

AIDS and injecting drug use: very risky behaviour in a Perth sample of injecting drug users

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Abstract

This research was carried out in 1990 to examine high-risk injecting and sexual behaviour in a sample of injecting drug users (IDUs) in Perth. The study was a cross-sectional survey with a convenience sample drawn from drug treatment (54%) and non-treatment (46%) populations. In the sample of 150 IDUs, there were 11 very risky drug behaviour (VRDB) and 63 very risky sex behaviour (VRSB) respondents. Four respondents fell into both categories. Independent comparisons were made between each risk group and the rest of the sample. The VRDB respondents were heterosexual men, most of whom were in long-term monogamous relationships, with heavier levels of drug use than the rest of the sample. The VRSB respondents were largely single and mainly heterosexual, with more sexual partners than the rest of the sample. It was concluded that there was little evidence that very risky behaviour was related to a general risk-taking dimension, to inadequate knowledge about AIDS or to a low assessment of personal vulnerability to AIDS. However, situational influences in association with heavy drug use appeared to be a major component of high-risk injecting behaviour, while high-risk sexual behaviour appeared more to be a reflection of community norms about heterosexual sexual behaviour. The study should be replicated with larger samples, particularly as the VRDB group was so small, but if the findings are reproduced in other studies, it suggests that serious attention should be paid to the promotion of safer sex among injecting drug users. [Loxley WM, Hawks DV. AIDS and injecting drug use: very risky behaviour in a Perth sample of injecting drug users. *Drug Alcohol Rev* 1994; 13: 21–30.]

Key words: AIDS; injecting drug users; very risky behaviour; Perth.

Introduction

The pre-AIDS drug treatment literature tended to suggest that injecting drug users (IDUs) were unwilling or unable to change their behaviour in the direction of better health. In contrast, it is now commonly acknowledged that IDUs have changed injecting practices in response to the threat of HIV/

AIDS. This has been found in a number of different places, including Australia [1], the UK [2] and the USA [3]. Concern has, however, been expressed at the slower rate and smaller extent of changes in sexual behaviour, particularly among heterosexual IDUs [1,2,4].

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There are, however, still some IDUs whose injecting and sexual behaviour puts them at high personal risk of HIV/AIDS, and hence increases the risk to the IDU community as a whole, although little research attention has been paid to these people. In Australia, where the success of early community education and provision of clean needles is evidenced by low rates of HIV infection among IDUs [5], it may seem surprising that there are IDUs who still share unclean needles on a regular basis. Less surprising, perhaps, is the behaviour of those who have unprotected sex with a number of different partners, although it might be surmised that IDU heterosexuals would take more sexual precautions than non-IDU heterosexuals since their sexual partners are often themselves IDUs [6], thus increasing their chance of meeting an infected person.

How, then, can we explain this maintenance of risky behaviour? Wiebel and Lampinen [3], who point out that there have been few published studies which distinguish IDUs who comply with risk reduction recommendations from those who do not, believe that some preliminary findings indicate the "overwhelming importance" of situational factors in determining compliance. However, other researchers see risk-taking as a "general psychological disposition" or personality dimension [7], while cognitions such as those specified by the Health Belief Model are also believed to determine compliance with health promotion [8]. Taking these into consideration, we could posit a range of alternative hypotheses to explain very risky behaviour: situational factors, personality, lack of understanding about AIDS and/or low AIDS-risk perception, or some combination of drug using and socio-sexual behaviour patterns which make unsafe behaviour on the part of some people more likely than others.

The Australian National AIDS and Injecting Drug Use Study (ANAIDUS), a multi-centre study, investigated the knowledge, attitudes and behaviour of Australian IDUs in two years: 1989/90 and 1990/91. In Perth, one of the study sites, 308 individual respondents—either current or recent IDUs—were interviewed during the two years: 150 of these in 1990/91. In a report on the second year of study in Perth, it was found that while the majority of respondents knew they could be at risk of HIV infection through their injecting drug use, were concerned about this risk, and took steps to avoid it, there were some respondents who did not fit this picture, and who could be characterized as

"recalcitrant" [9]. It was also found, as noted above, that there had been fewer changes to sexual behaviour than to drug-using behaviour in response to HIV/AIDS, and in a later and more detailed analysis such changes to sexual behaviour were found to be inadequate [6].

