

## Intravenous drug use and HIV transmission amongst inmates in Scottish prisons

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### Abstract

*The intravenous drug use behaviour and HIV risk reduction strategies used by a group of Scottish inmates prior to prison, during imprisonment and as expected after release was investigated. From a sample of 559 inmates (480 males and 79 females) 27.5% were involved in IVDU prior to imprisonment, 7.7% on at least one occasion during a period of imprisonment and 14.7% expected to do so after release. Prior to imprisonment 17.3% had shared needles, 5.7% at some time during imprisonment and 4.3% expected to do so after release. Some form of HIV risk reduction strategies were practised by the majority of IVDU inmates prior to imprisonment, during imprisonment and were expected to continue after release. The most at risk inmates were those who continued to share injecting equipment without reduction and without sterilizing. The reduction in IVDU and needle sharing during imprisonment in comparison to prior to imprisonment was paralleled by a self-perceived reduction of personal risk from HIV during imprisonment.*

### Introduction

In the majority of developed countries the incidence of HIV infection and of AIDS is highest among homosexual and bisexual males (Curran *et al.*, 1988). Indeed, the Communicable Diseases (Scotland) Unit (CDS) reported that of the 3688 people diagnosed as having AIDS by the end of August 1990 in the United Kingdom (UK) as a whole, transmission in 79% of cases was by homosexual or bisexual contact [Communicable Diseases Scotland Unit, (CDSU), 1990]. However, when the figures are examined for Scotland alone, it appears that 53% of Scottish AIDS cases occurred by homosexual or bisexual transmission (CDSU, 1990). In Scotland, 27% of the 175 AIDS cases identified by the end of August 1990 were intravenous drug users (IVDUs)

whereas in the rest of the UK less than 3% of the people diagnosed as having AIDS reported a history of IVDU (CDSU, 1990). Thus, the pattern of findings, in terms of cases of AIDS, suggests that the nature of the problem of HIV/AIDS in Scotland differs from that for the rest of the UK. In Scotland, IVDUs are more often infected by HIV than in other parts of Britain. While one study estimated that around 40% of Scottish IVDUs were infected with HIV (Peutherer *et al.*, 1985), a later report estimated seroprevalence among this group to be in excess of 50% (Robertson *et al.*, 1986). A recent article reports that of 1578 individuals in Scotland who were known to be infected with HIV by the end of 1988, 55% were identified as IVDUs (Delamothe, 1989).

In Scotland it appears that the problem of HIV/AIDS is focused primarily on the IVDU population and although this must be pertinent to all

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areas of public health policy, this fact has particular relevance for Scottish prisons. It is widely recognized that a substantial proportion of IVDUs are highly likely to spend a period of time incarcerated at some point during their addiction (Laurence, 1988). Despite stringent measures taken by the prison authorities, illicit drugs do appear to get into prison. As needles and syringes are more difficult to smuggle into prison, drug-taking by injection is likely to be relatively low compared to the time when IVDUs are not incarcerated (Braslow, 1987; Curran, 1987). However, according to the Prison Reform Trust (1988) the corollary of there being a limited number of needles and syringes available in prison is that the pressure to share may be increased.

The problem of HIV/AIDS in prison was originally highlighted by Wormser *et al.* (1983). Between September 1981 and June 1982 these researchers diagnosed seven cases of AIDS in previously healthy males incarcerated in New York correctional facilities. None of these inmates was homosexual, but all had been IVDU's prior to incarceration. Wormser *et al.* (1983) concluded that it was justified to consider a segment of the prison population to be at high risk for developing AIDS. Harding (1987) has added further weight to this argument by reviewing the prevalence of HIV seropositive cases among inmates from various European countries. Harding (1987) concluded that 'the results confirm the expectation that in prisons there is an unusually high proportion of seropositive persons in relation to the general population', and many of these inmates will have contracted HIV by sharing injecting equipment prior to imprisonment. The potential for continued illicit drug use and high risk homosexual behaviour whilst imprisoned also exists. This has led the Council of Europe (1986) and the World Health Organization (1987) to advocate that consideration be given to issuing condoms, and disposable needles and syringes to prisoners during their period of incarceration. This policy has not been widely adopted.

