HIV Risk Behavior in Female Injecting Drug Users in Madrid, Spain

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Abstract

A cross-sectional study was performed to explore the behaviour of female intravenous drug users (IDUs) in Madrid, Spain, to determine the relationships between behaviour and a number of dependent variables. We considered:

1. Sociodemographic characteristics
   Drug-taking behaviour, sexual behavior (including prostitution), reproductive health, and utilisation of services targeted at female IDUs.

2. Direct and indirect determinants of HIV in the study population

3. Determinants of potential risk factors for HIV

4. Attitudes among women towards safer sexual practices

5. The effects of different kinds of drug treatment on risk behavior

The limitations inherent in a cross-sectional study design, such as the time sequence of events, were addressed appropriately in the questionnaire. Because of the potential for selection bias, we implemented sampling techniques (such as sampling from multiple sites) to correct for this. Finally, in order to explore at different stages how the different variables might have a direct and indirect effect on the dependent variables and how the effect may be mediated through other variables in the causal pathway, we built a number of hierarchical models.

The foremost conclusion that can be drawn is the significance of low socioeconomic status. Furthermore, the high-risk population is homogenous and represents an already marginalised population. The result of regression analysis showed the most important and most predictive variable (OR=12.2) to be having a regular partner who is HIV-positive. Other significant factors were: age 35 or over; no fixed address; history of sharing needles; and co-infection with an STD. Early age of first pregnancy (younger than 18) was a direct determinant of prostitution and needle sharing. We also detected a link between sexual risk behaviour and drug-taking risk behaviour. The public health implications of these findings seems obvious. Women have a range of special needs, including reproductive needs. Efforts directed towards peer education for men and women are likely to be successful since the person delivering the intervention is someone the target population can identify with.

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Chapter One

Background Information, the HIV/AIDS Epidemic, and Literature Review

1. Introduction

The relation of gender to health, gender to drugs and gender to human immunodeficiency virus (HIV) infection is an issue that probably depends greatly on the way society is organised. Although organisational structure may differ widely between countries, it is likely that many societies are characterised by major inequalities for women. Given this assumption, the principal objective of this study is to examine risk behaviour in female intravenous drug users (IDUs). The current chapter introduces some of the concepts pertinent to the thesis. Section Two describes some background information that led to the implementation of this study. Section Three presents data regarding the HIV and auto-immune deficiency syndrome (AIDS) epidemic and drug use in both Europe and Spain. Section Four reviews the literature on gender-specific risk factors associated with HIV/AIDS and IDU.

Women make up an increasing proportion of persons infected with HIV and AIDS. In some African countries, men and women have been infected in approximately equal numbers since the beginning of the epidemic. In North America and Europe, however, women originally made up a small fraction of those infected, but the female-male ratio has shown an ever increasing trend in recent years. In industrialised countries women now comprise the fastest growing group of persons infected with HIV and AIDS; a situation that has multiple repercussions including, for example, transmission to unborn children.

The main reason for the increase in heterosexual transmission of HIV among women is that they are more vulnerable to HIV than men. This vulnerability is not only linked to a greater anatomical susceptibility to HIV but also to social, cultural, economic and political factors. For example, one of the major risk factors associated with heterosexual HIV infection is the presence of sexually transmitted diseases (STDs). STDs are frequently asymptomatic in women, thus females may not seek treatment as often or in as timely a manner as men. In fact, it is only recently that the scientific community has begun to consider the possibility of gender bias in medicine caused by making incorrect assumptions about similarities between men's and women's health situations and risks or vice versa, about differences where there are none (Ruiz and Verbrugge, 1997). It is proposed that these incorrect assumptions have led to inequalities in knowledge about women's health problems, resulting in inequalities in treatment and prevention of diseases. Other factors also put women at a disadvantage in comparison to men, especially in developing countries, where women may have less access to information and health services, as they are economically dependent on men and they have little power in their sexual relationships with men.

The continuous increase in the number of cases of HIV and AIDS in female injecting drug-users (IDUs) is a worrying feature of the current situation. Moreover, it is thought that most HIV-positive women in western countries have been infected by sharing contaminated injection equipment. Until recently, investigations on drug-dependent women occurred infrequently. Data on men and women were usually merged as though there were no significant differences between

genders. Possibly for this reason, studies have not found gender-specific risks of contracting HIV infection, despite there being important lifestyle differences that make women more likely to engage in risk behaviour than men. Many of these lifestyle differences between men and women stem from the different roles played by men and women. For example, women may lack decision-making power in their sexual relationships. While male drugs users typically resort to drug dealing and robbery to finance their drug habits, it is often assumed that female drug users exchange sex for money or drugs. This risk behaviour could, for example, be one factor in determining women's increased vulnerability to heterosexual transmission. In addition, female IDUs have male sexual partners who are also IDUs, a fact which has great implications for HIV transmission, not only through the possibility of sharing injecting equipment, but also due to a women's unequal power in making decisions about sex.

Despite these problems, it is surprising that studies regarding HIV transmission and control have traditionally paid little attention to women. Many of the problems in HIV control strategies stem from a lack of knowledge about the epidemic in women, the development of fewer prevention measures aimed at this group and a lack of interest in the research about reproductive issues.

The lack of research interest in women has also occurred in the drug addiction field. Despite the central role played by female IDUs in the spread of the epidemic, there is also a relative paucity of research on gender-specific HIV risk behaviours. Gender is a key variable to be taken into account in attempting to understand any behaviour. An understanding to what extent women may differ in their risks from their better-studied male counterparts should enhance our ability to formulate better policies of prevention and control. Most research on IDUs' risk behaviour either has been conducted among male subjects or has been carried out with samples in which the proportion of women were so small that they were not considered as a separate group in the analysis. In general, gender has not been treated as a variable, thus it has been assumed that IDUs' behaviour and risk are gender neutral.

In fact, there are several reasons to think that female IDUs may have a higher possibility of acquiring the HIV infection than male IDUs. Some studies have shown female drug injectors almost never shoot drugs alone and that women almost always share needles when they inject drugs. Most women drug users are strongly influenced by men in their drug behaviours. For example, they often need someone else to inject the drug and this is usually the male who injects his partner after first injecting himself.

The role played by contraceptive methods such as the pill or intrauterine devices in enhancing HIV transmission is controversial. Despite the great impact of issues surrounding contraception on society, it is still unclear whether or not oral contraception might facilitate HIV transmission.

In order to understand women's drug behaviour, it is necessary to take into account certain social, cultural and economic characteristics of today's world. Such factors as job scarcity, social isolation and marginalisation could influence drug abuse, especially among women. Women are more frequently passive and dependent, have lower self-esteem, and may suffer from greater social marginality than male IDUs. Consequently this gender-specific behaviour can only be understood in the social and cultural context in which it takes place.

On the other hand, it has been suggested that patterns of entering into treatment may also differ between men and women, with male subjects predominating in both treatment clinics and research studies. Thus, to date, the possible special needs of women addicts have not been adequately assessed, and treatment programs have, to that extent, been hampered in their efforts to treat women.

Furthermore, a large proportion of prison entrants are IDUs who have committed crimes because of their need to obtain income to buy illegal drugs. The relation between HIV and prisons depends on the proportion of drug users among the prison population, and the prevalence of HIV among IDUs and risk practices among them. A number of risk behaviours for HIV transmission occur in prison including the injection of illicit drugs, unprotected sexual intercourse and tattooing with inadequately disinfected equipment. These factors potentially increase the risk of HIV transmission among women in prison.

In summary, risk factors for HIV infection may differ substantially between men and women, which implies that the epidemiology of HIV in IDUs may be gender-specific. Given the extent of HIV/AIDS, and the fact that there are not, at present, effective vaccines or therapies to fight the disease, there is an urgent need to know specific risk factors in different populations in order to assess and develop appropriate preventive and health education programs.

So far several questions have been posed, but few answered. Further research is particularly needed into the many problems that have not yet been addressed but concern the links between women, drug use and HIV. The present study is part of a European multicentre cross-sectional study on the HIV risk behaviour of IDU women. The purpose of the Spanish study was to answer some of those questions which have great implications on the public health of Spain. In total, 304 female IDUs recruited in Madrid (Spain) were interviewed about their drug use and sexual behaviour, their reproductive and gynaecological history, their experience of preventive interventions and their attitudes toward services (including health, drug dependency and social services). The results of this research, the knowledge of risk behaviour and the evaluation of the use of services are expected to lead to a better understanding of drug-addicted women, their needs and the type of intervention necessary to begin to meet those needs. Such findings could facilitate the design of more appropriate services for women and aid in the control of the HIV epidemic.

2. The HIV/AIDS Epidemic and Drug Use in Europe and Spain

2.1. The HIV/AIDS epidemic

By December 1997, an accumulated total of 11.7 million deaths caused by AIDS cases have been reported globally (UNAIDS and WHO, 1997). In 1997 alone 2.3 million AIDS related deaths were reported (one fifth of the total). This data, however, probably underestimates the true extent of the pandemic. For example, the World Health Organisation (WHO), estimates that there are 30.6 million people world-wide living with HIV/AIDS, of which 12.1 million are women and 1.1 million are children (under age 15). Furthermore it is estimated that there are 16,000 new cases daily. Of course, it should be noted that the grand majority of these cases (more than 90 percent) occur in the developing world.

In the WHO European region, the accumulated number of all notified AIDS cases (i.e., paediatrics, adolescents and adults) up to December 1997 was 204,858. Of the cases notified during 1997, nearly a third (31.6 percent) were diagnosed in Spain. Spain has consistently had the highest reported incidence of AIDS cases in Europe since 1990. Although the AIDS incidence rate among homo/bisexual men appears to be leveling off, it continues to increase among IDUs and heterosexual contact cases (see Table 1.1). However a recent age-period cohort analysis of AIDS in Europe suggested that if you look at the most recent cohorts of homo/bisexual men and IDU you find reduced HIV transmission, yet amongst young heterosexuals the epidemic is still expanding (Houweling, et al. 1998). There has also been a consistent increase in the number of AIDS cases amongst women (Table 1.2).

Up until December 1997, 7,778 cases of AIDS amongst children (i.e., younger than 13 years) had been notified in Europe; 37.6 percent had been transmitted via the maternal-infant route of which 36.9 percent of children were born to IDU mothers (European Centre for Epidemiological Monitoring of AIDS, 1997).

Of the 197,073 cumulative cases of adolescent/adult AIDS cases reported in Europe by December 1997, women account for 17.4 percent, increasing from 8.0 percent in 1985 and 13.0 percent in 1990 (European Centre for Epidemiological Monitoring of AIDS, 1997). Injecting drug use is the principal risk factor in female AIDS cases, with 50.0 percent of female cases notified by December 1997 occurring among IDUs, and 38.5 percent associated with heterosexual contact.

Table 1.1

Notified AIDS cases in Europe for adolescents and adults by year of diagnosis and transmission group reported by 31 December 1997[a], with adjustments for delayed notification

	Homo/bisexual men		IDU		Heterosexual contact	
Year	N	percent	N	percent	N	percent
1991	6808	37.0	7480	40.6	2208	12.0
1992	7349	36.0	8246	40.4	2829	13.8
1993	7415	33.3	9092	40.8	3486	15.7
1994	7721	30.7	10738	42.7	4326	17.2
1995	7203	29.2	10414	42.2	4687	19.0
1996	5747	26.1	9462	43.0	4642	21.1
1997	3598	22.9	6497	41.4	3735	23.8

[a]European Centre for the Epidemiological Monitoring of AIDS, 1997

Table 1.2

Number of notified AIDS cases in Europe for adults and adolescents by year of diagnoses and sex reported by 31 December 1997[a], with adjustments for delayed notification.

Year	No. of cases	Men (%)	Women (%)
1991	18425	83.8	16.2
1992	20438	83.3	16.7
1993	22260	81.5	18.5
1994	25172	81.1	18.9
1995	24681	80.0	20.0
1996	21982	79.1	20.9
1997	15700	78.9	21.1

[a]European Centre for the Epidemiological Monitoring of AIDS, 1997

2.2. The HIV/AIDS epidemic in Spain

In Spain, a total of 48,989 accumulated AIDS cases have been notified up until December 1997, of which 19.0 percent were female adults/adolescents and 845 (or 1.7 percent) were paediatric. The most frequent category of transmission was IDU (64.3 percent), whilst 11.6 percent of cases were due to heterosexual contact and 1.6 percent due to maternal-infant transmission. In 1996 heterosexual transmission increased in importance to be the second most popular category (Centro Nacional de Epidemiologia Registro Nacional del SIDA, 1996). Amongst Spanish IDUs, the rising incidence in AIDS has been associated with specific birth cohorts, with rising incidence rates in the successive generations born during the 1950s, peaking in men born in 1962 and women born in 1964 (Castilla et al., 1997). Subsequent cohorts demonstrate a marked falloff in incidence for both sexes, possibly reflecting a tendency in new generations of drug users to avoid risky drug use practices. However, this decline appears to halt abruptly in men from the 1972 birth cohort onwards, which may reflect a return to risky behaviours among a new generation of drug users.

As in Europe, there has been a progressive increase in the number of AIDS cases amongst women which is illustrated by the decline in the male:female ratio of AIDS cases in Table 1.3. Amongst Spanish women, heterosexual contact accounts for 25.3 percent of transmissions and together with IDU accounts for 89 percent of all transmissions. Furthermore the percent of female cases reportedly resulting from heterosexual contact has increased steadily from 12.0 percent in 1986 to 34.6 percent in 1997. In other words in Spain and Europe, the current state of the AIDS epidemic has been characterised by the increasing proportion of women infected by HIV and AIDS.

Based on the increasing number of cases in female IDUs, it can be foreseen that this will be one of the major problem areas for controlling the spread of AIDS in Europe. Considering that heterosexual and perinatal transmission from female IDUs is also becoming a serious problem, it is evident that there is an urgent need for studies focusing on females in order to provide more appropriate tools to public health authorities and political leaders.

Table 1.3

Accumulated AIDS cases in Spain by men and women and male:female ratio, without adjustment for delayed notification, 1981 to December 1997[a]

Year	Case	Men (%)	Women (%)	Male:female ratio
1981-84	70	92.9	7.1	13.1/1
1985	242	89.7	10.3	8.7/1
1986	731	84.0	16.0	5.3/1
1987	1796	83.3	16.7	5.0/1
1988	4024	82.8	17.2	4.8/1
1989	7117	83.1	16.9	4.9/1
1990	10936	82.8	17.2	4.8/1
1991	15379	82.5	17.5	4.7/1
1992	20303	82.2	17.8	4.6/1
1993	25644	81.9	18.1	4.5/1
1994	32753	81.6	18.4	4.4/1
1995	39496	81.3	18.7	4.3/1
1996	45522	81.1	18.9	4.3/1
1997	48790	81.0	19.0	4.3/1
Total	**49989[b]**	**81.0**	**19.0**	**4.3/1**

[a]Centro Nacional de Epidemiologia Registro Nacional del SIDA, December 31, 1997.

[b]The total number of accumulated cases included 199 cases where year of diagnosis was not known.

2.3. The HIV/AIDS epidemic in IDUs

The prevalence of HIV infection amongst female IDUs is not well documented because little research has been carried out on prevalence and risk factors in female injecting drug users. As data from drug users are not collected or analysed by gender, women are under-represented in most studies. Risk factors for HIV infection differ substantially between men and women, and a rising prevalence of HIV among females is shown in most studies carried out in Europe and United States of America (USA), as can be seen in Table 1.1. It is surprising that few of the investigators discuss this data and that until recently little attention has been paid to this important problem.

Nevertheless, incidence studies also suggest that female IDUs have higher rates of HIV seroconversion than male IDUs (Solomon et al., 1993; Salmaso et al., 1991), whilst evidence available from the international literature also indicates that female IDUs have a higher rate of HIV (Chin, 1991; Hankins, 1989; PHLS, 1991; European Centre for the Epidemiological Monitoring of AIDS, 1992).

2.3.1. Addiction to IDU

As previously mentioned, up until December 1996, 39.3 percent of adolescent/adults notified AIDS cases in Europe were associated with IDU, thus making this the principal cause of transmission in the heterosexual population. In the heterosexual adolescent/adult population, 50.9 percent of accumulated AIDS cases in women (15,496) and 37.3 percent in men (55,325) were associated with IDU (European Centre for the Epidemiological Monitoring of AIDS, 1996). In other words, IDU is the principal risk factor for women with AIDS. The increasing number of AIDS cases in female IDUs is one of the major issues in Europe and, as noted elsewhere, drug addicts constitute the principal source of HIV transmission for heterosexuals (Des Jarlais, 1992).

2.3.2. The prevalence of HIV in IDU populations

It is not possible to provide an exact estimate of the prevalence of HIV infection within the IDU population. The majority of studies have demonstrated that, first, IDUs are not representative of the population *per se* and, secondly, there are geographic variations between and within different countries. It is also important to realise that the estimates of seroprevalence can depend on the type of investigation, the protocol followed in the study and where the sample was collected (i.e., AIDS clinic, drug-addiction treatment centres, on the street, etc.).

In Europe, IDUs account for the largest and an increasing proportion of AIDS cases. The reported prevalence of HIV among IDUs in several western European cities was found to be over 40 percent in the mid-1980s (Robertson et al., 1986; Rezza et al., 1994; Sopelana et al., 1991; Rebagliato et al., 1995). In a report on the HIV prevalence rates among IDUs in European countries from 1985 to 1995, Hamers et al. (1997) noted that decreases in prevalence rates have been observed in several cities, including Madrid (74 percent in 1986 to 59 percent in 1990). However, as these authors warn, declines in HIV prevalence should be interpreted with considerable caution, particularly in high prevalence settings, where this does not necessarily imply a reduction in new infections. Rather, declining prevalence rates may be due to differential loss (through cessation of injecting or death) whereby IDUs who were infected early in the epidemic have not been completely replaced by newly infected IDUs.

2.3.3. HIV prevalence rates in female versus male IDUs

In concordance with the increase in HIV and AIDS cases amongst women, the majority of investigations that have studied female IDUs have found higher levels of seroprevalence when compared to male IDUs, although some of these results have not been statistically significant. For example, in a study undertaken in Baltimore, United States of America (USA), between 1988 and 1989, IDUs were recruited into the study from drug treatment centres, health services and from the street. A quarter (24.1 percent) of the total study population (n=2921) was seropositive, with a seroprevalence rate of 25.9 percent amongst female IDUs versus 23.7 percent of male users (Nelson et al., 1991). Amongst active drug users (within the past year; n=2616), the HIV seropositive rate increased to 25.3 percent, with a non-significant gender difference (27.0 percent amongst women versus 24.9 percent amongst men). It is, however, interesting to note that when the sample was stratified by sexual orientation, there was a statistically significant gender difference (Vlahov et al., 1990). In San Francisco (USA), however, a lower rate of seroprevalence (11.4 percent) was observed in a study of female IDUs (n=403) recruited in the community between 1991 and 1992 (Watters et al., 1994b).

Some European studies have also observed a higher rate of seroprevalence in female IDUs. A multicentre study in Italy in 1987, found a global seroprevalence rate of 33.2 percent amongst IDUs that were attending public centres for drug dependency. In this sample of 14,363 IDUs there was a statistically significant difference in the rates of HIV infection between female and male IDUs (40.3 percent versus 36.5 percent respectively) (Sasse et al., 1989). In a study in the following year, a North-South geographical variation was demonstrated with regards to the prevalence of HIV amongst IDUs (47.0 percent of respondents in the north Italy were HIV positive compared to 19.0 percent in the south). This gradient is probably due to the fact that the AIDS epidemic started in northern Italy. This study identified no gender differences: the rate of seroprevalence among 1,348 IDUs was 38.0 percent for women and 37.9 percent for men (Salmaso et al., 1991).

In London, Stimson et al. (1996) reported a reduction in HIV-1 prevalence rates amongst IDUs recruited from multiple sites. Between 1990 and 1993 the prevalence rate declined from 12.8 percent to 6.9 percent. They found no difference in prevalence rate by gender or in length of time of injecting drug use.

In Madrid, Spain, between 1985 and 1990, 60.0 percent of drug addicts admitted to a hospital detoxification unit were HIV-positive (Sopelana et al., 1991). Moreover the rate was 65.0 percent for the IDUs who accounted for 91.0 percent of the sample. However, a progressive, and statistically significant, decrease in the rate of seroprevalence was observed for the study population: 74.0 percent of drug addicts were HIV-positive in 1985 and 59.0 percent in 1990 ($p < 0.05$). Likewise, for IDUs, 74.0 percent were HIV-positive in 1985 compared to 59.0 percent in 1990 ($p = 0.05$). Finally, 67.0 percent of female addicts were HIV-positive compared to 65.0 percent of male addicts. However, the prevalence of HIV amongst IDUs recruited in Madrid may not be representative of the Spanish IDU population, in light of large regional variations that have been reported (Lardelli et al., 1993). This study also failed to demonstrate a statistically significant (i.e., $p < 0.05$) gender difference for HIV infection.

In Valencia, Spain, the HIV-1 seroprevalence rate observed in a sample of 2,687 IDUs recruited between 1987 and 1991 was 50 percent. No gender differences were reported with seroprevalence rates of 50 percent for men and 51 percent for women (Hernández-Aguado and

Bolumar, 1993). However, a study of 650 intravenous drug addicts admitted to a Hospital Detoxification Unit in Barcelona between 1987 and 1993 did find higher rates of HIV seroprevalence in females, especially when the time-period of addiction was shorter than 24 months ($p < 0.05$) (Egea et al., 1996).

In Austria, HIV seroprevalence was found to be 49.2 percent from a sample of users of an AIDS and drug dependency clinic (n=268) (Zangerle et al., 1992). There were no significant differences between female (56.5 percent) and male (45.5 percent) patients. There was, however, a tendency for the number of IDUs admitted to the drug dependency clinic to decline (72.2 percent in 1985 to 12.5 percent in 1990) with a progressive increase in the numbers using the AIDS clinic. Similarly, in Berlin, a progressive decrease in the global figures for seroprevalence between 1985 (25.0 percent) to 1992 (3.2 percent) has been reported for IDUs that were admitted for the first time to a clinic (Stark and Muller, 1993). The overall rate of seroprevalence between 1992 and 1993 was 19.1 percent amongst IDUs in Berlin, without any significant gender differences (23.1 percent of women versus 17.1 percent of men).

In Greece, between 1986 and 1989, data also suggests a decline (of around 10 percent) in the number of IDUs who presented themselves at an AIDS clinic who were seropositive. There was also a decline in the number of prisoners who reported being IDUs (of around 2 percent). For the IDUs who were not in prison, 3.8 percent of women and 2.2 percent of men were seropositive (Papaevangelou et al., 1991).

A number of other studies have also shown a higher rate of HIV seroprevalence in male IDUs than in female IDUs, although, as with a number of the previously cited studies, the differences were not statistically significant. For example, in a study of HIV seroprevalence amongst 473 IDUs attending a methadone maintenance programme in New York (USA), between 1985 and 1986, 41.2 percent of men were HIV-positive compared to 37.4 percent of women (Schoenbaum et al., 1989). Likewise, in 1990 in New Jersey (USA), global seroprevalence was reported to be 47.6 percent for drug addicts who had injected within the last six months and were not in treatment. Amongst men the rate was 48.8 percent and amongst women 43.2 percent (Freeman et al., 1994). It has also been observed that seroprevalence was lower (39.0 percent) amongst heterosexual IDUs of an Italian neighbourhood considered to be a low-risk area. In this study there were no statistically significant gender differences (41.0 percent of men were HIV-positive compared to 33.0 percent of women) (Serraino et al., 1991).

2.3.4. The size of the Spanish IDU population

It is estimated that there are 150,000-200,000 IDUs in Spain. Although it is difficult to know the exact rates, in the Community of Madrid the number of female drug users is estimated to be between 2000 and 3000.

A network of drug treatment programmes distributed throughout Spain offers services to nearly 50 percent of IDUs. In 1988, a surveillance system was set up by the Spanish government in order to gather information about drug users attending the general health care system and the public drug treatment centres. In 1995, among the 6,048 women who sought advice and treatment from the system, 2,736 were prior attendees (defined as individuals who had already been in treatment in previous years) and 3,059 were new entrants (defined as individuals seeking drug treatment for the first time). Specifically for the Madrid area, among the 717 women treated, 255 were prior attendees and 379 were new entrants (National Plan on Drugs, 1995).

3. Gender-Specific Risk Factors of HIV/AIDS amongst IDUs

It is likely that risk factors for HIV infection differ substantially between men and women. For example, there is evidence that in heterosexual populations, women have a greater susceptibility of contracting HIV infection via IDU and/or heterosexual contact. In addition to differential biological risk, women are also likely to be exposed to a greater risk of HIV infection from a range of sociocultural and economic factors. The remainder of this section reviews the literature on gender-specific risk factors associated with both IDU and the transmission of HIV/AIDS.

3.1. Sharing injecting equipment

A number of studies have demonstrated that the sharing of drug injecting equipment is a principal risk factor associated with the transmission of HIV in IDU populations (e.g., Marmor et al., 1987; Des Jarlais, 1992). That is, the re-using and sharing of injecting equipment, whether it is borrowed or lent, contaminated or inadequately sterilised, increases the likelihood of intravenous transmission between different IDUs (Freeman et al., 1994). In Berlin, for example, a study undertaken between 1984 and 1988, reported that 88.0 percent of 741 heterosexual IDUs interviewed had ever shared injecting equipment (Stark et al., 1990). Likewise, a study in Italy reported that 97.9 percent of drug addicts had intravenously injected drugs and that 70.8 percent of this sub-population reported to have at sometime shared injecting equipment (Salmaso et al., 1991). Moreover, Nicolosi et al. (1992b) demonstrated that the 69.6 percent of a sample of seronegative IDUs interviewed had shared needles and syringes. In Spain, the rates of sharing injection equipment appear to be lower. For example, in a nationwide sample of Spanish IDUs (n=1,074), 31.9 percent shared or had shared injecting equipment (Bravo et al., 1994). Furthermore, a large study of IDUs in Valencia (n=3,755) found that 18.0 percent reported recent sharing of injection equipment (in the last month) (Hernández-Aguado et al., 1994). In a multicentre Spanish study of prostitutes (n=1,556), 19.9 percent had injected drugs at some time and the majority of these had shared injecting equipment (Estébanez et al., 1992).

It has also been shown that the probability of infection is greater for those IDUs who frequently share injecting equipment when compared to those IDUs who never share (e.g. the odds ratio (OR) = 13.2 for Nicolosi et al. 1992b). Also in the study of IDUs in Baltimore, for those who had injected drugs in the previous year of the study, risk of HIV infection was associated with the sharing of needles and/or syringes (OR = 1.59; Vlahov et al., 1990), and especially with the use of injecting equipment attained in "shooting galleries" (OR = 2.21; Vlahov et al., 1990). Similarly, in Italy the principal risk factor of HIV for IDUs is the sharing of injecting equipment (OR = 9.5; Sasse et al., 1989). Serraino et al. (1991) make the same observation, that it is the sharing of injecting equipment that is the principal risk factor of HIV infection and an independent predictor of seropositivity (OR = 4.4; Serraino et al., 1991).