Moore and Rosenthal have developed a Sexual Activity Risk Scale which takes into account three dimensions: the activity practised, use of condoms, and the number of sexual partners [10]. Using this scale, the highest risk category consists of those who engage in penetrative sex with more than one partner and use condoms inconsistently or not at all. An analogy to injecting drug use is possible, making the highest risk category those who share needles with more than one partner and use bleach inconsistently or not at all.

In the present analysis, those in the Perth 1990/91 ANAIDUS sample who practised very risky drug-using and/or sexual behaviour have been distinguished from those whose behaviour was more compliant. Demographic differences, knowledge about HIV/AIDS, attitudes towards HIV/AIDS, and drug-using and sexual behaviour variables have all been analysed in an attempt to formulate some hypotheses about the persistence of very risky behaviour in some injecting drug users.

Method

The overall aims of the ANAIDUS were to estimate the seroprevalence of HIV among IDUs; collect data regarding the risk-taking behaviour, and proximal and distal antecedents of risk-taking behaviour of the IDU population; identify facilitators and obstacles to behavioural change; identify target groups within the IDU population and assess their educational requirements; identify the most credible information sources concerning risk-reduction behaviour for particular target groups; and provide feedback on the efficacy of particular safe practices and IDU campaigns. Equal numbers of IDUs in and out of treatment were to be interviewed.

Respondents

Data were collected in Perth from 150 respondents in the second wave of the study, between July 1990 and March 1991. All respondents were current or recent IDUs. Fifty four percent of the respondents were recruited from drug treatment centres while the

remainder were not in treatment at the time of interview, but 23% of these had been in treatment previously. The sample was stratified by gender to obtain roughly 60% male and 40% female representation, which approximates the current male/female balance in Perth drug treatment agencies. The treatment sample was stratified to obtain 80% from the WA ADA methadone clinic and the remainder from the government detoxification centre and non-government treatment agencies. Respondents were recruited to the study by four main procedures: advertising, referrals by staff at treatment agencies; direct approach and snowballing.

Questionnaire

The data were collected by means of a standard structured questionnaire, which had been piloted on a sample of 100 IDUs in Sydney, administered in a face to face interview. Questionnaire topics included demographics, drug use, needle use and the sharing of injecting equipment, cleaning and disposal of used injecting equipment, the social context of drug use, sexual behaviour, knowledge and attitudes regarding HIV/AIDS and behaviour change (additional details are given in Loxley, McDonald and Marsh [9]).

Data analysis

The data were coded and punched for analysis at the ANAIDUS national co-ordinating centre in Sydney. Perth data were held on the Curtin University Vax mainframe, and analysed using procedures in SPSSx.

Respondents were divided into risk groups based on predetermined criteria. Very risky drug behaviour (VRDB) was defined as having had more than one needle-sharing partner in the last six months, and not using bleach 99–100% of the time. Very risky sexual behaviour (VRSB) was defined as having had more than one sexual partner in the previous year, and using condoms less than 100% of the time for penetrative sex. The difference in critical time period between the two groups is related to the wording of the questionnaire.

There were two independent sets of comparisons. In the first set, the whole sample was divided into VRDB and non-VRDB; the data were then recombined and divided into VRSB and non-VRSB. Because the VRDB group was small, a general category of risk incorporating both VRDB and VRSB would

have consisted almost entirely of VRSB, and hence was not created. Differences in categorical variables were assessed with odds ratios and differences in continuous variables with the Mann-Whitney *U* test, to allow for the possibility that underlying distributions were non-normal.

Results

Overlap between VRDB and VRSB

Eleven respondents met the VRDB definition and 63 respondents met the VRSB criteria. There were some overlap between the two groups: of the 11 VRDB, only four were also VRSB. Thus 36% of VRDB were also VRSB, and 6% of VRSB were also VRDB.

Very risk drug behaviour group

Demographics. Of the 11 respondents who were categorized as VRDB, all were men, with an average age of 27.2 years, ranging from 20 to 34. The majority had not completed high school. Ten were heterosexual and nine of the 11 were in monogamous relationships, the majority for years. All but one received Social Security benefits. Seven had been in prison, and eight had received drug treatment, all on more than one occasion.

