

# Behind Bars - Risk Behaviours For HIV Transmission In Prisons, A Review

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**S**oon after the Acquired Immune Deficiency Syndrome (AIDS) was first described, prisons were recognised as places where individuals with the syndrome could be found (Wormser et al. 1983). The seven cases reported by Wormser all had a history of intravenous drug use (IDU) and all denied ever engaging in homosexual activity.

With the advent of an aetiologic epidemiology of the syndrome and in particular, serological testing for antibodies to the Human Immunodeficiency Virus (HIV), it soon became apparent that prisoners in many prison systems throughout the world were infected (Hammett 1987, Harding 1987, Heilpern & Egger 1989, Norberry & Chappell 1989).

It was also recognised early that prisons were places where, compared to the general population, disproportionately large numbers of individuals had a history of engaging in risk behaviours associated with AIDS and HIV infection. Infected prisoners were more likely to have injected drugs than engage in homosexual activity. In the USA, these patterns were consistent with the observation that the geographic distribution of AIDS cases among prisoners followed closely that among cases in the general community where intravenous drug use was the primary risk (Vlahov & Polk 1988).

This knowledge raised concerns that prisons might be places where transmission of HIV could occur more frequently than elsewhere but the limited evidence to date suggests that transmission within some prisons occurs infrequently (Horsburgh et al. 1990).

Whether HIV transmission occurs is a function of the interaction between risk behaviours and the prevalence of infection. To date, studies of HIV transmission in prison have occurred in settings where the prevalence of infection has generally been low and the prevalence of risk behaviours unknown.

But it is now well-known that the prevalence of HIV infection among intravenous drug users (IDUs), can increase very quickly (Des Jarlais & Friedman 1989) so it would be premature to discount the possibility that prisons could be places where HIV infection

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occurs frequently. At least one author has implied a role for prisons in the rapid rise in seroprevalence of HIV among IDUs in Thailand (Dolan et al. 1990a).

While there should be concern about transmission in prisons, the wider issues of the occurrence of risk behaviours among prisoners, former prisoners and those at risk of incarceration, risk to their partners, children and prison staff should be considered also. Prisons have a definite role to play in limiting the spread of HIV both inside and outside prisons.

Knowledge and surveillance of the extent and nature of risk behaviours among prisoners should assist this process. While there has been frequent anecdotal comment in the media, in particular, that risk behaviours are rampant in prisons there have been few systematic studies of risk behaviours of prisoners particularly studies in which prisoners have been interviewed during their imprisonment. There is a modest literature of studies which have investigated risk behaviours among prisoners at entry to prison or after they have left prison.

Better knowledge of risk behaviours is essential to an understanding of the epidemiology of HIV in prisons. It will help to direct and focus more sharply health and education services and could be used as a tool to monitor the risk of transmission and evaluate the effectiveness of HIV prevention programs.

### **Sources of Information**

Sources of information which can be used to build a picture of risk behaviours among prisoners are shown in Figure 1 (*see* next page). These sources can be used to derive quantitative estimates of the prevalence of risk behaviours. But they do not necessarily provide information on important contextual aspects of risk behaviours which may, in some circumstances, have a greater influence on the likelihood of transmission than measures of aggregate risk. In the course of this study descriptions of the nature of some of these contexts have been noted and are presented here as anecdotal summaries.

*Figure 1*


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**Sources of Information which can be used to estimate Extent of Risk Behaviours in Prisons (sources used for this review are highlighted)**

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**DIRECT AND INDIRECT QUESTIONING of:****PRISONERS****at entry to prison****while in prison**

at discharge from prison

**after discharge****PRISONS STAFF****OTHER METHODS:****urinalysis for drugs****blood tests (HIV, hepatitis serology)**

medical examination (sexually transmitted diseases, injection sites)

incident reports (rape, drug overdose or intoxication)

records of offence categories (e.g. property crime, drug possession or dealing)

finds of drugs or drug implements

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**Characteristics of Prison Populations**