Thus, the potential for the spread of HIV infection through the sharing of needles and syringes to inject drugs in the prison environment is clear. However, according to Farmer *et al.* (1989) the extent of this problem is unknown as 'there are no studies on the prevalence of injecting drug abuse amongst prisoners'. This lack of detailed information has led to speculation regarding the number of inmates involved. Farmer *et al.* (1989) cites a staff member of the Parole Release Scheme who estimated that up to 25% of prisoners in remand

centres, open prisons and short-stay institutions may be involved in intravenous drug abuse whilst imprisoned. The same authors, while failing to cite the source, nevertheless present figures relating to HMP Saughton 'where 60% of 589 inmates are estimated to have been sharing between two and eight syringes'. Unfortunately, such speculative statements are not substantiated by reliable data. It may well be that risk of cross-infection from needle sharing does exist in prison, but this has to be assessed with regard to the prevalence of such behaviour before imprisonment. The present study attempts to address some of these issues by assessing the prevalence of intravenous drug use and methods of HIV risk reduction prior to imprisonment, during imprisonment and as expected after release among a group of Scottish inmates.

## Methods

### Subjects

A group of 559 inmates, comprising a random stratified cross-sectional sample of 480 males (85.9%) and 79 (14.1%) females from eight Scottish prisons were studied. The mean age of the group was 25.1 years (range 16-68 years). Inmates were selected from three categories; remand,  $n=190$  (34.0%); short-term, serving less than 3 years,  $n=205$  (36.7%); long-term, serving 3 or more years,  $n=164$  (29.3%). The sample was stratified in an attempt to achieve balanced cell numbers of remand, short-term and long-term inmates while simultaneously striving for equal numbers of adults and young offenders. The eight penal establishments were chosen to be representative of the Scottish Prison population in terms of the previously mentioned inmate features, prison security category and standard prison regimen. Information was not collected on those inmates who refused to take part and we are, therefore, unable to state whether any selection bias occurred. However, there was no selection bias in terms of penal institution and inmate categories as there was no significant difference in response rate between institutions or between inmate categories. Excluding the 190 remand inmates, the mean sentence length was 56.7 months (range 1 month to 20 years) with a life sentence rated as 20 years. The average length of time served of current sentence was 11.0 months (range 1 month to 20 years). The average number of previous sentences was 3.6 (range 0-98) and the mean total time served was 33.9 months (range 1 month to 360 months).

### Procedure

Inmates were interviewed in privacy. Prior to participation in the study they were informed that the survey was part of a series of studies concerned with the assessment of HIV/AIDS knowledge and attitudes. They were also informed that more personal information regarding sexual behaviour and intravenous drug use behaviour would be required. The patterns of drug use prior to imprisonment, during imprisonment and as expected after release were assessed in a semi-structured interview format.

Prior to commencement of the study it was decided by the research team that if we were only to ask about current drug usage while in prison inmates may have been reluctant to provide any information for fear of disciplinary action or prosecution. However, questions about drug usage at any time while imprisoned were thought to be less temporally specific and, therefore, more likely to provide an accurate picture of inmates drug usage during their prison career and the methods they used in prison to reduce risk of HIV transmission.

Once the purpose of the study had been explained, and assurances of anonymity and confidentiality had been given, inmates were given the opportunity to decide whether they wished to participate. It was emphasized to inmates that the study was anonymous, voluntary and confidential, that their name and inmate number was not required, and that the data would be stored and analysed outwith the Scottish Prison Service. The overall response rate was 86.4%.

## Results

### *Drug use prior to imprisonment*

The pattern of drug use for the inmate sample is illustrated in Table 1. From a total of 559 inmates, 154 (27.5%) had used intravenous drugs prior to imprisonment and 97 (17.3%) of these IVDUs had shared drug injecting equipment before imprisonment. Due to administrative time constraints on the length of time allowed for each interview, especially at the beginning of the study, a small sample of inmates were not able to be assessed in as much detail as we would have liked and a small amount of data is, therefore, missing. Of the 97 'sharers', 87 were asked in detail about sterilizing practices. Only 42 of the 87 'sharers' routinely sterilized their equipment before sharing. The routine methods of sterilization for this sample were the following: 15

people used boiling water, 12 used bleach, nine used hot water, three used disinfectant and three used sterilizing fluid. From the sample of 154 IVDUs a subsample of 132 were asked what was the main drug they injected prior to imprisonment: 53 used heroin, 49 temgesics, 13 amphetamine sulphate, seven temazepam, four cocaine, three diconal and three morphine. From this sample 47 injected only one drug exclusively, 32 used two different compounds, 28 used three different compounds, 10 used four different compounds, eight used five different compounds, six used a variety of 6-10 different compounds and one reported having injected up to 14 different substances.

