

# Evaluation of a Needle Exchange Program at *Pereiro de Aguiar* prison (Ourense, Spain): A ten year experience

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## ABSTRACT:

**Objectives:** To evaluate the effectiveness of NEPs in prison to reduce the prevalence of infections associated with intravenous drug use and to know more about acceptance of the program by inmates and staff.

**Material and methods:** cross-sectional observational study at baseline, 6 and 12 months and 10 years of program development. Interviews were conducted with program users, as well as random sample surveys of officials at the various cuts, and a random sample of inmates from the centre after 10 years. Activity indicators of the program were recorded continuously, and the prevalence of HIV, HBV and HCV at baseline and after 10 years was evaluated. For the statistical analysis, the chi-square test was used with the Yates correction when necessary.

**Results:** In ten years we have supplied a total of 15,962 syringes to 429 users, (average 20.2 users/month), and 11,327 (70.9%) were returned. The prevalence of HIV infection decreased from 21% in 1999 to 8.5% in 2009, HCV prevalence from 40% to 26.1% ( $p < 0.01$ ), finding no significant differences in the prevalence of HBsAg +. Most of the inmates and civil servants believe that the program did not increase intravenous drug use and improves hygienic living conditions in prison.

**Conclusions:** After ten years of development of the NEP, there was a significant decrease in the prevalence of HIV and HCV in the prison population at the centre, and the program is accepted as beneficial by most of the inmates and staff participating in the survey.

**Key words:** Needle-Exchange Programs; Prevalence; Program Evaluation; Prisons; HIV Infections; Hepatitis C; Methadone; Naltrexone.

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## INTRODUCTION

Spain is the European country with the highest incidence of AIDS, and intravenous drug abuse is the most common high-risk practice related to it, even though throughout recent years there has been a significant increase in cases due to potential sexual transmission (both homosexual and heterosexual)<sup>1</sup>.

In 1998, it was estimated that up to 45% of inmates hosted in Spanish prisons were or had been intravenous drug users (IDUs)<sup>2</sup>. According to the

National Survey on Health and Drug Use among inmate population, carried out by the National Plan on Drugs of the Spanish Government in 2000, 11.4% of inmates reported intravenous drug use up to 30 days before imprisonment, a percentage which dropped to 8.4% in the 2006 survey<sup>3</sup>.

The 2006 National Survey on Health and Drug Use among inmate population concludes that 25.2% of inmates hosted in Spanish prisons have a previous history of intravenous drug use. This percentage rises up to 37.1% in the 31 to 40 years old group, and is

higher among Spanish inmates (34.7%) than among foreigners (3.7%), and higher among men (25.8%) than among women (17.9%)<sup>3</sup>.

In our prison, the prevalence of HIV infection in November 1999 was 21%, while the infection by the Hepatitis C Virus (HCV) affected 40% of the imprisoned population, and over 80 % of those with a drug addiction. Currently, up to 40 % of those imprisoned in our facility report a history of drug abuse and over 70% of them do it or have done it intravenously. In spite of the difficulties of drug access in prison and intervention and harm reduction programs implemented in our facility, up to 20% of inmates frequently or usually turns to the intravenous route for drug abuse.

Drug use under unhygienic conditions, and above all, the sharing of injection material between intravenous drug users (IDUs) entails a high risk regarding the transmission of infections such as hepatitis, HIV, abscesses, yeast infections, etc.<sup>1, 4-6</sup>. 92.5% of inmates affected by HIV and 80% of those infected by HCV have a history of intravenous drug use<sup>7, 8</sup>.

The impaired access to sterile needles and syringes in a closed environment such as the prisons, entails that these are reused many times and shared between different inmates. If we also take into account the high prevalence of HIV and hepatitis, as well as drug use under unhygienic conditions, we will encounter a high risk for the transmission of infections<sup>9</sup>.

In 1993, the World Health Organization and the Council of Europe, invited those countries where Needle Exchange Programs (NEPs) were being developed within the community for intravenous drug users, to consider their implementation in prisons<sup>10</sup>.