The inhabitants of prisons are not representative samples of communities in general. People get to be in prison because their behaviour has transgressed accepted standards. These standards are by and large clear (if not widely agreed upon) but can vary from community to community. In most communities the use of illicit drugs, buying or selling them or engaging in other criminal activity in order to get money to purchase them can result in imprisonment. It is no surprise that intravenous drug users may be disproportionately represented in prisons. Thus, for example, a recent study of intravenous drug users seeking methadone in NSW estimated that about 50 per cent of men and 25 per cent of women had been in prison at some time (Bell et al. 1990). While the proportion of Australians who have ever been in prison is not known precisely it is most likely that it is nowhere near 50 per cent. The situation for homosexuality is less clear, particularly since in most communities it is not in itself illegal or necessarily associated with illegal activities. The other important characteristic of prison populations is their large turnover which in a year can be up to five times as great

as the population in prison at any one time. This rapid and large turnover also affects the characteristics of prison populations such that those in prison at any one time are more likely to be those who have been imprisoned for serious crimes (Walker 1989). Durations of sentences vary for particular crimes across Australia and this also may affect the characteristics of prison populations and, as a result, the likelihood of risk behaviours occurring.

The implications of such patterns for HIV risk behaviours and transmission are that prisons may tend to cause the association of large numbers of intravenous drug users and that those who may never have engaged in potentially risky practices may find themselves in an environment where those around them have.

Table 1 summarises results of some recent surveys of prisoners about the prevalence of risk behaviours at any time in their lives.

Fourteen studies conducted in prisons since 1980 reported lifetime or prior to incarceration prevalences of IV drug use which ranged from 20 per cent to 53 per cent. The mean of the estimates was 36 per cent (95 per cent CI 30-42 per cent). Seven studies which did not specifically describe IV drug use but rather, heroin use reported prevalences of 20 per cent to 42 per cent with a mean estimate of 29 per cent (95 per cent CI 20-35 per cent). The mean estimate of prevalence of homosexuality was appreciably lower. The value from nine studies was 9 per cent (95 per cent CI 2-16 per cent) but the range was large and showed a skewed distribution (3-28 per cent). The data from these studies (which are largely from male prison populations) support the contention that male prisoners are more likely to have engaged in IV drug use than in homosexual activity.

These estimates should be regarded as approximate only since the samples of prisoners varied widely in regard to offence categories, participation rates, type of study and other characteristics. For example, the mean prevalence of IV drug use or heroin use was greater for studies which were cross-sectional in design (41 per cent) compared to studies which sampled entrants to prisons (28 per cent). This difference was statistically significant ( $t=3.00$   $P<0.01$ ). Such observations may mean that studies which sample entrants to prisons could underestimate the prevalence of risk behaviours of prisoners within prisons.

Few studies specifically address risk behaviours of female prisoners. Patel et al. (1990) found that 35 per cent of a sample of female prisoners in Michigan reported injecting themselves ever, compared to 23 per cent of male prisoners. In South Australia, 13 of 19 (68 per cent) women prisoners interviewed in 1988 volunteered that they had injected themselves at some time (not shown in Table 1) compared to 37 per cent of male prisoners. The United States National Institute of Justice (1990) described slightly greater prevalences of self-reported injection and positive drug screen by urinalysis among female arrestees compared to male arrestees in the USA. Miner and Gorta (1986) found that 65 per cent of a sample of ninety female prisoners in NSW had used heroin.

Studies of the Australian population of lifetime prevalence of injecting drugs or male homosexual experience have reported estimates of 2-5 per cent for intravenous drug use and 6-11 per cent for male homosexual experience (Ross 1988, Commonwealth Department of Community Services and Health 1988). Clearly, prisons aggregate intravenous drug users but not necessarily homosexual men.

### **Evidence for Risk Behaviours Occurring in Prisons**

A straightforward way of finding out whether people engage in risk behaviours is to ask them. This approach, while desirable, involves practical and ethical problems in prisons because the behaviours are illegal and many prisoners may not wish to incriminate themselves. But assurances of anonymity and asking indirect questions are two ways of overcoming such problems. It seems reasonable to argue that if the results of prevalence estimates which have been obtained by different methodologies are similar and consistent

then it is likely that they are reasonably robust. Some investigators either because of the nature of their studies or their particular situation have not been affected by current constraints and because of this it has become possible to compare results which have been derived from data collected in different ways.

Since 1980 a few researchers either because of a primary interest in the behaviours or as a secondary interest associated with the investigation of communicable diseases have asked prisoners whether they or their peers have injected themselves while in prison and whether they have engaged in homosexual behaviour. The results of these studies are shown in Table 2. It is readily apparent that there are far fewer studies which have investigated the prevalence of risk behaviours within prisons compared to studies which have asked about lifetime risk behaviours. The considerable ethical and practical difficulties of working in prisons are probably the main reasons for this situation.