A number of measures specifically implemented as a means of HIV risk reduction were used to varying degrees by the inmates prior to imprisonment. Of the 154 IVDUs, 85 reported stopping injecting as a means of reducing the risk of HIV infection. From the remaining 69 who continued to inject, 54 increased the use of new needles. Of the 69 who continued to inject, 56 had shared injecting equipment and 13 had never shared injecting equipment. Of those 56 sharers, 22 actually stopped sharing to reduce risk of HIV infection. From the remaining 34 who continued to share, 21 started to share less. Of the 34 who continued to share, 18 began sterilizing before sharing, but 16 did not do so. Of the 13 who did not stop or reduce their sharing, and the 16 who did not sterilize shared needles, a group of five individuals neither reduced sharing or increased sterilization of works. These five individuals, representing 0.9% of the entire 559 inmates sampled and 3.2% of the 154 IVDUs, must be regarded as high HIV risk.

### *Drug use during periods of imprisonment*

The pattern of drug use, not necessarily during their current sentence, but during any past or present sentence is shown in Table 2.

From a total of 559 inmates, 43 (7.7%) had used intravenous drugs at some time in prison and 32 (5.7%) had shared drug injecting equipment while imprisoned. Of the 32 sharers, 25 were asked in detail about sterilizing practices. Only 15 of the 25 sharers questioned, routinely sterilized their equipment before sharing. The routine methods of sterilization for this group were the following: seven people used bleach, four used disinfectant, three used boiling water and one used hot water. From the sample of 43 who had injected at some point in prison a subsample of 28 were asked what was the

**Table 1.** Intravenous drug behaviour of 559 inmates prior to imprisonment

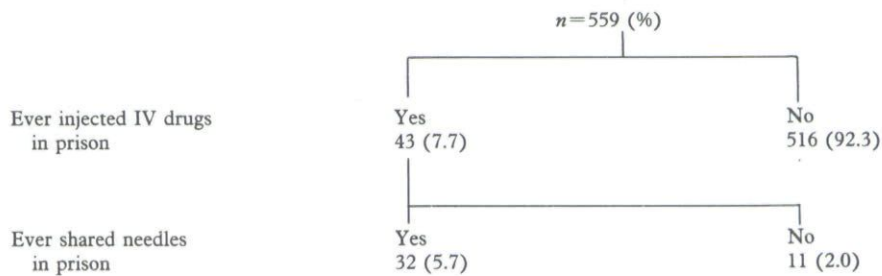
Drug use prior to imprisonment	
n = 559 (%)	
Ever injected IV drugs before imprisonment	Yes 154 (27.5) / No 405 (72.5)
Ever shared needles before imprisonment	Yes 97 (17.3) / No 57 (10.2)
Precautions to reduce HIV infection before imprisonment	
n = 154 (27.5) ever injected before prison	
Stopped injecting before imprisonment	No 69 (12.3) / Yes 85 (15.2)
	Have previously shared 56 (10.0) / Have never shared 13 (2.3)
Stopped sharing works before imprisonment	No 34 (6.1) / Yes 22 (3.9)
Shared less before imprisonment	No 13 (2.3) / Yes 21 (3.8)
Sterilized works before sharing	No 16 (2.9) / Yes 18 (3.2)
Increased use of new needles	No 15 (2.7) / Yes 54 (9.7)

main drug they injected during imprisonment; 16 used temgesics, seven heroin, four temazepam and one dextromoramide. From this sample 14 had used only one drug exclusively while in prison, nine used two different compounds, two used three different substances, two used four different compounds and one reported having injected up to five different substances.