After the pioneering experiences of German and Swiss prisons<sup>11-13</sup>, Spain was the first state of the European Community to progressively implement NEPs in prisons as part of drug-related harm reduction strategies<sup>9, 14</sup>. Currently, in the European Community, there are NEPs implemented in prisons in Germany, Spain, Luxembourg, Portugal and Romania, and their implementations are being undertaken in the United Kingdom (Scotland)<sup>15</sup>.

Several studies have concluded that NEPs developed within the community are efficient in modifying high risk practices directly related to intravenous drug use, and therefore, are efficient in reducing the risk of infection transmission<sup>16-19</sup>. Pilot Programs developed in prisons in Hindelbank (Switzerland)<sup>12</sup> and Basauri<sup>20</sup> and Pamplona<sup>21</sup> (Spain) pointed out their viability in the prison environment.

The main objective of this paper is to evaluate the efficiency of a NEP developed within a prison, as far as the reduction of the prevalence of infections related

to intravenous drug abuse and the sharing of injection material reported by its users are concerned.

A secondary objective is to assess the acceptance of the program among inmates and officers and, by considering a low baseline acceptance for NEP by officers, to evaluate potential changes in the short, medium and long term.

## MATERIAL AND METHODS

It is an observational cross-sectional study which considers four moments: baseline, 6 months, 12 months and 10 years.

Officers, randomly selected filled in opinion surveys on the NEP at the four specific evaluation periods. We then compared the differences between percentages at each evaluation time.

In order to know the opinion of inmates, a random sample of 110 out of 425 inmates was taken 10 years after the initiation of the program. Out of such sample 81 were voluntary participants (76.3%), who filled in a survey on their beliefs and attitudes towards the NEP.

Group interviews were also conducted with inmates, health agents and drug users, where their opinion on the program as well as any suggestions to improve it were asked.

Specifically trained healthcare staff conducted guided interviews on drug use habits and NEP use to inmate users at all the four evaluation cuts. Since the average of users per month had significantly dropped at the ten year evaluation cut, inmates who had used the program throughout the 6 previous months were instead interviewed.

The prevalence and incidence of drug use as well as the known prevalence of HIV, HCV and HBV infections among the inmate population were recorded at baseline and 10 years later, by consulting the total amount of clinical records (326 at baseline and 425 ten years later).

Continuous recording of the NEP activities was also carried out throughout the ten year period: user number, syringes provided and syringes returned.

### Program Description:

For the execution of the exchange a human resources approach was chosen, since this model allows personal contact with program users and the provision of information and health related advice during the exchange act, encouraging IDU program users to adopt hygienic habits<sup>22, 23</sup>. The possibility of being

derived to other healthcare programs such as serologic diagnosis, vaccination, Tuberculosis prevention or HIV programs; and drug addiction interventions such as methadone treatment, Naltrexone, detoxification or drug free programs; is also provided.

Since there is no anonymity in the human resources approach (in comparison with a dispensing machine approach), the strictest confidentiality is promoted together with the commitment to never report of the identity of inmates attending the program.

On November 4<sup>th</sup> 1999, we undertook the implementation of the NEP in our centre. After ten years, the results of its evaluation are presented.

Data collected was processed in specifically designed Epi Info version 3.5.1 databases, and such information was further analyzed with Epi Info ANALISYS software. For the statistic analysis of qualitative variables, the chi-square test with the Yates correction was used when necessary.

## RESULTS

### 1. Opinion of prison officers:

The vast majority of prison officers interviewed before the implementation of the NEP (77.3%) were quite or very worried that some inmates could become infected by the human immunodeficiency virus and hepatitis by sharing needles for drug use. Nevertheless, only 38.6% considered necessary the implementation of the program and 81.6% thought that other measures were needed before initiating the NEP, especially by promoting drug addiction intervention programs and other harm reduction measures.

Table 1 depicts the distribution of officers interviewed and their opinion on the potential increase of illegal drug use and the conflict that could arise from the implementation of the NEP, as well as the changes of their opinion throughout the program's development period.