It has been suggested that for IDUs, women could have a greater chance of acquiring HIV than men, and that this may be associated with the practice of risk-taking behaviours. It seems that the proportion of female IDUs that frequently share equipment is greater than that of men. In an examination of sharing injecting equipment and sexual behaviour in a nationwide sample of Spanish IDUs (n=1074), gender was shown to be associated with needle sharing with females sharing significantly more frequently than males (42.7 percent versus 29.8 percent respectively) (Bravo et al., 1994). According to a study conducted in Madrid in 1990, in which 45.0 percent of

IDUs studied had used lent syringes in the previous six months, women shared injecting equipment more frequently than men (53 percent versus 42 percent respectively) (Estébanez et al., 1992). Sasse et al. (1989) in a study of 1323 IDUs have also shown that more women than men share equipment to prepare the drugs (58 percent of women versus 53 percent of men) and/or for injection (69.1 percent of women versus 61.6 percent of men). Furthermore, Freeman et al. (1994), found that 42.9 percent of female IDUs and 43.0 percent of males had, at least once, lent equipment and 18.9 percent of women and 25.8 of men had, at least once, borrowed equipment. However Hernández-Aguado et al. (1994) reported no gender differences in recent (within the last month) sharing of injection equipment (16 percent for men and 21 percent for women).

One of the major explanations for the tendency of female IDUs to share injecting equipment is that women often inject in groups and/or with their sexual partner. For example, it has been shown that female IDUs are more likely than men to be injected in the company of other people (Zunzunegui et al., 1993). In addition, for those IDUs that tend to inject with other people, women are more likely to share equipment than men, and are more likely to be injected by their sexual partner (Sotheran et al., 1992). In Madrid, it has also been observed that female IDUs who have a stable partner who is also an IDU, share their equipment more frequently than those whose partners were not IDUs (58.0 percent and 44.0 percent respectively) (Zunzunegui et al., 1993). Similar results have been reported in other studies examining risk behaviours of HIV amongst IDUs. For example, women are more likely than men to inject with their sexual partner or with friends, while men inject with a colleague or "running partner" or alone (Barnard, 1992). Furthermore, female IDUs share injecting equipment with their partner with a greater frequency than men and are more likely to be injected after their partner has injected (Freeman et al., 1994). According to the authors of this study, female IDUs would therefore have a greater chance of infection than male heterosexuals.

3.2. Prison

Although the use of drugs in jails and prisons is not generally permitted, there is evidence that drugs are available in the majority of prisons and it would seem that a large percentage of IDUs have reported to have continued their habit whilst incarcerated. Moreover, the ability to procure sterile injecting equipment in jails and prisons is reduced as the practice is prohibited. Consequently, the sharing and re-use of needles and syringes is a common practice between imprisoned IDUs. In a study carried out in Scottish prisons it was observed that 27.5 percent of prisoners had a record of IDU before arriving at the prison. In addition, 7.7 percent had injected at least once whilst incarcerated and of the 5.7 percent that had previously shared equipment 17.3 percent had continued with this practice in prison (Power et al., 1992). In a study of 145 female prisoners conducted at HMP (Her Majesty's Prison) Cornton Vale, Scotland, 46 percent of female inmates had injected drugs and 57 percent of these injector-inmates reported to have injected whilst in prison (Gore et al., 1997). In the United Kingdom, 27.4 percent of prisoners have reported to have injected drugs during their stay in prison (Turnbull et al., 1991). In Australia, over half of the needles and syringes found in three prisons in Adelaide seemed to have been utilised a number of times, suggesting that equipment sharing was prevalent (Seamark et al., 1994). In a multicentre study of seroprevalence conducted amongst 472 IDUs (of which 33.1 percent were women) in Berlin, 69 percent had been in prison (76.3 percent of the men and 53.8 percent of the women). In addition, almost half of the men (44.9 percent) and 21.2 percent of the women had injected drugs whilst in prison. This survey demonstrated a strong association between HIV infection and the use of shared needles for injecting during the stay in prison (OR = 3.9; Confidence interval (CI): 1.8 - 8.5) (Stark and Muller, 1993). Previous surveys in the same

city reported lower rates of injecting drug use in prison. For example, 63.2 percent of IDUs studied between 1984 and 1989 reported to have been in prison, of which 29.5 percent of men and 22.6 percent of women had injected drugs during their stay (Stark et al., 1990).

In a Canadian study conducted between 1988 and 1989, on seroprevalence and risk factors of HIV in women recently imprisoned, it was demonstrated that, when compared to an average seroprevalence of 6.9 percent in the sample population, 92.6 percent of seropositive women and 45.5 percent of seronegative women had a record of IDU prior to imprisonment (OR = 14.9; Hankins et al., 1994). Moreover, 76.2 percent of the seropositive women and 44.3 percent of the seronegative reported to have shared injecting equipment with a stranger before imprisonment (OR = 4.0), thus increasing the probability of infection by a factor of six when the person sharing the equipment was also seropositive.

3.3. Sexual behaviour

It has been suggested that the risk of acquiring HIV is the result of a complex interaction of drug use and sexual behaviour (Schoenbaum et al., 1989). Furthermore, as Freeman et al. (1994) point out, heterosexual female IDUs have an elevated risk of HIV infection from an infected partner, principally through sexual contact, but also as a result of shared injecting equipment as many of these women are injected by their partner after he has injected himself.

3.3.1. Heterosexual transmission

Heterosexual contact accounted for 14.9 percent of notified adolescent/adult AIDS cases in Europe up to 30 September 1997. However, this category of transmission differs between men and women. Heterosexual contact is the only category of transmission in which the proportion of cases of AIDS in women surpasses that of men (European Centre for the Epidemiological Monitoring of AIDS, 1996). More than a third (38.7 percent) of accumulated AIDS cases in adult and adolescent women, up until 30 September 1997, were attributed to heterosexual contact compared with 10.2 percent of men. A recent age-period cohort analysis of AIDS in Europe suggested that if you look at the most recent cohorts of homo-/bisexual men and IDU you find reduced HIV transmission, yet amongst young heterosexuals the epidemic is still expanding (Houweling, et al. 1998). Furthermore a national study of AIDS surveillance in the United States has also shown that the number of AIDS cases attributed to heterosexual contact is increasing at a faster rate than are the numbers of those acquired through other routes (Neal et al., 1997). These authors report that at this point in the U.S., persons with heterosexually acquired AIDS remain disproportionately women (65 percent) who report sexual contact with a male IDU partner (47 percent).

3.3.2. Heterosexual relations with an IDU partner

A number of studies have shown that heterosexual contact with an IDU partner is an important independent risk factor for HIV. Sasse et al. (1989) observed that sexual relations with a drug addict was associated with seropositivity with an estimated risk of 1.73. For the heterosexual sample (91.5 percent of the study population), HIV infection was most frequent among those that had had an IDU partner (OR = 1.34), with a further increase in risk for those who had had an increase in the number of partners. Similarly, a study by Schoenbaum et al. (1989) showed that

heterosexual contact with an IDU was an independent factor associated with HIV infection, and that this risk was higher for women. Evidence suggests that the importance of heterosexual behaviour as a risk factor is elevated by the number of partners and IDU partners and is more important for female IDUs than male IDUs. The probability of HIV infection for women increased by 24.0 percent with every additional IDU partner, demonstrating the increased HIV risk for women associated with heterosexual behaviour.

The possible impact of the sexual transmission of HIV by IDUs to the general population is reflected in a study undertaken in England and Scotland in 1988 to determine possible changes in sexual behaviour of IDUs that were attending a needle exchange service. It was reported that the majority of this population was sexually active and that 46 percent of users had had a non-IDU as a sexual partner. In addition 38 percent of the sample population had used condoms in sexual relations during the preceding three months. The authors estimated that, if it was assumed an average of two non-IDU partners for every sexually active IDU (69 percent of the 60,000 IDUs estimated in United Kingdom), then 82,800 non-IDUs were potentially at risk of acquiring HIV, in a three-month period, from an IDU partner (Donoghoe et al., 1989). In another study undertaken in England, for the 73 percent of the sample that declared heterosexual relations, over half (54.5 percent) of the non-commercial sexual partners of seropositive IDUs were not themselves IDUs. This was more frequent for casual partners (71.4 percent) than regular pairs (39.6 percent) (Rhodes et al., 1993). In Madrid, a higher rate (49.0 percent) of mixed IDU partners (i.e., one IDU and one non-IDU) was reported amongst stable partners (Zunzunegui et al., 1993).

It is thought that the probability of HIV transmission, via heterosexual contact from an IDU partner would be greater for women than for men, as various studies have demonstrated that heterosexual male IDUs are more likely to have non-IDU female partners. Murphy (1988) observed that among heterosexual IDUs who were attending a drug dependency clinic, 70.0 percent of male IDUs had a sexual partner who was not an IDU compared to 40.0 percent of female IDUs. In London, 78.0 percent of female drug users (heroin or cocaine) with a regular sexual partner stated that their partner had used heroin compared to 55.0 percent of male drug users (Powis et al., 1996). In New York (USA), 45.4 percent of male IDUs (almost all heterosexual) who were attending methadone maintenance programs had had a female IDU partner, compared to 57.0 percent of women who had had a male IDU partner (Schoenbaum et al., 1989). In Berlin, between 1984 and 1989, in a study of predominantly heterosexual IDUs, 85.2 percent of women and 75.5 percent of men reported to have had a sexual partner who was an IDU (Stark et al., 1990). In an American study, 42.1 percent of female drug addicts interviewed had had a male IDU sexual partner (Kline and Strickler, 1993). In a study of seroconversion carried out in northern Italy on a sample of 635 HIV seronegative IDUs, over half of the women studied had had a male IDU partner who was also seronegative, compared to 41.2 percent for men (Nicolosi et al., 1992b). Almost 69 percent of female IDUs questioned by Freeman et al. (1994) had a male IDU partner. According to the authors, the probability of having a heterosexual partner who was an IDU was two times greater for women than for men.

3.3.3. Heterosexual relations with a seropositive partner

Numerous studies have associated the transmission of HIV with a heterosexual relationship with a seropositive partner. For example, in Austria it was estimated that the risk of seroconversion for IDUs was greater if the stable partner was a seropositive IDU (Zangerle et al., 1992). Likewise, Stark and Muller (1993) observed that in a sample of 472 IDUs, HIV infection was associated with heterosexual relations with a seropositive partner (OR = 3.0; CI: 1.5 - 9.2). In a multicentre study reported by Salmaso et al. (1991), in which 97.9 percent of the population were IDUs, heterosexual activity with an HIV-positive partner or with a partner of unknown serostatus, was associated with HIV infection (OR = 5.6; CI: 1.6 - 8.9 and OR = 2.6; CI: 1.9 -3.6 respectively). The authors also noted that women had a seropositive heterosexual partner more frequently than men (41.0 percent of women compared with 18.0 percent of men). The same relationship was found in another Italian study of IDUs in which having a sexual partner who was HIV-positive was independently associated with HIV infection (OR = 4.0; CI: 1.5 - 10.4) (Nicolosi et al., 1992b). Furthermore, more women (26.4 percent) than men (13.9 percent) had a seropositive partner. Thus according to these authors and as demonstrated in the previous section, women are more likely to have a seropositive partner than men, putting them at greater risk of sexual transmission of HIV than men.

3.3.4. Gender-specific susceptibility to HIV infection

Being exposed to a male seropositive partner is not the only gender-specific risk of HIV infection for women. For example, it has been suggested that women are two to three times more susceptible to HIV transmission from a man, than a man is from a women. Nicolosi et al. (1994a) carried out a case-control study to determine the relative efficiency of the male-female and female-male transmission for people only exposed to risk from having an HIV-positive partner. The risk factors for infection in women included: a high number of sexual relations (OR = 2.0), anal sexual intercourse with an AIDS infected partner and a history of STDs such as syphilis (OR = 5.2), and genital warts (OR = 6.2). The significant risk factors associated with seropositivity in male-female transmission were: vaginal intercourse more than twice per week (OR = 2.0), anal sexual intercourse (OR = 2.3), partners with AIDS (OR = 2.6), partner with fewer than 400 CD4 (OR = 2.2), history of STDs (OR = 2.9), vaginitis (OR = 4.5) and the use of the IUD (OR = 2.5). In the female-male transmission, significant associations with HIV infection were: vaginal intercourse more than twice per week (OR = 5.2) and an AIDS infected partner (OR = 7.8). This study lead the authors to conclude that relative efficiency of the male-female transmission is 2.3 times more efficient than that of female-male.

Further evidence for this hypothesis is available from a multicentre study, undertaken in Spain, on risk factors for the heterosexual transmission of HIV from men to women. The overall rate of male-female transmission was 16 percent, although no difference between male-female and female-male transmission was observed (although this may be due to the small number of partners studied for the female-male transmission). A significant association was observed for the following risk factors for the heterosexual transmission to a woman in a stable relationship: CD4 (OR = 4.1), history of STD in the woman (OR = 4.0), and anal sexual intercourse (OR = 3.1). The CD4 and the history of STDs are independent factors associated with the heterosexual transmission from man to woman. According to the authors, the risk of heterosexual transmission for a partner with a case index that is CD4 and in a woman that has a history of STDs and practiced unprotected anal sexual intercourse is almost 14 times greater than in a partner without these factors (Zunzunegui et al., 1992).

3.3.5. Use of condoms

The use of condoms amongst IDU heterosexuals is rare, especially with stable partners. Consequently, the use of this barrier method seems to be most frequent when a partner is not an IDU or when one member of the pair is known to be seropositive. The majority of drug-dependent men and women (79.3 percent and 73.5 percent respectively) studied by Nicolosi et al. (1992b) stated that they never or almost never used condoms during heterosexual relations. In the study by Stark and Muller (1993) only 12.9 percent of heterosexual IDUs declared to have always used condoms during sexual relations with a regular or casual partner during the previous six months. Also, a multicentre WHO study observed that the use of condoms between IDUs was low, and that the majority of IDUs interviewed stated that they never used them with their regular partner, although the most frequent usage was with casual partners (WHO Collaborative Study Group, 1993). The same conclusion was arrived at by Rhodes et al. (1993) who showed that for seropositive IDUs, 73.2 percent never used condoms during heterosexual relations with a regular partner compared with 20.0 percent that stated they never used the same barrier method with a casual partner. Likewise, among sexually active heterosexual IDUs (n=315) interviewed in Madrid in 1990, only 22 percent were always or almost always using condoms during sexual relations, and more frequent use was reported with casual, as opposed to stable, partners (22.0 percent never used a condom with a casual partner and 49.0 percent with a regular partner). The most frequent use of condoms was reported for pairs in which one partner was a non-IDU (33.0 percent were always or almost always using condoms) (Zunzunegui et al., 1993).

In a study of injection equipment sharing amongst 3,755 IDUs in Valencia, Spain, the proportion of subjects who never used condoms for vaginal intercourse was 57 percent. These authors noted that sharing of injection equipment was associated with not using condoms for vaginal intercourse in both univariate and multivariate analysis (Hernández-Aguado et al., 1994).

In a cross-sectional study undertaken in North America amongst female drug addicts, 66.0 percent stated that they never had used a condom in spite of that fact that 46.2 percent had a sexual partner who was an IDU or an ex-IDU. Furthermore 47.5 percent of these cases did not know the serostatus of their partner (Kline and Strickler, 1993). In a study carried out in London, 59 percent of male heroin users and 65 percent of female heroin users stated that they never or almost never had used condoms during heterosexual relations in the past year. For cocaine users, condom use was marginally greater, although 47 percent of men and 46 percent of women stated they only rarely or never used a condom in the past year (Strang et al., 1994). A study by Freeman et al. (1994) also showed that the use of condoms was rare for heterosexual IDUs, especially among those with only one sexual partner. For example, 72.4 percent of men and 81.8 percent of women interviewed never used condoms with their partner. In the case of having multiple heterosexual partners, the female IDUs reported to use condoms more frequently than men, although only 17.6 percent stated that they always used them. According to Rhodes et al. (1994) the use of condoms is inversely related with the number of sexual relations. Paone et al. (1995) have also noted that female IDU participants in a syringe exchange program in New York City were more likely to "always" use condoms with casual partners than with primary partners. The authors also reported that 60 percent of prostitutes reported "always" using condoms.

Another aspect is that sexual behaviour appears to be safer with regular partners who know of their HIV seropositivity than with partners who are unaware of their serostatus. Sasse et al. (1989) observed in a sample of drug addicts attending a treatment centre that only 7.1 percent of the population and 7.6 percent of the heterosexual population, were always using condoms, and that their use was most frequent among those who were seropositive (c2 for trend = 35.07, p = 0.00001) and in heterosexual relations with a non-IDU partner (c2 for trend = 13.5, p = 0.001). Also in the study by Rhodes et al. (1993) IDUs that knew that they were seropositive were more likely to use condoms than those who did not (58.3 percent compared to 18.2 percent respectively). The risk of heterosexual transmission between IDUs and non-IDU partners is dependent, in part, on the knowledge of seropositivity and subsequent use of condoms.

In a sample of 317 IDUs collected in the street, 33 percent of heterosexual IDUs declared to have always used condoms with their partner in the previous month and a significantly greater number used them during sexual relations with a seropositive partner or a non-IDU partner. The use of condoms in relationships between seropositive IDU and non-IDU was 68 percent (Friedman et al., 1994). Another American study also carried out amongst female IDUs observed that the use of condoms was generally low: 34 percent of women stated that they always used condoms during sexual relations. For seropositive women, condom prevalence was 28 percent compared to 6 percent for seronegative women. For stable partners, 42 percent always used condoms, with 36 percent of seropositive women using condoms and 6 percent of seronegatives (Watters et al., 1994b).

Therefore the risk of sexual transmission of HIV is high for the partners of IDUs, especially for women and in particular for female IDUs. It has been suggested that for female IDUs the principal risk factor for HIV could be unprotected sexual activity (Watters et al., 1994b). Moreover, female IDUs have a greater risk of transmission through heterosexual relations with an IDU partner than from transmission via IDU itself (Schoenbaum et al., 1989). Rhodes et al. (1994) pointed out that the risk of heterosexual transmission for an IDU is progressive as injecting drug use would continue to be a particular risk. For example, 27.7 percent of IDUs with stable partners who were non-IDUs had shared needles at least sometime during the time of their study, and similarly 36.0 percent of IDUs with a casual non-IDU partner reported needle sharing. This would suggest a greater risk for women as male IDUs are most likely to have as a regular partner a non-IDU woman than vice versa.

3.4. STDs and prostitution

Sexually transmitted diseases, which are prevalent amongst those who engage in unprotected sexual activity, occur more frequently within the IDU population than the general population, especially amongst women. For example, 67.7 percent of IDUs studied in Berlin between 1984 and 1989, were positive for hepatitis B; a disease also strongly associated with HIV seropositivity (Stark et al., 1990). In a study of IDUs attending drug treatment in Dublin, gender differences were found with a greater proportion of women testing positive for the hepatitis C virus, the prevalence of which can be an indicator of HIV-related risk behaviour (Smyth et al., 1994). Furthermore, in a study of HIV seroprevalence carried out with IDUs in Baltimore, 60.0 percent of drug addicts had had some type of STD, with an increased frequency for female heterosexual IDUs (syphilis and genital herpes). According to the results of the statistical analysis, women with a record of syphilis would have a greater major risk of HIV infection than male heterosexuals with similar backgrounds (OR = 1.78; CI: 1.02 - 3.10) (Nelson et al., 1991).

The greater frequency of STDs amongst female IDUs is probably due to the more frequent exchange of sex for drugs and/or money when compared to men. Serraino et al. (1991) observed that for an IDU heterosexual population, women were more likely to be prostitutes than men. Likewise, according to an Italian study of seronegative IDUs, women would have exchanged sex for drugs or money more frequently than men (19.8 percent and 1.5 percent respectively) (Nicolosi et al., 1992b). In Berlin, one of the highest reported rates of prostitution among interviewed IDUs was recorded: 73.1 percent of women and 12.7 percent of men reported to have worked as a prostitute (Stark and Muller, 1993). Also, in London, female IDUs interviewed were more likely to be prostitutes than men (OR = 10.9; CI: 3.28 - 39.9) (Rhodes et al., 1994). Furthermore, three quarters of IDU women that participated in the study by Freeman et al. (1994) had exchanged sex for money in the preceding six months. According to the authors, the probability of being a prostitute for female IDUs was over five times greater than for male IDUs.

It is important to realise that, in some cases, the clients as well as the steady partners of prostitutes put these women at increased risk of HIV infection. In the study by Zunzunegui et al. (1992) 40 percent of seropositive men interviewed said that they had had commercial sexual relations with a prostitute. Although Nicolosi et al. (1992b) found that only 12.2 percent of HIV-positive males reported this type of sexual encounter (ranging from 22 percent in Milan to 2 percent in Turin). In Spain, it was shown that two thirds of IDU prostitutes interviewed had a stable partner who was a male IDU, compared with 8.6 percent of non-IDU prostitutes (Estébanez et al., 1992). According to Van Ameijden et al., (1994) 63 percent of prostitutes interviewed in Amsterdam had a stable partner, of which 28 percent were currently male IDUs. For Astemborski et al. (1994) female IDUs who had had over two sexual IDU partners were more likely to have been a prostitute with the greatest number (i.e., > 50) of customers.

Some of the studies undertaken amongst prostitutes in Europe and North America have shown that the relationship between prostitution and HIV infection is closely associated with the intravenous injection of drugs. In a study of HIV seroprevalence amongst prostitutes in nine European countries, 5.3 percent of the global population were seropositive, but HIV infection was more frequent amongst IDUs than non-IDUs (31.8 percent and 1.5 percent were seropositive respectively), and IDU was the principal risk factor for HIV (European Working Groups on HIV Infection in Female Prostitutes, 1993). According to the results of a Spanish study of female prostitutes, 60.2 percent of IDUs were positive for HIV-1 compared to 3.4 percent of non-IDUs. Consequently, IDU was the principal risk factor associated with HIV infection for prostitutes (OR = 47.6), along with unprotected sexual activity for non-IDUs (Estébanez et al., 1992). In Amsterdam, the estimated seropositivity was 30 percent amongst prostitutes examined in the city, all of which had a record of IDU (Van Ameijden et al., 1994). In the study by Astemborski et al., (1994) in which the 39.2 percent of IDU women had exercised prostitution at least once in the previous 10 years, the overall seropositivity for HIV was 24.6 percent and the rate for IDU prostitutes who had had more than 50 customers was greater than those with fewer than 50 customers (47.6 percent versus 23.2 percent).

According to the results obtained from these diverse studies amongst female IDUs, prostitution and a history of STDs are independent risk factors with a strong association with HIV infection, providing evidence of the risk of sexual transmission of HIV in this population. Of the female prostitutes studied in Amsterdam between 1986 and 1992, the relative risk for STDs was 2.92, due to the high rate of STDs in seropositive women (92 percent) compared to seronegative women (57 percent) (Van Ameijden et al., 1994). In a study carried out in San Francisco amongst

female IDUs it was shown that prostitution was independently associated with seropositivity (OR = 3.11) (Watters et al., 1994b). Also Astemborski et al. (1994), observed that for prostitutes, having more than 50 customers (OR = 3.0) and previous STDs (OR = 1.84) were independently associated with HIV infection.

On the other hand, in the study by Serraino et al. (1991), prostitution was not a predictive risk factor of HIV infection for the global population and it was only associated with infection when the analysis was conducted for women alone (OR = 3.1; CI: 0.9 - 10.1). Amongst imprisoned women in Canada with a history of IDU, the strongest predictors of HIV seropositivity were sexual or needle contact with a seropositive person, self-reported genital herpes, and having had a regular IDU sexual partner, but it was not predicted by prostitution (Hankins et al., 1994). In the study by Watters et al. (1994b) on female IDUs, a record of syphilis was independently associated with HIV seropositivity (OR = 3.30; CI: 1.36 - 7.99).

The use of condoms by prostitutes varies according to the country studied. There is a lower use in the countries of southern Europe than in northern and central Europe (Estébanez et al., 1992). It has been suggested that IDU prostitutes do not seem to be a major cause of HIV transmission to the general population. Although clients of prostitutes can expect to be infected, it is the private sexual relations, where condom use is extremely low, that are associated with transmission (Van Ameijden et al., 1994). It seems to be the case that, although the use of condoms by prostitutes is generally low, frequency is greater during commercial sexual relations than during private sexual relations, despite the fact that these women have male IDUs as partners. Paone et al. (1995) found that close to 60 percent of women engaging in commercial sex work, in a study of IDU women participating in New York City syringe exchange programs, reported "always" using condoms. In a cross-sectional study carried out in 11 Spanish provinces, almost 50 percent of prostitutes included stated that they used condoms "always" or "almost always" during vaginal sexual intercourse with clients. IDU prostitutes were using condoms with customers less frequently than with non-IDU partners ($p = 0.05$). Without doubt, sexual relations with stable partners are also at risk as 96.3 percent declared that they never used condoms during oral sex and 90.2 percent never during anal sexual intercourse (Estébanez et al., 1992).

3.5. Early sexual experience

Early sexual experience, including childhood sexual abuse, has been linked to a number of factors which also have links to HIV risk. Studies of sequellae of childhood sexual abuse (victimization is reported more often by women than men) have identified associations with substance abuse (Briere & Runtz, 1988), prostitution (Zierler et al., 1991), low self-esteem (in Johnsen and Harlow, 1996), adult depression (in Johnsen and Harlow, 1996), risky sexual behaviour (Zierler et al., 1991; Johnsen & Harlow, 1996), younger age at first intercourse (Johnsen & Harlow, 1991), and early age of first pregnancy (Zierler et al., 1991). Furthermore, a study of early sexual experience (defined as becoming sexually active between the ages of 10 and 14) also noted links to risky sexual behaviour and STDs (Greenberg et al, 1992). A study of prostitutes versus "normal women" found that prostitutes had generally initiated sexual activity at a younger age and had a higher incidence of early involvement in abusive sexual encounters (incest and rape) (James and Meyerding, 1977). As Greenberg and colleagues suggest, early sexual experience (or age at first intercourse) should be used as a marker for identifying women at risk for STDs (and HIV) and a target for preventive interventions.

3.6. Factors determining reproductive outcome amongst female IDUs

As already mentioned above (Section 3.3.4), the efficiency of the sexual transmission of HIV will rely on the infectivity of the case index, the susceptibility of the partner and the type of sexual relation (Najera and Cols, 1990). However, the proceeding discussion is limited to the susceptibility of HIV transmission between heterosexual contact between men and women. Women are more susceptible to infection due to a series of biological, anatomical and histological factors, that make them more vulnerable to heterosexual HIV transmission. For example, vaginal secretions are less infectious than semen due to the pH of vaginal acid which makes the vagina an unfavourable environment for HIV. On the other hand, the base pH of semen is not only more favourable for HIV, but the survival of the virus is prolonged in the interior of vagina following ejaculation (Voeller and Anderson, 1992). In addition, the deposited semen in the vagina suppress the proliferation of T cells, thereby permitting the survival of HIV in the female genital tract (Anderson and Hill, 1991). Furthermore, the time of exposure is prolonged, as the semen remains in the reproductive tract following sexual intercourse until it has been completely absorbed. The anatomical and histological differences between male and female genital organs also contribute to the increased susceptibility of women, as female organs present a greater surface area of contact than do the male organs and thus are more receptive to HIV. In men, the foreskin provides a protection from infection which, in the absence of ulcers or abrasions, would make the penis invulnerable to HIV (Polk, 1985).

Other additional factors that would influence the greater susceptibility of women would include: the presence of recurrent vaginitis (Nicolosi et al., 1994a) and other STDs (Zunzunegui et al., 1992) which, due to inflammation in the vagina and/or lesions, would facilitate infection (Holst et al., 1987); the use of the IUD (Nicolosi et al., 1994a; Zunzunegui et al., 1992) as this can produce chronic inflammation of the cervix and can cause micro-lesions after being inserted (Musicco et al., 1994); sexual relations during menstruation (Hellman et al., 1991; Green et al., 1990); anal sexual intercourse (Zunzunegui et al., 1992) due to the traumatic effect on the rectal mucus; and possibly the use of oral contraceptives. This last factor is debated as some authors conclude that oral contraception is associated with infection (Simonsen et al., 1990; Plummer et al., 1991), while others think that it provides a protective effect (Nicolosi et al., 1994a; Goedert et al., 1988; Mati et al., 1990).