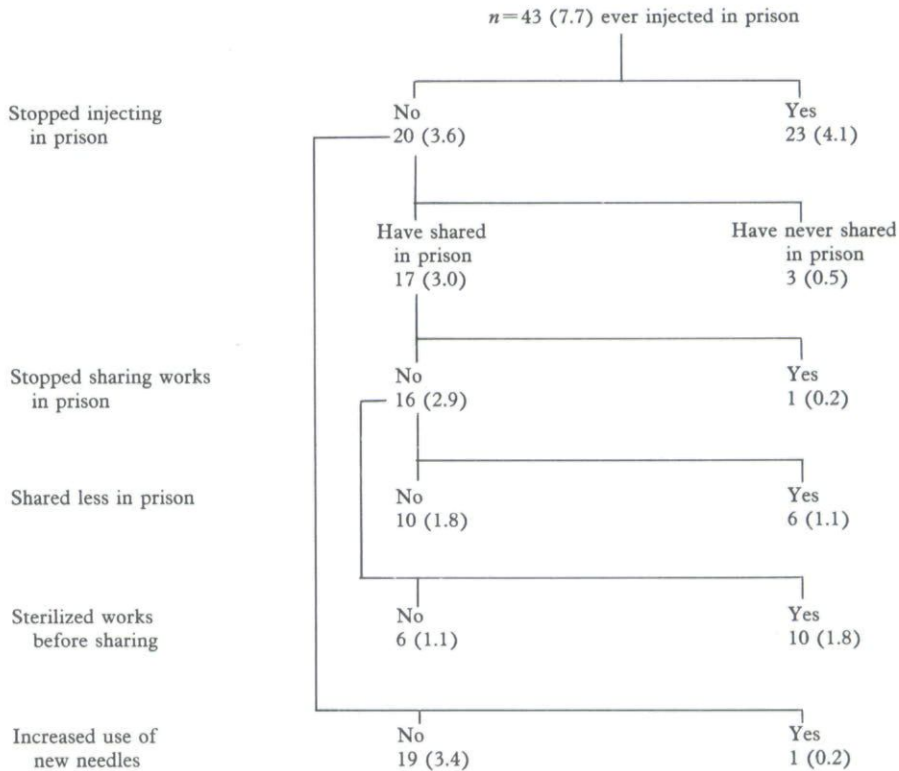
A number of measures specifically implemented as a means of HIV risk reduction were used by this group while imprisoned. Of the 43 inmates who had injected in prison 23 had actually stopped doing so as a means of reducing the risk of HIV infection. From the remaining 20 who continued to inject, one increased the use of new needles. Of the 20 who continued to inject, 17 had shared injecting equip-

Table 2. Intravenous drug behaviour of 559 inmates during periods of imprisonment

Drug use in prison



Precautions to reduce HIV infection in prison



ment in prison and three had never done so. Of those 17 sharers only one actually stopped sharing to reduce the risk of HIV infection. From the remaining 16 sharers, six started to share less. Of the 16 who continued to share, 10 began sterilizing before sharing although six did not do so. Of the 10 who did

not stop or reduce their sharing, and the six who did not sterilize shared needles, a group of five individuals neither reduced sharing or increased sterilization of works. These five individuals, representing 0.9% of the entire 559 inmates sample and 11.6% of the 43 who had injected at some point in their prison

career, must be regarded as high HIV risk individuals. However, the five individuals prior to imprisonment and the five individuals during imprisonment who neither reduced sharing or increased sterilization of works are not the same individuals. There is only one individual common to both groups who continued sharing, without sterilization, both outside and inside prison.

The total sample of 559 inmates were asked how many fellow inmates within their own institution they personally 'knew' (i.e. had seen or firmly believed) to be involved in IVDU while in prison. A large proportion of inmates (245, 43.8%) know of no other inmate who is involved in IVDU. The mean number of inmates 'known' to be involved in IVDU while imprisoned was 7.42 (SD=18.87). When expressed as a percentage of the total number of inmates in each respective institution this is equivalent to a mean percentage of 2.67 (SD=6.79). It may be expected that inmates with a history of IVDU are more likely to know about drug use in prison compared to those inmates without a history of IVDU. For those with a history of IVDU the mean number of inmates 'known' to be involved in IVDU while imprisoned was 11.5 (SD=27.89), for those with no history of IVDU the equivalent figure was 5.96 (SD=13.60) and the difference between groups was significant ( $t=2.83$ ,  $df=513$ ,  $P<0.01$ ). Similarly, when presented as a percentage of the total numbers of inmates in each respective institution the equivalent figures were 4.21 (SD=10.03) for those with a history of IVDU and 2.07 (SD=4.88) for those with no history of IVDU, again showing a significant difference between groups ( $t=3.23$ ,  $df=513$ ,  $P<0.01$ ).