Despite these difficulties, different methodologies and few studies, there is striking consistency among the studies that about one-third of prisoners inject themselves while in prison and that estimates of the prevalence of homosexual activity are lower than those for intravenous drug use. The results are also similar to estimates obtained from one maximum security prison in Adelaide where both prisoners and officers were asked to estimate prevalence of risk (Douglas et al. 1989). In Federal prisons in the USA the prevalence of drug use detected by random urine drug screening in prison (4-7 per cent) is substantially lower than the prevalence estimate from drug testing at time of arrest (Quinlan 1987 reported by Heilpern & Egger 1989 cf National Institute of Justice 1990). This difference is consistent with behavioural data which suggest decreased prevalence and frequency of drug use in prison compared to outside prison.

When studies of risk behaviours of intravenous drug users while incarcerated are compared (Table 3) this consistency in the data remains. It is also strikingly apparent that in all studies a large proportion of intravenous drug users shared needles while in prison. Dolan et al. (1990b) commented that in the UK, needle sharing increases in prison among those who inject but it should be borne in mind that the total number of sharing events may decrease since the frequency of injection appears to be on average substantially lower than among regular intravenous drug injectors outside prison (Tables 4 & 5). A more precise answer to that question would help a better epidemiologic understanding of the risk of HIV transmission in prisons.

While these somewhat crude values give us an idea of the likely extent of the problem in prisons they do not shed much light on the more detailed aspects of behaviours which may well be crucial to transmission. For example, only the Australian and UK studies have collected data on how needles were cleaned in prison. The evidence is that the majority of injectors fail to do so adequately. Risk behaviours should be assessed from their contextual aspects also. Whether injection occurs in groups, whether bleach is available and whether a prison officer is likely to approach may all profoundly alter the nature and severity of the risk associated with injection.

Little is known about what happens to risk taking behaviours on discharge from prison and whether they are relatively safe or unsafe. There is some evidence that prisoners after discharge are more likely to suffer adverse health outcomes, particularly death from drug overdose (Harding-Pink & Frye 1988). Again, the challenge is to ensure that the transition from prison to the outside community is a safe one. In our studies of IDUs in South Australia the data suggest that on release from prison most returned to their pre-incarceration injection behaviour but that perhaps there is a reduction in the prevalence of needle sharing (Table 5). Some caution is required in interpreting behaviour after prison since most IDUs were recruited from drug treatment facilities. Dolan et al. (1990a) found that almost half of a sample of 139 IDUs who had been in prison shared syringes once outside prison and that 39 per cent had two or more sexual partners outside prison.

Prison sexuality requires special comment. While prevalence of male homosexual practices is estimated to be relatively low, the context of sexuality may have large implications for subsequent sexual behaviour and/or drug use. A young, powerless prisoner may be intimidated into engaging in quasi-consensual sexual activity which he may cope with

by using drugs in prison. There are insufficient data, qualitative or quantitative, to be confident about the extent and effects of such activities but the fact that individual prisoners and officers mention these special circumstances should alert prison authorities to be aware of the possibility of sexual abuse. Conolly and Potter's (1990) observations that 8 per cent of drug injectors in a random sample of 158 NSW prisoners commenced injecting in prison and that of 14 men who had a homosexual experience as an adult 11 commenced in prison (personal communication to the authors) are telling in this regard. Some of these aspects of sexuality have been reviewed by Heilpern and Egger (1989). It is clear that more well-designed studies in this area are needed.

Prisons are frequently places where physical violence occurs and the possibility of HIV transmission as a result should not be dismissed. Similarly, tattooing is a practice which occurs in prison and the needles which are used could transmit HIV (Doll 1988). Dolan et al. (1990b) found that the prevalence of sharing tattooing equipment was 4-9 per cent among a sample of IDUs who had been in prison.

### **Behaviour of HIV-Infected Prisoners in Prison**

There is some reason to expect that HIV-infected prisoners may differ from non-infected prisoners in their risk behaviours. The fact that they are infected indicates high-risk behaviour at some time. An important question is whether their behaviour within prison is risky. Again, because studies are few and have in general been done in low HIV prevalence populations, there are few data to compare. They are shown in Tables 6 and 7. It is apparent that most of the individuals interviewed injected themselves and shared needles while a smaller proportion engaged in homosexual behaviour. Dolan et al. (1990a) found that HIV-infected prisoners were more likely to inject and share needles in prison than non-infected prisoners and those who did not know their antibody status.

