).

3.2. Heroin use in prison

Heroin use while in prison was reported by all patients and 23 non-patients (100% versus 57.5%, $p < 0.005$) (Table 2). Four of the 60 inmates reported using heroin for the first time while in prison; one was a patient and three were from the general population. To compare heroin use in the absence of treatment, self-reported use by patients for the 30-day period prior to enrolling was compared to self-reported use for non-patients in the 30-day period prior to interview. All patients reported heroin use whereas only fifteen of the inmates from the general population reported heroin use (100% versus 37.5%, $p < 0.02$). Program patients had used heroin more often than the heroin-using inmates not in the program. Eighteen of the 20 patients reported daily use whereas only six of 23 inmates reported such a high level of heroin use (90% versus 26.1%, $p < 0.0001$). Nineteen of the 20 patients reported injecting heroin compared to 17 of 23 non-patients.

To assess the impact of the program we compared self-reported heroin use among patients in the 30-day period prior

Table 1
Comparison of Acuerdo de Superacion patients to sample of inmates from the general population

Question	AS patients ^a (n = 20)	General population ^b (n = 40)	Significant difference
Age			NS
Average	36.4 years	32.8 years	
Standard deviation	8.8	8.9	
Range	21–50 years	21–56 years	
Duration of sentence			NS
Average	19.9 years	22.1 years	
Standard deviation	16.1	31.7	
Range	4–64 years	4–174 years	
Heroin use prior to prison	19 (95%)	25 (62.5%)	$p < 0.01$
Drug treatment prior to prison	15/19 (78.9%)	8/25 (32%)	$p < 0.01$

^a AS patients: patients in Acuerdo de Superacion.

^b General population: randomly selected inmates not in AS.

Table 2
Drug use while in prison

	Acuerdo de Superacion patients (n = 20)	Non-patients		
		All (n = 40)	Heroin using (n = 23)	
Heroin use while in prison	20 (100%)	23	57.5%**	–
Intravenous injection in prison	19 (95%)	17	42.5%***	73.9%***
Daily use while in prison ^a	18 (90%)	6	15%***	26.1%***
Heroin use in past 30 days	1/18 ^b (5.6%)	15	37.5%*	65.2%***
Heroin in urine	1 (5%)	9	22.5%*	39.1%*
Methadone in urine	20 (100%)	0	0%***	0%***

^a Daily use for AS patients refers to use prior to entry into program. Subsequent variables were for use while enrolled in the program.

^b Only 18 of the 20 patients could be assessed on this variable since two patients had been in the program less than 30 days.

* Percentages of non-patients are significantly different from Acuerdo de Superacion patients with $p < 0.05$.

** Percentages of non-patients are significantly different from Acuerdo de Superacion patients with $p < 0.01$.

*** Percentages of non-patients are significantly different from Acuerdo de Superacion patients with $p < 0.001$.

to interview with (1) their reported use in the 30 days prior to entering treatment and (2) use reported by non-patients. For the 30 days prior to the interview, only three of the patients reported any heroin use, but two of these individuals had been in the program for less than 30 days. Thus, only one of the 18 patients (5.6%) with 30 days or more in treatment reported heroin use in the past 30 days, a 94.4% reduction from the 100% use reported by these patients prior to entering treatment. In contrast, non-patient heroin use was reported by 15 (37.5%) of the non-treated inmates, a rate significantly higher than among patients ($p < 0.05$). The 15 users comprised 65.2% of inmates who reported any use of heroin in prison.

The low level of heroin use reported by patients once entered into Acuerdo de Superacion was supported by the results from urine testing. Only one patient had evidence of recent heroin use by urinalysis. In contrast, nine of the 40 inmates from the general population had evidence of recent heroin use. The correspondence between self-report and urine testing was investigated. None of the three patients who reported use in the past 30 days had evidence of heroin use in his urine. The one positive urine among the patients came from a patient who did not report recent heroin use. Urines positive for heroin were obtained from seven of the 15 non-patients who reported any heroin use during the prior 30 days. Five of six inmates who reported daily heroin use had evidence of heroin in their urines. Two who reported no use in the past 30 days tested positive by urinalysis, but both did report that they had used heroin at some point during their incarceration.

The distribution of the 10 positive urine tests as a function of reported heroin use frequency was examined. Six positive tests were on urine samples from individuals reporting high-frequency heroin use (at least four times per week), one was on a urine sample from an individual reporting occasional heroin use, and three were on urine samples from individuals reporting no use in the 30 days prior to interview (Table 3). Of the 50 negative tests, four were on samples from individuals reporting high-frequency heroin use, seven were on samples from individuals reporting occasional use, and 39 were on samples from individuals reporting no use. Because the timeframes for the urine test and self-reported heroin use were different, it was determined that in 52 cases it was possible to analyze the agree-

ment between self-report and urine testing. Eight individuals were excluded from the analysis because they reported using heroin three or fewer times a week; given the sensitivity of urine testing, such individuals could with equal probability test positive or negative. The observed rate of agreement for the 52 cases available for analysis was 0.865. The calculated expected rate of agreement, based purely on chance was 0.701. The analysis yielded a kappa coefficient of 0.549, about halfway between that expected by chance and if self-report and urine data were in complete agreement. Nevertheless, this was significantly greater than would have been arrived at by chance ($p < 0.001$).