The total sample of 559 inmates were also asked to speculate what percentage of inmates they 'thought' might be involved in IVDU while imprisoned. Inmates 'estimates' of what proportion of fellow inmates are involved in IVDU while imprisoned was higher than the figure produced when they are asked to state how many inmates they actually 'know' to be involved in such behaviour. The mean percentage of fellow inmates 'estimated' to be involved in IVDU while imprisoned rises to 19.42 (SD=21.88). There was no difference in 'estimates' for those inmates with a history of IVDU in comparison to those with no history of IVDU.

#### *Expected drug use after release*

Table 3 shows that from the sample of 559 inmates, 477 (85.3%) did not expect to inject IV drugs after

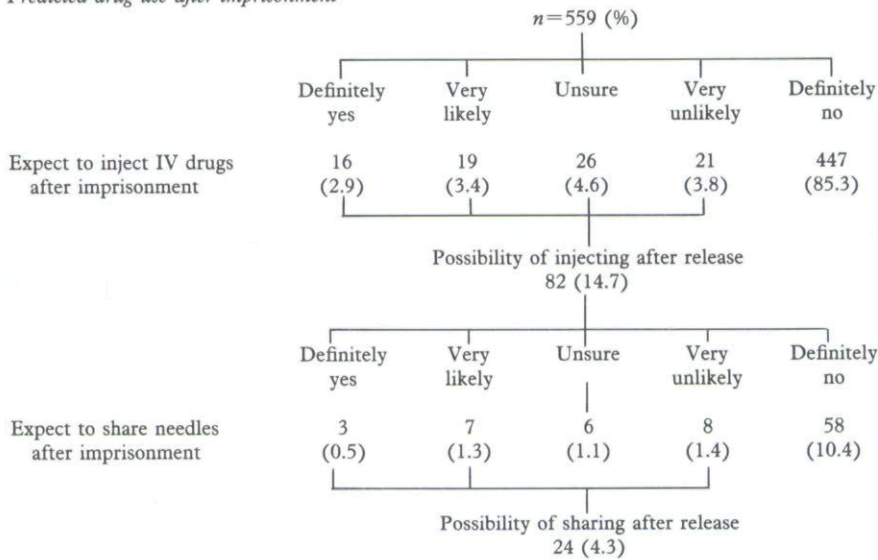
release. For the remaining 82 (14.7%) inmates there was a possibility that they may inject, ranging from 16 (2.9%) who stated they will definitely do so to 21 (3.8%) who thought it is possible, but unlikely. From this sample of 82 possible IVDU's the majority ( $n=58$ ) definitely did not intend to share needles and injecting equipment. This left a group of 24 (4.3%) who thought it possible that they will share needles after release, three of whom (0.5%) thought that this will most definitely occur. Inmates were asked what precautions they might take to specifically reduce the likelihood of HIV infection after release. Of the 24 (4.3%) who thought it possible that they might share needles 15 (2.7%) were certain that they would share less and four (0.7%) thought this very likely. From the same 24 (4.3%) a group of eight (1.4%) definitely expected to sterilize works before sharing and a further four (0.7%) thought this very likely. However, it is worrying that seven (1.3%) definitely did not intend to sterilize injecting equipment before sharing. From the total of 82 (14.7%) who indicated a possibility that they might be involved in IVDU after release 77 (13.8%) were certain that they would expect to increase the use of new needles with only two (0.4%) individuals indicating that they thought this to be unlikely or definitely did not intend to do so.

The 24 (4.3%) inmates who indicated a possibility of sharing after release were asked why they intended continuing such high risk behaviour. From this group 12 (2.1%) stated that not having their own works was the reason for sharing, six (1.1%) stated that they would be sharing with a 'low risk' friend or partner and the remaining six (1.1%) gave a variety of other reasons (for example, one individual stated that although he intended to continue sharing he would ensure that he always used the injecting equipment first and then let others share afterwards!).

