HIV-RISK BEHAVIOUR AMONG NON-HEROIN USING COCAINE INJECTORS AND NON-INJECTORS IN SÃO PAULO, BRAZIL

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ABSTRACT

The aim of this study was to investigate HIV-risk behaviour among cocaine users in relation to preferred route of administration and to relate this to reported HIV serostatus. Two hundred and ninety-four patients were interviewed in 15 different services that offer treatment, assistance or counselling to drug users and/or HIV positive patients using a structured questionnaire that had been developed and piloted in Brazil. At the time of interview lifetime use of snorted cocaine was 94%, of smoked crack 82% and of injected cocaine 32%. Twenty-eight percent described themselves as HIV positive, 32% as negative and 40% were unaware of their status. Non-injectors tended to be younger, had used fewer substances, had spent less time using cocaine, were less likely to have had sex with other drug users or to have been tested for HIV. Non-injectors had high levels of contact with injectors. Those reporting a positive HIV result were older, had used more classes of drugs, had used cocaine for longer and were more likely to have injected and participated in at-risk behaviours. The findings are discussed in terms of policy changes that may be necessary to reduce the high level of risk behaviour among Brazilian cocaine users.

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INTRODUCTION

Latin America was placed third in the UNAIDS international league table of world regions in terms of the number of adults and children living with HIV/AIDS (UNAIDS, 1998). In Brazil, the first case of AIDS was reported in São Paulo in 1980. Since then over 135 000 cases have been notified to the Ministry of Health (Ministério da Saúde, 1998), although the Ministry works on an assumption of up to 30% under-notification in some regions. Like many Western countries, the Brazilian AIDS epidemic began in the homosexual community, but by 1991 intravenous drug use had become the principal risk factor among notified cases. Since 1993 heterosexual transmission has taken the lead and the male to female ratio has plummeted - currently standing at 2.4:1.

Several Brazilian studies have specifically investigated HIV seroprevalence and its relation to risk behaviour among intravenous drug users (IDUs) (WHO Collaborative Study Group, 1993; Lima *et al*, 1994; de Carvalho *et al*, 1996) and a multi-site study is nearing completion (Mesquita, 1997). No Brazilian study has yet looked at risk behaviour among samples of drug users that include non-injectors. In other countries too, research into HIV-risk behaviour among cocaine users tends to be with either injectors (Battjes *et al*, 1988; Samuels *et al*, 1992; Gossop *et al*, 1993) or crack smokers (Chiassson *et al*, 1991; Weatherby *et al*, 1992; Edlin *et al*, 1994). An additional problem with studying cocaine users in countries with a high prevalence of heroin use, such as the USA and most of western Europe, is that many cocaine users also use heroin (Weatherby *et al*, 1992; Gossop *et al*, 1994; Barrio *et al*, 1998). Consequently, it can be difficult to disentangle the behaviours associated with heroin use from

those of cocaine use. Among treatment-seeking, Brazilian drug users, the most frequently cited drugs of choice are cocaine and crack (Dunn *et al*, 1996) and cocaine is the principal drug of injection (Lima *et al*, 1992). Heroin has a very limited availability in Brazil, although sporadic case reports have reached the national literature (Laranjeira *et al*, 1997).

The objective of this study was to examine HIV-risk behaviour among cocaine users in relation to their preferred route of administration and to see how risk behaviour related to reported HIV status – however, this was not an HIV prevalence study.

METHODS

The methods used in this study have been described in detail elsewhere (Dunn & Laranjeira, 1999a), therefore the following account summarises the main points.

Setting

A cross-sectional design was used with patients interviewed between January 1996 and October 1997. They came from 15 different settings offering treatment, counselling or assistance to drug users and/or HIV-positive patients.

Procedures

Patients were included in the study if they admitted to having used cocaine or crack more than once in their lives. Interviews were conducted by three researchers, the majority (n=262, 89%) by the first author (J.D.) and the rest by a psychiatrist and a psychologist with clinical experience in the drug misuse field. Subjects gave verbal consent to maintain anonymity and were guaranteed that all information would be treated confidentially. The project was approved by the local ethics committee.