The only demographic differences between the VRDB and the rest of the sample were that the VRDB were more likely to be male (Table 1).

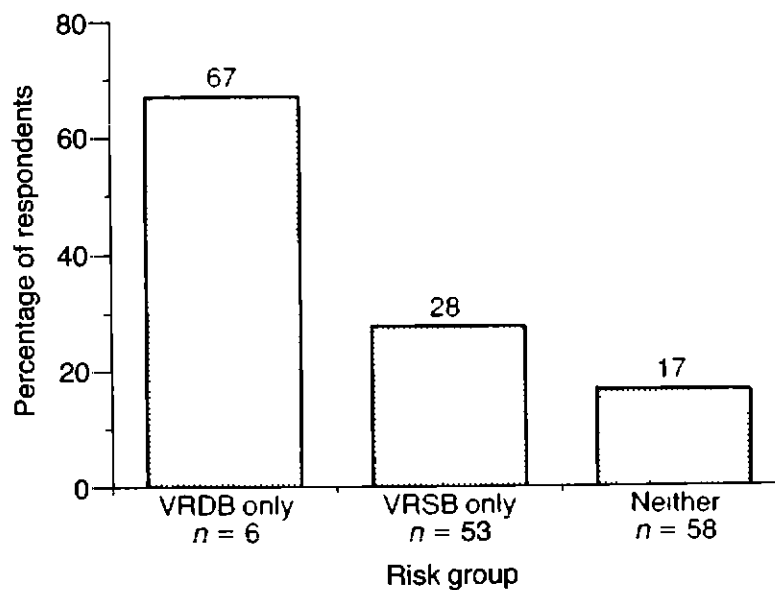
Knowledge. Thirteen questions related to factual information about AIDS. The answers to these were summed to give a scale ranging from 1 to 17, where high scores indicated more knowledge. All missing answers were scored as 0. The mean for the VRDB was 10.55 (95% CI 7.01 to 14.08) and the mean for the rest was 10.55 (95% CI 10.23 to 11.69). The difference between the two groups was not significant.

Attitudes. There were no differences between the VRDB and the rest of the sample in the perceived ease of obtaining new injecting equipment in Perth, the perceived riskiness of a range of different behaviours, perceptions of which groups in the Australian community were most at risk of HIV infection, or personal reasons for not using needle-exchange schemes. However, perceptions of the per-

Table 1. Differences between VRDB and the rest of the sample: demographics

	VRDB (%) <i>n</i> = 11	Others (%) <i>n</i> = 139	OR	95% CI	<i>p</i>
Male	100	60		1.56-∞	0.005 ¹
Heterosexual	91	85	1.33	0.47-3.82	0.593
Married	73	54	1.46	0.74-2.90	0.278
(If married) monogamous	100	95		0.00-22.00	> 0.05 ¹

¹ No odds ratio (OR) can be calculated because of empty cells. One side of confidence interval (CI) calculated using Fisher's Exact Test (hypergeometric distribution)

**Figure 1.** Perception of personal risk of HIV infection as 1/100 or greater, by risk category.

sonal risk of HIV infection varied with risk behaviours. Fig. 1 shows the risk perception of those who were VRDB only, those who were VRSB only, and those who were neither VRDB nor VRSB. There were only four respondents who had dual risk categories, and these were omitted from the graph because the numbers were too small to be meaningful, as were those respondents who were unable to answer this question. It is apparent from this graph that there was an association between the riskiness of behaviours practised and perceptions of those risks. Those who found themselves at high risk by virtue of their drug-using behaviour were more likely to perceive themselves at higher risk of HIV infection than those at risk because of their sexual behaviour, or those whose drug-using or sexual behaviour did not place them at risk. When odds ratios were calculated, however, only the comparison of VRDB

only with Neither was significant (OR = 3.10; 95% CI = 1.24 to 7.73, $p = 0.015$).