3.6.1. Menstrual cycle

A number of studies have reported that female IDUs have irregular menstrual cycles. It is likely that high prevalence of irregular periods is caused by a number of interacting factors including the use of opiates (Bai et al., 1989) and other drugs, stress, weight gain (caused by obesity) and weight loss (caused by anorexia nervosa) (Symonds, 1987). It should, however, be noted that the cessation of menses, concomitant with the use of drugs (and opiates in particular), is due to amenorrhea and does not imply that a women is infertile (Ralph and Spigner, 1986). This has been illustrated by the reported increase in fertility among 201 opiate-dependent women on enrollment into a methadone maintenance programme in Liverpool, UK (Morrison et al., 1995).

Menstrual abnormalities have also been associated with HIV infection. In a study of 248 premenopausal HIV-infected women without AIDS and 82 HIV-negative women, the HIV-infected women were found to have an increase in amenorrhea (> 3 months) and in menstrual cycle intervals (> 6 weeks) and lower rates of premenstrual breast symptoms. Changes in menstrual function were also significantly associated with a past history of, but not current,

substance abuse, suggesting the possibility that socioeconomic factors rather than biologic effects of drugs may be responsible (Chirgwin et al., 1996).

3.6.2. Contraceptive efficacy

It has been suggested that IDUs have a lower uptake of contraceptives due, amongst other factors, to the (partly misguided) belief that opiates and other drugs cause infertility (Ralph and Spigner, 1986). The use of contraceptives, it is thought, is lower amongst female IDUs than for the population per se. For example, in a study of 115 heroin-addicted women from California, USA, 25.8 percent reported any type of contraception compared to 48.5 percent of a national sample (Ralph and Spigner, 1986). Likewise, in the study of 201 opiate users from Liverpool, UK, 21.4 percent of women reported condom use compared to 46.5 percent of young women attending British Family Planning Clinics (Morrison et al., 1995).

Efficacy, safety and acceptability are all factors which need to be considered when prescribing a contraceptive method. Further, these factors need to be matched to individuals and communities (Williamson and Joanis, 1994); that is whilst one method may be appropriate for the general population, it may be inappropriate for IDUs and other marginalised groups. Thus, in light of the high prevalence of hepatitis amongst IDUs, the contraceptive pill may be an inappropriate method. It has also been suggested that the use of hormonal contraception may be associated with a reduction in the use of barrier contraception such as the condom. Another complicating factor is the concurrent use of petroleum-based lubricants. A recent European study identified the use of petroleum-based lubricants to be a risk factor for HIV infection in non-IDUs (European Working Group on HIV Infection in Female Prostitutes, 1993). Another issue to consider is the "dual" use of barrier contraceptives. A number of studies have suggested a reduction in the rates of sexually transmitted diseases (STDs), including HIV, for women who use condoms with a spermicide (reviewed in Roddy, 1994). Whilst the evidence is not yet conclusive, it is important to stress that both methods must be used concurrently (Cain and Williamson, 1994). Finally, the IUD has been associated with HIV infection in a number of studies (reviewed in Carlin and Boag, 1995).

3.6.3. Pregnancy

A number of studies have concluded that female IDUs are as likely to have children as the general population (reviewed in Wells and Jackson, 1992), as illustrated by the 70.0 percent of ever-pregnant female IDUs reported from an American study (Brown, 1989). There are a number of reasons why female IDUs have a higher rate of pregnancy and, in particular, teenage pregnancy. For example, female IDUs often lead a somewhat "traditional" lifestyle with low levels of educational attainment and employment (Wells and Jackson, 1992). Self-esteem is probably low, and it may be perceived that childbirth may break this cycle. Another possibility is that female IDUs often experience irregular menstrual cycles resulting in infertile periods and many women then assume they are infertile and do not need to take precautions to avoid pregnancy.

A number of studies have suggested that pregnancy itself may be a risk factor for HIV infection. Although as yet there is no consensus, what cannot be disputed is the increase in the number of HIV-infected pregnant women. Indeed this is probably a reflection of the sociodemographic characteristics of HIV in women. In Europe, for example, 76 percent of AIDS-diagnosed females

are in the 15-49 age group (European Centre for the Epidemiological Monitoring of AIDS, 1996). It is therefore important that policy makers and public health practitioners alike are aware of the effects of pregnancy on the natural history of HIV. It has been suggested that HIV pregnant women may be susceptible to atypical immunological changes and that this will facilitate the progression from HIV to AIDS. To date, studies examining immunological changes have produced contrasting results. More evidence, however, is available with regard to the effects of drug use. Whilst there seems to be no relationship between opiate use and disease progression, there is evidence that continued IDU may accelerate progression from HIV to AIDS. Although there is no evidence of gender-specific difference in the progression rate, the interaction of pregnancy and/or IDU with HIV-infected women makes this likely. The confused state of knowledge with regard to the reproductive health of pregnant women demonstrates the need to examine the association between HIV/AIDS and pregnancy.

The effect of HIV seropositivity on pregnancy outcomes has also been examined. In general, most of these studies have looked at the effect on obstetric or neonatal complications (e.g. premature rupture of membranes, intrauterine growth retardation) and concluded that in industrialized settings the impact of asymptomatic HIV infection is negligible. A few studies have looked at the impact of seropositivity on reproductive decisions. One such study which compared the rates of reproductive events before and after HIV diagnosis in a cohort of women aged 20-34 years with HIV infection found that diagnosis of HIV infection in women produced a 44 percent decline in age-adjusted live-birth rates (Stephenson et al.,1996). The decline was attributed to increases in termination of pregnancy (50 percent), decreases in overall pregnancy rate and an increase in miscarriages. Thus the diagnosis of HIV infection may have a substantial impact in reducing live-birth rates which has significant implications for expanding HIV testing in women and highlights the need for better contraceptive support for HIV-infected women.

3.7. Sociocultural, educational, and economic factors

Sociocultural, educational and economic factors are likely to be negatively associated with IDU populations, thus creating difficulties in developing and implementing health education campaigns aimed at decreasing and modifying risk behaviours. In spite of the inherent risks of treating IDUs as a collective group, the sociodemographic characteristics most often observed in different studies have included: a low level of education (Vlahov et al., 1990) unemployment (Sasse et al., 1989; Salmaso et al., 1991); a low income (Vlahov et al., 1990); high levels of prostitution (Stark and Muller, 1993; Freeman et al., 1994; Stark et al., 1990; Van Ameijden et al., 1994; Astemborski et al., 1994); and, theft or drug dealing in order to finance a habit, thereby causing a high rate of previous imprisonment (Sasse et al., 1989; Sopelana et al., 1991; Serraino et al., 1991; Stark et al., 1990; Estébanez et al., 1992).

It has also been observed that the sociodemographic characteristics of IDUs differ according to whether the drug addict is receiving treatment or not. According to a study undertaken amongst an IDU population in Madrid, participants recruited in the street (as opposed to those recruited in treatment centres) were more likely to have less education, less employment, a record of previous imprisonment and were less likely to live with partners or family. The authors of this study suggested that IDUs recruited in the street were less socially integrated than those in treatment centres (Zunzunegui et al., 1990). This being the case, then social isolation will probably be associated with a greater vulnerability to HIV infection due to the lack of assimilation within preventive health programmes and continued risk-taking behaviour; all of which could lead in itself to a greater sense of social isolation.

Another indicator of low socioeconomic status and a high degree of social marginalisation is not having a fixed address. Although studies of homelessness in IDU populations are rare or don't exist, studies of homeless populations have identified elevated levels of HIV risk practices, including IDU, crack cocaine use, sexual relations with an IDU, exchange of sex for money or drugs, multiple sexual partners and inconsistent condom use (Fisher et al., 1995; Nyamathi et al., 1997).

Psychological factors associated with marginalisation, social isolation and low self-esteem, also play an important part in designing and implementing prevention strategies. A number of studies have detected high levels of psychological distress and depressive disorders among homeless women, drug-recovering women and drug-using prostitutes (Nyamathi et al., 1997; Fisher et al., 1995; El-Bassel et al., 1997; Alegría et al., 1994). Furthermore these women have been found to have partners who are also at high risk for emotional distress and risky behaviours (Nyamathi et al., 1997). Poor mental health combined with the negative impact of their closest sources of social support may undermine the motivation and ability to help themselves, whether in seeking and following through with drug treatment or in adopting safer sex behaviour.

Numerous studies of black or Hispanic populations, which have been historically marginalised, have shown significantly higher rates of HIV infection (Nelson et al., 1991; Vlahov et al., 1990; Schoenbaum et al., 1989; Lehman et al., 1994; Vlahov et al., 1991). Female IDUs may also be more likely to suffer greater social isolation than men. According to some studies, these women live alone more frequently than men, have more children under their care, and do not live with the family of origin (Freeman et al., 1994; Estébanez et al., 1992). This situation could drive these women to greater isolation and social marginalisation. Moreover, marginalisation could lead to prostitution, and thus to greater marginalisation and lower esteem. We have already shown that women are more likely to be prostitutes than men, while men are more likely to turn to robbery or to the sale of drugs (Stark et al., 1990). It has also been observed that amongst IDUs, more men than women have a principal source of income (Freeman et al., 1994), which would help integration into the wider society.

The importance of psychosocial factors has not been recognised with regard to gender-specific infection of HIV. For example, prevention campaigns have stated that the principle mode of HIV transmission is the use of shared injection equipment, and to a lesser degree the practice of unprotected sex. Consequently, drug addicts and the general heterosexual population, have avoided (or reduced) the sharing of needles and syringes whilst underestimating risk of unprotected sexual activity (Kline and Strickler, 1993). This could explain why IDUs have modified their risk behaviour with regard to sterilising or not sharing injecting equipment (Watters et al., 1994a; Donoghoe et al., 1989). Likewise, there could exist a certain tendency amongst women to under value the risk of sexual activity with an IDU partner, as opposed to sexual risk behaviour per se. We have already commented on the specific risk of sexual relations between a non-IDU female and an IDU partner. It may be the case that emotional factors including dependence and/or economics, reduce the capacity of a woman to introduce change into her sexual relations and that the social status of the partnership could influence the perception of the risk. In relations like these, women have to trust their partners with regard to current and/or past risk behaviour. In casual relations the reverse may be the case and the women would not necessarily trust the partner. It has been suggested that this would be an erroneous perception of risk, as it would impede these women from utilising condoms with their stable partner (Kline and Strickler, 1993).

The scarcity of dedicated studies into the social context of HIV risk factors makes it difficult to differentiate between global and gender-specific IDU behaviour. Women have a greater likelihood of sharing injecting equipment than men, as women are more likely to share in a group and use shared equipment from men. Although both have a greater probability of sharing equipment with their sexual partner than with other types of companions, women are more likely to inject with their partner (Freeman et al., 1994; Sotheran et al., 1992), which for women means that they are more likely to have a sexual relationship with an IDU partner (Murphy, 1988). Moreover, women are also likely to be injected afterward, thus further increasing the risk of transmission for these women (Freeman et al., 1994).

3.8 Access to and utilisation of treatment

There exists little documentation of the utilisation of drug dependency services by this population, although it seems that uptake is low. Of the 104 confirmed seropositive IDUs examined by Rhodes et al. (1993), 43.1 percent had never received help or treatment for drug dependency and 52.2 percent had not been formerly tested for HIV. It was also observed in London that 42.0 percent of heroin addicts and 75.0 percent of cocaine users had never received treatment for drug dependency (Strang et al., 1994). In a study carried out in Madrid amongst IDUs, only 42.0 percent of those interviewed in the street had received some type of help or treatment for drug dependency. Of these, 21.6 percent had received treatment in a municipal centre for drug dependence, 21.1 percent had received methadone treatment, 22.9 percent had been to a hospital detoxification unit, 22.9 percent had received ambulatory detoxification, and 30.0 percent had received care in the community (Zunzunegui et al., 1993). According to the results of a European study (conducted between 1989 and 1990 in 12 countries) on the knowledge, attitudes and beliefs of IDUs about measures taken for HIV prevention, the low utilisation of drug dependency services could be due to the low opinion of these services amongst IDUs. By comparison, the direct provision of sterile injection equipment was generally welcomed (Richardson et al., 1994).

Inequalities between men and women also occur with regard to attending services and to assimilating information. The inequality of access and/or utilisation of health services could explain the difference of survival according to a study following the progress of HIV-infected patients between 1990 and 1993 in North America. According to the results, women– irrespective of being IDUs– had lower survival rates than seropositive men, as women had a lower rate of utilisation, and access to, health services (Melnick et al., 1994). In another North American study examining the utilisation of health services by HIV infected people, it was observed that women and IDUs tended to use health services in an emergency. The authors suggest that IDUs, and women in particular, are slow to seek medical help until the problem becomes a medical emergency (Mor et al., 1992). Furthermore a multi-site U.S. study on access to care for drug abusers with HIV reported that multiple barriers in access to service exist for drug-using women (Weissman et al., 1995). The most important barriers were cost and waiting times. The authors also noted that significantly fewer women than men received pre- and post-test counseling and were advised to get medical services after their first positive HIV test.

According to the data recorded amongst drug addicts interviewed in Madrid in 1990, women had a lower rate of uptake into drug dependency services, although the differences were not statistically significant (Zunzunegui et al., 1993). About 50 percent of men and 40 percent of women in the study were recruited from drug dependency centres, suggesting a lower rate of access and/or utilisation for these women. Although data on the use of social services amongst these women was not recorded, it is probable that drug-dependent women have lower rates of access due, in part, to feelings of guilt and/or the fear that the state might consider removing their children.

Gender differences in the process and response to drug treatment have also been examined. As men have traditionally accounted for a higher proportion of those addicted to heroin and therefore a higher proportion of those entering treatment facilities, it has only recently been questioned whether treatment intervention methods and goals are too "male-oriented" and not appropriately geared for women. In general women are found to be more likely to drop out of treatment than men, though when they do carry through with treatment they have similar rates of success (reviewed in Anglin et al., 1987). Studies of the factors which contribute to positive treatment outcome for women, though few, have consistently indicated that a partner's involvement in entry into treatment and continued support in attending treatment are critical (reviewed in Anglin et al., 1987). In a study of behavioural differences between men and women during and after methadone maintenance treatment, it was noted that women may actually have higher motivation for treatment in that they took less time than men to seek entry into their first methadone maintenance treatment programme after addiction. They entered more often without direct legal pressure, fewer were discharged for negative reasons, and they complied to a greater extent with treatment regulations than men (Anglin et al., 1987). Yet they were no more likely than men to have positive treatment outcomes. Some of the factors observed to be associated with poor outcomes included: having a partner who is also a narcotics user; and a lack of social and vocational skills necessary to relate to and become assimilated into the non-drug-using world. Furthermore, studies of gender differences in treatment populations have indicated that women in treatment report more medical, psychiatric, family-social and employment problems than men (McLellan et al., 1992; Brown et al., 1993). Thus it has been suggested that drug treatment programmes need to modify their services to specifically address women's issues by taking into account the important role the partner plays in treatment, by addressing women's health and vocational needs, and by addressing child care needs.

Furthermore, a more recent study into the apparent gender paradox in drug treatment found that although women have more "risk factors" associated with drug-use relapse, they are no more likely to relapse than men, and found that women become more engaged in treatment specifically by participating more in group counseling (Fiorentine et al., 1997). They did not find support for the drug severity hypothesis (women are less likely to relapse because their drug-use histories are less severe) or the social support hypothesis (women are less likely to relapse because they have higher levels of social support, facilitating recovery). The authors attribute the differences in treatment engagement to gender norms concerning help-seeking, personal independence, strength, and control.

4. Conclusion

This chapter has sketched the outline of the epidemiological and sociological literature on IDU and particularly female IDUs, with reference to the HIV/AIDS epidemic. Despite its importance, very little research has been carried out in order to establish if female IDUs have additional risk factors and to increase our knowledge of this population so that more appropriate intervention programmes can be developed. In view of the problems outlined above, it is important to answer the following research questions:

- Does gender have an effect in the risk of HIV prevalence in IDUs?
- Are there any socioeconomic characteristics responsible for the low use of prevention measures?
- What support services are appropriate for female IDUs in order to limit the AIDS epidemic?

It is therefore the objective of this thesis to address these research questions. In the following chapter the formal objectives are presented. Chapter Three describes the methodology and data collection. Chapter Four presents the characteristics of the female IDUs interviewed for this study, including their sociodemographic characteristics, drug-taking risk behaviour, sexual behaviour, prostitution, reproductive health, and utilisation of services. Chapter Five examines the determinants of HIV seropositivity in this population. Chapters Six, Seven, Eight and Nine study the determinants of prostitution, imprisonment, syringe sharing, and condom use, respectively. Chapter Ten looks at the utilisation of social services and drug treatment amongst these women. Chapter Eleven provides a summary of all findings and presents concluding remarks on directions for future interventions and research with this population.

Chapter Two

Aim and Objectives of the Study

1. Introduction

Following the literature review in Chapter 1 (Section 4), three research questions were identified (Chapter 1, Section 5):

- Does gender have an effect in the risk of HIV prevalence in IDUs?
- Are there any socio-economic characteristics responsible for the low use of prevention measures?
- What support services are appropriate for female IDUs in order to limit the AIDS epidemic?

In order to address these questions it is appropriate to formulate the specific aim and objectives of the study (Section 2). In addition, this chapter introduces the methodologies used and will describe the background of the study, study design, sampling, field work, and data analysis. In so doing, the difficulties in recruiting a suitable representative sample of female injecting drug users (IDUs) from different research settings will be demonstrated.

2. Aim and Objectives of the Study

To study the social and behavioural determinants of HIV infection in female IDUs in Madrid in order to improve implementation of appropriate prevention programmes to control the AIDS epidemic in Spain.

2.1. Objectives

The general study framework was structured with the following objectives:

1. To describe the sociodemographic characteristics, drug-taking behaviour, sexual behaviour (including prostitution), reproductive health, and utilisation of services of female intravenous drug users in Spain.
2. To assess the direct and indirect determinants of HIV in the study population.
3. To identify determinants of potential risk factors for HIV.
4. To study attitudes among women towards safer sexual practices; and
5. To assess the effects of different kinds of drug treatment on risk behaviour among female IDUs.

2.2. Operational objectives

To achieve these objectives, the following operational objectives were structured.

2.2.1. Objective I

To describe the sociodemographic characteristics, drug-taking behaviour, sexual behaviour (including prostitution), reproductive health, and utilisation of services of female intravenous drug users in Madrid, Spain.

Specific objectives:

i) To provide baseline information about HIV risk factors in Spanish female IDUs so that changes in prevalence of HIV and risk behaviour can be measured over time.

ii) To describe HIV and STD prevalence in the study population.

iii) To describe the reproductive health of the study population.

iv) To assess the extent of social service, drug treatment, and health service utilisation in the study population.

2.2.2 Objective II

To assess the direct and indirect determinants of HIV in the study population.

Specific Objectives:

i) To evaluate the risk of heterosexual transmission of HIV infection amongst female IDUs.

ii) To study the effect of injection practices on HIV prevalence in women IDUs.

iii) To examine the role of social factors in transmission of HIV.

2.2.3 Objective III

To identify determinants of potential risk factors for HIV.

Specific objectives:

i) To identify direct and indirect determinants of prostitution.

ii) To identify factors associated with previous imprisonment.

iii) To identify determinants of "needle sharing."

iv) To identify determinants of "never-used condoms."

2.2.4 Objective IV

To study attitudes among women towards safer sexual practices.

Specific objectives:

i) To study knowledge and attitudes towards measures to prevent HIV.

ii) To study attitudes towards pregnancies.

iii) To assess the extent to which women make decisions about sexual behaviour.

2.2.5. Objective V

To assess the effects of different kinds of drug treatment on risk behaviour in female IDUs.

Specific objectives:

i) To assess the effect of health care and drug services utilisation on HIV risk behaviour.

ii) To identify determinants of having "never attended treatment."

Chapter Three

Methodology and Data Collection

1. Background to the Study

The data used in the thesis was collected from a sample of 304 female IDUs recruited in Madrid at the time of interview. This sample is a subset of a five-centre study (Paris, Madrid, Rome, London and Berlin) funded by the European Union and coordinated by the author of this thesis (Estébanez et al., 1996).

2. Study Design

An observational cross-sectional design was chosen as the most appropriate way to fulfill the objectives of the study (i.e., to estimate the behaviour of female IDUs and to explore the associations between behaviour and a number of dependent variables, such as HIV positivity, prostitution, prison record, etc.). However, there are a number of limitations to these methods which need to be addressed in order to place the results in the appropriate context. (Hennekens and Buring, 1987).

First of all, a cross-sectional study is carried out at one point in time; therefore it only measures the prevalence and not the incidence of a disease. Thus the influence of certain risk factors which have been modified over time cannot be measured with this design. This limitation was lessened because we designed the questionnaire to assess past behaviours using a six-month recall period and dichotomous variables, such as "ever-shared injection equipment" versus "never", as advocated by McElrath (1994). Secondly, there is the issue of the consistency of behaviour over time. Whilst these two problems theoretically could be overcome with a prospective cohort study, the recruitment and retention of a sufficiently large sample of initially seronegative IDUs would be extremely difficult. Finally, a limitation which applies to all studies of IDUs is that of the representativeness of the sample. Due to the characteristics of the population studied, and their inaccessibility (due to the illicit and clandestine nature of drug injecting), random sampling methods cannot be used leaving a potential for selection bias. To minimize this bias we recruited subjects from a variety of settings (for more details see
Section 6).

3. Study Sample

3.1. The social context of the study

Madrid, like many other Spanish and European cities, underwent an epidemic of heroin use in the early 1980s. The use of illicit drugs, particularly heroin and cocaine, remains high, with police and drug agencies reporting an increase in the availability of heroin and cocaine in the 1990s

(National Plan on Drugs, 1995). The economic recession in the late 1980s and the geographical position of Spain as a bridge for drug trafficking into Europe seems to have increased IDU in the areas surrounding Madrid including, for example, the Chabolismo slums, Gypsy populations and marginalised groups. The increased realisation of this problem by society due, in part, to the AIDS epidemic has resulted in government and non-government organisations (NGOs) developing an extensive network of drug services in the region.

3.2. Population

Based on estimates from the Plan Nacional de Drogas, in 1996 there were approximately 150,000-200,000 IDUs in Spain, with about 15,000-20,0000 in Madrid. Although exact figures are not available, it is estimated that in the Autonomous Community of Madrid the number of female drug users is between 2,000 and 3,000.

3.3. Profile of the study population in Spain

In the absence of a recent population census or a study of IDUs that could provide a sampling frame for Madrid, we used a surveillance system set up by the Spanish government in 1988 in order to gather information about drug users attending the general health care system and the public drug treatment centres.

3.4. Network in health and social services

In order to obtain the support of recruitment centres and health and social services, we studied the current system for the provision of national health services, with particular regard to drug treatment. This information was collected in 1995.

3.4.1. Health services

The current Spanish public health system (as of 1995) can be divided into the following administrative levels:

- **Central level**. The Ministry of Health & Consumer Affairs manage public health at the central level.

- **Autonomous Community**. Autonomous Communities have control over health promotion and prevention. The responsibility for health care is assumed by the autonomous communities rather than by central government.

- **Health areas**. Care is provided for 200,000 - 250,000 people. There is at least one health area per province. According to the Health Law, health areas should carry out their activities by working in teams in order to serve individuals, families and communities, through programmes for health promotion and prevention, treatment and rehabilitation.

The health areas are divided into basic health zones that constitute a national framework for primary health care. The Social Security system provides health care to 98 percent of the population of the Autonomous Community of Madrid. Health services act in the health areas of this Community at three levels:

- **Primary health care**. Health reforms in the 1980s led to the creation of Health Centres. Interdisciplinary teams work on the diagnosis, treatment and cure of diseases using specific protocols, and in community health through prevention and health promotion programmes.

- **Specialised health care**. Health care needing specialised professionals, technology and treatment can be carried out in outpatient centres with specialised surgeries, laboratories and diagnosis, supporting both the specialised level and primary health care.

- **Hospitals**. In some areas there are hospital day units for specific diseases such as AIDS and cancer.

General health care for drug users should be carried out by a doctor at the primary health care level. Nevertheless it is well known that drug addicts are usually reluctant to visit a doctor and prefer direct access to hospitals through casualty services.

3.4.2. Drug treatment services

The Regional Plan on Drugs is a General Programme, an assistance network, aiming to provide a response to the drug dependency problem on three different levels of intervention: prevention, assistance-rehabilitation and social reintegration. This network of drug treatment programmes distributed throughout Spain offers services to nearly 50 percent of IDUs. It is targeted at both female and male drug users that either want to stop taking drugs or don't want to or are not able to give them up. During 1995 only 20 percent of the total number of individuals assisted by this Plan were women. Services are all free of charge.

General intervention resources could be summarised as follows:

- **Council centres and day centres**. Local Centres that offer prevention, social rehabilitation and reintegration for drug users. Treatment is also offered.

- **Detoxification units**. Physical detoxification may be carried out as an outpatient in a Day Centre/Council Centre or as an inpatient in a hospital Detoxification Unit. In the Region of Madrid there are only 2 Units with a total capacity of 22 beds. Access is restricted to pregnant drug users, those with a cardiovascular pathology or another serious illness. A patient must be referred by a Local Centre and must be over 16 in order to gain access.

- **Therapeutic communities**. This service aims to offer individuals, through a wide counselling programme, the personal tools needed to complete their rehabilitation in an outpatient Local Centre. Access is only for those drug users with a minimum age of 18 referred by a Local Centre.

- **Methadone programmes**. This programme is extremely limited and is offered only to pregnant drug users, to drug users with a serious organic pathology, and to individuals highly adapted to drug consumption. Access to this programme is limited to drug users referred by a Local Centre and a minimum age of 18 is required.

- **Isidro bus**. A service designed to reach drug users on the street in Madrid. This service provides information on health and social resources, injecting equipment, health advice, etc.

- **Sitade**. A twenty-four-hour phone line that provides information on the programmes offered by The Regional Plan on Drugs.

3.4.3. Social services

The current social and community services available are:

- **IMI (Minimum Integration Income)**. This programme has been devised to fulfill the basic needs of those people who have social problems and have no income. The philosophy of the Programme is to give economic support to those prepared to commit themselves to beginning a specific Programme to deal with their problems.

- **Women's Services**. This is a social welfare service of the Ministry of Social Integration of the Region of Madrid. The main aim of the Service is the total integration of women who are at risk and in marginal positions. The following programmes form part of this service:

- **Programme for abused women and their children**. Legal advice about women's rights and duties when they have been victims of some kind of abuse. Admittance and shelter at a residence centre, when needed. Counselling and treatment.

- **Programme for pregnant young women and for single mothers and their children**.

- **Programme for young women with personal and/or family problems**. The first goal is to give women an integral training including: basic educational training, sexual and sanitary information, and work training. Help is also given to drug users.

- **Programme for prostitutes**. This programme is focused mainly on giving financial support for the maintenance of a Centre where street prostitutes can take a break from their work, get condoms and syringes, talk with a social worker, etc. However, access to this programme is difficult for IDU women.

The Council of Madrid also provides financial help with school dinners, domestic help, and books for children.

3.5. Criteria for Inclusion

The study population comprised women who had:

(1) injected drugs for more than one month and in the six months prior to the date of interview;

(2) decided to participate in the study after being informed of its objectives; and,

(3) given their informal (oral) consent to be interviewed.