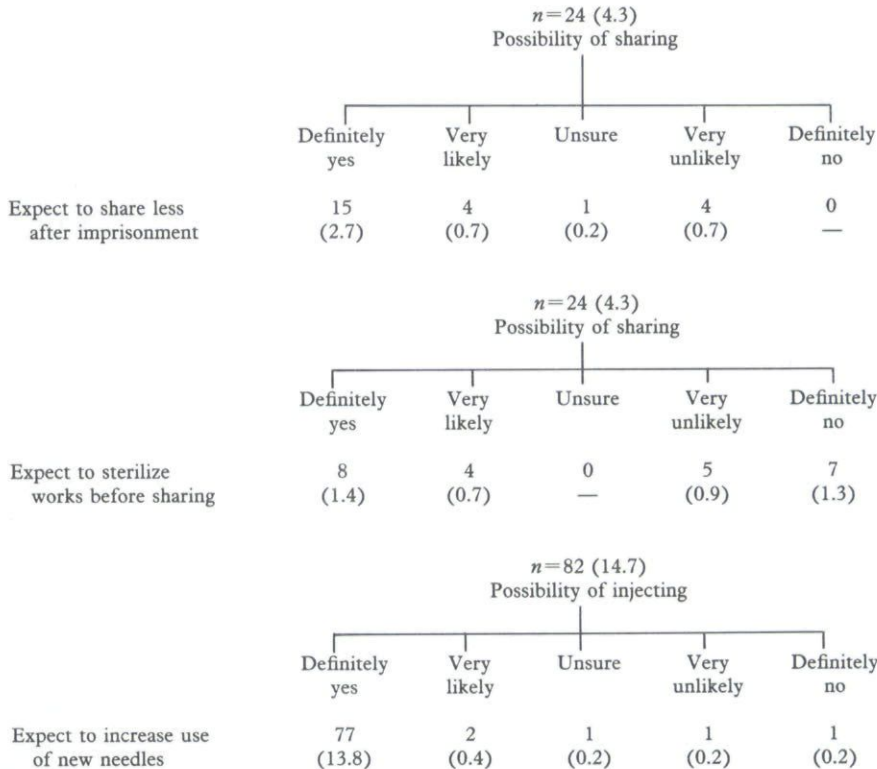
It may be argued that assessments of expected drug use after release are of dubious value as there are no grounds for assuming that people will actually do what they say they intend doing. It was, therefore, considered important to investigate whether those 24 inmates who expressed a possibility of injecting after release were characterized by any particular features. From those 24 inmates the following characteristics were identified: sex—20 male, 4 female; prison category—8 remand, 12 short-term, 4 long-term; IVDU prior to imprisonment—24 yes; ever IVDU during a period of imprisonment—17 yes, 7 no; sexual partner an IVDU—20 yes, 4 no; ever had HIV test—19 yes, 5

**Table 3.** *Expected drug behaviour of 559 inmates after release from imprisonment*

*Predicted drug use after imprisonment*



*Precautions to reduce HIV infection after imprisonment*



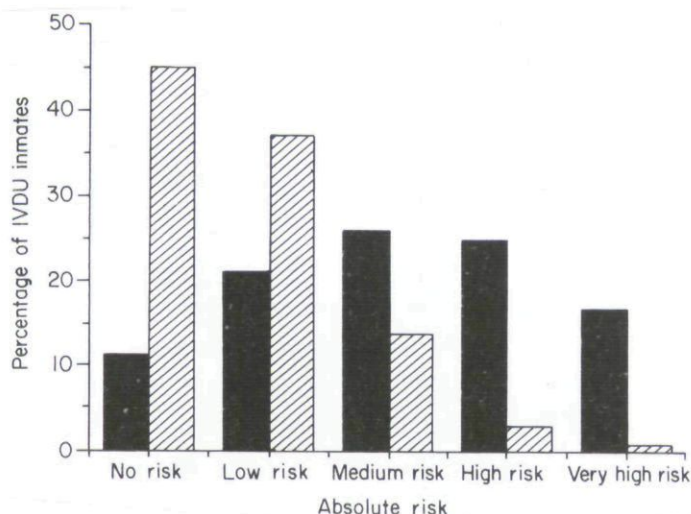


Figure 1. IVDU inmates perception of 'absolute risk' outside (■) and inside (▨) prison (n=154).

no. Of the 19 who had been HIV tested, four reported being seropositive, 14 seronegative, and one was unaware of his/her current serostatus. Furthermore, these four self-reported HIV seropositive inmates all had sexual partners who were also IVDU. It therefore appears that intention to use IV drugs after imprisonment may be associated with IVDU prior to and during imprisonment, previously having been HIV tested and having a sexual partner who is also an IVDU.