	Before NEP (n 44)	6 months (n 47)	12 months (n 47)	10 years (n 55)	p
Officer groups					
Surveillance	72.8	83	83	87.3	
Treatment	22.7	10.6	12.8	9.1	NS
Administration	4.5	6.4	4.3	3.6	
Do you believe that the NEP has encouraged the use of intravenous drugs in the prison?					
A lot/ Quite	47.8	17.1	25.5	18.9	<0.01
Do you believe that the NEP has promoted conflict in the prison?					
A lot/ Quite	56.8	2.1	25.5	18.1	<0.01
Has your opinion about the NEP changed since it was first implemented?					
No		72.3	57.5	47.3	
Favorably		23.4	40.4	49.0	<0.05
Unfavorably		4.3	2.1	3.6	

Results in percentages

NS= not significant; p>0.05

Table 1: Distribution of prison officers according to position and opinion on NEP.

	>45	19.8
Age group	31-45	53.1
	25-30	21.0
	<25	6.2
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Education	Primary	65.4
	Secondary	28.4
	College	6.2
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Prison Status	Preventive	14.8
	Convict	85.2
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Have you ever used illegal drugs?	Yes	25.6
	No	74.4
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Have you ever used intravenous drugs?	Yes	12.0
	No	88.0
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Have you used illegal drugs in the last 30 days?	Yes	20.5
	No	79.5
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Have you used intravenous drugs in the last 30 days?	Yes	6.4
	No	93.6
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Do you believe that the NEP has encouraged the use of intravenous drugs in the prison?	Yes	35.7
	No	64.4
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Do you believe that the NEP has reduced the sharing of injection material in the prison?	Yes	75.4
	No	24.6
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Do you believe that the NEP has entailed improved hygienic conditions?	Quite /A lot	84.4
	Few/ No	15.6
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Do you believe that the NEP has promoted conflict in the prison?	Quite /A lot	27.4
	Few/ No	72.6

Results in percentages

Table 2: Features on the inmate sample and their opinion on the NEP after a 10 years period. (N=81).

## 2. Opinion of inmates on the NEP:

81 inmates (19.1% of our centre's imprisoned population) answered the survey: 75 men and 6 women. 51.8% had been imprisoned for a period comprised between 1 and 5 years and 46.9% had been hosted in our facility for a period of 1 to 5 years. Table 2 depicts the main features of the inmate sample as well as the answers given.

In the interviews conducted by health agents and other inmate drug users the problem which was most frequently reported concerned confidentiality. They asserted that some inmates did not personally carry out the exchange since they were concerned that the fact that they still used drugs in prison could entail negative consequences when trying to access prison benefits.

## 3. Main features and evolution of user inmates and activity indicators:

At baseline, 25% of inmates use intravenous drugs once or more times every day, 87% do so 6 months later, 13.3% 12 months later and 9.1% 10 years later. Drugs are used several times every week in 54%, 29.6%, 13.3% and 26.4% of cases at baseline, 6 months, 12 months and ten years later respectively. Drugs are used less than once per week in 30.4%, 54.2%, 72.4% and 63.2% of cases at each evaluation period. At baseline 22 inmates (39.3%) did not know or didn't want to specify the frequency of drug abuse, three inmates (7.5%) did so 6 months later and other three (13.6%) did so 10 years later (see Figure 1).

Throughout the first 10 years of program development, the total number of different users was

429, with an average number of 20.2 inmates per month. A total amount of 15,962 needles were provided (ranged between 700 and 4304 every year) and 11,327 were collected, implying a mean return rate of 71.0% (ranged between 90.8 and 45.8% every year) (see Table 3).

At baseline, 45.8% of inmates reported sharing needles for intravenous drug use (25 out of 56), while only 4% (1 out of 26) and 7.1% (1 out of 14) did so sometimes 6 and 12 months later ( $p < 0.01$ ). Ten years later 81.8% (18 out of 22) denied having shared needles for drug abuse (see Figure 2).