4. Sampling

One of the main difficulties in preparing this research is a common problem for research on IDUs; that is the lack of a sampling frame for the population under study. The precise number of IDUs in Madrid is unknown, hence it was necessary to employ non-random methods of sampling. It has also been suggested that, given the general inaccessibility of IDUs, convenience samples should be accepted. Another problem arises from the degree to which users from one setting differ from users in other settings with respect to, for example, demographic characteristics, risk practices and the prevalence of HIV infection. For example, Powis et al. (1996) noted a higher proportion of women in their sample of drug users recruited from community settings when compared to the proportion normally found among treatment populations. Differences were also illustrated by Lampinen (1992) who identified a two-fold risk of HIV seropositivity among community-recruited IDUs compared with entrants to drug-treatment programmes. However Alcabes et al., (1992) has found that the correlates of HIV infection in IDUs are not substantially different when comparing subjects currently in treatment and those not in treatment. Nevertheless, since it is the aim of this study to provide descriptive as well as bivariate and multivariate findings, we decided to recruit in different settings, as has been recommended in the international literature (Stimson, 1992), while attempting to control for differences between settings statistically. In summary, after reviewing the Spanish literature, looking at previous studies commissioned by the European Union and talking with professionals in this area, we decided to recruit the sample in three different settings: treatment centres, methadone centres, and outreach programmes.

4.1. Treatment centres

In 1992, among the 6,048 women who sought advice about and/or treatment for drug use, 2,736 were prior attendees (defined as individuals who had already been in treatment in previous years), and 3,059 were new entrants (defined as individuals seeking drug treatment for the first time). For the Madrid area, among the 717 women treated, 255 were prior attendees and 379 were new entrants.

In the emergency services of Madrid in 1992, 1,718 women were treated for drug use problems, of whom 31 died.

4.2. Methadone centres

Methadone programmes at the time of the study (1995) were scarce and overly restricted due to controversies in health policy. At that time, there were 50 female drug users in methadone programmes and 1,565 in day-centres run by the "Community of Madrid".

4.3. Outreach programmes

Needle exchanges are administered by NGOs. In 1993, 437 female IDUs used the needle exchange buses which tour the area of Madrid. In addition, about 14 women IDUs started treatment in the project named "HOMBRE", and 102 in specialised detoxification centres.

4.4. Recruitment strategy

The current sample of 304 women IDUs who completed questionnaires were recruited as follows:

Drug dependency units

One hundred and seven (35.2 percent) were recruited from drug dependency units. This sample was taken from different services: "Proyecto Hombre", "CADs", and "ISIDRO BUS".

- *"Proyecto Hombre"*. Fifty-nine women were approached, but only 26 fulfilled the criteria of injecting drugs in the last six months. Of the 26 women eligible, 1 refused to participate.
- *Governmental Institutions: "CADs" and "ISIDRO BUS"*. Eighty-two eligible women were recruited by the staff at these centres.

Methadone services

Fifty (16.4 percent) women were recruited from different methadone units: governmental and non-governmental. Many of the women approached were currently engaged in a methadone programme and therefore not currently injecting (in the last six months), so a high proportion were not eligible (105 of 157 approached), and two of them refused to participate. Thirteen questionnaires were completed at the "Centro de Metadona Cruz Roja de Fucar", 32 at the "Centro Metadona Cruz Roja de Marroquina", and 5 at the "Servicios de Metadona de los CADS de San Blas y Tetuan".

Outreach Services

One hundred forty-seven (48.4 percent) were recruited from outreach services, including the "Médicos del Mundo" bus scheme for needle exchange. Of the 250 women approached, 95 were ineligible for having begun to inject too recently or failing to complete the questionnaire, and 8 refused to participate.

Thus, overall, 11 women out of 315 (3.5 percent) refused to participate in the study. We have no information about these women, but since the refusal rate was so low, we feel this will not bias our results. It should be noted that the refusal rate was higher among women recruited through outreach programmes versus regular treatment centres. We think this is due to the fact that those in treatment centres are more likely to have an established relationship with the staff and therefore feel less threatened by the interview. Furthermore, we believe we were able to attain such a low refusal rate because the interviewers hired for this study had a great deal of experience in working with drug users.

5. Data Collection

Two forms of data collection were used. A questionnaire was administered in a face-to-face interview to all eligible females, and a specimen of blood was collected to assess the HIV status of all who consented and had not been recently tested. Those who had been tested were asked to present their medical card which indicates their HIV status. These cards are issued by the medical services, and many drug users carry them to avoid problems with the police.

5.1. The questionnaire

The questionnaire used in this study for assessment of risk behaviour and use of services was based, with modifications, on: (1) that used in another study in Europe for males; and (2) national health surveys of women in Spain. The interview was checked in the pilot phase of the study for consistency and reliability in the five centres of the European study.

The questionnaire was geared towards IDUs by using a theoretical framework based on plausible biological risk characteristics about transmission of agents by parental and sexual routes, and by ethnographic observations.

In spite of the limitations of retrospective self-report on behaviour relating to sexual practices and drug use, this method has been evaluated in numerous studies. It is accepted that the use of retrospective self-report is a valid method for assessing HIV risk behaviour. We have chosen a recall period of six months based on the work of McElrath (1994) whose findings supported the use of retrospective self-reported data although there was moderate disagreement between the retrospective and the prospective data sets by the six-month follow-up (memory decay). These authors suggest certain strategies for maximizing the reliability of retrospective data, including the use of dichotomous measures of risk behaviour, careful construction of research instruments, a thorough training period for interviewers, and specific methods to enhance subject's recall.

Another concern in asking questions related to sexual behaviour is the reliability, depending on who asks the question and how the respondent reacts to such questions. Due to the very intimate nature of the questions asked, interviewers were trained to take care of these issues together with subcultural aspects, such as the slang used by these women (Pickering, 1988).

5.1.1. Subjects of the questions

After encountering problems with the pilot questionnaire about the length of the interview, wording of some questions and the assurance of confidentiality, the final questionnaire was structured as follows:

- **Sociodemographic characteristics.** Questions related to age, marital status, educational attainment, etc.

- **Drug use.** Our emphasis is on unprescribed drug use as reported by respondent, covering the following types of drugs: heroin (and other opiates), cocaine (and crack), amphetamines, barbiturates, benzodiazepines, ecstasy, hashish, alcohol and tobacco. There are also questions related to recency of consumption, injection drug use, frequency of injection and risk behaviours, including sharing of injection equipment, cleaning equipment, and injecting in prison.

- **Sexual behaviour.** Questions related to sexual relationships with regular partners, casual partners and clients. Number of HIV-positive partners and IDU partners. Frequency of oral sex, vaginal and anal intercourse. (Criteria for regular or casual partner and client were included in the questionnaire.)

- **Use of condoms.** Questions to achieve a better knowledge of the determinants of the use of condoms by this population, such as: reasons to start using condoms; sources of condoms; and frequency of condom use with regular and casual partners and clients during oral sex, vaginal and anal intercourse.

- **Reproductive health.** Questions including age at first period, frequency of periods, contraceptive methods used, pregnancy, number of miscarriages and abortions, number of children, smear test, STDs, HIV-positive children, and HIV tests.

- **AIDS public education campaigns.** Questions included knowledge of public health campaigns, etc.

- **Women's experience of health, drug and social and community services at local levels.** These questions were related to frequency of use and reasons for using each service, and to women's perception of the usefulness and the accessibility of each service. Measurement of service utilisation is scored on a series of items covering encounters with three different types of services - health, drug, and social. There were multiple service utilisations, so this will represent the total number of different types of service systems utilized during the previous six months.

- **HIV test.** At the end of the interview, study participants were asked if they had been tested for HIV. If they responded that they had been tested for HIV, they were asked to provide a written confirmation of their test results by their doctor. It should be noted that it is common in Madrid for the medical services to issue a medical card indicating HIV status and that it is common for drug users to carry these cards in order to avoid problems with the police. Those who had not been tested and who gave their informed consent were asked to provide a blood sample for HIV testing.

5.1.2. Formatting and coding of variables

Data were collected on more than 84 sociodemographic, behavioural, and health variables. All centres used the same protocol for sampling and administration and the same core questionnaire. Questionnaires were coded to ensure the anonymity and confidentiality of the study participants

In the pilot study some difficulties were met with in the content and format of some types of variables, and after discussion with the collaborators these variables were reclassified using continuous (such as the number of sexual relationships, number of injections) and categorical (such as dichotomies (yes/no)) variables. However, it should be noted that the level of detail required by continuous scales may exceed the capabilities of some participants and for this reason some responses are categorised using, for example: "always", "very often", "almost never," and "never".

5.1.3. Types of variables

- **Qualitative and categorical variables**
  - Demographic characteristics (i.e., sex, marital status, educational attainment, residence, source of income, etc.).
  - HIV prevalence.
  - Probable risk factors (i.e., prison, drug practices and variables concerning sexual behaviour).
  - The use of health services and social networks, and variables about knowledge, attitudes, access and acceptability of these services.

For the multivariate logistic regression analysis we used different scales, including dichotomous, nominal, and ordinal variables. Dummy variables/reference categories were assigned as the group with the least risk.

- **Quantitative variables**
  - Continuous variables (i.e., age, age of first injection, age of first period, etc.).
  - Discrete variables (i.e., parity, number of children, abortion, frequency of sexual relationships, frequency of injection, etc.).

Continuous variables were measured in the appropriate scale (i.e., years, etc.). Some of the continuous variables were recoded into categorical variables for the multivariate logistic regression analysis.

5.2. Testing for HIV status

HIV antibody testing was performed only after informed consent had been given. Refusal to be tested was not grounds for exclusion from the study, and was recorded. Samples of blood were collected and tested by ELISA (enzyme-linked immunosorbent assay for saliva) with positive tests confirmed by Western Blot.

5.3. Training of interviewers

The data collection period was preceded by a session of training for the interviewers. Around 10 potential interviewers participated in the training sessions. The training was conducted by the main investigator who presented to the interviewers the background and objectives of the study, and discussed each item and question on the questionnaire. The training session placed particular emphasis on completing questionnaires with each participant. Following training, the person responsible for the field work carried out the first questionnaire with each interviewer and conducted a special session on coding skills.

The interviewers were mostly workers in the treatment centres and people who have been working in research on drug users.

6. Field Work

6.1. General guidelines

Interviewers were selected from the staff of different centres. For the outreach sample, the process of "snow balling" the sample was used to increase the number of female IDUs interviewed. This involves making initial contacts with respondents and then using respondents to provide access through personal introductions and recommendations to friends and colleagues.

6.2. Strategies in the field

Originally, field work was planned to span over a six-month period, commencing in October 1994 and finishing in April 1995. However, unforeseen obstacles arose, and the data-collection phase was delayed and extended.

6.2.1. The first phase

The participating centres' staffs met on two occasions to prepare the questionnaire to be used in this study. This questionnaire was translated into Spanish and pre-tested in a pilot phase conducted between January and October 1994 when 25 women were interviewed. Results from this pilot study were used to refine the questionnaire and to adapt the wording of questions.

In this period, the major activities were to develop and adapt the final questionnaire for the main survey. Based on the final questionnaire, an interviewer's manual was prepared, and a technical training workshop was held for interviewers in order to achieve standardisation in the enrollment of participants and data collection.

6.2.2. The second phase

Between October 1995 and January 1996, the project was delayed in the recruiting of centres and interviewers due to political repercussions from changes in the Autonomous Government of Madrid. The main investigator and research assistant held numerous meetings with relevant individuals and organisations to explain the objectives of the study.

6.2.3. The third phase

Between October 1995 and March 1996, 309 face-to-face interviews were conducted by trained personnel, using the structured questionnaire which had previously been tested during the pilot phase of the study

7. Statistical Analysis

7.1. Treatment of missing values

First of all, participants with incomplete questionnaires were excluded from the study. Participants who failed to provide written confirmation of their HIV test were coded as "not known" in the HIV prevalence variable so that the rest of the data collected from these participants is included in the study. However, when HIV prevalence is the dependent variable in the multiple logistic regression analysis, the "not known" cases were excluded. This approach is warranted provided that the missing data occurred completely at random (Heitjan, 1997).

7.2. Descriptive analysis

In order to identify the risk factors for HIV infection and the predictive factors for other "at risk" situations (including risk behaviours), such as prison, sharing injecting equipment, prostitution, lack of treatment, we have done a univariate analysis considering each of these risk variables as the dependent variable.

Categorical variables

Frequency distributions and percentages were calculated using 2x2 tables. For categorical and discrete variables, levels of significance were tested using the chi-square test for proportions. Each variable was studied and their potential relationships as main effect and as confounders were analysed. This was done through univariate analysis using the Mantel-Hanzel statistic to obtain the odds ratio (OR) between the dependent and independent variables. The OR provides a measure of association but does not imply a causal relationship. However it is a very useful method to identify those risk factors which are associated with the variable of interest.

Quantitative variables

For continuous data, differences in means were tested using the approximated normal distribution, with the t-test and the z-score. The use of the normal distribution was justifiable due to the large sample size.

We transformed continuous variables into categorical intervals and calculated the frequency distributions.

7.3. Multivariate logistic regression analysis

Few attempts have been made to develop conceptual models of the complex relationship between injecting drug use and AIDS using multifactorial analysis. Frischer et al. (1993) used the Linear Structural Relations Program (LISREL) technique to develop a model to represent the grid of relationships among the observed data in a large-scale cross-national study of IDU in Scotland. The LISREL approach involves the construction of measurement and structural models. The measurement model consists of a number of underlying or latent variables that account for the common relationship among a number of observed variables. Each latent variable is defined by at least two valid indicators. In addition to the latent variables, exogenous variables can be included in the model, which are considered to be predictive of, but not predicted by the latent variables. These variables are generally sociodemographic in nature. The structural model involves path analysis, which has been defined as: "the process of estimating the coefficients of a set of linear structural equations (i.e., regressions) representing the predictive relationships hypothesized by the investigator" (Frischer et al., 1993). One of the advantages of the LISREL model is its ability to consider the model as a system of equations and estimate all the structural coefficients simultaneously.

Although path analysis is not used in the current study, the grid of relationships modeled by Frischer et al. (1993) did influence our conceptual framework and plan for logistic regression analysis. First of all. we chose the causal model rather than the predictive model because we are interested in studying behaviour, and this is the more appropriate model for explaining the behavioural process. The primary dependent variable we studied was HIV seropositivity. Then we examined various latent factors including: prostitution, imprisonment, unsafe drug use, unsafe sex, exposure to drug treatment and the exogenous factors associated with them, including sociodemographic and socioeconomic factors.

For each dependent variable, the relationship between the dependent variable and independent variables was evaluated through crude and adjusted odds ratios with their 95-percent confidence intervals. Those variables which had a statistically significant association with the dependent variable were included in the logistic regression models.

The strategy used for analysis in the multivariate logistic model followed a stepwise approach. A logical and hierarchical structure was used to simulate reality and determine the direct and indirect effects of the explanatory variables. In other words, the explanatory variables were grouped into explanatory groups or models and each group of variables was forced into the regression sequentially. The explanatory groups used to study each of the dependent variables

generally included age, socioeconomic status, marginalisation factors, risk behaviours, and co-infection with STDs or hepatitis B, in that order, although the models included varied according to the dependent variable being studied in each chapter.

The order in which each group was entered into the regression was established based on the biological and sociological hierarchy of their effect on the dependent variable with the more proximal determinants entered first and distal determinants entered later. These effects were estimated based on published literature as well as the author's knowledge of this topic. We also checked variables for interaction effects because in the causal model the effect can be changed by interaction between variables.

The idea behind building these different groups at different stages was to be able to see how each variable works under different "at-risk" situations and be able to consider the whole picture. For example, an explanatory variable such as "age" may have a direct effect on the dependent variable such as "HIV status" (via the decline in immune function with age) and it also may have an indirect effect on the dependent variable, HIV in this case (via exposure to risk factors, such as imprisonment). In other words, the hierarchical structure allows one to see how the relationship between an explanatory variable and the dependent variable changes when certain other explanatory variables are introduced. That is, it permits the identification of indirect, intervening, and direct effects, which is particularly useful in the study of HIV with such a variety of interrelated explanatory variables. Furthermore, in the study of HIV the identification of indirect effects can provide useful "risk behaviour markers" for targeting preventive interventions. For example, cocaine use may not be directly associated with HIV status but its direct relationship with lack of condom use, which is directly associated with HIV highlights cocaine use as a useful "risk behaviour marker".

Using the statistical software programme SPSS, each of the explanatory groups is entered into a stepwise logistic regression. For each step, when a group is entered, the most parsimonious model is chosen, through a process of backward elimination, and then the next group of variables is added. Therefore the final regression model is comprised of the best variables from each of the five explanatory models. The regression models are compared using the improvement in the -2 Log likelihood value (-2LL) measured with the Chi-Square. To determine if there are any significant interaction effects which should be included, interaction terms are defined and systematically analysed for all the variables included in the final model. The addition in goodness of fit gained by including interaction terms is then examined.

Thus, the final picture we obtain from the five different explanatory models is one which allows us to evaluate the effect of how these different variables have a direct effect on the dependent variable and how their effect is mediated through other variables in the causal pathway (see Figure 1).

8. Conclusion

In summary, we have chosen a cross-sectional study to explore the behaviour of female IDUs and determine the relationships between behaviour and a number of dependent variables. We have considered the limitations inherent in a cross-sectional design such as the time sequence of events and have adopted appropriate measures in the questionnaire. Because of the potential for selection bias given the population we studied, we implemented sampling techniques to correct for this, such as sampling from multiple sites. Finally, we have built a number of hierarchical models which at different stages explore how the different variables have a direct and indirect effect on the dependent variables and how their effect is mediated through other variables in the causal pathway.

Chapter Four

Characteristics of Female IDUs

1. Introduction

Women make up an increasing proportion of people infected by the Human Immunodeficiency Virus (HIV). Originally, and in contrast with some African countries where the incidence of HIV and AIDS has been approximately equal in both men and women since the beginning of the epidemic, in North America and Europe women represented only a small fraction of the HIV-infected population. However, the female-to-male ratio has shown an ever increasing trend in recent years: of the 24,920 cases of AIDS reported in Europe by the end of 1996, women accounted for 21 percent of cases among adults and adolescents (European Centre for Epidemiological Monitoring of AIDS, 1996). This represents an increase from 8 percent in 1985 and from 13 percent at the end of 1990 (European Centre for Epidemiological Monitoring of AIDS, 1990).

The increase in female HIV/AIDS cases is due to a set of biological, social, cultural, economic and political factors that make women more vulnerable to HIV transmission than men. Heterosexual transmission, accounting for almost a third of female AIDS cases (European Centre for Epidemiological Monitoring of AIDS 1996), is favoured by a woman's anatomical features, and the relative efficiency rate of male-to-female transmission has been found to be over twice as high as female-to-male transmission (Nicolosi et al., 1994). Women are generally more susceptible to sexually transmitted diseases (STDs), a history of which has been identified as a major risk factor in heterosexual HIV infection (Holst et al., 1987; Musicco et al., 1994). In addition, women tend to have less access to information and health services, are economically dependent on men and have low levels of negotiating power in their sexual relationships with men.

However, the main identified risk factor for HIV transmission in women is injecting drug use, which in Europe accounts for more than half of reported female AIDS cases (European Centre for Epidemiological Monitoring of AIDS 1996). There are a number of gender-specific lifestyle differences which may be putting female injecting drug users (IDUs) at a greater risk of acquiring HIV than male IDUs. Prostitution as a means of financing a drug habit, for example, is more common in women than in men, and has been linked to HIV in both Europe and the United States (European Working Group on HIV Infection in Female Prostitutes, 1993; Watters et al., 1994b). Also, previous studies have shown that female IDUs are more likely to have seropositive male partners and to practice high-risk sexual behavior (Cohen et al., 1989; Klee et al., 1990; Estébanez et al., 1991). The sharing of needles, identified as a major risk factor for HIV transmission (Marmor et al., 1987; Des Jarlais, 1992) also appears to be more common in female than male IDUs (Salmaso et al., 1991; Sotheran et al., 1992).

Even though there is evidence of gender-specific high-risk behaviours, studies on HIV transmission in drug-dependent populations have failed to include gender-specific data. Thus, little research has focused on the role played by reproductive health in the complex relationships among women, drug use and HIV.

Evidence indicates that female IDUs do not constitute a homogeneous population and that different subpopulations may be identifiable on the basis of certain sociodemographic characteristics or behaviours involving the risk of transmitting HIV. The documentation of these characteristics and risk behaviours in female IDUs is important to predict the future course of the AIDS epidemic in the community and to define policies which can appropriately target subgroups at the highest risk. Before predictions can be made, it is important to examine the range of factors specific to women which may possibly influence HIV risk, such as reproductive health, as well as the types of sexual behaviour and the degrees to which injecting equipment is shared, and of course the rate of infection in this group.

Thus by knowing more about the social context within which these women live and their gender-specific needs, such as reproductive health, more effective policies and treatment programmes can be established.

This chapter will present the descriptive results from the interviews with 304 female IDUs recruited from a variety of settings in Madrid with two objectives in mind. Firstly, it is the author's intention that the baseline data presented herein will aid in the formation of policy for this population. Secondly, the data presented will allow the reader to have a firm understanding of the population at hand before examining the multitude of possible bivariate and multivariate relationships between the characteristics of female IDUs and HIV (Chapter Five, prostitution (Chapter Six), previous imprisonment (Chapter Seven), needle sharing (Chapter Eight), condom use (Chapter Nine), and exposure to treatment (Chapter Ten). The sociodemographic characteristics are described in Section 2; Drug-taking risk behaviour in Section 3; Sexual behaviour in Section 4; Prostitution in Section 5; Reproductive health in Section 6; and Service use in Section 7.

2. Sociodemographic Characteristics

Selected sociodemographic characteristics of the total sample population are presented in Table 4.1. The data presented in Table 4.1 identified a young population: more than 60 percent of interviewed female IDUs were less than 30 years old and the median age was 29 years. Almost 55 percent had left school when they were 15 years old, indicating that educational attainment was at a medium level. That is, the majority of the population completed secondary school education (i.e., up to the age of 16), but further education was rare.

In addition, other characteristics presented in Table 4.1 indicate that the population sample was marginalised and of a disadvantaged socioeconomic status. For example, almost one quarter (22.7 percent) are homeless, having no fixed address, although 22.0 percent report living with their parents. Furthermore, only 12.8 percent of women earned a regular salary whilst, conversely, 20.7 percent of women earned their main source of income through sex work and 24.3 percent through illegal activity. Moreover, 32.2 percent of female IDUs recruited into the study reported having been in prison since first injecting drugs.

When the sociodemographic data for Madrid were compared with the four other centres (Paris, Rome, London and Berlin) which participated in the study (Estébanez et al., 1996), no major differences were identified. For example, the median age for all five centres ranged from 29 years (in Spain) to 31 years (in France, Italy, and Germany). However, Spain recorded the lowest mean age of leaving education (the other four countries ranged from 17.08 in Italy to 20.01 in Germany) and the highest rate of homelessness (the other four countries ranged from 6.9 percent in Italy to 17.6 percent in France). Spain also recorded the highest rate of reporting illegal activity (theft, dealing, etc.) as their main source of income (the other countries ranged from 17.6 percent for England to 9.5 percent for France). In contrast, the proportion of Spanish IDUs reporting their main source of income as sex work was higher than the rates reported by Italy (8.3 percent) and England (10.9 percent), but lower than France (24.4 percent) and Germany (28.2 percent). Surprisingly, Spain recorded the lowest rate of previous imprisonment (the other countries ranged from 35.7 percent in England to 58.5 percent in Germany). Finally, a marked difference in living patterns was apparent between the northern European countries (England and Germany) and the southern European countries (Spain and Italy). For example, in Italy, 39.0 percent of female IDUs lived with their parents, compared to 2.7 percent in England.

When we look at data from a 1991 Spanish national survey, we find that amongst women aged 16 to 44 years, 6 percent were illiterate or had had no education, 29 percent completed primary school, 45 percent completed middle school, 9 percent completed professional training, and 11 percent completed university or higher (Instituto de la Mujer, 1991). If we look at unemployment, it appears that 23 percent of Spanish women who want to work are unemployed. This compares to 50 percent of the IDUs in the current study if we combine the following source of income categories: unemployed with regular income from state (6.3 percent), welfare from state (8.2 percent), illegal income (24.3 percent), and no source of income (4.9 percent). Another interesting point of comparison is the rate of living with parents. According to a study by Juan Antonio Fernández Cordón of the Institute of Economy and Geography of the Superior Council of Scientific Investigations (CSIC), the rate of living with one's parents for Spaniards between the ages of 25 and 30 varies between 74 percent for those who are unemployed and 58.6 percent for those who are employed (Díaz de Tuesta, 1997).

In other words, two inferences can be made from the data presented in Table 4.1. First, as would be expected from a study into the risk behaviour of female IDUs, the sociodemographic characteristics of the sample population are not typical of society in Madrid per se and represent a marginalised young community of women. In fact, this sample from Madrid appears to be more marginalised than the samples from other European capitals, as evidenced by their having less education, more homelessness, more illegal income, and more prison experience. Of particular concern is the relatively high rate of homelessness. This subgroup of female IDUs may be at particularly high risk for HIV given the risk behaviours frequently associated with homelessness (drug abuse, alcohol abuse, trading sex for money or drugs, sexual relations with drug-using partners, multiple sexual partners, unprotected sex) and the relationship of homelessness to other health risks, such as mental distress, depression, and trauma, including battery and rape (Fisher et al., 1985; Nyamathi et al., 1997).

Secondly, and of considerable interest, was the number of women (45.5 percent) who reported earning their main source of income through sex work or an illegal activity. It has often been assumed that male IDUs financed their drug habit through theft and drug dealing, whilst women have traditionally been assumed to do so through prostitution. In these data, there is evidence that women use both sources of income in roughly equal proportions. This finding coincides with the findings of a study of criminal activity among women crack addicts which indicated that the women are not only involved in prostitution but also in petty crimes and drug-selling activities and the levels of involvement in these activities are approaching those of their male counterparts (McCoy et al., 1995).

Table 4.1 Sociodemographic characteristics of the studied population

Variable	N	percent
Age at the time of interview		
15-19	7	2.3
20-24	66	21.7
25-29	110	36.2
30-34	72	23.7
35-39	42	13.8
40-44	5	1.6
45+	2	0.7
TOTAL	304	100.0
Age left full-time education		
10-13	88	29.1
14-15	82	27.2
16-18	73	24.2
19+	56	18.5
still studying	3	1.0
TOTAL	302	100.0
Living with		
Parents	67	22.0
Relatives	25	8.2
Partner	76	25.0
Children	6	2.0
Partner and children	22	7.2
Friends	13	4.3
Alone	60	19.7
Other	35	11.5
TOTAL	304	100.0
Where they lived during the past 6 months		
No fixed address	69	22.7
Room rented on a daily basis	27	8.9
Rented flat	29	9.5
Your own (or partner's) flat	76	25.0
Someone else's flat	39	12.8
Shelter, welfare residence	3	1.0
Other	45	14.8
Your parents'/relatives' flat	16	5.3
TOTAL	304	100.0

Table 4.1 (continued) Sociodemographic characteristics of the studied population

Variable	N	percent
Source of income during the last 6 months		
Employed with regular salary	39	12.8
Unemployed with regular income from state	19	6.3
Temporary work	21	6.9
Welfare from state (allowances)	25	8.2
Self-employed	11	3.6
Sex worker	63	20.7
Illegal income (theft, dealing, etc.)	74	24.3
Other	37	12.2
No source of income	15	4.9
TOTAL	304	100.0
Who finances the major part of your expenses		
Yourself	182	59.9
Your partner	45	14.8
Your family of origin	58	19.1
The social support system	14	4.6
Others	5	1.6
TOTAL	304	100.0
Been in prison since first injection		
Yes	98	32.2
No	206	67.8
TOTAL	304	100.0

3. Drug-Taking Risk Behaviour

Consistent with the marginalised socioeconomic characteristics of the study population (Section 2), the age at the time of first injection was quite young (Table 4.2). The median age of first injection was 19 years (range 11 to 35 years). More than half (53.4 percent) started injecting drugs before the age of 20. This, without a doubt, has an important impact on their psychological development and social behaviour as it is in this stage of life when the basis of their adult personality is established. Therefore, in these women future behavioural problems are found with greater frequency than in those who started injecting drugs later in life.