None of the 60 inmates interviewed reported having used methadone illegally while incarcerated. None of the non-patient inmates tested positive for methadone in his urine, entirely consistent with self-report.

3.3. Inmate attitudes about substitution therapy

When asked about their attitudes and beliefs about methadone as treatment for addiction, Acuerdo de Superacion patients were uniformly supportive of methadone in general and as treatment for themselves (Table 4). All 20 believed that methadone was effective for treating heroin addiction and lowering the risk of HIV infection. All 20 would recommend methadone to others needing treatment for heroin addiction and all wanted to continue with their treatment while incarcerated. Nineteen of

Table 3
Agreement of self-report and urinalysis for heroin use^a

	Self-report		Total
	Yes	No	
Urinalysis			
Yes	6	3	9
No	4	39	43
Total	10	42	52

^a This analysis is restricted to the 52 participants who either reported no heroin use in 30 days prior to the interview (42) or use at least four times weekly (10). It includes nine of the 10 positive urine tests. It excludes eight individual who reported using within the 30 days prior to interview but at a frequency less than four times per week. One of these eight individuals had evidence of heroin in his urine.

Table 4
Beliefs and attitudes about methadone treatment among those using heroin while in prison

	AS patients (n = 20)	General population (n = 23)	Significant difference
Treatment for addiction before prison	55%	30.4%	NS
Is methadone effective treatment?	100%	82.5%	$p < 0.05$
Does methadone lower HIV risk?	100%	90%	NS
Recommend methadone to others?	100%	92.5%	NS
Accept methadone in prison?	100%	73.9%	$p < 0.02$
Accept methadone after release?	95%	82.6%	NS

the 20 expressed a desire to continue methadone treatment once released from prison. Of the 40 non-patient inmates, only those 23 who reported heroin use while in prison were asked about their attitudes and beliefs regarding methadone. They were significantly less likely than those in treatment to consider methadone effective and acceptable as treatment, and only 17 (73.9%) said they would be willing to enter treatment. Willingness to enter treatment was higher among the 15 inmates who reported using heroin in the previous 30 days; 13 (86.7%) said would consider treatment. Only eight of the heroin-using, non-patient inmates had received some form of treatment for heroin addiction prior to incarceration (Table 1). Differences in attitudes about methadone between those who had and those who had not were not significant. In other words, for non-patients prior treatment was not associated with affirmatively indicating they would consider treatment either in prison or upon their release.

Eighteen of 20 patients responded that they were “satisfied” or “highly satisfied” with their program. The remaining two reported that they were “somewhat dissatisfied”. The most common complaint was related to the lack of activities available during the enforced segregation during the initial stabilization period.

3.4. Official attitudes towards the program

Senior agency administrators and prison staff held generally favorable opinions of Acuerdo de Superacion. Even though the program was only 1 year old at the time of our evaluation, the preponderant opinion was that the program was a success and should be expanded. There were several areas mentioned in which the program could be improved: increase in personnel, especially psychosocial worker and correctional officer staffing, and expansion of the facilities and the space devoted to program. The prison staff reported no problems or irregularities associated with the program. None felt that methadone diversion was a problem.

There was greater divergence on how expansion of methadone maintenance in Puerto Rico’s prisons should be accomplished. ASSMCA staffs were more interested in an expansion of the program under their auspices, whereas, Corrections staff wanted greater freedom to expand the program under their oversight. Individuals outside either agency felt that ASSMCA had not been a strong advocate for methadone on the island. Most felt that expansion would be most effective if it occurred through the Corrections and Rehabilitation Administration. There was uniform concern that there were insufficient

funds for prison healthcare in general, and no one (with the notable exception of Corrections Secretary Miguel Pereira) was entirely sure that Corrections, on its own, could secure the necessary funding to support program expansion. A major concern was the lack of maintenance care in the community to accommodate a large increase in the number of prisoners being released who need continuity of care.

4. Discussion

In the past, the effectiveness and acceptability of methadone maintenance in the prison setting have been shown only in studies from Australia and France (Dolan et al., 1996, 2003, 2005; Levasseur et al., 2002) or in jail or specialized pre-release facilities in the United States (Kinlock et al., 2002; Magura et al., 1993). The process evaluation we describe in this report is the first for a program providing methadone maintenance for sentenced inmates in a traditional American prison.

Three findings about Acuerdo de Superacion are worth noting. First, prior to their entry into Acuerdo de Superacion, inmates selected for the program had been, on average, significantly heavier users of heroin and more likely to be injecting than was the sample taken from the general inmate population. This suggests that the program has attracted an appropriate group of inmates for treatment. Second, once entered in the program, patients were significantly less likely than those not receiving treatment to report recent use of heroin. Third, no evidence of any kind of methadone diversion was obtained. Fourth, participation in Acuerdo de Superacion was associated with reporting an increased likelihood of accepting methadone treatment upon release from prison. This suggests that the program may exert an influence that extends beyond the period of incarceration. Although it is a small, pilot program, its successes suggest that prison-based methadone maintenance can provide effective treatment for opioid addiction and promote the acceptance of continued treatment following release.