Drug-using behaviour (Table 2). Relative to the rest of the sample the VRDB were no more likely to report injecting when alone, or being intoxicated before injecting, but they were more likely to report using alcohol before injecting. The recency of their last injection was similar, but they reported more occasions of injecting during their most recent typical using month. They reported sharing needles more frequently and were more likely to have shared needles recently (within months weeks or days of the interview). They were more likely than others to say that they would share needles with a close friend. Those respondents who had ever shared needles (all of the VRDB and approximately half of the rest) were asked to give reasons for doing so. Significant

Table 2. Differences between VRDB and the rest of the sample: drug use

	VRDB (%) n = 11	Others (%) n = 139	OR	95% CI	p
Has not shared recently	0	53		0-0.48	0.002 ¹
Share with close friends	55	13	2.84	1.49-5.40	0.002
Uses alcohol before inject	73	33	2.32	1.17-4.61	0.016

	VRDB		Others		U	p
	Mean	95% CI	Mean	95% CI		
% inject alone	33.64	12.33-54.94	37.40	31.64-43.15	845.0	0.916
TotInj ²	71.36	20.03-122.70	33.12	25.16-41.08	458.5	0.027
Sharing freq ³	17.91	3.04-32.78	6.73	3.93-9.52	328.0	0.001

¹No odds ratio (OR) can be calculated because of empty cells. One side of confidence interval (CI) calculated using Fisher's Exact Test (hypergeometric distribution)

²Total injections: retrospective diary, most recent typical using month

³Usual percentage of injecting occasions on which needle sharing occurred

Table 3. Differences between VRDB and the rest of the sample: reasons for sharing

	VRDB (%) n = 11	Others (%) n = 65	OR	95% CI	p
Difficult ¹	73	32	2.36	1.16-4.82	0.018
Hanging out ²	54	17	2.43	1.23-4.77	0.010
Hanging out, don't care ³	54	20	2.19	1.13-4.27	0.021
Stoned ⁴	45	11	2.63	1.29-5.35	0.008

¹"I find it difficult to get hold of new ones"

²"When I'm really hanging out for a taste the dangers don't seem so important"

³"When I'm really hanging out for a taste I don't care whether I share or not"

⁴"I know that it's not safe to share but when I'm stoned or drunk or high I don't care so much"

differences in reasons for sharing between the VRDB and the rest are shown in Table 3.

Table 3 shows that the VRDB were more likely than the rest of the sample to share needles for reasons that had to do with their drug use: i.e. being in withdrawal ("hanging out", "hanging out—don't care"), or being intoxicated before injecting ("stoned"), as well as because needles were not readily available ("difficult").

Sexual behaviour (Table 4). Relative to the rest of the sample, the VRDB had similar numbers of sexual partners and were as likely to have a regular partner. They had similar experiences of having been

paid for sex. They were more likely to have used amphetamines, cannabis and alcohol before engaging in sex. They were no more or less likely to have changed their sexual behaviour in response to HIV/AIDS.

Very risky sexual behaviour group

Demographics. Of the 63 respondents categorized as VRDB, 65% were men, with an average age of 27.7 years, ranging from 17 to 39. Fifty seven percent had not completed high school. All of the men and 86% of the women were heterosexual. Sixty two percent were single, and of those who were married or *de*

Table 4. Differences between VRDB and the rest of the sample: sexual behaviour

	VRDB (%)		Others (%)	OR	95% CI	<i>p</i>
	<i>n</i> = 11	<i>n</i> = 139				
Has regular sex partner	91	69		2.12	0.75–6.01	0.159
Has been paid for sex	9	26		0.53	0.19–1.51	0.234
Use amphetamines before sex	64	26		2.28	1.20–4.34	0.012
Use cannabis before sex	91	54		3.05	1.08–8.64	0.036
Use alcohol before sex	73	42		1.99	1.00–3.94	0.049
Changed sex behav.	36	53		0.72	0.38–1.36	0.309

	VRDB		Others		<i>U</i>	<i>p</i>
	Mean	95% CI	Mean	95% CI		
Sexual partners	2.73	0.95–4.51	4.29	2.27–6.1	720.5	0.815

Table 5. Differences between VRSB and the rest of the sample: demographics

	VRSB (%)		Others (%)	OR	95% CI	<i>p</i>
	<i>n</i> = 63	<i>n</i> = 87				
Male	65	62		1.06	0.76–1.50	0.706
Heterosexual	95	78		2.36	1.26–4.50	0.008
Married	37	71		0.49	0.34–0.70	0.001
(If married) monogamous	82	100			1.08– α	0.021 ¹

¹ No odds ratio (OR) can be calculated because of empty cells. One side of confidence interval (CI) calculated using Fisher's Exact Test (hypergeometric distribution)

facto, 82% were in monogamous relationships, the majority for months. Most were unemployed or on sickness benefits. One-third had been in prison and 70% had received drug treatment, 52% more than once.