After aggregating the data from these studies the consistent finding is that HIV-infected prisoners are more likely to have injected themselves when they were in prison compared to non-infected IDUs or those who did not know their antibody status. But both HIV-infected and non-infected IDUs who injected in prison were about equally likely to share needles (Table 7). One difficulty with these data is that some of those who reported themselves as HIV-infected did not know their antibody status during their imprisonment. And, other determinants of injection such as sentence length may confound the apparent association between HIV status and the likelihood of injection.

While there are too few data to generalise confidently to prisons as a whole, the data should sound two warnings. First, a great deal more information is needed about the risk behaviours of HIV-infected prisoners. Second, vigorous attempts should be made to assist HIV-infected individuals to reduce the risk they pose to others.

### **Evidence for Prison Environments Facilitating Risk Behaviours**

Intravenous drug use by itself is not necessarily a risk behaviour for HIV transmission. Sharing of implements for injection and/or failure to clean previously used needles adequately are almost certainly high-risk behaviours. What might distinguish prisons from other environments is the availability of education, and methods to make potentially risky behaviours safe. In early November 1990 a telephone survey of correctional jurisdictions in Australia by this research group indicated that clean needles with which to inject, bleach to clean needles and specifically targeted education about how to clean them (as in the *Gaolwize* comic) were not available in most Australian prisons (Table 8). Data from a South Australian study of prisoners in a maximum security prison suggest that prisoners are concerned about HIV infection, feel they need to know more about HIV to protect themselves and, while they are of the opinion that most injectors have not reduced their

injecting because of HIV, they are also of the opinion that clean needles would reduce the risk of HIV transmission (Gaughwin et al. 1990). In the current climate of uncertainty surrounding the implications of distributing sterile needles, an appropriate measure would be at least to make bleach more widely available. If prisoners were adequately instructed to use bleach before and after injecting this would not only reduce risk to themselves but also to those officers who accidentally prick themselves while searching for contraband. Condoms are in the same category as bleach. They present no hazard to staff or prisoners and should be widely distributed.

These, of course, are not the only ways of approaching or dealing with the actual and potential problems of risk behaviours in prisons. Other approaches such as education, counselling and drug treatment programs are just as important. But a certain amount of pragmatism is called for in the current climate of risk. One outstanding generalisation from the research which has investigated the relationship between intravenous drug use and HIV infection is that prevalence and presumably transmission of infection can change very rapidly. The reasons for such rapid change are by no means clear. This behoves us to be vigilant in our surveillance of both infection and behaviours which might transmit the virus and to be vigorous, innovative and pragmatic in our approaches to reducing the risk of transmission. We have a number of choices. We can deny the behaviours exist, we can proclaim their illegality or we can attempt to do something about them. Prisoners know about AIDS and are concerned for themselves (Gaughwin et al. 1990a) but they need responsible assistance from those who control and manage them to lessen their risk of infection.

### **The Possible Future of HIV Infection in Prisons**

The HIV epidemic in Australia continues with new infected individuals being detected. There is insufficient information on HIV seroprevalence and transmission among intravenous drug users in Australia to know precisely whether transmission is increasing, stable or decreasing. Seroprevalence of HIV in South Australian prisons was low (about 0.8 per cent) and stable during 1989 (Gaughwin et al. 1991) suggesting that there has not yet been the rapid increases in infection among IDUs that have been observed elsewhere in the world. But the total number of infected persons detected is increasing and, as treatments become better, we can expect those infected to live longer, some to be imprisoned and some to be infectious to others. Prison administrators can expect an increased burden of caring for and managing HIV-infected prisoners in the coming years. The somewhat peculiar characteristics of population dynamics in prisons mean that there is an opportunity to regulate to some degree the exposure of non-infected prisoners to HIV. But to do this effectively will require a commitment to adequate surveillance of infection and risk behaviours and provision to prisoners of optimal opportunities to reduce risk to themselves. The extent of the likely worst-case scenario might be gleaned from information which is available about the seroprevalence of hepatitis B infection among prison populations. Transmission of hepatitis B is thought to be more efficient than HIV and natural immunity occurs unlike HIV. Measurement of the prevalence of any markers of infection can be used as a surrogate indicator of the potential extent of HIV infection. The prevalence of hepatitis B serological markers in USA prison populations (there are no recent Australian studies) is shown in Table 9. It can be seen that up to almost half of some prison populations have been infected. If this occurred for HIV, the economic, administrative, social and health burdens would be profound. Far better for us to act now so that it never does. Risk behaviours are occurring in Australian prisons. If we are to avoid a catastrophe definite action will need to be taken. We cannot just hope that the situation will get no worse than it is now.

