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# Evolution of the need and coverage of syringe exchange programs in Spanish prisons, 1992-2009. A revised estimation

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## ABSTRACT

**Introduction:** The objective of this paper is to amend the bias included in our previous work, presenting a corrected estimation of the need and coverage of syringes/needles in Spanish prisons between 1992 and 2009.

**Methods:** Data on the provision of the needles exchange programs (NEPs) in prison is taken from official publications. The need was calculated by applying multiplicative methods to secondary data from several sources. Coverage was estimated as the quotient between provision and need and the difference between these magnitudes. The detected need estimate bias has been corrected.

**Results:** NEP's in prisons started in 1997. Their maximum coverage reached 36% in 2005, which is much higher than the initially estimated value. However, it decreased by half in the next four years, reaching 17.4% in 2009.

**Conclusion:** The remarkable coverage reached by these programmes must be valued, but more recent evolution leads us to emphasize the need to be imaginative so that new epidemiological and economic circumstances do not lead to their disappearance.

**Key words:** needle-exchange programs; prisons; program evaluation; harm reduction; substance abuse; intravenous; Spain; HIV; hepatitis-C; corrected and republished article

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Text received:12-09-2012

Text approved: 10-10-2012

## INTRODUCTION

Spain was one of the countries which first and more broadly implemented harm reduction programs (opioid substitution therapies and syringe exchange programs) in response to the epidemics of HIV and hepatitis infections<sup>1</sup>. Recently this Journal published an article which analysed the evolution of the need and coverage of such programs<sup>2</sup>. Two letters to the Editor have been received ever since, evaluating its content. Both refer to the coverage of Syringe-Exchange programs (SEP). In the letter by Enrique J. Acin<sup>3</sup> two critical remarks are set out.

One of them is very appropriate and of paramount relevance, since it points out that the estimation made by the aforementioned article contains a bias which leads to a strong underestimation of the coverage achieved by such programs throughout the period under study, without any consequences on its trend. His second comment is much more controversial.

The objective of this article is to correct the bias included in the previous article by presenting a corrected estimation of the need and coverage of syringes in Spanish prisons throughout the period 1992-2009.

## METHODS

The remark which has triggered the new estimation notes “As to calculate the need of syringes in prison (SN) during one year the whole number of inmates hosted in the prison at some point during that year has been considered, as if all had stayed for the whole year in prison, something which obviously does not depict the real situation”. He is totally right. This mistake derived from not changing the population which we had used for the estimations regarding the coverage of methadone substitution programs.

The arguable comment regards a supposed overestimation of the need of syringes in the last three years under study. It is alleged that the prevalence of injection would have dropped further than what our article assumed. His claim is based on information that he himself provides and that comes from the clinical history collected by physicians upon imprisonment. According to those facts, the prevalence of injection among new inmates would have gone from 11.3% in 2006 to 4.3% in 2011. He does not provide the evolution observed between 2006 and 2009, the period considered in our study. By assuming a linear