A structured interview schedule in Portuguese had been especially designed for use in this study and had been extensively piloted beforehand. The interview consists of 245

questions covering sociodemographic details, drug history and HIV-risk behaviour. The interviewer fills in the questionnaire, so patient literacy is not a prerequisite.

HIV testing was not carried out but results of previous tests were recorded and where possible checked in the case notes. Patients who had never had a test, or who were still awaiting the result were classified as being of unknown status.

Subjects

Only six patients refused to participate, claiming pressure of time and a further three had to be excluded as they were too heavily sedated. Two hundred and ninety-four patients were interviewed, 90% (n = 265) were men. The mean age at interview was 27.1 years (S.D.= 7.8 yr., range = 10 – 49 yr.). Sixty-two percent (n= 183) were single, 24% (n = 71) married or co-habiting and 14% (n = 40) separated, widowed or divorced. Thirty-seven percent (n = 105) were working and 46% (n = 135) unemployed. Sixty-one percent (n = 180) had gone only to primary school, 28% (n = 81) to secondary school and 10% (n = 30) to university. Monthly legitimate income was calculated in terms of the number of minimum wages (R$114 approximately U$114) earned in the last month. Thirty-four percent (n = 101) of interviewees earned less than one minimum wage per month, 27% (n = 78) between 1 and 3 minimum wages, 19% (n = 54) between 3 and 5 and 21% (n = 61) more than 5. Sixty-six percent (n = 193) said that they had had an HIV test, with 28% (n = 83) describing themselves as HIV positive, 32% (n = 95) as negative and 40% of unknown status (101 never tested, 14 tested but awaiting result and 1 tested but never collected result).

Statistical Analysis

A data bank was created using SPSS (Statistical Package for Social Scientists) for Windows, version 6.0.1. To compare normally distributed variables with equal variances the Student t-test, 95% confidence intervals and one way analysis of variance were used.

Parametric but skewed data were transformed, for example, *duration of cocaine use* underwent a square root transformation. Transformed data were then analysed using parametric tests. To compare the relative frequency of categorical variables the X^2 test was used.

RESULTS

Drug Misuse History

Eighty-seven percent of patients (n = 255) were current or ex-smokers and 88% (n = 258) were current or ex-drinkers. Lifetime use of cannabis was 96% (n = 283), solvents 54% (n = 160), tranquillisers 51% (n = 150), anticholinergics 30% (n = 88), amphetamines 24% (n = 69) and opiate just 3% (n = 10). Only 3 patients had ever used heroin and only 2 had bought it in Brazil, but none was using it at the time of interview. Polydrug misuse was the norm with patients having experimented with a mean of 4.7 different classes of drugs in addition to cocaine. Cocaine use began at a mean age of 18.9 years and the initial route of administration had been by snorting in 87% (n = 255), smoking 7% (n = 21) and injecting 6% (n = 18). However, experimentation with other routes was common, such that at interview lifetime use of snorted cocaine was 94%, of crack smoking 82% and of injected cocaine 32%, whilst a full transition in the route of administration was reported by 74%. The median duration of cocaine use was 6.3 years.

Differences in demographic and drug use histories between non-injectors and injectors are shown in Table 1. The major differences were that non-injectors tended to be young and single, to have used fewer drug classes, to have used cocaine for less time and to be unaware of their HIV status.

TABLE 1

Injecting History

Lifetime use of injectable drugs was reported by 32% (n = 95) of patients. On the first occasion that a drug had been injected, 81% had used cocaine, 6% amphetamine and 13% other substances, usually illicitly obtained pharmaceutical agents. On this first occasion, it was more common for a colleague to inject the substance (62%) than the patient him- or herself (38%). Twenty-two percent of injectors (n = 21) only experimented with this route once or twice before reverting to another route of administration, but 78% (n = 74) became regular injectors. Thirty-one percent of patients who had ever injected had also taught someone else to inject - the median number taught was two.