	Users/month	Needles provided	Needles collected	Return Rate
1999(*)	30.5	168	143	82.1
2000	29.6	1143	1038	90.8
2001	29.8	1431	1176	82.2
2002	13.8	849	555	65.4
2003	18.0	700	480	70.0
2004	25.9	1428	1139	79.8
2005	25.5	2892	2514	86.9
2006	25.1	4304	1972	45.8
2007	13.6	972	715	73.6
2008	11.6	1014	770	75.9
2009	8.9	1061	825	77.8
TOTAL	20.2	15962	11327	70.9

(\*) 04/11/99 to 31/12/99

Table 3: NEP Activity Indicators

#### 4. Prevalence of infections related to the use of shared injection material:

In November 1999 21% of our inmates were infected by HIV, while 8.4% were so in November 2009. The prevalence of HCV infection was 40% at baseline and by the end of 2009 it had dropped to 26.2%. The prevalence of HBV infection did not experience the same reduction, which was 2% in November 1999 and currently is 2.2% (see Table 4).

	1999 (n 362)	2009 (n 425)	p
Drug users	40	43.8	NS
IDUs	27.9	25.9	NS
HIV	21	8.5	<0.01
HCV	40	26.1	<0.01
HBsAg	2	2.1	NS

Results expressed in percentage.

NS= Not significant,  $p > 0.05$ ;

n represents the total inmate population of the facility by 04/11/99 and 04/11/09 respectively.

Table 4: Prevalence of drug abuse and viral infections

#### DISCUSSION

This study is one of the first to evaluate a needle exchange program in the prison environment, and asserts its long-term viability, its acceptance by both officer and inmates and its efficiency in the preventing the transmission of blood-borne infections.

Previous NEP in prison (Hindelbank, Basauri and Pamplona)<sup>12, 20, 21</sup> encouraged us to implement in our facility a program which initially counted upon more critics than approvals. High number of intravenous drug users (IDUs) among inmates, together with the high prevalence of HIV and HCV and the verification that both Methadone Maintenance Programs (MMP) and Health Education Programs (HEP) had proven insufficient to avoid the sharing of injection material implied the need to take a step further in harm reduction measures.

Since its initiation, we considered the need to evaluate the program as a means of verifying its viability and efficiency and to correct potential functioning errors, since seldom are NEPs evaluated in prison<sup>25</sup>.

It is of paramount importance to know the opinion of prison officers, especially of those implied in sur-

veillance duties, who are those more directly affected by the NEP and whose cooperation is essential for the implementation and development of the program<sup>26</sup>.

Before launching the NEP, a vast majority of officers surveyed (77.3%) were aware of the health problem that sharing injection material between IDUs implied, yet only 38.6% were in favour of implementing a NEP in our facility.

Throughout these ten years officers have not recognized any improved conflict nor an increased intravenous drug use, and most of them believe that the NEP improves hygienic conditions for inmates. By the end of this decade, almost 50% of officers reported that their opinion was more favorable than at baseline and only 3.8% report a worsened opinion.

Only the normal development of the program throughout these ten years, together with the cooperation of officers, has turned an initial unfavorable opinion towards the implementation of a NEP into a more favorable one and it has entailed its standardization.

The opinion of inmates was also gathered independently of whether they were NEP users or not.

Most of the inmates who answer to the self-filled survey believe that the NEP has not increased the consumption of intravenous drugs, yet a significant 37.5% believe that it fairly or very much does so, in comparison of 17.1% of officers who think similarly. Over 75% of inmates believe that the NEP has significantly reduced the sharing of injection material and almost 85% believe that hygienic conditions have been improved for IDUs in prison.

It is relevant to underline the acceptance of the NEP by both drug users and non users.

As far as NEP users are concerned, far from increasing the frequency of intravenous drug abuse, this has progressively been reduced and ten years later 60% of users report intravenous drug use less than once every week. 10 years after the implementation of the NEP in our facility, 81.8% of users deny having shared injection material in the last 6 months while only 54.2% did so in the initial survey (see Figure 1).