Indicator	Algorithms, Assumptions	Definitions, Intermediate Estimates	Data Sources
<b>B) Sterile Syringes among injecting drug users</b>			
Number of IDUs upon entering prison ( <b>IF</b> )	$IF=PIF*PP$	<b>IF</b> : Number of inmates who had used injecting drugs 30 days prior to entering prison. <b>PIF</b> : Prevalence of injecting drug use 30 days prior to entering prison among people imprisoned throughout that year. $PIF_{1994}=0.390$ ; $PIF_{2000}=0.219$ ; $PIF_{2006}=0.117$ The PIF for the rest of years was obtained through linear projection of the prevalence found in the aforementioned years. <b>PP</b> : Imprisoned population halfway through the year	<b>PIF</b> : Surveys on health and drug use to inmates of Spanish prisons (ESDIP): 1994, 2000 and 2006 <sup>6-8</sup> . <b>PP</b> : National Statistics Institute <sup>9</sup> .
Number of IDUs in prison ( <b>IP</b> )	$IP=PIP*PP$	<b>IP</b> : Number of inmates who had used injecting drugs 30 days before in prison. <b>PIP</b> : Prevalence of injecting drug use within the last 30 days in prison among those imprisoned throughout that year. $PIP_{2006}=0.013$ . The PIP for the rest of years was obtained by multiplying the annual PIP and the quotient $PIF_{2006} / PIP_{2006} = 9.0$ [ $PIP=PIF*(PIF_{2006}/PIP_{2006})$ ].	$PIP_{2006}$ : 2006 Survey on health and drug use to inmates of Spanish prisons (ESDIP). <sup>8</sup>
Needle provision ( <b>PJ</b> )	-	<b>PJ</b> : Number of syringes provided per needle exchange program in prison.	Prison records <sup>10</sup>
Needle Need ( <b>NJ</b> )	$NJ=IP*IA$ Assuming: a sterile syringe per injection and one injection per day.	<b>NJ</b> : Annual need of needles in prison. <b>IA</b> : Average number of injection days per year and IDU. $IA_{2006} = 6.9*12=82.4$ For the rest of years the same IA was applied.	$IA_{2006}$ : 2006 Survey on health and drug use to inmates of Spanish prisons (ESDIP). <sup>8</sup>
Unfulfilled Needle Need ( <b>NJNC</b> )	$NJNC=NJ-PJ$	<b>NJNC</b> : Number of sterile syringes needed per IDU in prison not provided by NEP.	-
Needle Coverage ( <b>CJ</b> )	$CJ=(PJ/NJ)*100$	<b>CJ</b> : Relative coverage of syringes by needle exchange programs in prison.	-
Needles provided per IDU ( <b>JPI</b> )	$JPI=NJ/IP$	<b>JPI</b> : Average number of syringes distributed every year by NEP to each IDU.	-

Corrected version of section b in Table 1 of the first estimation <sup>2</sup>. All indicators were calculated for one year and make reference to the imprisoned population in Spain. NEP: Needle Exchange Program; IDU: Injecting Drug User.

Table 1: Methods to estimate the need, provision and coverage of sterile syringes for injecting drug users in Spanish prisons; 1992-2009.

trend we have calculated that in 2009 the prevalence of injection would have been 7.2%- which would have meant a 36.6% decrease for such period. Given the lack of empirical data our article had assumed a 17% reduction for that same period. This fact was the mean of 11.1% —the result concluded by a recent study<sup>4</sup>— and 23% concluded in the whole drug related treatments in Spain in the same period<sup>5</sup>. Although it was not used, we already knew that the decrease regarding new drug treatments was considerably lower (7%)<sup>5</sup>. We think that the data provided by Enrique J. Acín implies a higher reduction than the values on which our estimation was based, so we will keep the value assumed in our first article.

Under this premise, the new estimation follows a methodology completely alike the one assumed in the previous article<sup>2</sup>, except for the fact that the

imprisoned population halfway through the year is considered, estimated as the value ranged between the population hosted at the end of the previous year and at the end of the year under study (see Table 1)<sup>6-10</sup>.

## RESULTS

### Need, provision and coverage of sterile syringes (see Table 2, Figure 1):

Assuming that only one sterile syringe was used per injection and day, it is estimated that the highest need corresponds to 1993, when 145,741 syringes would have been needed. In 1995 a strong and maintained reduction was initiated ever until 2006, when the reduction rhythm dropped (see Table 2). In