There were several limitations to this study. The major limitation is that the this report represents the findings of a process evaluation and not an outcomes evaluation. At the time the evaluation was undertaken, Acuerdo de Superacion was only one year old, and only one patient had been released from custody (12 months earlier than expected, as it so happened). It will be quite some time before it will be possible to conduct a study that investigates recidivism and reincarceration after release. Furthermore, given the small number of patients, an investigation with recidivism and reincarceration as its endpoints would be compromised by a small sample size and the potential

confounder of significant differences in the ease of access to continued methadone treatment and quality of the island's shrinking methadone providers (Porter, 1999). Only a careful study that controls for prisoners' history of heroin use before and while being incarcerated and for where on the island the prisoner lives after release could yield the needed information. Organizing such a study would not be easy and would not yield useful data any time in the near future. Waiting for such an evaluation before making decisions on whether or not the current program merits continuation or expansion is impractical, especially given the widespread support for the program that currently exists among prison and health officials in Puerto Rico. However, it is important to conduct a study that investigates post-release continuation in methadone treatment, resumption of heroin abuse, and reincarceration of Acuerdo de Superacion patients.

A second major limitation is that random selection from the non-patient population of Las Malvinas yielded a sample that was not directly comparable to the patient population in terms of heroin use. Nevertheless, as expected, about half (23 of 40) of the randomly selected sample reported abusing heroin while incarcerated, permitting direct comparisons of heroin use and attitudes between treated and untreated inmates who reported heroin use while incarcerated (as presented in Tables 2–4). It is not surprising that the patients had been, on average, heavier users of heroin (based on their self-reported drug use prior to entering Acuerdo de Superacion) than were the heroin users randomly selected from the general inmate population. It speaks to the success of the program that it was able to provide treatment to heavy users, those most in need of treatment.

A third limitation of the evaluation resulted from the brevity of the interview instrument and the small sample size. As the study was conceived, with its focus on the patients of Acuerdo de Superacion, a small sample was sufficient to achieve the primary objectives—determining whether the program was reducing heroin use among patients without opening an avenue for methadone diversion. The limited objectives and modest means of this process evaluation meant that data were not collected that would allow more detailed analysis of recent heroin use or attitudes regarding opiate addiction treatment. Because the survey instrument was narrowly focused, using the data to attempt an investigation of the factors underlying behaviors and beliefs using multivariate analysis could easily mislead—through misidentification of a confounder addressed in the circumscribed interview instrument while failing to identify the real correlate that was simply not addressed in the survey.

A fourth limitation is a direct result of the sampling frame that included only a single, albeit simultaneous, assessment of heroin use by self-report and urine testing among study participants. Although it would have been preferable to take multiple measurements of heroin use at intervals, the limited funds provided to conduct this study made this impossible. And while the study would have been strengthened by repeat testing at intervals, its absence does not diminish the major findings—that continuing heroin use by inmates can be dramatically reduced by providing, during incarceration, addiction treatment that includes methadone maintenance and that engagement in such a pro-

gram might increase the likelihood that treatment is pursued by inmates upon their release.

A fifth limitation results from the opportunity for inmates to decline to participate. This may have reduced the likelihood that active drug users would agree to participate in a study that included urine testing. The influence of this selection bias would have a bigger impact on non-patients, limiting, in turn, the ability to detect differences between the two groups. Nevertheless, results indicated significant differences in the extent of heroin use and the acceptability of treatment, and the differences pointed in the same direction.

The comparison of self-report and urine testing shed some light on the extent of social desirability, a common problem in studies that use self-reported behavior. Although the agreement between self-reported heroin use and testing was only moderate, it was not due entirely to misrepresentations to disguise illicit drug use. There were three people who denied use and tested positive, and four individuals who reported high-frequency heroin use and did not have positive urines. This, in turn, suggested that the results of the evaluation were not unduly influenced by social desirability.

In summary, the patients in Acuerdo de Superacion demonstrated reduced heroin use and a willingness to continue use of methadone. That nine of the 40 inmates selected at random from the general population reported using heroin at least every other day while incarcerated was a clear indication that the program needs to be expanded. These findings were released to the governmental authorities in Puerto Rico in October 2003 (Parés Arroyo, 2003). We can report that our findings have served as the impetus for a planned program expansion from 24 to 300 or more patients (Pacheco, 2003). This expansion is currently underway but seems to be proceeding slower than anticipated. Further studies are needed including outcome evaluations of the patients following release and a new process evaluation of the program's expansion. Until such studies are completed, the data in this report allow one to be cautiously optimistic about the value of providing methadone maintenance to sentenced inmates who continue to actively use heroin while incarcerated.

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