Relative to the rest of the sample (Table 5), the VRSB were of similar age and gender distribution. They were less likely to be married or *de facto* and, if married, to be monogamous. They were more likely to be heterosexual.

Knowledge. The VRSB had significantly lower scores on this scale than the non-VRSB (VRSB: mean, 10.13; 95% CI 8.99–11.26; non-VRSB: mean, 11.51; 95% CI 10.60–12.41; $U = 4190.0$; $p = 0.031$).

Attitudes. There were no differences between the VRSB and the rest of the sample in the perceived

ease of obtaining new injecting equipment in Perth, the perceived riskiness of a range of different behaviours, perceptions of which groups in the Australian community were most at risk of HIV infection, or personal reasons for not using needle-exchange schemes.

Drug-using behaviour (Table 6). The VRSB were more likely to share with close friends, to use alcohol before injecting and to inject when alone than the rest of the sample.

Sexual Behaviour (Table 7). Relative to the rest of the sample, the VRSB had had more sexual partners in the previous year and were less likely to report having a regular sexual partner. They were less likely to have been paid for sex. They were more likely to use alcohol but not other drugs before having sex and they were more likely to report having changed

Table 6. Differences between VRSB and the rest of the sample: drug use

	VRSB (%)		Others (%)		95% CI	<i>p</i>
	<i>n</i> = 63		<i>n</i> = 87	OR		
Shared needles recently	52		49	1.06	0.77-1.47	0.721
Share with close friends	52		9	1.83	1.15-2.91	0.010
Uses alcohol before inject	51		25	1.75	1.24-2.50	0.002

	VRSB		Others		<i>U</i>	<i>p</i>
	Mean	95% CI	Mean	95% CI		
% inject alone	45.86	37.97-53.75	30.79	23.40-38.19	2090.1	0.013
TotInj ¹	36.87	25.12-48.63	35.24	23.78-46.70	2537.0	0.438
Sharing freq ²	5.63	1.92-9.35	8.93	4.91-12.95	4633.0	0.612

¹Total injections: retrospective diary, most recent typical using month²Usual percentage of injecting occasions on which needle-sharing occurred**Table 7** Differences between VRSB and the rest of the sample: sexual behaviour

	VRSB (%)		Others (%)		95% CI	<i>p</i>
	<i>n</i> = 63		<i>n</i> = 87	OR		
Has regular sex partner	57		81	0.57	0.40-0.82	0.002
Has been paid for sex	16		32	0.64	0.42-0.96	0.030
Use amphetamines before sex	30		26	1.10	0.77-1.57	0.617
Use cannabis before sex	58		52	1.15	0.81-1.60	0.395
Use alcohol before sex	57		35	1.58	1.13-2.21	0.007
Changed sex behav.	62		44	1.45	1.04-2.02	0.029

	VRDB		Others		<i>U</i>	<i>p</i>
	Mean	95% CI	Mean	95% CI		
Sexual partners	7.54	3.28-11.80	1.71	1.07-2.35	410.0	0.000

sexual behaviour in response to HIV/AIDS, although clearly these changes had been inadequate.

Summary

The VRDB respondents were mainly heterosexual men, most of whom were in long-term monogamous relationships. They had heavy levels of drug use as indicated by a variety of direct and indirect measures. By direct measure, they were found to have averaged more injections of any substance in

the most recent typical using month than non-VRDB respondents. By indirect measure they had shared needles more recently and frequently and were more likely to use amphetamines, cannabis and/or alcohol before sex. Their major reasons for sharing needles were largely related to their drug use.

The VRSB respondents were largely single and mainly heterosexual men and women. They had more sexual partners than the non-VRSB¹ and were less likely to have regular sexual partners. They used

¹The influence of prostitution on these figures has not been explored.

alcohol before injecting and sex more frequently than the rest of the sample. They were more likely than the rest of the sample to have changed their sexual behaviour in response to HIV/AIDS.