Most injectors bought their syringes themselves (92%), with pharmacies being the most frequent source (95%). Thirty-four percent said that they had been refused sale of a syringe on at least one occasion. The commonest reasons given for refusal were that the pharmacist did not sell syringes to "drug addicts" or that they had "run out".

Injectors were asked to estimate the number of injections they performed on days when their cocaine use was heavier. The median number of injections was 15 (range 1 to 50). The same needle was used a median of four times before it became blocked or blunted, consequently most injectors got through more than one syringe a day (80%). The most usual form of disposal of syringes was simply to throw them in the dustbin (80%), on waste ground (8%) or even down the toilet (3%).

Sharing of injecting equipment was extremely common and spoons (used for "cooking up" cocaine) and rinse-water were shared even more frequently than syringes. A lower threshold for sharing works other than syringes was apparent, such that 56% of regular cocaine injectors who had not habitually shared syringes had shared rinse water and 55% had shared spoons. Attempts were usually made to clean syringes before use but ineffective

disinfecting agents were generally employed. The frequency and range of these behaviours are summarised in Table 2.

TABLE 2

Proximity of non-injectors to injectors

Eighty-one percent of non-injectors were personally acquainted with an IDU or had been at some stage in their lives. Sixty-five percent had been present when someone else had injected and 14% had even assisted, for example gripping the person's arm to make the veins stand out. Forty-four percent of non-injectors had been offered an injection by another drug user. Thirty-eight percent of non-injectors cited fear of AIDS as the principal reason for never having taken up injecting, whilst 31% said they were afraid of needles.

HIV Risk Network and Sexual Behaviour

Forty-eight percent (n = 140) of patients had a current sexual partner, of whom 15% were also cocaine users, 12% HIV positive and 3% IDUs. However, an even greater proportion reported having had sexual relations with a previous partner who had belonged to one of these categories: 51% with a cocaine user, 20% with an IDU and 19% with a person known to be HIV positive. Women were more likely to report having had sexual relations with another cocaine user (X^2 = 6.6, p = 0.01), an intravenous drug user (X^2 = 7.7, p = 0.006) and a person known to be HIV positive (X^2 = 11.1, p = 0.001). Injectors were also more likely to report having had sexual contact with people belonging to one of these three groups (Table 3). Only one patient reported having children who were positive but 20% (n = 60) had other first- or second-degree relatives who were positive. The majority of patients were acquainted with another drug user with HIV (81%, n = 237) and 74% (n = 218) knew someone who had died with AIDS.

Differences were apparent between injectors and non-injectors in terms of sexual-risk behaviour, in particular non-injectors were less likely to use condoms with their fixed partners or to have had sex with a prostitute (Table 3).

TABLE 3

Risk Behaviour and Reported HIV Status

Reporting a positive HIV test was strongly associated with a lifetime history of injectable drug use, having borrowed a used syringe, and having habitually shared syringes with others. However, patients with a positive result were less likely to report having had sex in the last 6 months and said that they tended to use condoms with their fixed partners but not with casual partners (Table 4).

Overall the proportion of men who had had sex with a prostitute was high (62%) and most had done so on more than one occasion (81%). HIV positive patients were more likely to report having had sex with a prostitute and not to have used a condom when they did so. Transactions in which sex was exchanged for drugs or money to buy drugs were not uncommon (13%) and were more frequently reported by women than men (24% vs. 12%) as well as by patients who were HIV positive. Of the thirty-two men who had had sex for money or drugs, 17 had done so with a woman and 25 with another man, even though the majority identified themselves as heterosexual. Sex for drugs/money transactions were not associated with ever having used crack (X^2 = 3.4, p>0.06) or with having used crack during peak usage (X^2 = 4.9, p = 0.09).