Year	Imprisoned Population (PP)	N. of IDU upon entry (IF) <sup>a</sup>	N. of IDU I prison (IP) <sup>a</sup>	Needle Provision (PJ) <sup>a</sup>	Needle need in prison (NJ) <sup>a</sup>	Unfulfilled Needle Need (NJNC) <sup>a</sup>	Needle Coverage (CJ) (%)	Needles provided per IDU (JPI)
1992	35075	15679	1742	0	143621	143621	0,0	0,0
1993	38017	15910	1768	0	145741	145741	0,0	0,0
1994	40286	15711	1746	0	143921	143921	0,0	0,0
1995	39680	14344	1594	0	131397	131397	0,0	0,0
1996	37255	12406	1378	0	113642	113642	0,0	0,0
1997	36515	11119	1235	2582	101851	99269	2,5	2,1
1998	37748	10419	1158	4943	95437	90494	5,2	4,3
1999	38299	9479	1053	7056	86830	79774	8,1	6,7
2000	38617	8457	940	8584	77470	68886	11,1	9,1
2001	40066	8093	899	11339	74137	62798	15,3	12,6
2002	43028	7960	884	12970	72917	59947	17,8	14,7
2003	46785	7860	873	18260	71998	53738	25,4	20,9
2004	49959	7544	838	22356	69103	46747	32,4	26,7
2005	52010	6969	774	22989	63841	40852	36,0	29,7
2006	53898	6306	701	20626	57765	37139	35,7	29,4
2007	56387	6231	692	13998	57076	43078	24,5	20,2
2008	60621	6305	701	10582	57752	47170	18,3	15,1
2009	64533	6292	699	10038	57636	47598	17,4	14,4

\*Corrected version of Table 3 in the original estimate 2.

<sup>a</sup>: Absolute numbers, IDU: injecting drug user

PP: Number of imprisoned population halfway through the year. IF: Number of inmates who had used injecting drugs sometime 30 days before entering prison. IP: Number of inmates who had used injecting drugs some tome 30 days before in prison. NJ: Annual need of syringes in prison (NJ=IP\*IA). PJ: Number of sterile syringes annually distributed by Needle Exchange Programs in prison. NJNC: Number of syringes needed but not provided by NEPs. (NJNC=NJ-PJ). CJ: Syringe coverage [CJ=(PJ/NJ)\*100]. JPI: Annual average number of syringes provided per every IDU in prison (SPI=SP/I).

Table 2: Corrected estimates of need, provision and coverage of sterile syringes for injecting drug users in Spanish prisons, 1992-2009.