With regard to drug-taking behaviour there is some evidence that the practice of needle sharing had declined with time. For example, 71.6 percent of female IDUs reported having ever shared needles or syringes and 34.2 percent reported sharing in the past six months. However, the valid proportion for the past six months (i.e., the proportion of female IDUs who have shared over the past six months to those who have ever shared) was 47.9 percent. In fact, there is evidence that drug users in a variety of countries are modifying their risky practices. In a study conducted in the U.K., Hunter et al (1995) reported a decline in the proportion of IDUs that had shared injecting material during the six months prior to the interview over four consecutive years (from 1990 to 1993). Specifically they found a decline from 46.8 percent in 1990 to 39.3 percent in 1993. This reduction in recent needle sharing is comparable to rates found by Estébanez et al. (1996) in other E.E.C. countries: in the U.K. there was a reduction from 69.2 percent that had ever shared injection equipment to 38.5 percent who had shared in the previous six months; the reduction in Germany was from 56.4 percent to 26.9 percent; in Italy from 47.2 percent to 26.3 percent; and in France, where rates were quite a bit lower, from 34.4 percent to 10.0 percent. These data provide encouraging evidence that a decline is underway in the risky behavior of IDUs perhaps as a result of public health interventions advocating harm-reducing behaviour during the 1990s.

The proportion of female IDUs that shared needles in the past 6 months was 34.2 percent, and the frequency of at least once a month or less was 51.0 percent, although a significant number (30.6 percent) shared needles at least once a day (Table 4.2), thus reducing the real number at risk from transmission of HIV by this means to 9.9 percent (The 30.6 percent of the 34 percent). These figures imply that habits concerning the sharing of needles have changed and that HIV prevention campaigns aimed at the drug-using population have been successful.

Almost half of the women questioned (49 percent) injected drugs for the first time with their regular sexual partner. In a study of male and female drug users, Powis et al. (1996) also reported that half of female injectors (51 percent) reported having been given their first injection by a male sexual partner. (Male injectors more often received their first injection from a friend.) This demonstrates the great influence a stable male partner has over a woman, and must be taken into account when developing strategies against drug addiction. Maybe one of the most effective measures to prevent drug addiction in women would be to persuade the drug-using partner to discourage the women from taking drugs and to inform him of the enormous influence he can have in this regard and the consequent responsibility.

Unlike men, very few women (1 percent) participate in drug-taking behaviour alone (Barnard, 1992). This implies that women, more than men, need to feel supported by someone in making decisions of this kind, involving the transgression of a behavioural norm. This is another

indication of the great difference between men and women in the drug-injecting experience. Women are seen to be more affected by prejudice than men and thus need to have someone reaffirm their behavior and push them into action. The explanation for this can be found in the roots of a society which establishes different roles according to one's sex, producing gender differences.

Women most commonly shared needles with a regular sexual partner (47.5 percent), whilst 17.8 percent shared with a male friend and 10.9 percent with a female friend. The main source of injecting equipment for women was the pharmacy or chemist, although 56.6 percent of women reported the use of needle exchange schemes. This observation, however, probably reflects the sample characteristics of recruitment and thus any comparison with other (associated or independent) studies would be meaningless.

Another interesting observation is the types of drugs consumed in the past six months: 89.9 percent of female IDUs reported taking heroin; 63.8 percent cocaine; and 53.3 percent, a combination of both cocaine and heroin. Crack cocaine was used by 15.1 percent of women in the past six months. Pills, such as benzodiazepines and barbiturates, were consumed by 60.6 percent of this sample. The vast majority (97.7 percent) of female IDUs smoked tobacco.

In spite of beliefs to the contrary, alcohol consumption is high, with 70 percent of the sample reporting alcohol consumption in the last six months. These data are similar to those obtained by Estébanez (1996) in the U.K. However, in the other countries consumption was significantly less: 35.5 percent in Italy, 49.8 percent in France, and 44.4 percent in Germany.

The most commonly injected drugs in Spain were heroin (78.9 percent), cocaine (52.6 percent) and heroin and cocaine together (49.7 percent). When compared to the other four centres, rates of heroin injection were higher for Italy (99.5 percent), rates of cocaine injection were lower for Italy (10.6 percent), England (25.8 percent) and France (16.3 percent), and rates of injecting both heroin and cocaine were lower for all four countries (ranging from 9.0 percent for England to 39.4 percent for France) (Estébanez, 1996).

Neither does our data coincide completely with that of other Spanish studies such as Bravo et al. (1996), carried out among drug users of both sexes, in which 38.3 percent had injected cocaine and 71.2 percent had injected heroin and cocaine.

Chitwood and Comerford (1990) found that injectors of cocaine used in combination with opiates were more likely to have multiple sex partners and high-risk injecting behaviour than cocaine-only or opiate-only injectors. Kowalewski (1990) reported that the disinhibiting effects of cocaine may predispose users to HIV infection through high-risk sexual behaviour. These findings are supported by the work of Joe & Simpson (1995) who reported that HIV risks increased as a direct function of cocaine usage level, though only for males. Among females, low-to-intermediate levels of cocaine use (less-than-weekly) were associated with high-risk behaviours. We were not able to establish statistically significant associations with any of these relationships.

Only 15.5 percent used crack in a non-injected form, a finding which coincides with data from the Spanish study by Bravo (1996) in which 13.4 percent used it in the month prior to the study. However, there is quite a bit of variation in crack use reported in other countries studied by

Estébanez (1996), with 11.8 percent in France, 0.9 percent in Italy, 0.4 percent in Germany, and 48.4 percent in England. In a study carried out in the U.S.A. by Watters (1994b), about half (54.3 percent) of the women IDUs reported smoking crack in the 30 days before the interview.

Crack is thought to be an important risk factor for HIV infection and other STDs because of the associated behaviours of the users, including a tendency toward unprotected sexual intercourse and multiple sexual partners (Wilson, 1997; Watters, 1994b; Sterk, 1988; Goldsmith, 1988). Furthermore, studies of criminal activity among women crack addicts indicate that they are not only involved in prostitution but also in petty crimes and drug-selling activities, and the levels of involvement in these activities are approaching those of their male counterparts (McCoy et al., 1995).

Indeed it should be stressed that drugs apart from heroin can be injected and thus need examining. For example, in a sample study based in North West England, Klee (1993) concludes amongst other things, that the injecting of amphetamines was associated with a greater frequency of intercourse which in itself may be associated with a greater risk of HIV infection.

It is interesting to note that 32.7 percent of those who were in prison injected drugs during that time. Drug use in prison has been widely reported. For example, a recent study of female prisoners in Scotland's Corton Vale prison, found that 46 percent of inmates reported IDU and 57 percent of these injector-inmates reported to have injected whilst in prison (Gore et al., 1997). There is also evidence from a study of 559 Scottish inmates (480 males and 79 females) in which 7.7 percent reported IDU on at least one occasion during a period of imprisonment (Power et al., 1992).

Table 4.2 Drug-use habits

Variable	N	percent
Age at first injection		
13 or -	11	3.6
14-16	70	23.1
17-19	81	26.7
20-22	67	22.1
23-25	44	14.5
26-29	24	7.9
30 or +	6	2.0
TOTAL	303	100.0
Injected drugs for the first time with		
A regular sexual partner	148	49.0
A female friend	58	19.2
A male friend	35	11.6
Alone	3	1.0
Multiple users	45	14.9
Others	10	3.3
A relative	3	1.0
TOTAL	302	100.0
Drugs "used" within the last 6 months (n=304; multiple responses possible)		
Heroin	271	89.9
Cocaine	194	63.8
Heroin and cocaine simultaneously	162	53.3
Methadone	72	23.7
Other opiates	45	14.8
Amphetamines	21	6.9
Benzodiazepine	113	37.2
Barbiturates	71	23.4
Crack	46	15.1
Ecstasy	19	6.3
Alcohol	213	70.1
Tobacco	297	97.7
Hashish	126	41.4

Table 4.2 (continued) Drug- use habits

Variable	N	percent
Drugs "injected" within the last 6 months (n=304; multiple responses possible)		
Heroin	240	78.9
Cocaine	160	52.6
Heroin and cocaine simultaneously	151	49.7
Methadone	9	3.0
Other opiates	6	2.0
Amphetamines	3	1.0
Benzodiazepine	11	3.6
Barbiturates	3	1.0
Crack	1	0.3
Ecstasy	1	0.3
Ever shared used needles or syringes		
Yes	217	71.6
No	86	28.4
TOTAL	303	100.0
Shared needles within the last 6 months		
Yes	104	34.2
No	199	65.8
TOTAL	303	100.0
Frequency of needle sharing in the last 6 months		
Once a month or less	50	48.1
Once a week	18	17.3
Once a day	11	10.6
More than once a day	19	18.3
No response	6	5.7
TOTAL	104	100.0
Sharing behaviour in the last 6 months		
Only borrowing	9	8.6
Only lending	3	2.9
Both, but more borrowing	16	15.4
Both, but more lending	25	24.0
Both equally	48	46.2
No response	3	2.9
TOTAL	104	100.0

Table 4.2 (continued) Drug-use habits

Variable	N	percent
Get used needles from		
A regular sexual partner	48	47.5
A female friend	11	10.9
A male friend	18	17.8
Other	24	23.8
TOTAL	101	100.0
Give your used needles to		
A regular sexual partner	46	48.4
A female friend	10	10.5
A male friend	15	15.8
Other	24	25.3
TOTAL	95	100.0
Method used to clean used needles		
Cold water	47	46.1
Hot water	10	9.8
Boiling	0	0.0
Bleach	18	17.6
Alcohol	4	3.9
More than one method	10	9.8
Other	2	2.0
I don't clean them	11	10.8
TOTAL	104	100.0
Why you refused the offer of a used needle		
Because of HIV/AIDS	119	40.3
Because of hepatitis	1	0.3
Appearance of needle/syringe	12	4.1
Because of person offering	29	9.8
Because I never borrow	66	22.4
For other reasons	68	23.1
TOTAL	295	100.0
Injected drugs in prison		
Yes	32	32.7
No	66	67.3
TOTAL	98	100.0

4. Sexual Behaviour

The sexual behaviour of female IDUs is examined with respect to regular partners, casual partners and clients. The characteristics and sexual behaviour of prostitutes (i.e., with clients) are examined in Section 5. Selected characteristics describing the sexual behaviour with regular partners are presented in Table 4.3.

Contrary to the popular belief that IDUs are less sexually active than the general population, there are many recent studies that show that the majority of drug injectors are having sex: 82 percent in England (Donoghoe, 1991), 88 percent in North West England (Klee, 1990), 77 percent in Amsterdam (Van den Hoek et al., 1990), 93 percent in South Florida (Chitwood, 1990), and 89 percent of a sample of female injectors in New Jersey (Freeman, 1994). Similarly, our study concluded that out of those interviewed, most were sexually active.

Regular partner: The vast majority (i.e., 96.4 percent) of female IDUs reported ever having a regular sexual partner, and 61.4 percent reported having a regular partner at the time of the study. Furthermore, 87.7 percent of women reported ever having a regular partner who was an IDU. This high percentage of IDU partners is confirmed in other studies (Cohen et al., 1989; Mulleady et al., 1990; Dolan et al., 1991; Donoghoe, 1989) and is explained by the fact that there are many more male IDUs than female IDUs. Moreover, in the current study 49.5 percent of women reported ever having a regular partner who was HIV positive.

Vaginal intercourse was the most common (i.e., 88.8 percent) sexual activity. Oral sex was also common with 70.8 percent of women reporting it in the past 6 months. Anal intercourse was less common with 28.1 percent of women reporting "always" or "sometimes" having it in the past six months.

If these results are compared with sexual practices in the general population in Spain, according to the study by Usieto (1992), we find that they are comparable only as far as vaginal intercourse, in which 9 percent reported never or rarely having it. Comparing rates of anal and oral sex, there were big differences from the general population. Oral sex was practiced less in the general population (42 percent of women and 45 percent of men) than in our study. Usieto also reported that only 9 percent of men had ever had heterosexual anal intercourse in their lives, and no data was available on the anal sex practices of women. However, another study conducted in Spain amongst IDUs by Bravo (1994) found that 18.3 percent of women had had anal sex.

Similar figures were obtained by Strang (1994) in a study in London in which 20 percent of female heroin users had experienced anal intercourse within the last year and 10 percent within the last month. In another study on women attending a STD clinic in London by Sherr (1991), 10 percent reported anal intercourse with a frequency of 1-30 occasions over the previous month. Spira (1993) in his study about trends in sexual behaviour found that the occurrence of anal intercourse varies greatly from one country to another, and notes an important increase during the last 20 years. Spira found that 26.2 percent of French women and 21.7 percent of Danish women reported ever having anal intercourse. Clearly, preventive programmes need to address the risks of anal sex amongst heterosexuals.

Condoms were "always" used by 22.3 percent of women in our study who reported having vaginal intercourse in the past six months. These data coincide with those found by Van den Hoek (1992) who found that 25 percent of IDUs with steady partners reported using condoms for vaginal intercourse.

In anal intercourse, only 22 percent reported "always" doing so with condoms. Similarly, a study among California heterosexuals found that only 13.5 percent of women reported "always" using condoms for anal intercourse and 74 percent reported "never" using condoms (Erickson et al, 1995).

Finally, very few women used condoms during oral sex. For example, only 2.4 percent of women who had had oral sex in the past six months, "always" used a condom. Although generally considered a "lower-risk sexual behaviour", the transmission of HIV by unprotected receptive oral-genital contact (with and without ejaculation) is being described with increased frequency, particularly as the frequency of higher-risk sexual behaviour declines (Berry and Shea, 1997). As these authors suggest, recommendations for safer sex practices need to include discussion of the risks of receptive oral-genital contact.

There is a significant association between never using condoms with the regular partner and other risk factors, such as having shared needles in the last six months. In fact, the risk of having shared injecting equipment is 3.5 times higher for those women who never used condoms in vaginal intercourse with their regular partner, as can be seen in Table 4.5

Casual partner: As illustrated in Table 4.4, 79.5 percent of women reported having casual sexual partners. In the study by Van de Hoek in Holland, only 23 percent of the women IDU's had had casual partners in the previous six months. The proportion of women who reported having a casual partner who was also an IDU or was HIV-positive was 66.4 percent and 30.1 percent, respectively. Condom use was higher with casual partners. For example, 51.0 percent of women who reported having vaginal intercourse with a casual partner in the past six months, "always" used a condom. Likewise, 40.0 percent of women, "always" used condoms during anal intercourse with a casual partner, and 12.0 percent during oral sex.

With respect to casual partners, a significant association was also found between never using condoms and having shared needles in the last six months. In fact, the risk of sharing needles is 7.3 times higher for women who never use condoms in vaginal relationships with a casual partner (Table 4.6).

Condom use requires a degree of confidence within the relationship to be able to talk about sex. However, this is not always the case, as sex is often a spontaneous event. The results of the survey into sexual activity imply that female IDUs are at an increased risk from heterosexual transmission of HIV, putting a greater emphasis on the man as he is expected to take the lead in sexual relations and should therefore be responsible for the supply of condoms.

Table 4.3 Sexual relationship with regular partner

Variable	N	percent
Ever had regular partner		
Yes	293	96.4
No	11	3.6
TOTAL	304	100.0
Ever had regular IDU partner		
Yes	257	87.7
No	36	12.3
TOTAL	293	100.0
Ever had regular HIV+ partner		
Yes	138	49.5
No	141	50.5
TOTAL	279	100.0
Changed behaviour with regular HIV+ partner		
Yes	64	46.7
No	73	53.3
TOTAL	137	100.0
How behaviour changed with regular HIV+ partner		
Stopped having sexual contacts	19	30.2
Stopped vaginal sex	1	1.6
Stopped anal sex	0	0.0
Stopped oral sex	0	0.0
Stopped sex during your periods	0	0.0
Increased condom use	43	68.3
TOTAL	63	100.0
Current regular partner		
Yes	180	61.4
No	113	38.6
TOTAL	293	100.0

Table 4.3 (continued) Sexual relationship with regular partner

Variable	N	percent
Frequency of sexual relationships with current partner		
Never	43	23.9
Once a month	55	30.6
Once a week	61	33.9
Once a day	21	11.7
TOTAL	180	100.0
Kind of sex in the last 6 months		
-Vaginal intercourse		
Always/sometimes	158	88.8
Never	20	11.2
TOTAL	178	100.0
-Anal intercourse		
Always/sometimes	50	28.1
Never	128	71.9
TOTAL	178	100.0
-Oral sex		
Always/sometimes	126	70.8
Never	52	29.2
TOTAL	178	100.0
Condom use in the last 6 months		
-Vaginal intercourse		
Always	35	22.3
Never/sometimes	122	77.7
TOTAL	157	100.0
-Anal intercourse		
Always	11	22.0
Never/sometimes	39	78.0
TOTAL	50	100.0
-Oral sex		
Always	3	2.4
Never/sometimes	123	97.6
TOTAL	126	100.0

Table 4.4 Sexual relationship with casual partner

Variable	N	percent
Ever had casual partners		
Yes	241	79.5
No	62	20.5
TOTAL	303	100.0
Ever had casual IDU partners		
Yes	156	66.4
No	79	33.6
TOTAL	235	100.0
Ever had casual HIV+ partners		
Yes	53	30.1
No	123	69.9
TOTAL	176	100.0
Kind of sex in the last 6 months with casual partners		
-Vaginal intercourse		
Always/sometimes	98	96.1
Never	4	3.9
TOTAL	102	100.0
-Anal intercourse		
Always/sometimes	15	14.7
Never	87	85.3
TOTAL	102	100.0
-Oral sex		
Always/sometimes	75	72.8
Never	28	27.2
TOTAL	103	100.0

Table 4.4 (continued) Sexual relationship with casual partner

Variable	N	percent
Condom use in the last 6 months with casual partners		
-Vaginal intercourse		
Always	50	51.0
Never/sometimes	48	49.0
TOTAL	98	100.0
-Anal intercourse		
Always	6	40.0
Never/sometimes	9	60.0
TOTAL	15	100.0
-Oral sex		
Always	9	12.0
Never/sometimes	66	88.0
TOTAL	75	100.0

Table 4.5 Condom use with regular partner and sharing injecting equipment

Condom use	Equipment shared Yes	No	Total	OR (95 % CI)
Vaginal intercourse				
Always	5	30	35 (22.3 %)	1(reference)
Never/sometimes	45	77	122 (77.7 %)	3.5(1.2-11.1)
			157 (100 %)	
Anal intercourse				
Always	1	10	11 (22.0%)	1(reference)
Never/sometimes	15	24	39 (78.0 %)	6.2(0.7-143.8)
			50 (100 %)	
Oral intercourse				
Always	–	3	3 (2.4 %)	1(reference)
Never/sometimes	47	76	123 (97.6 %)	undefined
			126 (100 %)	

Table 4.6 Condom use with casual partner and sharing injecting equipment

	EQUIPMENT SHARED			
Condom use	**Yes**	**No**	**Total**	**OR(95 % CI)**
Vaginal intercourse				
Always	7	43	50(51.0 %)	1(Reference)
Never/sometimes	26	22	48(49.0 %)	7.3(2.5-21.9)
			98 (100 %)	
Anal intercourse				
Always	–	6	6(40.0 %)	1(reference)
Never/sometimes	2	7	9(60.0 %)	undefined
			15 (100 %)	
Oral intercourse				
Always	3	6	9(12.0 %)	1(reference)
Never/sometimes	23	43	66(88.0 %)	1.1(0.2-6.0)
			75 (100 %)	

5. Prostitution

Selected characteristics, describing the sexual behaviour with clients can be found in Table 4.7, where it is shown that 46.1 percent of women, reported ever having a client. The median age at first client was 22 years. The median number of clients per month was 9, range: minimum 0 and maximum 240. It should be noted, however, that 64 of the women (or 40.4 percent) could be considered ex-prostitutes (i.e., they had no clients in the past six months).

Condom use was higher with clients in comparison to regular and casual partners (Tables 4.3 and 4.4). For example, 66.7 percent of women who "always" or "sometimes" had vaginal intercourse with a client, "always" used a condom. Similarly, 40.9 percent of women did so during anal intercourse; 28.6 percent during oral sex; and 5.6 percent whilst masturbating a client. It should, however, be noted that these figures may be subject to small number problems.

The reported rate of prostitution in Spain (46.1 percent) was similar to that reported for all five centres in the European study (45.7 percent; range: 33.5 percent in Italy to 62.0 percent in Germany; Estébanez et al. 1996). These rates are higher than those observed by Donoghoe et al. (1991) who reported that between 7 and 10 percent of drug injectors had accepted drugs for sex. Likewise, in a study of drug injectors in South Florida, 21 percent reported trading sex for money and 21 percent sex for drugs (McCoy and Khoury, 1990). The relationship between drug use and prostitution is also highlighted by data looking at IDU amongst sample populations of prostitutes. For example, in a study of prostitutes in Frankfurt, 74 percent of women were IDUs (Doerr et al 1990); in Madrid, 45 percent of female prostitutes were IDUs (Colomo et al., 1990); and in Glasgow, 59 percent of female prostitutes were drug users (McKeganey et al., 1990).

In the current study, the majority of women (63 percent) reported that they initially exchanged sex for drugs or money, in order to pay for drugs. This relation has been documented frequently, but there has been no conclusive evidence as to whether drug use was the cause or effect of prostitution (Serraino et al., 1991; Nicolosi et al., 1992). These data, however, provide some evidence that drug taking is the cause of prostitution, as opposed to its effect. In this study, 81 percent of prostitutes reported that drugs came first and afterwards came prostitution. To explore this relationship in further detail the determinants of prostitution are examined through bivariate and multivariate analysis in Chapter 6. However, it is worth stressing that the link between drug use and sexual behaviour is complicated by a multitude of other factors including, for example, the disinhibiting effects of drugs, direct pharmacological effects on sexual behaviour and the "milieu in which sexual opportunities are interwoven with drug and alcohol use, such as bars and clubs" (Donoghoe, 1992).

With respect to sexual relations with clients, a significant association was shown between never using condoms and sharing needles, with the risk of sharing needles 4.8 times higher in women who never use condoms (Table 4.8).

Table 4.7 Sexual relationship with clients

Variable	N	percent
Ever had clients		
Yes	140	46.1
No	164	53.9
TOTAL	304	100.0
Age at first sex with client		
17 or -	20	14.6
18 to 22	52	38.0
23 to 27	43	31.4
28 or +	22	16.1
TOTAL	137	100.0
Which came first		
Drugs	111	81.0
Prostitution	17	12.4
Both	9	6.6
TOTAL	131	100.0
Why did you first do this		
I needed money for drugs	88	62.9
I needed money other than for drugs	47	33.6
I needed somewhere to stay	4	2.9
Other	1	0.7
TOTAL	140	100.0
Average number of clients per month during the last 6 months		
Ex-prostitute	55	40.4
1 to 30	20	14.7
31 to 60	14	10.3
61 to 90	13	9.6
91 to 120	13	9.6
121 to 150	14	10.3
151 or +	7	5.1
TOTAL	136	100.0

Table 4.7 (continued) Sexual relationship with clients

Variable	N	percent
Kind of sex in the last 6 months with clients		
-Vaginal intercourse		
Always/sometimes	78	91.8
Never	7	8.2
TOTAL	85	100.0
-Anal intercourse		
Always/sometimes	22	25.9
Never	63	74.1
TOTAL	85	100.0
-Oral sex		
Always/sometimes	77	90.6
Never	8	9.4
TOTAL	85	100.0
-Masturbation		
Always/sometimes	72	85.7
Never	12	14.3
TOTAL	84	100.0
Condom use in the last 6 months with clients		
-Vaginal intercourse		
Always	52	66.7
Never/sometimes	26	33.3
TOTAL	78	100.0
-Anal intercourse		
Always	9	40.9
Never	13	59.1
TOTAL	22	100.0
-Oral sex		
Always	22	28.6
Never	55	71.4
TOTAL	77	100.0

Table 4.7 (continued) Sexual relationship with clients

Variable	N	percent
Condom use in the last 6 months with clients (cont.)		
Masturbation (n=72)		
Always	4	5.6
Never	68	94.4
TOTAL	72	100.0
Usually ask the client to use a condom (n=109)		
Yes	88	80.7
No	21	19.3
TOTAL	109	100.0
Behaviour if the client refuses to use a condom (n=87)		
Lose the client	46	52.9
Have sex and worry later	17	19.5
Have sex and do not worry	15	17.2
Other	9	10.3
TOTAL	87	100.0

Table 4.8 Condom use with clients and sharing injecting equipment

	Equipment shared			
Frequency condom use	**Yes**	**No**	**Total**	**OR(95 %CI)**
Vaginal intercourse				
Always	13	39	52(66.7 %)	1(Reference)
Never/sometimes	16	10	26(33.3 %)	4.8(1.6-15.0)
			78 (100 %)	
Anal intercourse				
Always	3	6	9(40.9 %)	1(reference)
Never/sometimes	6	7	13(59.1 %)	1.7(0.2-14.4)
			22 (100 %)	
Oral intercourse				
Always	7	15	22(28.6 %)	1(reference)
Never/sometimes	22	33	55(71.4 %)	1.4(0.5-4.6)
			77 (100 %)	

6. Reproductive Health

The reproductive and sexual health of the sample population is summarised in Table 4.9. The majority of women (67.4 percent) reported having irregular periods, although 46.3 percent of women had not consulted a health professional about this. Most of the women (89.2 percent), suggested that their irregular periods were due to drug taking (for which there is a biological explanation due to hormonal changes). This could confirm the link between heroin and the female reproductive system and the need to investigate this area which has been largely unexplored until now. However, the gynaecological effects of HIV may also be an explanation, and further study is needed in order to explore the possible cause-effect relationship.

As noted above, a women's fertility is partly determined by her ability to conceive. A number of studies have reported that female IDUs have irregular menstrual cycles, an observation confirmed by the current data (Table 4.9). It is likely that high prevalence of irregular periods is caused by a number of interacting factors including the use of opiates (Bai et al., 1989) and other drugs, stress, weight gain (caused by obesity) and weight loss (caused by anorexia nervosa) (Symonds, 1987). The association between IDU and irregular periods was known by the majority of women who reported their disorder to be "because of drugs". It should, however, be noted that the cessation of menses, concomitant with the use of drugs (and opiates in particular), is due to amenorrhea and does not imply that a women is infertile (Ralph and Spigner, 1986). This has been illustrated by the reported increase in fertility of 201 opiate-dependent women on enrollment into a methadone maintenance programme in Liverpool, UK (Morrison et al., 1995).

Menstrual abnormalities have also been associated with HIV infection. In a study of 248 pre-menopausal HIV-infected women without AIDS and 82 HIV-negative women, the HIV-infected women were found to have an increase in amenorrhea (> 3 months) and in menstrual cycle intervals (> 6 weeks) and lower rates of premenstrual breast symptoms. Changes in menstrual function were also significantly associated with a past history of, but not current, substance abuse, suggesting the possibility that socioeconomic factors rather than biologic effects of drugs may be responsible (Chirgwin et al., 1996).