TABLE 4

DISCUSSION

In this study the majority of cocaine injectors reported lifetime sharing of injecting equipment and a lower threshold for sharing spoons and rinse water. In the WHO

Collaborative Study Group (1993) of HIV prevalence among drug injectors, which included the Brazilian cities of Rio de Janeiro and Santos, sharing of injecting equipment in the last 6 months was reported by 39% of Brazilian subjects and lending by 40%. The high level of injecting-risk behaviour and the lack of a comprehensive needle-exchange programme are reflected in the prevalence of HIV and other infectious agents among Brazilian IDUs: HIV 28 to 71% (WHO Collaborative Study Group, 1993; de Carvalho *et al*, 1996; Mesquita, 1997), hepatitis B 40 to 75% (Barata *et al*, 1993; de Carvalho *et al*, 1996) and hepatitis C 75% (de Carvalho *et al*, 1996). The greater willingness of the cocaine injectors to share rinse water and spoons has also been observed among IDUs in London (Gossop *et* al, 1997). This phenomenon may explain why hepatitis C is often found to be more prevalent than HIV among IDUs, since it is more readily transmissible (Bodsworth *et al*, 1994). It may also indicate that campaigns have focused too much on the sharing of needles and syringes and not enough on the sharing of other injecting paraphernalia (Gossop *et al*, 1997).

Cocaine has a short half-life and the median number of injections reported on "heavy" days was 15, with patients saying that the needle had to be replaced after about four applications. This frequency of injecting is much higher than that seen with heroin (Des Jarlais & Friedman, 1990; Dunn & Laranjeira, 1999b). Even if one accepts a more conservative estimate of the number of injections per day, 10 for example, a cocaine user injecting 6 days per week, using a new syringe with each application, would spend over R$100.00 (US$76) per month just on syringes. This amount is slightly less than the minimum wage and greater than the monthly income of one third of our sample; it would also buy about 10g of cocaine. In Brazil syringes are sold "freely" in pharmacies, although as this study reveals one third of injectors had been refused sale, often simply because they were perceived as being "drug addicts". Furthermore, many high-street pharmacies do not sell syringes after 6 or 8pm. These findings could be used to support the argument that freely available injecting

equipment be provided by needle-exchanges. However, only as late as 1997 were exchanges legally sanctioned in the State of São Paulo.

The majority of the sample had never injected but the level of contact between cocaine smokers/snorters and injectors was high. Most non-injectors were personally acquainted with an injector and had witnessed drugs being injected; many had been offered an injection and some had even helped someone else inject. This suggests that cocaine injectors do not form a closed social network but interact with cocaine users who prefer other routes of administration. This is a worrying finding as research suggests that one of the factors associated with non-injectors taking up injection is having injectors in the one's social network (Des Jarlais, *et al*, 1992). That therapeutic interventions should be directed not only to the drug misusing individual but also to that individual's social network is an area that is being increasingly discussed (Orford, 1999)

Thirteen percent of the sample admitted to sex for money/drugs transactions, although commoner among women, 12% of men also reported them. The figure for men is much higher than that reported for male drug users in other countries, for example, 1.3% among US drug injectors (Friedman *et al*, 1998), 6% among UK heroin users (Gossop *et al*, 1993) and 5.7% among US crack smokers (Edlin *et al*, 1994). Most of the men had had sex with another man, even though the majority considered themselves to be heterosexual. Studies of non-gay identified men who have sex with other men, show that they have higher levels of sexual-risk behaviour than self-identified gay men (Bloor, 1995). Our patients implied that these transactions were often opportunistic rather than planned, which may account for the fact that nearly two-thirds had not used a condom. Hays *et al* (1997) used multivariate analyses to investigate predictors of unprotected intercourse among 364 HIV-positive, HIV-negative and untested gay and bisexual men and found that impulsivity, substance use, sexual enjoyment and communication problems were the strongest predictors. Darke *et* al (1995), studying

amphetamine users in Sydney Australia, found that the number of sexual partners in the last six months was independently associated with both having had paid sex in that period and higher levels of polydrug use - further illustrating the interrelationship between pattern of drug use and sexual behaviour. Innovative outreach work directed at drug users in the locations where high-risk sexual activity is likely to be initiated, such as in the areas surrounding drug markets, needs to be developed.