It is important to sound a note or two of caution about the data which is available on which to evaluate risk in prisons. Ethical restrictions have severely limited the collection of detailed data from prisoners while they are in prison and in our own situation in South Australia the indirect methods we have used have not allowed us to estimate the biases that may be present in voluntary samples. Studies of former prisoners are clearly biased to males with histories of significantly dysfunctional drug use. A large proportion of respondents are

relatively old and, in Australia, there are no published data which describe risk behaviours of Aboriginal prisoners.

The evidence from this review leaves little doubt that prisons are risky places. Circumstances of prison life may fortuitously decrease the risk of HIV transmission in prison but the situation is a fragile one with inherent instability. Such a situation requires vigilance. It would be gratifying to come back in three to four years time and observe that prisons in Australia have contributed significantly to stemming the transmission of HIV. This hope is neither naive nor idealistic. It is possible and the challenge is to make it happen.

### **Postscript**

Since this paper was published, a number of important articles have been published which add to our knowledge of risk behaviours for HIV infection in prisons. In general, these papers echo the main findings and conclusions of our review paper but a number of important contrasts are evident.

Large studies in England (Turnbull, Dolan & Stimson 1991) and Scotland (Power et al. 1992) have supported the observation that the prevalence of injection while in prison among those with a history of injecting drug use (IDU) is lower than the prevalence outside prison. But both these studies report prevalences of injection inside prison modestly lower than the mean prevalence reported in IDUs in our paper. Such differences should be expected as the number of studies increases principally because prison systems around the world are different, as are the judicial systems which determine whether an IDU will be imprisoned for a particular offence. The nature of samples in studies will assume increased importance and multiple regression techniques - which take account of many factors which may influence the likelihood of injection in prison - should be used.

Most studies do not allow calculation of the relative risk of engaging in risk behaviours in prison compared to outside prison principally because questions asked did not allow determination of the number of risk-taking events per IDU per unit time. Such estimates are important, and the value of developing suitable questionnaires for such research is clear.

An example of such a situation is seen in a study of IDUs at a Glasgow needle exchange (Kennedy, Nair, Elliott & Ditton 1991) which found that about 70 per cent of respondents had a history of imprisonment: of these about 50 per cent injected while in prison and slightly less than 50 per cent of those who injected shared needles while in prison. But information which would allow comparison of, for example, the number of times needles were shared in and out of prison per unit time was not reported.

While studies of former prisoners have predominated in recent literature, a few studies from within prisons have been published. One study from within the Saughton prison in Scotland (Dye & Isaacs 1991) which had a 32 per cent response rate reported a prevalence of injection among inmates outside prison of 35 per cent and an in-prison injection prevalence of 24 per cent. Among those who did inject while in prison, needle-sharing prevalence was 76 per cent. Prevalence of injection and HIV status varied by type of prison, but response rates varied substantially by prison also.

A study of New Zealand prisons (Patten & Gray 1991) conducted within prisons found that 26 per cent of 190 inmates surveyed had injected themselves in prison while 17/190 had engaged in any sexual activity and 2/190 in anal intercourse.

Remarkably, Power et al. (1992), in a study of a stratified random sample of 559 prisoners from eight Scottish prisons, achieved a response rate to questioning about risk behaviours of 86 per cent. They found that only 28 per cent of inmates reported ever injecting themselves and about 8 per cent had injected while in prison. Of those with a history of injection, 97/154 had shared needles outside prison and 32/43 had shared needles inside prison. About 50 per cent of those who shared needles sterilised them routinely either inside or outside prison. The absolute estimates of injection prevalence are low compared with other studies conducted within prisons but consistent with studies of IDUs in that about 30 per cent of those prisoners who were IDUs injected while in prison. In another report of the same population they found only 1/559 inmates had engaged in sexual activity while in prison (Power et al. 1991).