Three-quarters (75.7 percent) of women had ever been pregnant, although at the time of the interview only 4.6 percent of women were pregnant; 21.7 percent of women reported ever having a miscarriage. One-third experienced their first pregnancy before the age of 18. As a point of comparison, Spanish demographic indicators from 1995 estimate that the fecundity rate is 1.13 and that the median age of first birth is 28.6 (Demografia y Salud, 1996). In other words the study population appears to be experiencing pregnancy at a younger age than the general population.

Moreover, a number of studies have concluded that female IDUs are as likely to have children as the general population (reviewed in Wells and Jackson, 1992). The rate of reporting "ever being pregnant" (75.7 percent) is nearly identical to the 70.0 percent of "ever-pregnant" female IDUs reported from an American study (Brown, 1989). In a comparison of European countries, teenage pregnancy rates in Spain (31.3 percent of women were first pregnant between 15-17 years) were similar to Germany (30.2 percent) and England (29.9 percent), though lower than France (40.9 percent) and higher than Italy (16.1 percent) (Estébanez, 1996).

There are a number of reasons why female IDUs have a higher rate of pregnancy and, in particular, teenage pregnancy. For example, female IDUs often lead a somewhat "traditional" lifestyle with low levels of educational attainment and employment (Wells and Jackson, 1992). Self-esteem is probably low, and it may be perceived that childbirth may break this cycle. Although the current data do not provide evidence to examine this hypothesis, the inclusion of a question on desired family size in future studies may be of use.

Rates of miscarriage, however, appear to be similar to those reported in other countries. For example, in a household survey of 15 to 59 year olds in the UK conducted between May 1990 to November 1991, 20.7 percent of all women reported a lifetime experience of a miscarriage (Wellings et al., 1994). In Italy, for 1993, the ratio of the number of miscarriages to live-births was 26.2 percent (Statistiche della Sanita, 1995).

There was a higher rate of voluntary abortions amongst this sample of female IDUs than the population *per se*. For example, 39.1 percent of women reported ever having an abortion (Table 4.9). Reasons given for voluntary pregnancy termination included : "Because of drugs" (18.6 percent); "Because I do not want a child/more children" (14.4 percent); "It was too much responsibility" (25.4 percent); and, "Because I am HIV+" (22.0 percent). The highest reported lifetime experience of abortion was 15.4 percent amongst women aged 35 to 44 (Johnson et al., 1994). In Italy, the rate for voluntary abortions was 10.4 percent (Statistiche della Sanita, 1996). This rate should be considered in light of the findings of a recent study which found that rates of pregnancy termination doubled after diagnosis with HIV (Stephenson et al., 1996). It should be noted that there is a considerable deficit in the scientific literature with regard to female IDUs and pregnancy termination and that the data from the current study are almost unique for Europe.

Close to 45 percent of those interviewed regularly have a smear test. Over 16 percent have had an abnormal result from a smear test at some time in their lives.

There was a high prevalence (28.2 percent, i.e., 100 percent minus 71.8 percent; Table 4.9) of STD amongst female IDUs. The most common self-reported STD in the last year was candidiasis (15.8 percent), followed by genital warts (10.3 percent) and herpes (8.4 percent). Finally, hepatitis B and C were the most commonly reported infectious diseases (25.4 percent and 31.3 percent respectively), although the reliability of these data along with the STD information has to be queried in light of its self-reported nature.

Compared to other studies, there are variations between the prevalence and incidence of STDs probably reflecting social, geographical and climatic factors. For example, in a European sero-prevalence study of HIV among patients with STDs (for both men and women) the most frequently reported diagnosis was genital warts. The second most frequent diagnosis was male urethritis followed by chlamydia infections (European Working Group on HIV Infection in Prostitutes, 1993). In a sample of 220 heterosexual female IDUs from Sydney, Australia, 1.4 percent reported ever having syphilis in their lifetime (Ross et al., 1991). More importantly, the viral STD may be significantly associated with HIV, with injecting drug use facilitating this process (Musicco et al., 1994).

The role of STDs in transmitting HIV cannot be underestimated. For example, there is significant evidence that STDs are the major risk co-factor associated with the HIV epidemic (Beck et al., 1996). It is likely that conditions that increase the number of lymphocytes in the

female genital tract, such as STDs that elicit an inflammatory response, may potentiate the risk of HIV transmission by increasing the pool of infected cells in a seropositive person or the pool of target cells in a seronegative person (Kreiss et al., 1988). In addition, the high-risk sexual behaviour of IDUs may further exaggerate this problem, although to date the literature on the relationship between drug or alcohol use during sexual activity and the likelihood of participating in high-risk sexual activity is inconsistent (Stall and Leigh, 1994). Nevertheless, in examining STDs in a sample of 1245 IDUs (for both sexes) in Sydney, Australia, Ross et al., (1991) conclude that the lifetime prevalence of STDs in IDUs is high and that previously recognised gradients of STDs across sexual orientation, with homosexual men having generally higher reported STD rates than heterosexual men, with bisexual men at intermediate risk, is also apparent. For women the pattern was generally consistent with the finding that fewer homosexual women would have STDs than heterosexual women. Finally, it is worth emphasising the relationship between human papillomavirus (HPV) infection of the female genital tract, cervical cytology, and human immunodeficiency virus (HIV): Increased rates of positive smear tests among a growing population of young HIV-infected and immunocompromised women may herald an increase in cervical carcinomas in this population (Feingold et al., 1990). Indeed a high rate of invasive cervical cancer among female IDUs with AIDS has been reported in Italy (Serraino et al., 1996).

As illustrated in Tables 4.9 and 4.10, the type of contraception used by IDUs differs from the total female population. In the previous five years, a large number had relied on withdrawal as a means of contraception (40.4 percent). For female IDUs, condoms were the most popular form of contraception; 84.9 percent reported their use. The pill, which is an inappropriate method for IDUs due to their hepatic pathology, was used by 42.3 percent of women. This compares to a survey of a representative sample of Spanish women aged 15 to 49 from 1997 in which the most utilized contraceptive methods were: condoms (21 percent); the pill (14.26 percent); IDU (5.68 percent); tubal ligation (5.20 percent); withdrawal (1.49 percent); rhythm (0.87 percent); diaphram (0.29 percent); spermicide (0.10 percent); and others (0.19 percent). Over fifty percent of the population reported using no methods of contraception (Schering España, 1997).

It has been suggested that IDUs have a lower uptake of contraceptives due, amongst other factors, to the (partly misguided) belief that opiates and other drugs cause infertility (Ralph and Spigner, 1986). In the five years preceding the current survey only 4.3 percent of women reported using no form of contraception (Table 4.9). This finding is in contrast to other studies which have noted that the use of contraceptives tends to be lower amongst female IDUs than the population *per se*. For example, in a study of 115 heroin-addicted women from California, USA, 25.8 percent reported any type of contraception compared to 48.5 percent of a national sample (Ralph and Spigner, 1986). Likewise, in the study of 201 opiate users from Liverpool, UK, 21.4 percent of women reported condom use compared to 46.5 percent of young women attending British Family Planning Clinics (Morrison et al., 1995).

Efficacy, safety, and acceptability are all factors which need to be considered when prescribing a contraceptive method. Further, these factors need to be matched to individuals and communities (Williamson and Joanis, 1994); that is, whilst one method may be appropriate for the general population, it may also be inappropriate for IDUs and other marginalised groups. Thus, in light of the high prevalence of hepatitis amongst IDUs (Table 4.9), the contraceptive pill may be an inappropriate method. Despite this, and as noted above, 29.9 percent of women surveyed reported using the contraceptive pill (Table 4.9). It has also been suggested that the use of

hormonal contraception may be associated with a reduction in the use of barrier contraception such as the condom. Whilst there is little evidence of this in the current data (81.3 percent of women report condom use; Table 4.6), another complicating factor is the concurrent use of petroleum-based lubricants. A recent European study identified the use of petroleum-based lubricants to be a risk factor for HIV infection in non-IDUs (European Working Group on HIV Infection in Female Prostitutes, 1993). Another issue to consider is the "dual" use of barrier contraceptives. A number of studies have suggested a reduction in the rates of sexually transmitted diseases (STDs), including HIV, for women who use condoms with a spermicide (reviewed in Roddy, 1994). Whilst the evidence is not yet conclusive, it is important to stress that both methods must be used concurrently (Cain and Williamson, 1994).

Table 4.9 Selected variables describing reproductive and sexual health

Variable	N	percent
Women reporting regular periods		
Yes	99	32.6
No	205	67.4
TOTAL	304	100.0
They have consulted a health professional about this		
Yes	109	53.7
No	94	46.3
TOTAL	203	100.0
Why they think the periods are not regular		
Because of drugs	165	89.2
Is my constitution	6	3.2
Other	14	7.6
TOTAL	185	100.0
Type of contraception used in last 5 years (percentage using each contraception)		
Condoms	247	81.3
Withdrawal	123	40.5
Contraceptive pill	91	29.9
Spermicides	45	14.8
IUD	21	6.9
Cap/diaphragm	10	3.3
Depro-provera injection	6	2.0
No contraception used	13	4.3
Ever been pregnant		
Yes	230	75.7
No	74	24.3
TOTAL	304	100.0
Are pregnant now		
Yes	14	4.6
No	290	95.4
TOTAL	304	100.0

Table 4.9 (continued) Selected variables describing reproductive and sexual health

Variable	N	percent
Ever had a miscarriage		
Yes	66	21.7
No	238	78.3
TOTAL	304	100.0
Ever had a voluntary abortion		
Yes	119	39.1
No	185	60.9
TOTAL	304	100.0
Have a regular smear test		
Yes	134	44.4
No	168	55.6
TOTAL	302	100.0
Ever had an abnormal smear test		
Yes	49	16.2
No	253	83.8
TOTAL	302	100.0
Self-reported STDs in last year (percentage for each STD) (N=273)		
Candidiasis	43	15.8
Genital warts	28	10.3
Herpes	23	8.4
Syphilis	13	4.8
Chlamydia	7	2.6
Gonorrhea	5	1.8
Salpingitis/PID	0	0.0
Other STD	4	1.5
No STD	196	71.8
Self-reported infectious diseases in last year (percentage for each disease) (N=284)		
Hepatitis A	8	2.8
Hepatitis B	72	25.4
Hepatitis C	89	31.3
Hepatitis D	2	0.7
Tuberculosis	45	15.8

7. Service Use

Before reviewing the results of the survey with regard to services used (Tables 4.10, 4.11 and 4.12), it is important to be aware of the limitations of a comparative analysis such as this. As the data were collected from a convenient sample of female IDUs, information on awareness and attitudes may simply reflect differences in the sample population studied. For example, if some female IDUs are interviewed whilst attending a drug dependency clinic, it would not be surprising that awareness of this service was high. This being said, it is important to review this data because drug-dependent women are at an increased risk for a variety of medical and social problems and because this burden is shared by a wide variety of public agencies.

The majority of female IDUs reported using health services in the last six months. This is contrary to the perception that, although women seek medical care more readily than men, female IDUs are confronted with unique barriers making them less likely to use such facilities (Weisner and Schmidt, 1992). For those women who did not use health services in the past six months, 67.2 percent stated that they "Did not need them". Over half (i.e., 78.1 percent) of the population reported using GP or primary health services, followed by casualty services (41.4 percent), hospitals (32.1 percent) and AIDS screening (25.7 percent). The remainder of health services listed in Table 4.10 were used, on average, by less than ten percent of female IDUs.

The number of female IDUs reporting that the health services they used were "very helpful" was 26.5 percent. However, only 57.7 percent of the sample considered the health services used to be "accessible". The major inference to be made from these findings is that female IDUs find atypical health services to be more accessible than standard services. Thus it would be appropriate for female IDUs to be a target group for specific medical care (Dawe, Gerada and Strang, 1992), and for treatment to be available from a wide variety of public health services (Weisner and Schmidt, 1992). It should also be noted, that in a comparison of IDU and homosexual men in the USA, no difference between recorded satisfaction was found, thus indicating that gender-specific differences may be limited (Johnston, 1994).

As with the analysis of health services, the type of drug service provided will partly depend on how the sample population was recruited. However, as primary care for IDUs with HIV/AIDS may be the responsibility of medical personnel and hospital staff, drug-abuse treatment programmes will involve a multi-disciplinary team of individuals and agencies (Mondanaro, 1987).

Finally, the provision of social services to both IDUs and HIV-positive women is imperative. These women are subject to an interplay of psycho-social factors which require the attention of many different agencies (Harrison, 1989). As part of a multi-disciplinary approach, health and drug services should be supplemented by complementary social services (Glass, 1993). Despite these requirements, the current study identifies alarmingly low utilisation of social services by female IDUs. Only 25.7 percent of women had used these services in the past 6 months (Table 4.12). Moreover, the quality and accessibility of social services was, generally speaking, lower than the health and drug services. It seems likely that some of the non-utilisation is caused by administrative problems and lack of accessibility.

Drug-using women have multiple health-care, drug-treatment and social-service needs. A multi-disciplinary, multi-agency approach is needed to meet these requirements. However, policy makers must be aware that many women may believe that these services do not meet their needs and it is therefore important that gender-specific policy be implemented. Indeed, the preceding review of the provision of health, drug, and social services demonstrates that female IDUs utilise a wide range of different facilities. Because drug-dependent women are at an increased risk from a variety of medical and social problems (Mondanaro, 1987), it is appropriate that policy should focus on a range of settings including, for example, medical centres, mobile drug units, the criminal justice system, welfare agencies, etc., (Weisner and Schmidt, 1993). In implementing such a policy it is important the providers are aware that treatment is available from a number of sources and that low utilisation may not necessarily impact on the effectiveness of a particular service (Weisner and Schmidt, 1992). It is encouraging to note the relatively high utilisation of services by female IDUs in Europe (Estébanez, 1996). Indeed this contradicts perceived opinion which may have been formulated from studies based in the USA. The fact that European countries predominantly operate public (as opposed to private) health services may qualify a number of findings made based on the American system.

Policy discussion should consider the nature and quality of health, drug and social services utilised by female IDUs, and programmes must assist drug-dependent women to escape from a passive role (Mondanaro, 1987). Again, these data seem quite encouraging in this regard in light of the low number of women who reported that they "did not care" when asked why they did not utilise a specific service. Furthermore, treatment goals should continue to be based on a policy of harm-reduction with the specific aim of retaining women in any treatment/maintenance programme.

Less encouraging is the heterogeneity of services, emphasising the need for a European programme of standardisation. This is especially important for social policy which, according to these data, has failed in the delivery of services to female IDUs and HIV women in Europe (Estébanez, 1996). Likewise, any European (or Spanish) policy should be specifically targeted at women as these data suggest that policy to date is non-gender-specific (hence the low provision of family planning services).

Table 4.10 Type of health services used by pooled female IDUs

Variable	N	percent
Ever used health services in last 6 months		
Yes	237	78.0
No	67	22.0
TOTAL	304	100.0
Why never used health services		
I did not need them	45	67.1
I did not care	9	13.4
Too far away	4	6.0
Administrative problems	4	6.0
Personal or social problems	3	4.5
No medical insurance	2	3.0
TOTAL	67	100.0
Health services used (percentage using each service) (n=237)		
GP or primary health care	185	78.1
Out-patient clinic	47	19.8
Casualty hospital	98	41.4
Hospital	76	32.1
Family planning	9	3.8
STD clinic	7	3.0
Psychiatric settings	6	2.5
Private sector	30	12.7
AIDS screening	61	25.7
Quality of health services used (n=237)		
Useless	23	9.7
Not very helpful	36	15.2
Helpful	116	49.0
Very helpful	62	26.1
Accessibility of health services (n=237)		
Not accessible	25	10.5
Accessible	137	57.8
Very accessible	75	31.7

Table 4.11 Type of drug services used by pooled female IDUs

Variable	N	percent
Ever used drug services during last 6 months		
Yes	249	82.2
No	54	17.8
TOTAL	303	100.0
Why never used drug services		
I did not need them	24	44.4
I did not care	13	24.1
No confidentiality	9	16.7
Too far away	4	7.4
Personal or social problems	3	5.5
Administrative problems	1	1.9
TOTAL	54	100.0
Drug services used (percentage using each service) (n=249)		
Mobile drug-dependency unit	178	71.5
Drug dependency units	94	37.8
Out-patient rehabilitation centre	56	22.5
Methadone distribution centre	54	21.7
Therapeutic community	31	12.4
Residential rehabilitation centre	15	6.0
NGO, self-help groups	9	3.6
Quality of drug services used (n=249)		
Useless	13	5.2
Not very helpful	25	10.0
Helpful	125	50.1
Very helpful	86	34.6
Accessibility of drug services (n=249)		
Not accessible	29	11.6
Accessible	120	48.2
Very accessible	100	40.2

Table 4.12 Type of social services used by pooled female IDUs

Variable	N	percent
Ever used social services during last 6 months		
Yes	78	25.7
No	225	74.3
TOTAL	303	100.0
Why never used social services		
I did not need them	89	40.1
I did not care	43	19.4
Administrative problems	38	17.1
Service refused	19	8.6
Personal or social problems	11	5.0
No confidentiality	10	4.5
Long waiting list	6	2.7
Too far away	3	1.3
No social benefit	3	1.3
TOTAL	222	100.0
Social services used (percentage using each service) (n=78)		
Children support services	36	46.2
Services providing financial help	19	24.4
Housing services	18	23.1
Support specific for drug users	15	19.2
Legal assistance	15	19.2
Quality of social services used (n=78)		
Useless	3	3.9
Not very helpful	10	12.8
Helpful	37	47.4
Very helpful	28	35.9
Accessibility of social services (n=78)		
Not accessible	15	19.2
Accessible	49	62.8
Very accessible	14	18.0

8. Conclusion

The foremost conclusion to be drawn from this descriptive analysis of the characteristics of female IDUs is the low socioeconomic characteristics. Moreover, it is also worth noting that the population is pretty homogenous; that is (on average), the sample of female IDUs examined represents a very marginalised population located in Madrid. This has major implications for the forthcoming analysis of HIV prevalence (Chapter 5), drug use and prostitution (Chapter 6), and drug use and prisons (Chapter 7). It is therefore essential that the reader is consistently aware of the exceptional nature of the sample population. That is, in analysing the results of this project, the applicability of research and policy conclusions has to be put in context.

Chapter Five

Determinants of HIV amongst Female IDUs

1. Introduction

HIV prevalence in Spain is one of the highest in Europe, as noted in Chapter 1. A study of drug users receiving ambulatory treatment in Spain (the majority of which were men), reported significant variation in HIV seropositivity by the 17 autonomous regions (Lardelli et al., 1993). For example, the lowest rate was for Navarre (14.3 percent) and the highest rate in La Rioja (66.7 percent). The rate in the community of Madrid was 46.3 percent. The current study found an HIV prevalence of 52.6 percent amongst the 304 female IDUs (see Table 5.1). After adjusting for the 15.5 percent of women with unknown test results, the headline prevalence rate of HIV amongst female IDUs was 62.3 percent (for n = 257). Although this rate appears to be surprisingly high, one needs to reconsider the population from whence it came. This is an extremely marginalised group of women with a multitude of possible risk factors, living in the largest metropolitan area of a country with one of the highest rates of HIV in Europe. In fact, this study has perhaps succeeded in capturing a sample of a population which most likely represents one of the highest risk subgroups in Europe.

The purpose of this chapter is to explore the multitude of possible risk factors associated with HIV in this population of female IDUs and to develop a model to explain and/or examine direct and indirect determinants of HIV.

2. Methods

The methods used for this study are described in Chapter 3. The sample size for this chapter is 257, as 47 cases were removed because the HIV status was unknown. In a majority of cases (97.3 percent) HIV status was determined from a medical report.

First, a bivariate analysis will be conducted to identify significant relationships between HIV and a variety of independent variables. As concluded in Chapter 4, the sociodemographic characteristics of female IDU describe a marginalised population with a low socioeconomic status. Whilst none of the significant risk factors associated with HIV infection are known to have a direct causal effect, the status of the population acts as a generic proximate determinant of HIV infection. Through the analysis of specific risk-taking and risk-avoiding behaviours it may be possible to identify specific proximate determinants of HIV infection. In doing so, it is important to be aware of the limitations of bivariate analysis where, for example, specific risk factors may be either confounding and/or interacting with other risk factors.

The only variation from the methods described in Chapter 3 occurs in the logistic regression model in which the following five groups of explanatory variables have been identified:

Group 1: Age
Biological age is the first explanatory variable entered into the model because of its known relationship with HIV, as well as its influence on other independent variables.

Group 2: Socioeconomic status
Three variables were selected to define the general socioeconomic status of female IDUs: age left full-time education; source of income during past six months (illegal and prostitution *versus* legal); and, place of residence in past six months (no fixed abode *versus* abode). Each of these factors has been identified in prior research as having an influence on HIV status (see literature review in Chapter 1).

Group 3: Marginalisation
In addition to socioeconomic status, three variables were chosen to characterise the extreme marginalised nature of the sample population. These dichotomous variables were: previous imprisonment; having a regular partner who is an IDU; and prostitution. A number of earlier studies have identified these variables as potential determinants of HIV status (see Chapter 1).

Group 4: Sexual and drug-taking risk behaviour
Specific known risk behaviours of HIV infection were included in the fourth group. These included: the average number of clients a female IDU has had per month for the past six months (coded into four categories: never, i.e., not a prostitute; no clients, i.e., an ex-prostitute; 1 to 60 clients; and, 60+ clients); age at first injection; condom use; cocaine injection; heroin+cocaine injection; and a regular HIV-positive sexual partner. All of these risk behaviours were selected based on evidence from previous research of their potential or known influence on HIV status.

Group 5: Co-infection
The final group contained two dichotomous variables which are known to facilitate the transmission of HIV: hepatitis B and other sexually transmitted diseases (STDs). There is a variety of evidence to suggest that previous STDs are independently associated with HIV infection (see Chapter 1).

3. Results

First the bivariate relationships with HIV and selected independent variables are examined (see Table 5.2). Then findings from the regression analyses will be presented.

3.1. Sociodemographic characteristics and HIV prevalence

Several of the sociodemographic variables had significant relationships with HIV prevalence. First, there was a significant positive association with age at time of interview and HIV prevalence. For example, HIV prevalence was 49.1 percent for women aged 24 or less compared to 68.1 percent for women aged 35 or more. The linear trend test was significant. This association is most likely a function of exposure, as opposed to a direct determinant of HIV.

Second, those women who left full-time education before they were 13 years old (only 29.1 percent; Table 4.1; Chapter 4) were twice as likely to be HIV-positive than those who left school at age 16 or older.

- Imprisonment since first injection was also significantly associated with HIV prevalence, with those who had been in prison since their first injection nearly three times more likely to be HIV-positive.

Finally, not having a fixed address also nearly tripled the risk for HIV infection.

3.2 Drug-using habits and HIV prevalence

Age at first injection was significantly negatively associated with HIV prevalence. Those who started injecting by age 16 were three times more likely to be HIV-positive than those who started at age 20 or later.

Needle and/or syringe sharing was also significantly related to HIV prevalence. More surprising was a significant negative association found between needle sharing in the last six months and HIV prevalence. In other words, it would seem that those women who were aware that they were HIV-positive have ceased sharing needles.

Finally, it is worth mentioning that of the 89 women who reported having been in prison, 34.8 percent reported injecting whilst in prison and 87.1 percent of these were HIV-positive. Although the relationship did not attain statistical significance (Table 5.2), it is worth noting that the very high rate of HIV amongst female IDUs who injected drugs in prison probably reflects a cumulative aggregation of risk factors. The association between female IDU and previous imprisonment will be explored further in Chapter 6.

3.3. Sexual habits and HIV prevalence

Significant relationships were found with HIV prevalence for ever having had an HIV sexual partner, a casual sexual partner, a casual IDU sexual partner, a casual HIV sexual partner, and a client.

The frequency of condom use for vaginal intercourse with a regular sexual partner was negatively associated with the dependent variable, whereas no significant relationships were found for condom use with a casual sexual partner or casual client. The latter finding suggests that those who are HIV-positive are more inclined to always use condoms with their regular partners.

3.4 Reproductive health and HIV prevalence

The information collected on the relationship between reproductive and sexual health and HIV infection amongst female IDUs is, as far as we know, almost unique. Moreover the sample population is consistent with the atypical characteristics of a marginalised population. The majority of women reporting not having regular periods are HIV-positive. Another interesting result, which would also require further research to identify a causal effect, was the women who reported an abnormal smear test. These women also reported a higher prevalence of HIV which may have arisen due to the higher risk of HIV infection for women with cancerous cells.

A number of studies have suggested that pregnancy may be a risk factor for HIV infection. Although as yet there is no consensus, the bivariate analysis suggests that "ever-pregnant" women are 2.2 times more likely to be infected by HIV.

Another important observation with regard to contraceptive use, was the high (although non-significant) rate of HIV prevalence amongst women who use spermicides. This confirms a previous observation which speculated that the use of petroleum-based products has a detrimental effect on effectiveness of condoms as a barrier contraceptive and thus is associated with an increased risk in HIV infection (European Working Group on HIV Infection in Female Prostitutes, 1993).

Finally, there was a high prevalence of STDs amongst female IDUs, which was significantly associated with HIV. For example, HIV prevalence amongst women who had no STD disease in the last year was 50.0 percent versus 81.9 percent who had a STD. Approximately one-quarter of the women interviewed reported having had hepatitis B, and this was also significantly related to being HIV-positive.

3.5. Results of hierarchical logistic regression analysis

The results of the first stage of the analysis can be found in Table 5.3. A number of observations can be made from these results. First, as illustrated by the significant decline in the -2 log likelihood (-2LL) value, each model is an improvement on the preceding model with the sole exception of Stage 1 (which measured the improvement - i.e., 7.89 - from the constant value to the addition of the age variable). The second observation regards the variables that are eliminated from the model. These are: source of income; regular partner who is an IDU; number of clients per month; condom use; heroin+cocaine injection; prostitution; age at first injection; and, hepatitis B infection. It is important to realise that although these variables are not included in the model, they may still be indirectly related to HIV. Third, for those variables included in the final model (Group 5), a regular partner who is HIV-positive is by far the most important variable (i.e., OR = 12.2). Other significant factors revealed in the final model include: age 35 and over; no fixed address; ever shared needles; and co-infection with an STD.

It should be noted that although a direct association with HIV is often detected as a variable and is introduced in the model, thereafter this association seems to become indirect. For example, in Groups 1, 2 and 3 the age group 30-34 is a significant predictor of HIV serostatus (OR = 2.7, 3.7 and 3.1 respectively). However, for Groups 4 and 5, when other variables are introduced, the size and significance of the association declines.

4. Discussion

This chapter analyses the variety of factors including age, socioeconomics, marginalisation, risk behaviours, and co-infections that may be determinants of the HIV serostatus in an urban population of female IDUs. Before making any conclusions from these data, it is worth reiterating the limitations of this study. As noted in Chapter 3, a cross-sectional study is carried out at just one point in time and therefore it only measures prevalence as opposed to the incidence of a disease. Furthermore, as the period of time which has elapsed since infection is unknown, the data may be biased with regard to factors associated with disease progression. Another limitation to the adopted study design, was the necessity to use a convenience sample as opposed

to an equal probability scheme. Given these limitations it should also be noted that the multivariate logistics regression model does not examine risk factors (i.e., determinants) of HIV, but looks at statistical association in the data-set. For example, variables concerning risk behaviour during the whole injecting career (such as imprisonment) are included with variables concerning risk behaviour in the previous six months (such as shared needles/syringes in last six months).

Keeping in mind the caveats of this analysis described above, and the fact that HIV prevalence in Spain is one of the highest in Europe, a number of preliminary inferences can be made from these results.