The main limitation of this study is that although patients were interviewed in diverse settings, the sample is essentially a convenience sample, therefore, the results cannot be generalised to the whole population of cocaine users. One might expect that cocaine users from non-treatment settings would be less involved with drugs and have lower levels of risk behaviour. However, Carroll and Rounsaville (1992) found that treatment-seeking and community-recruited cocaine users were comparable in terms of both severity of cocaine use and the prevalence of psychiatric disorders and that it was the non-treatment sample that showed the highest levels of polysubstance misuse and criminal involvement.

Recall bias may have affected our patients as they were being asked to remember events that had taken place several months or even years ago. To improve recall, subjects were interviewed in private in an unhurried manner and significant life events used as memory prompts. Patients were excluded if they appeared to be under the influence of drugs or medication. Despite these precautions, it is possible that events were not always remembered with complete accuracy, although research suggests that drug users generally give truthful and accurate information in terms of their past and current drug use and risk behaviours (Morrison *et al*, 1995; Friedman *et al*, 1995; Menoyo *et al*, 1998). Social desirability may have influenced the responses of patients to questions concerning activities with moral overtones (Latkin & Vlahov, 1998), such as sex with prostitutes. However, the proportion of patients responding in the affirmative was often much higher than anticipated. The reliability of using

reported HIV status can be questioned (Menoyo *et al*, 1998), indeed there is evidence that HIV positive drug users may conceal their serological status (Latkin & Vlahov, 1998). Tests results were verified where possible but even so some patients could have seroconverted since last tested.

This study gives an indication of the prevalence of HIV-risk behaviour among treatment-seeking cocaine users who do not use heroin and allows for comparison of levels of risk behaviour between injectors and non-injectors. The main implications of this study are that more direct interventions with cocaine users are needed to try to reduce the high levels of both injecting and sexual risk behaviour. Now that the State Legislature has legalised needle-exchanges, it is to be hoped that governmental and non-governmental agencies will greatly increase the availability of free needles and syringes. Something also needs to be done to try to address the discrimination and obstacles that many drug users face when trying to legally purchase syringes from high-street pharmacies. The Brazilian HIV campaigns are already focusing on sexual transmission, particularly among heterosexual couples. However, outreach work needs to be done to try to increase condom availability and use among cocaine users in all their sexual relations, be they with regular partners, casual partners or opportunistic sex for money/drugs transactions.

REFERENCES

BARATA, L.C.B., ANDRIGUETTI, M.T.M. & DE MATOS, M.R.(1993) Surto de malária induzida entre usuários de drogas injetáveis [Outbreak of induced malaria among intravenous drug users], R*evista de Saúde Pública*, 27, pp. 9-14.

BARRIO, G., DE LA FUENTE, L., ROYUELA, L, DÍAZ, A, RODRÍGUEZ-ARTALEJO, F. & THE SPANSIH GROUP FOR THE STUDY ON THE ROUTE OF ADMINISTRATION OF DRUGS (1998) Cocaine use among heroin users in Spain: the diffusion of crack and cocaine smoking *Journal of Epidemiology and Community Health*, 52, pp172-180.

BATTJES, R.J., LEUKEFELD, C.G., PICKENS, R.W. & HAVERKOS, H.W. (1988) The acquired immunodeficiency syndrome and intravenous drug abuse *Bulletin on Narcotics*, 40, pp. 21-34

BLOOR, M. (1995) *The Sociology of HIV Transmission* (London, SAGE Publications).

BODSWORTH, N.J., ROBERTSON, M. & KALDOR, J. (1994) Transmission of hepatitis C virus but not HIV type 1 following sharing of cleaned injecting equipment *Genitourinary Medicine*, 70, pp. 206-207.

CARROLL, K.M. & ROUNSAVILLE, B.J. (1992) Contrast of treatment-seeking and untreated cocaine abusers, *Archives of General Psychiatry*, 49, pp. 464-471.