#### Perception of personal risk from HIV/AIDS

All inmates were asked questions regarding their perceived vulnerability to HIV/AIDS, considering their general lifestyle 'outside', prior to imprisonment; and 'inside', during imprisonment. A measure of 'Absolute Risk' was obtained by asking inmates 'How much risk do you feel you have of being infected with HIV/AIDS?' Responses were in terms of five alternatives, with 'no risk' being assigned a score of 1, and 'very high risk' being assigned a score of 5. Responses indicating 'low risk', 'medium risk' and 'high risk' were assigned scores of 2, 3 and 4, respectively.

Figures 1 and 2 illustrate the distribution of responses on the measure of 'Absolute Risk' for IVDU and non-IVDU inmates, respectively. Each figure compares both lifestyle outside prison and lifestyle while incarcerated.

Prior to imprisonment inmates who were IVDU regarded themselves as at greater risk of HIV infection than non-IVDU inmates ( $t=9.53$ ,

$df=557$ ,  $P<0.001$ ). During imprisonment there was no difference in self-perceived HIV risk between those who were IVDU before incarceration and those who were not ( $t=1.87$ ,  $df=557$ , ns). This change is due to two factors. First, there is a reduction in HIV risk assessment for non-IVDU inmates when comparing lifestyle prior to imprisonment with lifestyle during imprisonment ( $t=4.53$ ,  $df=405$ ,  $P<0.001$ ). Secondly, there is an even greater reduction in HIV risk assessment for IVDU inmates when comparing lifestyle prior to imprisonment with lifestyle during imprisonment ( $t=9.65$ ,  $df=153$ ,  $P<0.001$ ). Both groups, but especially IVDU, regarded themselves as at less risk of HIV transmission during imprisonment than prior to imprisonment.

#### Discussion

The interpretation of the results should take account of the different duration of the three periods concerned. For example, 'Drug use prior to imprisonment' covers a variable period according to the inmate's age and, where relevant, the duration of their IVDU. The period 'Drug use during periods of imprisonment' covers both present and previous sentences, but is, nevertheless, likely to be shorter than 'prior to imprisonment'. The notion of 'Expected drug use after release' covers an indefinite period. Direct comparisons of the rates of IVDU for these three periods are, therefore, not wholly appropriate and this should be borne in mind when assessing the results.



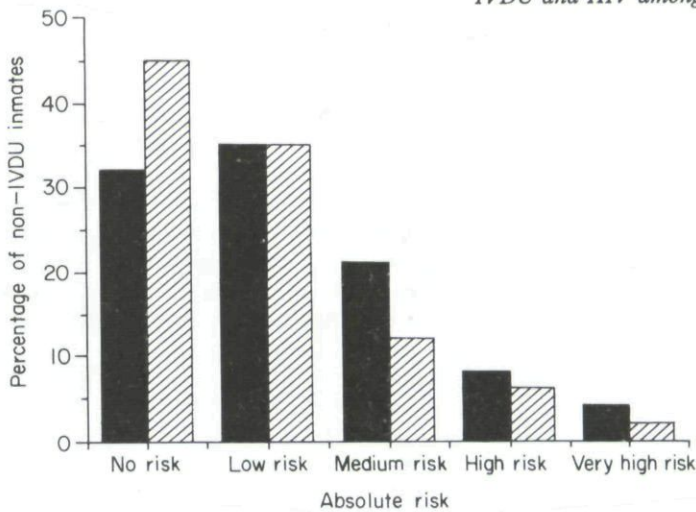


Figure 2. Non-IVDU inmates perception of 'absolute risk' outside (■) and inside (▨) prison (n=405).

A total of 27.5% of inmates had been involved in IVDU prior to imprisonment. This figure was 7.7% during imprisonment, but was expected to be 14.7% after release. The figure of 7.7% of inmates who had injected at some point during custody is far lower than the 25% and 60% estimates quoted by Farmer *et al.* (1989). It could be argued that inmates, in the present study, may have been reluctant to admit to IVDU whilst in prison for fear of disciplinary measures or further conviction. As such the 7.7% of inmates who admitted to IVDU at some point during imprisonment may arguably be an underestimate. However, inmates were assured of confidentiality and anonymity. Furthermore, they were deliberately not asked whether they had injected during their present sentence. Rather, they were asked the more general question of whether they had injected at any time during imprisonment. Giving such information was less likely to stigmatize them as current drug users. Taking a different perspective it could be argued that the 7.7% figure of IVDU at some time during imprisonment may be an artificially inflated figure as inmates may have wished to impress the interviewer by admitting to behaviour that is strictly against prison rules. However, ultimately inmates had nothing to gain or lose by providing misinformation. In addition, the questionable validity of the 7.7% figure of inmates admitting to IVDU at some time during a period of imprisonment should be assessed with reference to the mean number of 7.42 cases 'known' by fellow inmates to be involved in IVDU at present, during their current sentence. This latter figure being equivalent