First, it appears the sexual behaviour of these women is one of the strongest determinants of HIV infection. As unequivocally demonstrated in the regression analysis, having a partner who is HIV-positive increases the likelihood of HIV infection. Although the study design precludes us from making assumptions about directionality of this relationship, we believe it is more likely that the women are being infected by their male partners than the reverse based on scientific evidence suggesting that the relative efficiency of male-female transmission is two to three times more efficient than that of female-male transmission (Nicolosi et al., 1994a). Given that nearly 50 percent of this population of female IDUs reported having a regular partner who is HIV-positive, the importance of this factor cannot be underestimated. Clearly, one of the important conclusions to be made from this study is that the sexual partners of female IDUs are as important a component in explaining the HIV epidemic in this population as other risk factors, including high-risk drug-taking behaviour. Accordingly, and as discussed in further detail in Chapter 8, policy should emphasise this and provide information to female IDUs on reducing sexual risk behaviour. For example, the relatively low use of condoms with regular partners reported in Table 4.3 (Chapter 4), needs urgent attention.

Another sexual behaviour which warrants attention is prostitution. Although not an important factor in the regression analysis, sexual behaviour with a client did have a significant relationship with HIV prevalence, which has been demonstrated in previous studies in other western countries (Serraino et al., 1991; Zunzunegui et al., 1992). Another interesting, although non-significant, observation was the normal distribution with the average number of clients per month (not shown in Table 5.2). This has also been previously shown for prostitute populations in Amsterdam (Fennema et al., 1995) and Spain (Estébanez et al., 1996) where it has been suggested that after a certain point HIV prevalence decreases as women become more professional and reduce their risk- taking behaviour. It should also be noted that as mentioned above, HIV infection is more likely to be transmitted from men to women and that this pathway could be a contributory factor in HIV infection amongst female prostitutes (Nicolosi et al., 1994a).

The sharing of injecting equipment was also a significant determinant in the regression analysis. This finding was not too surprising, as a number of studies have demonstrated that the sharing of drug-injecting equipment is a principal risk factor associated with the transmission of HIV in IDU populations (e.g., Marmor et al., 1987; Des Jarlais, 1992; Nicolosi et al., 1992; Vlahov et al., 1990; Sasse et al., 1989; and Serraino et al., 1991). The fact that there is also a negative association between sharing injection equipment in the last six months and HIV prevalence is good news. Apparently those women who were aware that they were HIV-positive have ceased sharing needles. This is an observation that has been noted elsewhere (Delgado-Rodríguez et al. 1994), and emphasises the need for policy makers to provide easily accessible voluntary testing facilities to marginalised groups. A more in-depth look at the sharing of injection equipment in this population is undertaken in Chapter 8.

Age appears to have a direct as well as indirect influence on HIV status. One interpretation of this direct relationship found between age and HIV prevalence is that there is an exposure effect: the older an IDU gets the more likely she will become infected with the HIV virus. However,, it is also important to consider a recent study by Castilla et al. (1997), who found a relationship between specific birth cohorts and AIDS incidence amongst Spanish IDUs. The cohorts with the highest incidence of AIDS were born between the late-1950s to the late 1960s. The authors suggest that this peak in incidence possibly reflects the spread of injection drug use in Spain (particularly heroin) since the late 1970s. This peak roughly corresponds to the users in our study between the ages of 27 and 37, offering another possible explanation of the higher prevalence of HIV in the older age groups. However,, this finding should not direct interest away from the younger age groups which are experiencing higher rates of HIV incidence, particularly among heterosexuals (Houweling, 1998). The indirect influence of age on HIV prevalence will be studied further in subsequent chapters in which we will look at its relationship to prostitution, imprisonment, and treatment attendance.

The direct relationship between no fixed address and HIV prevalence is also an interesting result. Very few studies have looked at the relationship between homelessness and HIV prevalence in IDUs. Given that earlier studies have noted more HIV risk practices among the homeless (Fisher et al., 1995; Nyamathi et al., 1997), we anticipated an indirect relationship between homelessness and HIV prevalence with risk behaviours and prostitution acting as intervening variables. We were surprised to find in our model that the addition of "risk behaviour" actually improved the relationship between no fixed address and HIV prevalence, and the addition of "STD co-infection" only weakened the relationship slightly. Although more research needs to be done to replicate this finding in other IDU populations and to establish the directionality of this relationship, public health officials ought to consider that this may be an important subgroup of IDUs to target with HIV prevention interventions.

The association found between "ever being pregnant" and HIV (OR=2.2;CI=1.2 to 4.0; Table 5.2) is an important finding of this study. Although we did not find evidence of a direct relationship with HIV infection in this study, we do feel it is important to consider as an indirect determinant. The relationship between HIV infection and pregnancy has been the subject of various studies. It is possible that pregnancy may accelerate progression to AIDS through temporary immunosuppression during which women are at greater risk of contracting infections (Schoenbaum et al., 1988). A number of studies have concluded that female IDUs are as likely to have children as the general population (reviewed in Wells and Jackson, 1992). In the current sample, 75.7 percent of women reported "ever being pregnant" (Table 4.6). This is nearly identical to the 70.0 percent of "ever-pregnant" female IDUs reported from an American study (Brown, 1989). There are a number of reasons why female IDUs have a higher rate of pregnancy and, in particular, teenage pregnancy. For example, female IDUs often lead a somewhat "traditional" lifestyle with low levels of educational attainment and employment (Wells and Jackson, 1992). Self-esteem is probably low, and it may be perceived that childbirth may break this cycle. Although the current data do not provide evidence to examine this hypothesis, the inclusion of a question on desired family size in future studies may be of use.

A number of studies have also suggested that pregnancy itself may be a risk factor for HIV infection. Although as yet there is no consensus, the current data suggests that "ever-pregnant" women are 2.2 times more likely to be infected by HIV. What cannot not be disputed is the increase in the number of HIV-infected pregnant women. Indeed this is probably a reflection of the sociodemographic characteristics of HIV in women. In Europe, for example, 76 percent of HIV-infected females are in the 15-49-year age group. It is therefore important that policy makers and public health practitioners alike are aware of the effects of pregnancy on the natural history of

HIV. It has been suggested that HIV pregnant women may be susceptible to atypical immunological changes and that this would facilitate the progression from HIV to AIDS. To date, studies examining immunological changes have produced contrasting results. More evidence, However,, is available with regard to the effects of drug use. Whilst there seems to be no relationship between opiate use and disease progression, there is evidence that continued IDU may accelerate progression from HIV to AIDS. Although there is no evidence of gender-specific differences in the progression rate, the interaction of pregnancy and/or IDU with HIV-infected women makes this likely. The confused state of knowledge with regard to the reproductive health of pregnant women demonstrates the need for cohort studies to examine the association between HIV/AIDS and pregnancy.

Another important finding is the relationship between co-infection with an STD and HIV prevalence. As noted throughout the previous chapter, the relationship between STD and HIV is well reported. The fact that STD co-infection is a significant risk factor in the final logistic regression model (i.e., Model 5 in Table 5.3) of the multivariate analysis re-enforces this finding. As also noted previously, this is most likely due to the ease with which HIV can be transmitted following ulcerations, weakening of the tissues, and other physical changes associated with STDs (Holst et al., 1987). As discussed in Chapter 4, it has also been suggested that IDU facilitates this process (Musicco et al., 1994). However,, there is much discussion as to whether or not the relationship between HIV and STDs is a direct or indirect relationship (Beck et al., 1996). Direct transmission could be facilitated by breaks in the anatomical barriers due to ulcerating diseases, like genital ulcers and warts. Alternatively, since infected monocytes and macrophages constitute a main reservoir of HIV in infected individuals, they could act as transport vehicles for the virus within the infected host and between individuals. Thus effective and inexpensive containment strategies would include antimicrobial treatment for STDs and prevention of infection (via condom use) in non-infected individuals (Beck et al., 1996; Kreiss et al., 1988).

Previous imprisonment and injection whilst in prison are factors that need further attention. The results of the current study revealed that a third of the women who had been to prison injected drugs whilst in prison, and that this was associated with HIV infections (although the result was non-significant). A previous study into the prevalence of HIV amongst IDU prostitutes identified imprisonment as an important determinant (Estébanez et al., 1995). In that paper, it was questioned if previous imprisonment was acting as a generic marker for a marginalised population or if it was a causal risk factor of HIV infection. Likewise, a multifactorial analysis of 612 IDUs in Berlin, revealed that the most important risk factor for HIV infection was needle sharing in prison (Müller et al., 1995). Thus, regardless of whether there is a direct relationship between imprisonment and HIV prevalence, or imprisonment is merely acting as an indicator of high-risk behaviour whilst outside of prison, the fact that we have identified an association between HIV infection and imprisonment (and that there is also an association between HIV infection and injecting in prison) presents a major challenge to public health practitioners. Drugs are apparently readily available in prison whilst the availability of sterile syringes and needles and/or disinfectant is limited. Therefore it would seem that drug behaviour in prison is a factor which requires further research, and is examined further in Chapter 7.

Finally, this model needs to be validated on another independent group of women. Conceptual models of disease determination, such as the model presented here, are going to be of much use to policy makers.

5. Conclusions

- Sexual behavior plays an important role in determining HIV serostatus in IDU women.
- Those who continue to share injection equipment are at a high risk for contracting HIV, and those aware of their HIV-positive status appear to be discontinuing this practice.
- Co-infection with an STD is an important marker for those at risk for HIV.
- The roles of imprisonment and pregnancy in the transmission of HIV need to be further studied with prospective cohorts.
- It is important to note that the aim of this study was not to prove causal relationships with HIV, but to identify factors which can provide guidelines for the formulation of policy.

Table 5.1 Selected variables describing HIV prevalence

Variable	N	percent
Ever been tested for HIV (N=304)		
Yes	292	96.1
No	12	3.9
No response	0	0.0
Outcome of past HIV test (N=292)		
HIV +	166	54.6
HIV -	124	40.8
Not applicable/No response	12	4.6
Sample taken for current HIV test (N=304)		
Yes	7	2.3
No	297	97.7
Written confirmation of HIV test (N=304)		
Yes	257	84.5
No	47	15.5
Current HIV prevalence (N=304)		
HIV +	160	52.6
HIV-	97	31.9
Not known	47	15.5
Headline HIV prevalence (N=257)[a]		
HIV+	160	62.3
HIV-	97	37.7

a Headline rate excludes not-known current HIV prevalence results.

Table 5.2 HIV prevalence[b] by selected variables

Variable	Total	HIV + (%)	HIV - (%)	OR(CI.95 %)	p
Sociodemographics					
Age					
24 or less	57	49.1	50.9	1(reference)	*[a]
25-29	89	61.8	38.2	1.7(0.8-3.5)	
30-34	69	72.5	27.5	2.7(1.2-6.1)	
35 or more	47	68.1	31.9	2.2(0.9-5.4)	
Age left education					
13 or less	74	73.0	27.0	2.2(1.1-4.3)	*[a]
14-15	74	63.5	36.5	1.4(0.7-2.7)	
16 or more	112	55.4	44.6	1(reference)	
Been in prison since first injection					
Yes	89	77.5	22.5	2.8(1.5-5.0)	***
No	173	55.5	44.5		
Abode					
No fixed address	57	78.9	21.1	2.7(1.3-5.3)	**
Fixed address	205	58.5	41.5		
Income					
Illegal+prostitution	122	67.2	32.8	1.4(0.8-2.4)	n.s.
Legal	140	59.3	40.7		
Drug-using habits					
Age began injecting drugs					
16 or less	74	78.4	21.6	3.1(1.5-6.4)	***[a]
17 - 19	71	62.0	38.0	1.4(0.7-2.7)	
20 or more	117	53.8	46.2	1(reference)	
Ever shared needles/syringes					
Yes	203	70.9	29.1	4.3(2.3-8.0)	***
No	58	36.2	63.8		
Ever shared needles/syringes in last 6 months					
Yes	93	61.3	38.7	0.4(0.2-0.8)	**
No	111	78.4	21.6		
Injected in Prison					
Yes	31	87.1	12.9	2.6(0.8-8.5)	n.s.
No	58	72.4	27.6		

Table 5.2 (continued) HIV prevalence by selected variables

Variable	Total	HIV + (%)	HIV - (%)	OR(CL95 %)	p
Sexual habits					
Ever had a regular sexual partner					
Yes	254	62.6	37.4	0.6(0.1-2.8)	n.s.
No	8	75.0	25.0		
Ever had a regular sexual IDU partner					
Yes	226	64.6	35.4	1.6(0.8-3.3)	n.s.
No	36	52.8	47.2		
Ever had a regular sexual HIV partner					
Yes	133	88.0	12.0	14.4(7.5-27.6)	***
No	116	33.6	66.4		
Frequency of condom use with regular sexual partner -Vaginal intercourse					
Never/sometimes	99	47.5	52.5	0.3(0.1-0.7)	**
Always	33	75.8	24.2		
Ever had a casual sexual partner					
Yes	216	68.1	31.9	3.3(1.7-6.4)	***
No	46	39.1	60.9		
Ever had a casual sexual IDU partner					
Yes	145	75.2	24.8	3.6(2.1-6.1)	***
No	111	45.9	54.1		
Ever had a casual sexual HIV partner					
Yes	52	86.5	13.5	6.5(2.8-15.4)	***
No	149	49.7	50.3		
Frequency of condom use with casual sexual partner -Vaginal intercourse					
Never/sometimes	45	71.1	28.9	0.9(0.3-2.3)	n.s.
Always	38	73.7	26.3		
Ever had a client					
Yes	128	68.8	31.3	1.6(1.0-2.7)	*
No	134	57.5	42.5		
Frequency of condom use with casual client -Vaginal intercourse					
Never/sometimes	24	62.5	37.5	0.8(0.3-2.3)	n.s.
Always	48	66.7	33.3		

Table 5. 2 (continued) HIV prevalence by selected variables

Variable	Total	HIV + (%)	HIV - (%)	OR(CI.95 %)	p
Reproductive habits and infections					
Regular periods					
No	187	71.1	28.9	3.3(1.8-6.0)	***
Yes	75	42.7	57.3		
Age at first pregnancy					
< 18	62	71.0	29.0	1.3(0.7-2.5)	n.s.
18 or more	136	65.4	34.6		
Contraception currently					
Yes	134	64.2	35.8	1.1(0.7-1.9)	n.s.
No	124	61.3	38.7		
IUD used in last 5 years					
Yes	19	36.8	63.2	0.3(0.1-0.8)	*
No	243	65.0	35.0		
Condom used in last 5 years					
Yes	223	65.0	35.0	1.8(0.9-3.5)	n.s.
No	39	51.3	48.7		
Spermicide used in last 5 years					
Yes	41	73.2	26.8	1.7(0.8-3.6)	n.s.
No	221	61.1	38.9		
Contraceptive pill used in last 5 years					
Yes	76	38.2	61.8	0.2(0.1-0.4)	***
No	186	73.1	26.9		
Ever been pregnant					
Yes	202	67.3	32.7	2.2(1.2-4.0)	**
No	60	48.3	51.7		
Abnormal smear test					
Yes	44	75.0	25.0	2.6(1.2-5.6)	*
No	142	53.5	46.5		
STD in last 5 years					
Yes	72	81.9	18.1	4.5(2.2-9.5)	***
No	162	50.0	50.0		
Hepatitis A in last 5 years					
Yes	8	100.0	0.0	---	*
No	238	60.5	39.5		

Table 5.2 (continued) HIV prevalence by selected variables

Variable	Total	HIV + (%)	HIV - (%)	OR(CI.95 %)	p
Hepatitis B in last 5 years					
Yes	67	76.1	23.9	2.5(1.3-4.7)	**
No	179	56.4	43.6		
Hepatitis C in last 5 years					
Yes	84	59.5	40.5	0.9(0.5-1.5)	n.s.
No	162	63.0	37.0		
Hepatitis D in last 5 years					
Yes	2	100.0	0.0	—	n.s.
No	244	61.5	38.5		
Tuberculosis in last 5 years					
Yes	45	86.7	13.3	5.1(2.1-12.5)	***
No	201	56.2	43.8		
Some infection last year					
Yes	139	68.3	31.7	1.9(1.1-3.3)	*
No	107	53.3	46.7		
Type of Treatment					
Methadone maintenance	64	79.7	20.3	4.7(2.0-10.9)***	
Other treatment	128	64.1	35.9	2.1(1.1-4.0)	*
No treatment	70	45.7	54.3	1.0(reference)	

a: p value of linear trend test.

b: HIV prevalence is the headline rate presented in Table 5.1 and excludes not-known cases. Figures presented as percentages.

HIERARCHICAL LOGISTIC REGRESSION OF HIV ON RISK FACTORS

	MODEL A AGE N=262	MODEL B SOCIOECON.STATUS N=262	MODEL C MARGINALISATION N=262	MODEL D RISK BEHAVIOUR N=262	MODEL E CO-INFECTION N=262
	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C.95%)
AGE					
Age group					
24 or less	------	------	------	------	------
25-29	1.7 (0.9-3.3)	2.1 (1.0-4.2)*	1.8 (0.9-3.7)	1.4 (0.6-3.5)	1.5 (0.6-3.8)
30-34	2.7 (1.3-5.7)**	3.7 (1.7-8.1)**	3.1 (1.4-6.9)**	2.0 (0.7-5.2)	2.1 (0.8-5.8)
35+	2.2 (1.0-4.9)	3.4 (1.4-8.3)**	2.9 (1.2-7.2)*	3.0 (1.0-8.8)*	3.4 (1.1-10.4)*
SOCIOECONOMIC STATUS					
Age leaving education					
13 or less		3.3 (1.4-7.4)**	2.8 (1.2-6.4)*	1.6 (0.6-4.4)	1.7 (0.6-4.8)
14 - 15		2.4 (1.1-5.3)*	2.2 (1.0-4.9)	1.8 (0.7-4.8)	2.0 80.7-4.8)
16 - 18		1.8 (0.8-3.8)**	1.5 (0.7-3.3)	1.4 (0.5-3.7)	1.4 (0.5-3.9)
19 +		------	------	------	------
Abode					
No fixed adress		2.4 (1.2-5.0)*	2.3 (1.1-4.7)*	3.4 (1.4-8.1)**	2.9 (1.2-1.7)
Fixed adress		------	------	------	------
MARGINALISATION					
Previous imprissonment					
Yes			2.1 (1.1-3.9)*	2.3 (1.1-4.9)*	2.0 (0.9-4.4)
No			------	------	------
RISK BEHAVIOUR					
Ever sharing needles					
Yes				2.6 (1.2-5.7)*	2.6 (1.2-5.8)*
No				------	------
Inject cocaine					
Yes				0.6 (0.3-1.1)	0.5 (0.3-1.0)
No				------	------
Regular sex partnerHIV+					
Yes				13.1 (6.4-26.9)***	12.2 (5.9-25.3)***
No				------	------
CO-INFECTION					
STD					
Yes					2.8 (1.2-6.5)*
No					------
-2LL	337.46	319.646	314.005	231.541	225.209
Improvement Chi-Square	7.896*	17.814**	5.641*	82.464***	9.369**

a) The most parsimonious logistic regression were derived for each stage of the analysis using SPSS. For example, for Group 2 the Age variable was fixed, it could not be eliminated, whilst the new socioeconomic variables were selected trhough process of backward elimination.

b) * p<0.05; ** p<0.01; *** p<0.001.

c) For models.B.C.D and E the following variables were excluded from the equation. Stage 2:Income; Stage 3: Regular sexual partner IDU and prostitution; Stage 4: Number of clients per month, Condom use, Heroine+cocaine injection and age girst injection; Stage 5: Hepatitis B and genital warts.

Chapter Six

HIV, Drugs and Prostitution: An Examination of the Determinants of Prostitution amongst Female IDUs

1. Introduction

The close links between IDU and prostitution have been known for some time. For example, Goldstein (1979) suggested that between 30 to 70 percent of female IDUs were also prostitutes, and that 40 to 85 percent of prostitutes were also drug users. More recently, studies have reported broadly similar findings (see Gossop et al., 1994). However, differences in rates have been reported by other studies, and these probably reflect real differences in sociocultural context as well as differences in sampling. Nevertheless, as noted by Gossop et al. (1994), there is consistent evidence of an association between drug use and prostitution. Thus, with the emergence of the AIDS pandemic, the nature of this relationship has assumed increased importance.

At the beginning of the AIDS pandemic, it was thought that female sex workers, or prostitutes, might constitute a high-risk group for the transmission of the human immunodeficiency virus (HIV). Based on prevalence studies that showed high rates of infection in African prostitutes, it was feared that such women might also be spreading HIV heterosexually in Europe and the United States. This belief has resulted in even greater stigmatisation of sex workers, and in some places has led to restrictive legislation, such as mandatory HIV testing and the quarantine of infected persons (Committee on AIDS Research and the Behavioural, Social and Statistical Sciences, 1990).

Prostitutes, however, are a heterogeneous group in regard to their working environment, socioeconomic situation, health status, and their knowledge and practice of protective measures. Seroprevalence rates in this group vary a great deal from country to country, within the same country, and from one type of prostitute to another. More than sexual promiscuity itself, HIV infection has been seen to be associated with other risk factors, such as the use of intravenous drugs, having a steady partner who is an intravenous drug user, and the presence of sexually transmitted diseases (Hankins et. al., 1994).

The justification for taking an in-depth look at prostitution arises from its importance in this community. It will be recalled from Chapter 4 that 46.1 percent of female IDUs reported ever having a client. It is therefore of interest to examine the characteristics of female IDU prostitutes and to see how, if at all, policy should differ for this subgroup of women. The objectives of this chapter are to:

1) Look at the relationships between IDU, HIV risks, and prostitution;

2) Examine the determinants of prostitution amongst our study population of female IDUs; and

3) Propose some directions for future research as well as interventions that could be undertaken to reduce risk behaviours and the practice of prostitution.

2. Methods

The methods used for this study, including the bivariate and multivariate analyses, are described in Chapter 3. The only variation from those methods occurs in the logistic regression model in which the following four groups of explanatory variables were identified:

Model 1: Age
Biological age is the first explanatory variable entered into the model because of its anticipated relationship with prostitution among IDUs, as well as its influence on other independent variables.

Model 2: Socioeconomic status
Three variables were selected to define the general socioeconomic status of female IDUs: age left full-time education (coded into four categorical age groups: 13 or less; 14-15; 16-18; and 19+); place of residence in past six months (no fixed abode versus abode); and living with children (coded into three categories: has no children; has children and lives with them; and has children, but doesn't live with them). These variables were selected based on evidence in the literature that they are important socioeconomic markers for this population.

Model 3: Marginalisation
In addition to socioeconomic status, five variables were chosen to characterise the extreme marginalised nature of the sample population. These variables were: one categorical variable - age at first pregnancy (coded into two groups: younger than 18 and 18 or more), and four dichotomous variables (yes versus no): previous imprisonment; having a current regular partner; having a regular sexual partner who was an IDU; and having a casual sexual partner who was an IDU. All of these variables have been documented in the literature as having a relationship with prostitution. Early sexual experience, for example, has been described as a determinant of prostitution (James and Meyerding, 1971) and a marker for risky sexual behaviour in women (Greenberg et al., 1992). Prison experience has been noted as an important determinant of HIV risk amongst prostitutes in Spain (Estébanez et al., 1992). Finally, it has been found that prostitutes engage in more risky sexual behaviour (e.g. less frequent condom use) with non-paying partners (Ward et al., 1993) and that having an IDU partner is a predictor of HIV amongst non-IDU prostitutes (Estébanez et al., 1992).

Model 4: Risk behaviours and HIV seroprevalence
Specific known risk behaviours and HIV seroprevalence were entered into this model to assess whether the relationships with prostitution are direct or mediated through the socioeconomic and marginalisation variables.

The risk behaviours included: ever having regular HIV-positive partner; cocaine injecting; heroin+cocaine injecting; age at first injection; ever sharing needles; age at first injection and using alcohol. HIV seroprevalence was coded into three groups: positive, negative, and unknown.

3. Results of Descriptive Analysis

The principal data from the descriptive analysis are presented in Table 6.1. Amongst the IDUs of our study, 46.1 percent (140 women) reported having ever practiced prostitution, of whom 39.3 percent (55) were considered ex-prostitutes, having not had a client in the six months prior to the interview; another 15.0 percent were characterised as having a low level of promiscuity with fewer than 50 clients per month, while 42.9 percent were high promiscuity, having 50 or more clients per month.

When the date of initiating prostitution was compared to the date of initiating drug use, we found that drug use was initiated first in 79.3 percent of the cases, prostitution came before drug use in 12.1 percent, and 6.4 percent reported initiating both simultaneously. No data was available for the final 2.1 percent.

Almost two thirds of our sample request that their clients use condoms, while 15.0 percent reported not making this request, and 22.1 percent preferred not to respond to this question.

4. Results of Bivariate Analysis

The bivariate relationships with prostitution and selected independent variables are examined in Table 6.2. Following are the principal findings from this table.

4.1. Sociodemographic characteristics and prostitution

No association was found between prostitution and the age of the women. Leaving school at a later age appears to have a certain protective relationship with prostitution, with more than half of the female IDUs who left school before age 16 practicing prostitution, compared to 37.9 percent of those who left school after age 16.

4.2. Marginalisation variables

Not having a fixed address or living in a rented room paid for on a daily basis was found to have the strongest relationship with prostitution, carrying over five times the risk. Previous imprisonment was also significantly related, nearly doubling the risk of practicing prostitution. However, caution is warranted in the interpretation of these findings given that directionality of the relationship cannot be determined in cross-sectional designs. Therefore we can't really say that not having a fixed abode or previous imprisonment are determinants of prostitution. In fact in both cases, the relationship could even be reciprocal. For example, the circumstances surrounding the world of prostitution frequently result in prison and vice versa. Likewise, the circumstances surrounding not having a fixed abode may lead one into prostitution, while it can also be argued that the practice of prostitution implies this type of housing. Meanwhile, in other cases, both circumstances may have a common determinant. The only real conclusion we can establish is that prostitution is more common when a stable domicile doesn't exist and when one has been to prison.

We found an association between prostitution and living with one's children. Those who have children but don't live with them have the highest rate of prostitution (71.3 percent), compared to those who live with their children (31.1 percent), and those who reported having no children (40 percent). This result seems logical, due to the incompatibility between the lifestyle and schedules assumed by a prostitute and the responsibility of caring for a child.

4.3. Drug-using habits

Amongst injected drugs, we only found an association between prostitution and the injection of heroin+cocaine, with 51.7 percent of the IDUs who injected this combination reporting to have practiced prostitution, compared to 40.5 percent who had not injected this combination. The use of barbiturates is more than twice as likely among those who practice prostitution. In all probability, the odd hours implicit in prostitution may cause these women to begin using barbiturates to induce sleep which later becomes an abuse problem, reinforcing their drug addiction.

We did not find an association between age of beginning to inject drugs and prostitution. But there were some positive associations between other risk behaviours and prostitution. Those who had ever shared injection material and those who had shared injection material in the last six months were two times more likely to practice prostitution. Furthermore, those who had injected while in prison were nearly three times more likely to practice prostitution.

4.4. Sexual habits

As far as having a relationship with a stable partner, even if the partner is an IDU or HIV-positive, there were no significant differences between those who practiced prostitution and those who didn't.

Those who reported having ever had a casual partner were more than four times more likely to practice prostitution than those who didn't. Similarly, it is more common for those who have had a casual HIV-positive partner (OR=2.5;CI=1.4-4.7) or IDU partner (OR=3.2;CI=2.0-5.1) to work as prostitutes.