CARVALHO, H. B., MESQUITA, F., MASSAD, E., BUENO, R.C., LOPES, G.T., RUIZ, M.A. & BURATTINI, M.N. (1996) HIV and infections of similar transmission patterns in a drug injectors community of Santos, Brazil, *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*, 12, pp. 84-92.

CHIASSON, M.A., STONEBURNER, R.L., HILDEBRANDT, D.S., EWING, W.E., TELZAK, E.E. & JAFFE, H.W. (1991) Heterosexual transmission of HIV-1

associated with the use of smokable freebase cocaine (crack), *AIDS*, 5, pp. 1121-1126.

DARKE, S., ROSS, J., COHEN, J., HANDO, J. & HALL, W. (1995) Injecting and sexual risk-taking behaviour among regular amphetamine users, *AIDS Care*, 7, pp. 19-26.

DES JARLAIS, D.C. & FRIEDMAN, S.R. (1990) The epidemic of HIV infection among injecting drug users in New York City: the first decade and possible future directions. In: Strang, J & Stimson, G (Ed.) *AIDS and Drug Misuse*, London: Routledge, pp. 86-94.

DES JARLAIS, D.C., CASRIEL, C., FRIEDMAN, S.R., ROSENBLUM, A. (1992) AIDS and the transition to illicit drug injection – results from a randomized trial prevention program, *British Journal of Addiction*, 87, pp. 493-498.

DUNN, J. & lARANJEIRA, R. (1999a) Transitions in the route of cocaine administration - characteristics, direction and associated variables, *Addiction*, 94, pp. 813-824.

DUNN, J. & LARANJEIRA, R. (1999b) Cocaine - profiles, drug histories and patterns of use of patients from Brazil, *Substance Use & Misuse*, 34, pp. 1527-1548.

DUNN, J., LARANJEIRA, R., DA SILVEIRA, D.X., FORMIGONI, M.L.O.S., FERRI, C.P. (1996) Crack cocaine: an increase in use among patients attending clinics in São Paulo 1990-1993, *Substance Use & Misuse*, 31, pp. 519-527.

EDLIN, B.R., IRWIN, K.L., FARUQUE, S AND THE MULTICENTER CRACK COCAINE AND HIV INFECTION STUDY TEAM (1994) Intersecting epidemics – crack cocaine use and HIV infection among inner-city young adults, *New England Journal of Medicine*, 331, pp. 1422-1427.

FRIEDMAN, S.R., NEAIGUS, A., JOSE, B., ILDEFONSO, G. & CURTIS, R. (1995) Self-reports of HIV risk behavior by injecting drug users: are they reliable? *Addiction*, 90, pp. 1097-1104.

GOSSOP, M., GRIFFITHS, P., POWIS, B. & STRANG, J. (1993) Severity of heroin dependence and HIV risk - 1: sexual behaviour. *AIDS Care*, 5, pp149-157.

GOSSOP, M., GRIFFITHS, P. POWIS, B. & STRANG, J. (1994) Cocaine: patterns of use, route of administration and severity of dependence *British Journal of Psychiatry*, 164, pp. 660-664.

GOSSOP, M., GRIFFITHS, P., POWIS, B., WILLIAMSON, S., FOUNTAIN, J. & STRANG, J. (1997) Continuing drug risk behaviour: shared use of injecting paraphernalia among London heroin injectors, *AIDS Care*, 9, pp. 651-660.

HAYS, R.B., PAUL, J. EKSTRAND, M., KEGELES, S.M., STALL, R. & COATES, T.J. (1997) Actual versus perceived HIV status, sexual behaviors and predictors of unprotected sex among young gay and bisexual men who identify as HIV-negative, HIV-positive and untested, *AIDS*, 11, pp. 1495-1502.

LARANJEIRA, R., RATTO, L. & DUNN, J. (1997) Heroína: a próxima epidemia de drogas no Brasil? [Heroin: the next drug epidemic in Brazil?], *Jornal Brasileiro de Psiquiatria*, 46, pp 5-7.