Throughout these ten years 15,962 needles have been provided with an average number of 20.2 users per month. 11,327 needles (71.0% of those provided) were collected, a figure which entails a lower return rate than in other prison NEPs<sup>24, 25</sup>. Since one of the secondary objectives was to take out used and potentially contaminated syringes, further efforts need to be done to encourage program users to return the vast majority of syringes provided.

None of the NEPs implemented in Spanish prisons has evaluated the opinion of officers and inmates on the program's development. The program's indicators in a seven year period have been published in the prison of Pamplona<sup>24</sup>. In such period of time 9,456 syringes were provided and 8,745 were collected (a higher return rate: 93% vs. 71%). The average number of inmates per month was also slightly higher in Pamplona (26.3) than in our facility (20.2).

The average number of users/month has experienced a significant fall throughout recent years, a fact which is not analogous to the decreased number of exchanges carried out. This suggests that there are less NEP users but that they carry out exchanges both for themselves and for other inmates. This fact impairs accessing to some IDUs and offering them informa-

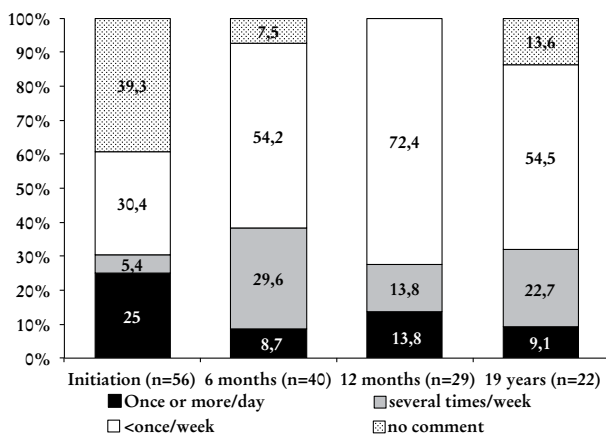


Figure 1: Reported Frequency for intravenous use among NEP users.

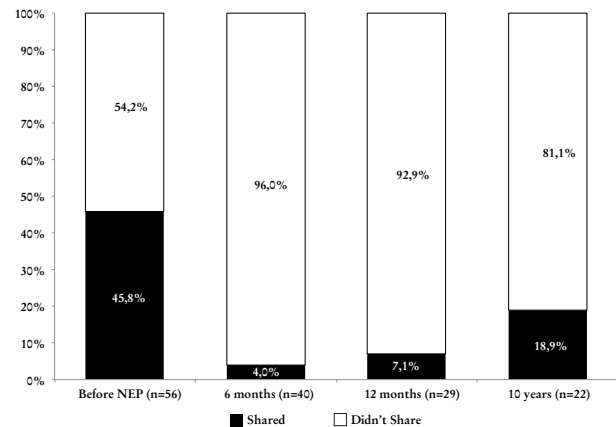


Figure 2: Shared use of injection material reported by NEP users.

tion on healthcare and intervention programs besides sterile injection material. This is also, most probably, the main cause leading to a decreased return rate.

In the interviews conducted by health agents to drug user inmates, the later asserted the concern of many IDUs that their condition becoming known if they access the NEP may entail the denial of prison benefits.

Obviously, in an enclosed environment such as the penitentiary, it is almost impossible to keep the identity of NEP users a secret, but that known as “confidential healthcare” must ascertain that personal information be never used under any circumstance, outside the exclusive field of preventive activities and the provision of healthcare to our inmates<sup>15, 27</sup>. The interest on the health of IDUs hosted in our facility thoroughly deserves it.

HIV and HCV infection rates have experienced a significant fall in our facility throughout the last ten years yet the percentages of drug user inmates and intravenous drug users in our centre have not followed such trend (see Table 2). Nevertheless, such fall can't be exclusively attributed to the NEP: several Health Education Programs (HEP) developed in prison and in the community are undoubtedly significant associated factors.

## CORRESPONDENCE

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