Discussion

The Health Belief Model, and other similar models of health behaviour maintenance and change, suggest that behaviour change must be preceded by accurate knowledge about the disease or condition, and good understanding of the risks incurred by unhealthy behaviour. While the VRDB were significantly less knowledgeable about AIDS than the non-VRDB, the actual difference was small and there were no differences between the VRDB and non-VRDB, suggesting that those who practised unsafe behaviour in this study were hardly less knowledgeable about AIDS than those who did not, nor did they have unreasonably low risk perception. On the contrary, those whose behaviour was riskiest were more likely to perceive their chance of contracting AIDS to be higher than those whose behaviour was less risky, which may indicate an accurate understanding of the magnitude of different AIDS-risks.

There were fewer VRDBs than VRDBs, which accords with other findings about the way in which IDUs have changed their behaviour in response to HIV/AIDS [4]. If, as has been suggested, risk-taking is a personality attribute [7] it seems it is hardly a global attribute, since so few of the sexual risk takers were also drug risk-takers, a finding similar to that found in the evaluation of an HIV risk-taking scale where separate factors, only somewhat correlated, were required to describe drug-related and sexual risk-taking behaviour [11]. Risk behaviour may, however, be related to factors other than personality. It may be, for example, that the safer sexual behaviour of the majority of our VRDB group was related to higher levels of opiate use which had depressed their libido.

It is, however, also possible that risky behaviour is less a matter of personality than of situation; as Wiebel and Lampinen suggest, situational factors appear to be an important determinant of unsafe injecting [3]. (Unfortunately our data allow us to say very little about the situational determinants of unsafe sex.) Difficulty in obtaining new injecting equipment was cited as the most common reason for sharing by both VRDB and non-VRDB respon-

dents, but by a greater percentage of the VRDB. However, given that there was no difference between the groups in their perception of the general availability of sterile equipment in Perth, this difficulty would seem to relate more to the immediacy of a particular situation, and in the case of the VRDB to the strength of withdrawal before injecting. The higher frequency of drug-related reasons for needle-sharing found among the VRDB would seem to suggest that they were more dependent on drugs, and shared if sterile equipment was not available when it was needed. This is supported by the fact that they had injected, on average, twice as frequently in their last typical using month as the non-VRDB, who may have been better able to wait to gather sterile, or to clean used, equipment before injecting.

A different set of dynamics appears to be operating for the VRDB. One might almost characterize them as 'swinging singles': the majority unmarried and presumably enjoying the same sexual freedom that was commonplace throughout the community pre-AIDS, and is probably still commonplace among many single heterosexuals [12]. What appears to be lacking, however, is any understanding that behaviour which is practised with impunity by non-IDUs, apparently with little risk since the rate of infection among heterosexuals is still very low in Australia, may be riskier for those whose sexual partner is—as he/she so often is [6]—also an injecting drug user. Of particular interest is the fact that all of the men in this group were heterosexual, suggesting that norms about appropriate sexual behaviour vary between the gay and straight communities, where those in the gay community have generally changed their behaviour in the direction of safer sex [13].

The other issue of concern for this group is what has been called "intoxicated sex". Some research suggests that unprotected sex is more likely after alcohol and other drugs have been consumed, although it is not clear that this is a consistent finding among heterosexuals [14]. In the present study, there is only indirect evidence of more intoxicated sex among the sexual risk-takers than among the rest of the sample. Respondents in both groups claimed to be 'high, stoned or drunk' around half of the time before having sex, and the patterns of drugs used on these occasions were similar in both groups other than that the VRDB were more likely to have used alcohol before sex than others. Whether this in-

creased use of alcohol was influential in determining whether or not condoms were used cannot be answered from these data, but being intoxicated before having sex was clearly a common behaviour.

The implications for health promotion from these findings are clear. Health education directed at the VRDB could be best carried out on a one-to-one basis in drug treatment clinics, since it is highly likely that with their levels of drug use they will enter treatment from time to time, and relapse prevention treatment of the kind advocated by Stallard and Heather [15], among other approaches, would seem appropriate. Such treatment should include discussion of the need for forward planning so that sterile injecting equipment is always to hand when it is needed.

Health education directed at the VRSB group is less likely to be effective if only carried out in drug treatment centres. All agencies and workers who come into contact with IDUs should stress that safer sex is as important as safer drug use, and point out the increased probability of an IDU, relative to a non-IDU, meeting, and having a sexual relationship with, an infected person. However, there needs also to be a concerted community effort towards educating all heterosexuals about the risks of unsafe sex.