LARKIN, C.A. & VLAHOV, D. (1998) Socially desirable response tendency as a correlate of accuracy of self-reported HIV serostatus for HIV seropositive injection drug users, *Addiction*, 93, 1191-1197.

LIMA, E.S., BASTOS, F.I., TELLES, P.R. & WARD, T.P. (1992) Injecting drug users and the spread of HIV in Brazil, *AIDS and Public Policy Journal*, 7, pp. 170-174.

LIMA, E.S., FRIEDMAN, S.R., BASTOS, F.I., TELLES, P.R., FRIEDMAN, P., WARD, T.P, & DES JARLAIS, D.C. (1994) Risk factors for HIV-1 seroprevalence among drug injectors in the cocaine-using environment of Rio de Janeiro, *Addiction*, 89, pp. 689-698

MESQUITA, F. (1997) Projeto Brasil, *Encarte do Boletim Epidemiológico – AIDS – Ano IX*, No. 6, pp. 3-4.

MENOYO, C., LAMIKIZ, E., ZULAIKA, D. URCELAI, A., ZUBIA, I., PANCORBO, M.M. (1998) The validation of statements by IDUs based on the analysis of blood traces on their used syringes, *AIDS Care*, 10, pp. 409-414.

MINISTÉRIO DA SAÚDE (1998) *Boletim Epidemiológico – AIDS – Ano XI*, No. 2.

MORRISON, C.S., MCCUSKER, J., STODDARD, A.M. & BIGELOW, C. (1995) The validity of behavioral data reported by injecting drug users on a clinical risk assessment, *International Journal of the Addictions*, 30, pp. 889-899.

UNAIDS (1998) *AIDS epidemic update: December 1998* (http://www.unaids.org/)

ORFORD, J. (1999) Future research directions: a commentary on Project MATCH, *Addiction*, 94, pp62-66.

WEATHERBY, N.L., SHULTZ, J.M., CHITWOOD, D.D., MCCOY, H.V., MCCOY, C.B., LUDWIG, D.D. & EDLIN, B.R. (1992) Crack cocaine use and sexual activity in Miami, Florida, *Journal of Psychoactive Drugs*, 24, pp. 373-380.

WHO COLLABORATIVE STUDY GROUP (1993) An international comparative study of HIV prevalence and risk behaviour among drug injectors in 13 cities, *Bulletin on Narcotics*, 50, pp. 19-46.

Table 1. *Differences in sociodemographic characteristics and drug history between cocaine injectors and non-injectors (n = 294).*

Characteristic	Injectors n=95 (%)	Non-injectors n=199 (%)	Test statistic
Sex:			
Male	91	90	X^2=0.2, d.f=1
Female	9	10	p=0.88
Mean age – years (SD)	32.1 (6.6)	24.8 (7.2)	t=8.3, p<0.0001
Civil status:			
Single	45	70	X^2=22.2, d.f.=2
Married/Co-habiting	29	22	p<0.0001
Sep./Wid./Div.	25	8	
Employment Status			
Employed	32	38	X^2=1.1, d.f.=1
Unemployed	68	62	p=0.31
No. drug classes used: mean (SD)	6.2 (1.8)	4.3 (1.8)	t=8.2,p<0.0001
Duration of cocaine use: mean (SD)$yr^{½}$*	3.3 (0.90)	2.3 (0.84)	t=9.6,p<0.0001
Ever abstinent from cocaine†	94	80	X^2=9.3, d.f=1 p<0.002
HIV status:			
positive	65	11	X^2=98.3, d.f.=2
negative	22	37	p<0.0001
unknown	13	52	

* Duration of use underwent a square-root transformation prior to analysis due to data being skewed.

† Ever abstinent from cocaine defined as having spent one month or more without using, following a voluntary decision to stop i.e. not including enforced abstinence due to incarceration.