Lower estimates of pre-imprisonment injection prevalence were obtained by Maden, Swinton and Gunn (1990; 1992) who reported a prevalence of 11 per cent among male prisoners and 23 per cent among women prisoners. Their study in male prisons was again remarkable in achieving a response rate of greater than 90 per cent. It involved a large random sample of 1751 and was conducted across all of England and Wales. These authors acknowledge the possibility of under-reporting of risk behaviours which must be considered seriously.

To reiterate the conclusions of our paper, prisons have responsibilities and power to make a substantial contribution to stemming HIV transmission. To accept such responsibility will require courage and the insight that they do not exist in a world which is apart from the communities in which they are located and that they need to address with their communities the welfare of prisoners both while they are in prison and while they are outside.

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## Appendices - Tables

*Table 1*

### Studies which Report Lifetime or prior-to-incarceration Prevalences of HIV Risk Behaviours

Author ( <i>see</i> References)	Year of Study	N	Study Type	Country/ State	IV Use %	Heroin Use %	Homosex- uality %
Barton 1980	1980	10400		USA		30	
Nacci & Kane 1983	1982	330	CS	USA			28
Chaiken 1982	1982	2200		USA/3 States		28	
Hull et al. 1985	1982	455/659	CS	USA/ New Mexico	41		4
Decker et al. 1984	1983	759/6503	CS	USA/ Tennessee	47		22
Anda et al. 1985	1983	619/876	EN	USA/ Wisconsin	27		4
Indermauer 1985	1986	90	CS	Aust/WA		31	
Dobinson & Ward 1986	1986	225	CS	Aust/NSW		42	
Indermauer & Upton 1988	1986	926	EN	Aust/WA		20	
Johnson & Egan 1986	1986	402	EN	Aust/WA		21	
Glass et al. 1988	1986	818	EN	USA/Iowa	28		5
Conolly & Potter 1990	1989	158	CS	Aust/NSW	46		10**
Barry et al. 1990	1985	406/470	CS	USA Massachusetts	33		3
Andrus et al. 1989	1987/88	977	EN	USA/Oregon	53		3
CDC 1989	1987/88	459/600	CS	USA Massachusetts	52		
Vlahov et al. 1990	1987/88	1932	EN	USA Maryland	34		
Vlahov et al. 1989	1985-87	1488	EN	USA Maryland	37		
NIJ 1990	1988		EN	USA	26		
NIJ 1990	1988		EN	USA		heroin 21 cocaine 53	
Gaughwin et al. 1991	1988/89	373	CS	Aust/SA	37		
Hoxie et al. 1990	1988	989	EN	USA Wisconsin	25		
Patel et al. 1990	1988	802	EN	USA Michigan	20		4
<b>MEAN</b>					<b>36</b>	<b>29</b>	<b>9</b>
<b>95% CI</b>					<b>30-42</b>	<b>20-35</b>	<b>2-16</b>

\*CS = Cross Sectional    EN = Entrants    \*\*pers comm

Table 2

**Studies conducted in Prisons of the prevalence of Risk Behaviours of Prisoners while in Prison**

Author ( <i>see</i> References)	Year of Study	Population/Study Type	IV Use (%)	Homosexuality
Decker et al. 1984	1983	random sample, 759 of 6503, Tennessee, USA direct questioning	28	18% unspecified
Nacci & Kane 1983	1982(?)	random sample, 330 from USA Federal prisons, (64% response) direct questioning		12% current prison 30% in any prison unspecified
Conolly & Potter 1990	1989	random sample, 158 in 6 of 26 NSW prisons Aust, direct questioning	32	9% unspecified 2% anal intercourse*
Gaughwin et al. 1991	1988/89	voluntary sample 373 of 791 Sth Aust prisoner's estimates	37	12% anal intercourse