In conclusion then, there is little evidence in this study that risk-taking is a general personality dimension. Neither do levels of knowledge about, or attitudes towards, HIV/AIDS appear to affect very risky behaviour in this sample; nor, as a recent review suggested, in IDUs generally [16]. On the contrary, we would tentatively suggest that high risk behaviour is more likely to be associated with situational constraints and particular patterns of drug use, or with socio-cultural norms about sexual behaviour. High-risk drug injecting was closely linked, in this study, to heavy drug use and perceived difficulty in obtaining sterile needles, while high risk sexual behaviour was found more frequently among single heterosexuals. While there is ample evidence that sexual behaviour norms have changed among gay men, work at this Centre and elsewhere [6,4] has demonstrated that large-scale behavioural change has not yet taken place among heterosexuals IDUs, suggesting that there is a long way to go before using a condom on every occasion becomes accepted practice for single heterosexuals.

We should, however, take heart from the size of the VRDB group, who represent only 7.3% of the sample. If this is reproduced in other samples it

means that the majority of injecting drug-users are complying with safer drug-use messages, although we should also note the non-representativeness of our sample, which under-represents those whose drug use is casual. The size of the VRSB group—42% of the total sample—is, however, cause for alarm and, should this finding be replicated, should awaken programme developers and educators to an awareness of a serious deficiency in our HIV/AIDS prevention efforts.

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References

- [1] Marsh A, Loxley W. The Australian National AIDS and Injecting Drug Use Study, Perth: differences between 1989 and 1990. Perth: National Centre for Research into the Prevention of Drug Abuse, 1992.
- [2] McKeganey N, Barnard M, Watson H. HIV related risk behaviour among a non-clinic sample of injecting drug users. *Br J Addict* 1989;84:1481-90.
- [3] Wiebel WW, Lampinen TM. Primary prevention of HIV-1 infection among intravenous drug users. *J Prim Prev* 1991;12:35-48.
- [4] Donoghoe MC, Stimson GV, Dolan KA. Sexual behaviour of injecting drug users and associated risks of HIV infection for non-injecting sexual partners. *AIDS Care* 1989;1:51-8.
- [5] Wodak A. Preventing HIV spread among injecting drug users. *Lancet* 1991;337:482.
- [6] McDonald C, Loxley W, Marsh A. A bridge too far? Injecting drug users' sexual behaviour. *AIDS Care* 1994 (in press).
- [7] Adlaf EM, Smart RG. Risk taking and drug use behaviour: an examination. *Drug Alcohol Depend* 1983;11:287-96.
- [8] Sorensen JL, Heitzmann C, Guydish J. Community psychology, drug use and AIDS. *J Comm Psychol* 1990;18:347-53.
- [9] Loxley W, McDonald C, Marsh A. The Australian National AIDS and Injecting Drug Use Study: Perth, 1990. Perth: National Centre for Research into the Prevention of Drug Abuse, 1992.
- [10] Moore SM, Rosenthal DA. Condoms, coitus, caution, change and college students: responses to AIDS. *J Adolesc* 1991;14:211-27.

- [11] Darke S, Hall W, Heather N, Ward J, Wodak A. The reliability and validity of a scale to measure HIV risk taking behaviour among intravenous drug users. *AIDS* 1991;5:181-5
- [12] Kippax S. AIDS and ostriches; the heterosexual response to HIV. University of WA. 62nd Annual Summer School, 15-26 Jan 1990. *One World-One Future*.
- [13] National Evaluation Steering Committee. Report of the evaluation of the National HIV/AIDS Strategy. Canberra: Commonwealth of Australia, 1993.
- [14] Leigh BC. Alcohol and unsafe sex: an overview of research and theory. In: *Alcohol, Immunomodulation and AIDS*. New York: Alan R. Liss, Inc, 1990.
- [15] Stallard A, Heather N. Relapse prevention and AIDS among intravenous drug users. In: Gossop M. (ed.) *Relapse and addictive behaviour*. London: Tavistock/Routledge, 1989.
- [16] Darke S. Injecting drug users and the Human Immunodeficiency Virus: what do we know? *Drug Alcohol Rev* 1992;11:153-62.