Table 2. *Injecting behaviour in relation to sharing and cleaning of equipment among cocaine users (n = 95)*

Behaviour	Percentage	Number
Ever borrowed a syringe	68	65
Ever lent a syringe	64	61
Injected:		
always alone	14	10
usually alone	24	18
usually accompanied	20	15
always accompanied	42	31
Number of people present when injecting: median (max.)	-	4 (20)
Usually shared syringes	73	54
Sharing partners:		
sexual partner	37	20
friend	96	52
acquaintance	78	42
stranger	37	20
Usually washed syringe	82	75
Washed syringe with:		
cold tap water	71	53
hot/boiling water	12	9
alcohol	7	5
distilled water	8	6
bleach	3	2
Shared spoons	78	68
Shared rinse water	82	66
Injected in:		
City of São Paulo	67	64
Other cities in State	69	66
Other States	26	25
Other Countries	5	5

Table 3. *Differences in sexual-risk behaviour between injectors and non-injectors (n = 294)*

Behaviour	Injectors n=95 (%)	Non-injectors n=199 (%)	Test statistic
Sexual relationship ever with:			
cocaine user	70	41	X^2=21.0, d.f.=1 p<0.0001
drug injector	52	5	X^2=87.6, d.f.=1 p<0.0001
HIV+ person	40	8	X^2=43.9, d.f.=1 p<0.0001
No. sexual partner last 6 months:			
0 – 1	71	65	X^2=0.9, d.f.=1
2 or more	29	35	p=0.33
Condom use with fixed partner(s) last 6 months[1]:			
never/sometimes	56	71	X^2=4.1, d.f.=1
usually/always	44	29	p=0.04
Condom use with casual partner(s) last 6 months[2]:			
never/sometimes	31	39	X^2=0.6, d.f.=1
usually/always	69	61	p=0.43
Lifetime sex for drug/money transaction	17	12	X^2=1.6, d.f.=1 p=0.21
Lifetime sex with prostitute	81	52	X^2=20.4, d.f.=1 p<0.0001

[1] number with fixed partners = 191 (52 injectors and 139 non-injectors), [2] number who had had casual partners = 100 (29 injectors and 71 non-injectors).

Table 4. *Injecting and sexual risk behaviour of cocaine users in relation to reported HIV status (n = 294)*

Behaviour	HIV positive n=83 (%)	HIV negative n=95 (%)	Unknown status n=116 (%)	Test statistic
Ever injected	75	22	10	X^2=98.3, d.f.=2 p<0.0001
Ever borrowed used syringe	65	10	3	X^2=124.9, d.f.=2 p<0.0001
Ever lent used syringe	59	6	5	X^2=103.1, d.f.=2 p<0.0001
Sex in last 6 months	61	83	90	X^2=24.8, d.f=2 p<0.0001
No. partners last 6 months:				
0 – 1	71	64	64	X^2=7.5, d.f.=4
2 – 3	11	23	26	p=0.11
4 – 5+	16	13	10	
Omitted to use condom in last 6 months[1]	57	73	72	X^2=4.7, d.f=2 p=0.94
Frequency of condom use with fixed partner last 6 months[2]:				
never/sometimes	49	77	67	X^2=8.4, d.f.=2
usually/always	51	23	33	p<0.02
Frequency of condom use with casual partners last 6 months[3]:				
never/sometimes	35	29	44	X^2=1.8, d.f.=2
usually/ always	65	71	56	p=0.4
Lifetime sex for money/ drugs transaction	21	16	6	X^2=9.6, d.f.=2 p=0.008
Condom use during sex for money/drugs transactions[4]:				
never/sometimes	75	47	57	X^2=2.6, d.f.=2
usually/always	25	53	43	p=0.27
Lifetime sex with prostitute*	85	59	49	X^2=23.0, d.f.=2 p<0.0001
Condom use during sex with prostitutes[5]:	68	33	30	X^2=20.2, d.f=2
never/sometimes	32	67	70	p<0.0005
usually/always				

[1]n = 234, [2]n = 190, [3]n = 99, [4]n = 39, [5]n = 162, *this question only asked of male patients (n=266)