\*Pers comm

Table 3

## Studies of Risk Behaviours of IDUs during past Imprisonments

Author ( <i>see</i> References)	Year of Study	Country	N	Approx Age	Sex	Months in Prison	Per cent Injected	Shared Needles (% of injectors)	Cleaned Adequately (% of sharers)	Per cent Homo- sexual Activity
Carvell & Hart 1990	1989	UK	50	31	84%M	21	66	79		10
Hart et al. 1989	1986/7	UK	32	29	M&F		34	73		
Wolk et al. 1990	1987	Aust	54	28	M		50	100		13
Dolan et al. 1990a	1988	UK	139	28	69%M	65%<1mth	23	75	25	8
Gaughwin et al. 1991	1989/90	Aust	50	27	M	14	52	73	16	2
Gaughwin et al. unpublished	1989/90	Aust	9	28	F	8	67	100	33	
Dolan et al. 1990b	1989	UK	59	30	76%M	11	39	75	25	5
Dolan et al. 1990b	1989	UK	54	29	73%M	7	15		13	8
Donoghoe et al. 1989	1989	UK	286		>50%M		30	65		4
Connolly & Potter 1990*	1989	Aust	50		?M&F			94	30	
<b>Mean</b>				<b>29</b>		<b>12</b>	<b>42</b>	<b>81</b>	<b>24</b>	<b>7</b>
95%CI				28-30		5-19	28-56	72-92	15-32	4-11

\*Imprisonment, interviewed in prison

Table 4

**Studies which Estimate the Frequency of Injection of IDUs while Incarcerated**

Author ( <i>see</i> References)	Daily	Weekly	Monthly	Occasionally	Mean (inj/wk)
Decker et al. 1984 (USA, n=759)	-----	23%	-----	77%	
Gaughwin et al. 1991 (Sth Aust)					
1. Prisoners' estimates (n=200)	9%	30%	-----	61% -----	
2. IDUs (n=56)	14%	28%	20%	38%	1 (approx)
Dolan et al. 1990a (UK, n=26)					0.7

Table 5

**Injecting Behaviour of South Australian male IDUs before, during and after their most recent Imprisonment**

	6 Mths Before	In Prison	6 Mths After
Injected	39/50 (78%) **	26/50 (52%) *	34/46 (74%)
Frequency (daily or weekly)	34/39 (87%) **	3/26 (12%) **	28/34 (82%)
Shared Needles	28/39 (72%) <sup>ns</sup>	19/26 (73%) <sup>ns</sup>	18/33 (55%)
Cleaned Adequately	6/28 (21%) <sup>ns</sup>	3/19 (16%) <sup>ns</sup>	4/18 (22%)

Z test for proportions \*P<0.05, \*\*P<0.01, <sup>ns</sup> not significant

Table 6

**Risk Behaviours of HIV-infected IDUs during their Imprisonment**

Author ( <i>see</i> References)	Injected	Shared Needles	Sex
Wolk et al. 1990	2/3 (66%)	2/2 (100%)	2/3 (66%)*
Gaughwin et al. 1991	6/7 (86%)	5/6 (83%)	1/7 (17%)
Dolan et al. 1990a	11/24 (46%)	10/11 (91%)	-----
<b>Totals</b>	<b>19/34 (56%)</b>	<b>17/19 (89%)</b>	<b>3/10 (30%)</b>

\* Both homosexual

Table 7

**Comparison of Injecting Behaviour during their Imprisonment of HIV-infected IDUs and IDUs who were not infected or did not know their Antibody Status**

	Injected	Shared Needles
HIV Infected	19/34 (56%)	17/19 (89%)
HIV Negative or Unknown	66/209 (32%)*	53/66 (80%) <sup>ns</sup>

\* Chi square = 6.56, P = 0.01, <sup>ns</sup> not significant

Table 8

**Availability of HIV Risk Reduction Measures  
in Australian Prisons, November 1990**

	STATE						
	NSW	VIC	QLD	SA	NT	WA	TAS
Condoms	N	N	N	N	N	N	N
Sterile Needles	N	N	N	N	N	N	N
Bleach	Y	Y	N	N	N	N	N
Education	Y	Y	Y	Y	Y	Y	Y
Gaolwize Comic	Y	N	N	N	Y	N	N
Methadone	Y	YR	YR	YR	N	YR	N

Y yes, N no, YR yes but significantly restricted

Table 9

**Prevalence of Hepatitis B Markers (antigen and antibody) in some  
USA Prison Populations**

Author ( <i>see</i> References)	Year of Study	Study Type	Hep B Markers
Hull et al. 1985	1982	entrants	47%
Decker et al. 1984	1983	cross sectional	30%
Anda et al. 1985	1983	entrants	19%
Barry et al. 1990	1985	cross sectional	43%
Andrus et al. 1989	1987	entrants	36%
<b>Mean</b>			<b>35%</b>

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