to a mean percentage of 2.67 of inmates currently 'known' at present by fellow inmates to be involved in IVDU. The 7.7% of inmates who admitted to IVDU at some point during a past or present period of incarceration may be higher than the number of inmates presently injecting during their current sentence. Despite the prevalence rates of IVDU being lower in this study than anecdotal accounts would have us believe, this should not give rise to complacency as whatever the extent of IVDU it is always a cause for concern. This is especially so when we see that 14.7% of the sample think it possible they may be involved in IVDU after release. Obviously, anticipated behaviour after liberation from prison may vary from actual behaviour once released. The data related to expected drug use after release should, therefore, be treated with caution. Nevertheless, it does not seem surprising that inmates who have stopped IVDU whilst imprisoned will again become involved with IVDU after release, when they return to an environment where drugs are more readily available.

Because this study was the first of its kind to be undertaken in Scottish prisons, and because of the sensitivity of the information, and the desire for high compliance and accuracy of response, the amount of detailed information we attempted to obtain was limited. We did not try to assess the number of individuals with whom each IVDU had shared and this needs to be addressed in future research. However, 17.3% of the sample had shared prior to imprisonment, compared to 5.7% during imprisonment and this was expected to be 4.3%

after release. It appears, therefore, that risk reduction strategies are being adopted by inmates prior to imprisonment, during imprisonment and expected on release. Nevertheless, these rates still imply a significant potential risk of transmission. The most at risk inmates were those who had previously shared injecting equipment without sterilizing at some point in their drug career. This group comprised 8.0% of the sample prior to imprisonment and 1.8% during some period of imprisonment. However, since many of these inmates had subsequently adopted some form of drug taking HIV risk reduction strategy the percentage of inmates who reported continuing sharing without reduction and without sterilizing fell to 0.9% ( $n=5$ ) prior to imprisonment and 0.9% ( $n=5$ ) during a period of imprisonment. After imprisonment 0.7% indicated they expect to continue sharing without sterilizing, and that it was unlikely they would reduce their frequency of sharing. The majority of inmates reported some attempts at risk reduction. Some inmates practiced maximal risk reduction, for example stopping IVDU or stopping sharing. Others reported partial risk reduction, for example reducing sharing or increasing sterilization. It is important to distinguish between these two groups as those who practice only partial risk reduction may be providing themselves with a false sense of security due to the inefficiency of their methods to reduce the chances of HIV transmission. Partial risk reducers must be encouraged to engage in maximal risk reduction as should the small number who fail to adopt any form of risk reduction. However, in order to achieve this goal it is necessary to identify the factors that determine why some individuals fail to adopt risk reduction strategies, others adopt such strategies in a haphazard or piecemeal fashion and others adopt risk reduction wholeheartedly.

The majority of IVDU's regard themselves as at medium, high or very high risk of HIV prior to imprisonment, while the majority regard themselves as at no risk or low risk during imprisonment. This reduction in self-perceived risk during confinement, in comparison to prior to imprisonment, may be a consequence of the reduction in IVDU and needle sharing during confinement in comparison to prior to imprisonment. There was also a smaller, but appreciably significant reduction in self-perceived HIV risk for non-IVDU inmates when comparing lifestyle outside and inside prison. This may be due to the reduction in sexual behaviour that applies to virtually all inmates during imprisonment. Nevertheless, the majority of non-IVDU inmates regard

themselves as at no risk or low risk of HIV infection whether in or out of prison. The self-assessed level of HIV risk for IVDU and non-IVDU inmates while in prison did not differ. The validity of such data is dependent on an accurate assessment of one's risk behaviour. Despite being aware of their own personal risk some individuals continue to indulge in high risk behaviour and every effort must continue to be made to alter behavioural patterns in order to further minimize the risk of HIV transmission.

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