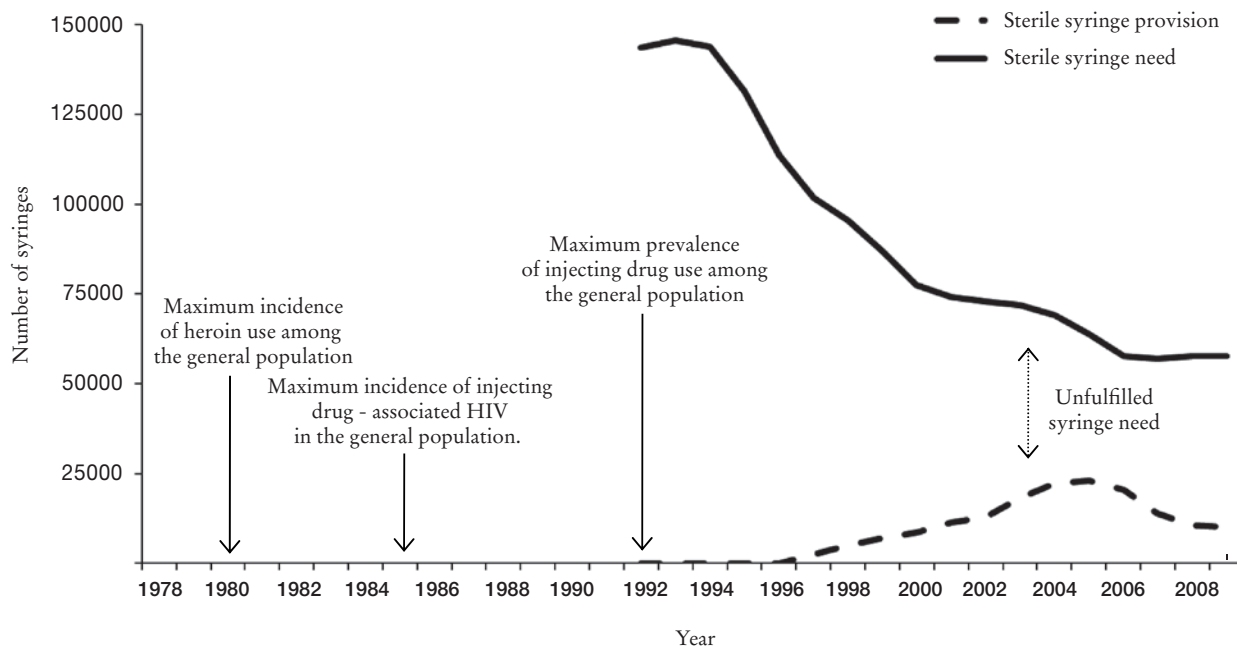


Figure 1: Corrected evolution of the need and provision of sterile syringes among injecting drug users hosted in Spanish prisons, 1992-2009.

Corrected version of Figure 2 in the original estimate <sup>2</sup>.

1997, when the first SEP was implemented in prison, 2,582 syringes were provided and the highest number was achieved in 2005 (22,989), dropping by half in only four years, although such reduction was specially abrupt in 2007, when the reduction was of almost one third. The highest coverage was achieved in 2005 (36%) and 2006 was very alike, sharply dropping to 24.5% in 2007. Now, as it can be observed in Figure 1, the main component of the increased coverage regarded the strong reduction in need, and the improved provision played a secondary role.

## DISCUSSION

This corrected estimation confirms that NEP implemented in Spanish prisons achieved halfway through the last decade a coverage rate of over one third, a value substantially higher than the one estimated in the original analysis <sup>2</sup>, although this seems to have dramatically dropped throughout recent years.

The new estimation —according to the suggestion of Enrique J Acín <sup>3</sup>— has corrected the overestimation bias regarding the need derived from not using the correct imprisoned population. Nevertheless, we would like to further emphasize that

in our opinion the reduction of coverage estimated is not mainly derived of a reduction of need but of a strong reduction of injection rates. It has been broadly reported that the reduction of injection rates in Spain has been a continuous process which began in the 80s <sup>11-13</sup>. There is no evidence whatsoever of a collapse or free fall. Yet, there is evidence of a slower reduction in the number of injecting drug users (or the prevalence of injection) throughout recent years, as it has been previously stated <sup>4, 5</sup>. Moreover, all epidemiologists know that this kind of phenomenon do not usually change so dramatically. With the data on the prevalence provided by Enrique J. Acín in his letter, the coverage between 2006 and 2009 would be 35.7%, 26.4%, 21.6% and 22.9%, which would entail a reduction of 35.8%. Thus, even if we assumed such a radical reduction in injection rates, the reduction in coverage would remain unexplained by a reduction of need.

On the other hand, the reduction by one third regarding the number of syringes provided in 2007 does seem attributable to the functioning of programs. In 2005 the highest provision was achieved, in 2006 the reduction was slighter and in following years there was a progressive drop alike the one observed between 2005 and 2006. Nevertheless, the trend is suddenly disrupted in 2007. Something must have

happened. It is not extremely risky to assume that probably such reduction in provision has not been generalized but due to specific penitentiary facilities, where probably it has never recovered. Prison health authorities remain the ones with the best information to explain this fact conveniently.

Our original article intended to fairly evaluate the enormous achievement that the development of harm reduction programs in Spanish prisons has meant for Public Health. We are sorry that an involuntary mistake may have given the wrong idea that we wanted to minimize it. If we remark the need of monitoring their maintenance is because we think that epidemiological, social and economic circumstances jeopardize more and more their maintenance.

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