4.5 Reproductive habits and infections

An elevated percentage (59.1 percent) of women who currently use some type of contraception work as prostitutes compared to 32.1 percent of those who don't currently use contraception. Of all the contraceptive methods, the condom is used most. and its use in the last years maintains a strong positive association with prostitution (OR=8.3;CI=3.6-19.1). The use of spermicides also has a strong positive association with prostitution (OR=5.1;CI=2.4-10.8).

When the first pregnancy occurred before the age of 18, we found a higher percentage of women who had practiced prostitution (66.2 percent), than when the first pregnancy took place at age 18 or later (42.7 percent).

Those who reported having an STD in the past five years were more than twice as likely to have practiced prostitution.

The association between HIV positivity and prostitution, however, was weak (OR=1.6;CI=1.0-2.6). The same occurred in the case of hepatitis B (OR=1.8;CI=1.0-3.0).

Table 6.1 Descriptive analysis of prostitution

Variable	Total	%
Prostitution		
Yes	140	46.1
No	164	53.9
Number of clients/month last 6 months		
0 (ex-prostitute)	55	39.3
< 50	21	15.0
50 +	60	42.9
No response	4	2.9
What came first?		
Drugs	111	79.3
Prostitution	17	12.1
Both	9	6.4
No response	3	2.1
To ask clients about using condom		
Yes	88	62.9
No	21	15.0
No response	31	22.1

Table 6.2 Proportion of women reporting having clients by selected variables

Variable	Total	Prostitute Yes(%)	Prostitute No(%)	OR(CI.95%)	p
Sociodemographics					
Age					
24 or less	73	43.8	56.2	1.2(0.6-2.8)	n.s.[a]
25 -29	110	50.9	49.1	1.6(0.8-3.4)	
30-34	72	45.8	54.2	1.3(0.6-3.0)	
35 or more	49	38.8	61.2	1(reference)	
Age leaving education					
13 or less	88	51.1	48.9	1.7(1.0-3.1)	*[a]
14-15	82	53.7	46.3	1.9(1.1-3.5)	*[a]
16 or more	132	37.9	62.1	1(reference)	
Marginalisation variables					
Previously imprisoned					
Yes	98	56.1	43.9	1.8(1.1-3.0)	*
No	206	41.3	58.7		
Abode					
No fixed address	96	72.9	27.1	5.3(3.0-9.4)	***
Fixed address	208	33.7	66.3		
Lives with children					
She has no children	150	40.0	60.0	1(reference)	***[a]
She lives with	74	31.1	68.9	0.7(0.4-1.3)	
She doesn't live with	80	71.3	28.8	3.7(2.0-7.0)	

Table 6.2 (continued) Proportion of women reporting having clients by selected variables

Variable	Total	Prostitute Yes(%)	Prostitute No(%)	OR(CI.95%)	p
Drug-using habits					
Age began injecting drugs					
16 or less	81	48.1	51.9	1.2(0.7-2.2)	n.s.[a]
17 - 19	81	49.4	50.6	1.3(0.7-2.3)	
20 or more	141	43.3	56.7	1(reference)	
Injecting heroin + cocaine					
Yes	151	51.7	48.3	1.6(1.0-2.5)	*
No	153	40.5	59.5		
Use barbiturates					
Yes	71	62.0	38.0	2.3(1.3-4.0)	**
No	233	41.2	58.8		
Use hashish					
Yes	126	38.9	61.1	0.6(0.4-1.0)	*
No	178	51.1	48.9		
Ever shared needles/syringes					
Yes	217	51.6	48.4	2.2(1.3-3.7)	**
No	86	32.6	67.4		
Ever shared needles/syringes in last 6 months					
Yes	104	55.8	44.2	1.8(1.1-2.9)	*
No	200	41.0	59.0		
Injected in Prison					
Yes	32	71.9	28.1	2.7(1.1-6.7)	*
No	66	48.5	51.1		

Table 6.2 (continued) Proportion of women having clients by selected variables

Variable	Total	Prostitute Yes(%)	Prostitute No(%)	OR(CI.95%)	p
Sexual habits					
Ever had a regular sexual partner					
Yes	293	46.4	53.6	1.3(0.6-2.8)	n.s.
No	11	36.4	63.6		
Ever had a regular sexual HIV+ partner					
Yes	138	49.3	50.7	1.3(0.8-2.1)	n.s.
No	152	42.8	57.2		
Ever had a regular sexual IDU partner					
Yes	257	45.9	54.1	1.0(0.5-1.8)	n.s.
No	47	46.8	53.2		
Frequency of condom use with regular sexual partner					
Vaginal intercourse					
Never/sometimes	122	36.9	63.1	0.6(0.3-1.3)	n.s.
Always	35	48.6	51.4		
Ever had a casual sexual partner					
Yes	241	52.7	47.3	4.6(2.3-9.1)	***
No	62	19.4	80.6		
Ever had a casual sexual HIV+ partner					
Yes	53	56.6	43.4	2.5(1.4-4.7)	**
No	186	33.9	66.1		
Ever had a casual sexual IDU partner					
Yes	156	59.0	41.0	3.2(2.0-5.1)	***
No	141	31.2	68.8		
Frequency of condom use with casual sexual partner					
-Vaginal intercourse					
Never/sometimes	48	66.7	33.3	1.8(0.8-4.2)	n.s.
Always	50	52.0	48.0		

Table 6.2 (continued) Proportion of women reporting having clients by selected variables

Variable	Total	Prostitute Yes(%)	Prostitute No(%)	OR(CI.95%)	p
Reproductive habits and infections					
Regular periods					
Yes	99	35.4	64.6	0.5(0.3-0.8)	**
No	205	51.2	48.8		
Age at first pregnancy					
< 18	74	66.2	33.8	2.6(1.5-4.7)	***
18 or more	150	42.7	57.3		
Contraception currently					
Yes	159	59.1	40.9	3.1(1.9-4.9)	***
No	140	32.1	67.9		
IUD used in last 5 years					
Yes	21	33.3	66.7	0.6(0.2-1.4)	n.s.
No	283	47.0	53.0		
Condom used in last 5 years					
Yes	247	53.8	46.2	8.3(3.6-19.1)	***
No	57	12.3	87.7		
Spermicide used in last 5 years					
Yes	45	77.8	22.2	5.1(2.4-10.8)	***
No	259	40.5	59.5		
Contraceptive pill used in last 5 years					
Yes	91	42.9	57.1	0.8(0.5-1.4)	n.s.
No	213	47.4	52.6		
Ever been pregnant					
Yes	230	50.0	50.0	1.9(1.0-3.5)	*
No	74	33.8	66.2		
Abnormal smear test					
Yes	49	57.1	42.9	1.9(1.0-3.5)	*
No	224	41.5	58.5		
STD in last 5 years					
Yes	77	61.0	39.0	2.7(1.5-4.8)	***
No	196	36.7	63.3		

-HIV +					
Yes	165	53.3	46.7	1.6(1.0-2.7)	*
No	97	41.2	58.8		
-Hepatitis A in last 5 years					
Yes	8	62.5	37.5	2.1(0.5-8.8)	n.s.

Table 6.2 (continued) Proportion of women reporting having clients by selected variables

Variable	Total	Prostitute Yes(%)	Prostitute No(%)	OR(CI.95%)	p
Reproductive habits and infections (continued)					
HIV+					
Yes	165	53.3	46.7	1.6(1.0-2.7)	*
No	97	41.2	58.8		
Hepatitis A in last 5 years					
Yes	8	62.5	37.5	2.1(0.5-8.8)	n.s.
No	276	44.6	55.4		
Hepatitis B in last 5 years					
Yes	72	55.6	44.4	1.8(1.0-3.0)	*
No	212	41.5	58.5		
Hepatitis C in last 5 years					
Yes	89	49.4	50.6	1.3(0.8-2.1)	n.s.
No	195	43.1	56.9		
Hepatitis D in last 5 years					
Yes	2	0.0	100.0	—	n.s.
No	282	45.4	54.6		
Tuberculosis in last 5 years					
Yes	45	53.3	46.7	1.5(0.8-2.8)	n.s.
No	239	43.5	56.5		
Some infection last year					
Yes	148	51.4	48.6	1.7(1.0-2.8)	*
No	136	38.2	61.8		
Type of Treatment					
Methadone maintenance	65	40.0	60.0	1.0(reference)	
Other treatments	143	51.7	48.3	1.6(0.9-3.1)	n.s.
No treatment	96	41.7	58.3	1.1(0.5-2.1)	n.s.

a: p value of linear trend test

5. Results of Hierarchical Logistic Regression Analysis

In the first model, none of the age categories enter significantly into the equation. In the second model, two variables representing the socioeconomic level appear in the equation: place of residence, and living with children. The place of residence maintains a strong association with the dependent variable, with those IDUs who don't have a fixed address presenting a higher probability of having practiced prostitution (OR=4.7;CI=2.7-8.1). This finding hardly varies in subsequent models. To examine the variable "living with children" we compared those "not living with their children" to those "living with children" or "not having children". The women who don't live with their children have an elevated probability of having practiced prostitution (OR=3.6;CI=2.0-6.4). This probability descends slightly when we incorporate the variables representative of marginalisation in the third model (OR=2.7;CI=1.4-5.1), but suffers few changes in the final model.

Of the six variables selected to study the relationship between the degree of marginalisation and prostitution, only two remain in the equation: 1) Having had a casual IDU partner; and 2) Age at first pregnancy. Having had a casual IDU partner appears to be a relatively strong determinant of prostitution (OR=2.9;CI=1.7-5.0). This finding does not change in subsequent models. Having had a first pregnancy before the age of 17 is also a significant determinant of prostitution (OR=2.0;CI=1.0-4.0) in both the third and fourth models. It is interesting to note that previous imprisonment does not enter into the model, suggesting an indirect relationship with prostitution.

Of the variables selected to represent risk behaviour and infections, only HIV seroprevalence entered the model. Not knowing one's HIV status appears to have a negative relationship with prostitution, and being HIV-positive appears to have no relationship with prostitution.

6. Discussion

The findings of this study are consistent with many previous studies in which the exchange of sex for money or drugs stood out as a common practice among female IDUs (Franceschi, 1988; Lewis, 1991; Saxon, 1991; Van den Hoek, 1988; Astemborski, 1994). In our study, more than 45 percent of the women reported having practiced prostitution at some point in their life. For the great majority of these women, it was the need to pay for their drug habit which drove them to prostitution.

Although in the bivariate analysis we observed a statistically significant association between prostitution and HIV infection, once we control for other variables in the logistic model, this association fails to be significant, indicating an indirect relationship. Furthermore, the negative relationship with unknown HIV status suggests that prostitutes are more likely to have been tested or at least more likely to have returned a physician's report on their HIV status. This finding of no relation between prostitution and seropositivity coincides with the findings of other European studies (Estébanez, 1995; Rhodes, 1994; Van den Hoek, 1988; Tirelli, 1989) in which the transmission of HIV among female prostitutes who also inject drugs is associated more with the use of drugs than with prostitution. Some studies such as Astemborski (1994) find significant

differences in the prevalence of HIV between prostitutes with a high level of promiscuity (50 or more clients per month) and those of low promiscuity (fewer than 50 clients per month), while they don't find a difference in prevalence between the latter group and non-prostitute IDUs. We did not find a significant difference using the promiscuity index.

There are no differences in condom use with regular partners or casual partners. Even though one knows that condoms are a reasonably safe way to prevent HIV infection, they are not particularly popular in private sexual relations. The obstacles to condom use which are typically mentioned are, in general, social factors. 'Prostitutes are reluctant to use condoms in private sexual relations, and not using them constitutes an essential distinction between the two types of relations (private versus commercial). Sexual relations without condoms with a private partner who injects drugs, exposes prostitutes to a greater risk of HIV infection than their relations with clients.

In the final interpretation of the logistic model of our study, the profile of the female prostitute IDU varied from that of a non-prostitute in that the former lacked to a greater degree a fixed address, they were less likely to live with their children, and the median age of the first pregnancy was lower. A higher level of homelessness among prostitute IDUs perhaps reflects a greater level of economic oppression amongst prostitute IDUs and possibly a reason for turning to prostitution as a source of income in the first place. An earlier age of first pregnancy is an interesting finding as earlier studies have linked both early age of first pregnancy and prostitution to childhood sexual abuse (Zierler et al, 1992). Furthermore, early sexual experience has been identified as a factor in prostitution (James and Meyerding, 1977) and age at first coitus as a marker for risky sexual behaviour (Greenberg, Magder and Aral, 1992). The implications of these findings are that early sexual experiences, including childhood sexual abuse, can be used as markers for high-risk sexual behaviour, and interventions aimed at delaying a woman's first sexual experience may lower the likelihood of later engaging in prostitution and other risky sexual practices.

Up until this point, the data are comparable to the possible differences one might find between prostitutes and non-prostitutes in a non-drug using population. But in the case of the IDUs, it stands out that the group of prostitutes is strongly associated with the existence of casual IDU sexual partners. Future investigations should attempt to verify this result in a non-drug-dependent population.

7. Conclusions

- This study makes it evident, once again, that the use of drugs and prostitution are directly associated.
- In the population studied of female IDU prostitutes in Madrid, the prevalence of HIV is slightly higher than non-prostitutes, but this difference disappears when we control for socioeconomic status and marginalisation variables.
- Condom use, while relatively frequent with clients, is less common in private sexual relations, which is comparable to what occurs with non-prostitutes.
- The degree of marginalisation and living conditions of IDUs who work as prostitutes, are even more unfortunate than those of IDUs themselves.
- This study provides further evidence that the age of first pregnancy or early sexual experience is an important determinant of prostitution.
- Those who are homeless, use drugs, and get pregnant at a young age are at higher risk for practicing prostitution.

HIERARCHICAL LOGISTIC REGRESSION OF PROSTITUTION ON RISK FACTORS

	MODEL A AGE N=304	MODEL B SOCIOECONOMIC STATUS N=304	MODEL C MARGINALISATION N=304	MODEL D RISK BEHAVIOUR AND INFECTIONS N=304
	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)
AGE GROUP				
24 or less	-------	--------	--------	--------
25 - 29	1.3 (0.7-2.4)	1.5 (0.8-2.9)	1.5 (0.7-3.0)	1.4 (0.7-2.8)
30 - 34	1.1 (0.6-2.1)	1.1 (0.5-2.3)	0.9 (0.4-2.0)	0.8 (0.4-2.8)
34 or more	0.8 (0.4-1.7)	0.9 (0.4-2.0)	0.9 (0.4-2.1)	0.8 (0.3-1.9)
SOCIOECONOMIC STATUS				
Abode				
No fixed adress		4.7 (2.7-8.3)***	4.7 (2.6-8.6)***	4.7 (2.6-8.5)***
Fixed adress		------	------	-------
Living with children				
No				
Yes or she has not children		3.6 (2.0-6.6)***	3.0 (1.5-5.8)**	2.6 (1.3-5.0)**
		------	------	-------
MARGINALISATION				
Casual partner IDU				
No			------	--------
Yes			3.1 (1.8-5.2)***	2.6 (1.5-4.6)***
Age first pregnancy				
17 or less			2.0 (1.0-3.9)*	2.1 (1.1-4.2)*
18 +			------	--------
RISK BEHAVIOUR and INFECTIONS				
HIV Seroprevalence				
HIV negative				--------
HIV positive				1.0 (0.6-1.9)
HIV unknown				0.4 (0.2-1.0)*
-2LL	419.537	356.506	336.824	331.807
Improvement Chi-Square	-2.243	60.787***	19.682***	5.017

a) The most parsimonious logistic regression were derived for each stage of the analysis using SPSS. For example, for Group 2 the Abode variable was fixed.it could not be eliminated, whilst the new variables were selectedrhough process of backward elimination.
b) * p<0.05; ** p<0.01; *** p<0.001.
c) For models B, and C the following variables were excluded from the equation. Stage 1: Age left education; Stage 2: Regular partner IDU, Actual regular partner, Previous imprissonment; Stage 3: Use alcohol, Regular partner HIV, Cocaine injectingHeroine+cocaine injecting, Age first injection, Ever sharing needles and STD last year.

Chapter Seven

Determinants of Previous Imprisonment amongst Female IDUs

1. Introduction

There is a considerable body of evidence to suggest that prisoners have a history of drug use before entering prison. For example, a survey of pre-arrest drug use amongst 1,741 men serving prison sentences in England and Wales, found that 11.0 percent of inmates had injected drugs (Maden, Swinton and Gunn, 1992). Likewise, a series of surveys in Scottish prison have reported previous or current IDU to range between 16.8 (Bird, Gore, Burns and Duggies, 1992a,b) and 33.5 percent (Taylor et al. 1995). Finally, in the USA in 1989, inmates were twice as likely as the general population to have ever used drugs: 78.0 percent of inmates had used drugs during their lifetime; 44.0 percent had used drugs in the month before their current offense; 20.0 percent daily or almost daily; and 27.0 percent were under the influence when they committed their current offense (Polonsky, 1994). Although less evidence is available, data from all female prison populations indicate that female prisoners also have a history of IDU. In a study of 145 female prisoners conducted at HMP (Her Majesty's Prison) Cornton Vale, Scotland, 46 percent of female inmates had injected drugs (Gore et al., 1997). In a larger scale study of the same prison population, 21.3 percent of 3,389 consecutive admissions admitted to drug misuse in the six months prior to custody (Stuart, O'Rourke & Power, 1997). In the USA in 1989, one in three female inmates had been imprisoned for drug-related offenses as compared to one in five male inmates (Polonsky et al., 1994).

Towards the beginning of the acquired immunodeficiency syndrome (AIDS) pandemic, it was realised that the prevalence of the human immunodeficiency virus (HIV) was disproportionately high in prison populations when compared to the population *per se*. Indeed, this is verified in the current study where previous imprisonment is demonstrated to be an important factor in the multivariate logistic regression models presented in Table 5.3 (Chapter 5).

In 1983, a study of an American prison population in New York State demonstrated the importance of intravenous drug use (IDU) in the transmission of HIV (Wormer et al., 1983; Harding and Schaller, 1992). At the time the population represented a convenient sample of drug users and little attention was given to the actual transmission of HIV in prisons (Harding and Schaller, 1992). Since then, however, the prime objective of a number of studies has been to examine the prevalence of HIV in prison populations and to identify relevant risk factors. Many of these studies conclude that the high prevalence of HIV arises because prison populations are predominantly drawn from young, sexually active groups who disproportionately engage in high-risk activities, including, for example, intravenous drug use. Moreover, many people who have a high risk of HIV transmission are also at risk of imprisonment.

If it is assumed that the high incidence of HIV among women were recorded at the outset of a prison sentence, then one can infer that HIV-infected women are more likely to be imprisoned than HIV-infected men. Studies of prisoners suggest that jails are places where a disproportionate number of individuals have a history of risk factors associated with HIV infection (Gaughwin et al., 1990). These include, for example, the injection of illicit drugs (Dolan, Donoghoe and Stimson, 1990), unprotected sexual intercourse (Magura, Shapiro and Kang 1994) and under-provision of

health care (Kendig et al., 1994). Although few studies have been published on risk factors of HIV for women entering prisons, evidence can also be accumulated from data based on male subjects and from studies of women in other high-risk populations.

As partly illustrated in Chapter 6, a further compounding factor in examining the characteristics of female prisoners, HIV prevalence and IDU is the proportion of prisoners who have exchanged sex for drugs or money. In the HMP Corton Vale study by Stuart and colleagues (1997), 16.5 percent of the 616 female drug abusers were in prison on charges of prostitution. Gore et al. (1997) reported that 20 percent of the female injector-inmates in their study had worked as prostitutes. In a multicentre study of female sex workers in Spain, 13.9 percent reported having been previously incarcerated (Estébanez et al., 1995).

In addition to the unrepresentative proportion of IDUs and female sex workers seemingly characteristic of prison entrants, these women are also susceptible to a gamut of diseases associated with both poverty and IDU/prostitution itself. For example, the presence of STDs has been shown to be another major factor that has been associated with sexual transmission of HIV. As previously mentioned, diseases that cause genital ulcers may facilitate both transmission of and susceptibility to HIV.

Other bloodbourne viruses, including hepatitis B and C, have been identified in both male and female prison entrants. In an Australian study the incidence for hepatitis B was 12.6 percent and, for hepatitis C, was 18.3 percent (Crofts et al., 1995). In an examination of 265 male prison inmates in Maryland, USA, intake prevalence for hepatitis C was 38.0 percent and seroincidence was 1.1 percent per person year in prison (Vlahov et al., 1993).

Finally, prison populations have long been considered to be at high risk of tuberculosis (TB) (Darbyshire, 1990). Most studies have either examined the incidence of TB within prison (Darbyshire, 1990) or have examined the prevalence of TB using a cross-section of prisoners (Martín et al., 1994). In the latter study, 56.2 percent of prisoners were infected with Mycobacterium tuberculosis, although the data do not permit the calculation of the prevalence for new entrants. Studies are therefore needed to examine the prevalence of TB, and other bacterial diseases, amongst prison entrants.

To examine the potential for the transmission of HIV and other diseases amongst prisoners, information is needed on risk activities whilst incarcerated. Evidence would then enable the development of effective and equitable policies for the care and treatment of HIV/AIDS prisoners. For example, in the current study nearly a third of those who had been in prison (n=98) reported injecting whilst in prison.

It is the aim of this chapter to look at the determinants of previous imprisonment amongst female IDUs. As with prostitution in Chapter 6, the main justification for so doing is to try to create a better understanding of the causes, and consequences, of a very marginalised environment/lifestyle with respect to HIV. Thus by examining prostitution and previous imprisonment (which were both associated with HIV prevalence in Chapter 5), it might be possible to build a more comprehensive picture. However, it should be noted that - as in Chapter 6 - in the proceeding bivariate and multivariate analyses the characteristics are examined; not risk factors.

Therefore the objectives of this chapter are:

1) To discern the profile of female IDUs that have been in prison, as well as the relationships with other marginalisation factors such as prostitution and HIV;

2) To examine the determinants of imprisonment in female IDUs using the data from this study; and

3) To facilitate the design of new strategies intended to prevent the transmission of HIV within prisons.

2. Methods

The methods used for this study, including the bivariate and multivariate analyses, are described in Chapter 3. The only variation from those methods occurs in the logistic regression model in which the following four groups of explanatory variables have been identified:

Model 1: Age
In order to evaluate the effect of age on the dependent variable (previous imprisonment) the biological age (coded into four categorical age groups: 24 or less; 25-29; 30-34; and 35+) was the sole variable used in this group.

Model 2: Socioeconomic status and marginalisation
Based on the literature and results of the bivariate analysis, three variables were selected to define the general socioeconomic status of female IDUs: age left full-time education (coded into four categorical age groups: 13 or less; 14-15; 16-18; and 19+); source of income during past six months (illegal and prostitution versus legal); and, place of residence in past six months (no fixed abode versus abode).

In addition to socioeconomic status, two variables were chosen to characterise the extreme marginalised nature of the sample population. These dichotomous variables (yes versus no) were: ever had clients and having a regular partner who was an IDU.

Model 3: Risk behaviours
Specific known risk behaviours of previous imprisonment were included in the third model: ever have regular HIV+ partner; cocaine injecting; heroin+cocaine injecting; age began injecting; ever share needles; and number of clients per month.

Model 4: Gynaecological background and infections.
The variables introduced in this model were: previous pregnancy; some STD in the past year; and hepatitis B during the past year.

3. Results

First we will examine the bivariate relationships with previous imprisonment and selected variables presented in Table 7.1. Then we will present findings from the multivariate logistic regression.

3.1. Sociodemographic characteristics and previous imprisonment

There is a clear positive association between age and prison stay: the older the age the higher the probability of having been in prison. Compared to the youngest stratum (24 years or less), those in the three older strata (25-29; 30-34; over 34) were two to three times more likely to have been in prison.

3.2. Marginalisation variables

The extreme marginalisation of the IDU population which has been to prison becomes evident when we examine the place of residence and source of income. Forty-nine percent of female IDUs that don't have a fixed address had been in prison, compared to 27.2 percent of those that do have one (OR=2.6;CI=1.5-4.5). Furthermore, 42.3 percent of the women whose source of income was illegal or prostitution had been in prison, compared to only 24.0 percent of those who had a legal source of income (OR=2.3;CI=1.4-3.9).

The age of leaving school did not have a significant p-value in the Linear trend test; however, the stratum of those who left school at age 13 or younger had a higher rate of having been in jail (43.2 percent) compared to those who stayed in school until age 16 or older (35.6 percent).

3.3. Drug-using habits

The age of beginning to inject drugs maintains a strong relationship with previous incarceration. Those that began injecting younger (16 years or less) are more than 3 times more likely to have been in prison compared to those who began at age 20 or later. Those who began between ages 17 and 19 are nearly twice as likely to have been to prison.

Those who have ever exchanged injection material are twice as likely to have been incarcerated. However there is not a significant association between having shared injection material in the last 6 months and having been in prison.

No significant associations were found between the use of any specific drugs and imprisonment.

3.4. Sexual habits

No significant associations were found between having a steady sexual partner and having been in prison, even when the partner was an IDU. It is useful to remember that almost all of these women (94 percent) reported having had a steady partner, and in the great majority of cases (85 percent), this partner was also an IDU. However, a positive association does appear between those women who had a steady sexual HIV-positive partner and imprisonment, with those who had an HIV-positive partner presenting an OR=2.1(CI=1.2-3.4) compared to those who hadn't. No relationship was found between condom use with regular partners and prison.

Although no association was found between having had a casual partner and prison, we did find an association when this partner was HIV-positive or an IDU. Having an HIV-positive casual partner produced an OR of 2.7(CI=1.4-5.1), and when the casual partner was an IDU the OR is 2.1(CI=1.2-3.4). No association was found with condom use with casual partners.

Prostitution is also associated with previous imprisonment: the women with a history of prostitution have nearly double the odds compared to those who never practiced prostitution.
No association appears between prison and the use of condoms with clients.

3.5 Reproductive habits and infections

We found a significant association between having a regular menstrual period and the dependent variable. When menstruation is regular, 21.2 percent have been in prison whereas the proportion increases to 37.6 percent when it is not regular (OR=0.4;CI=0.3-0.8).

No association was found between imprisonment and the various types of contraception used in the past five years. Nor was their a finding with current use of contraception.

We found a strong relationship between having ever been pregnant and the dependent variable. Those reporting a previous pregnancy were three times more likely to have been imprisoned compared to those who had never been pregnant.

Having had any type of STD in the five years prior to the interview also nearly tripled the odds of previous imprisonment.

As expected and in agreement with data presented in Chapter 5, there is a positive association between HIV and prison. The risk of having been in prison for those who are HIV-positive is 2.8 times greater than for those who are HIV- negative or unaware of their serostatus (CI=1.5-4.9).

Table 7.1 Proportion of women previously imprisoned by selected variables

Variable	Total	Imprisonment Yes(%)	No(%)	OR(CI95%)	p
Sociodemographics					
Age					
24 or less	73	17.8	82.2	1(reference)	**[a]
25 -29	110	33.6	66.4	2.3(1.1-5.1)	
30-34	72	41.7	58.3	3.3(1.5-7.6)	
35 or more	49	36.7	63.3	2.7(1.1-6.7)	
Age left education					
13 or less	88	43.2	56.8	1.4(0.7-2.7)	n.s.[a]
14-15	82	28.0	72.0	0.7(0.3-1.5)	
16 or more	73	35.6	64.4	1(reference)	
Abode					
No fixed address	69	49.3	50.7	2.6(1.5-4.5)	***
Fixed address	235	27.2	72.8		
Income					
Illegal+prostitution	137	42.3	57.7	2.3(1.4-3.9)	***
Legal	167	24.0	76.0		
Drug-using habits					
Age began injecting drugs					
16 or less	81	48.1	51.9	3.3(1.8-6.2)	***[a]
17 - 19	81	33.3	66.7	1.8(0.9-3.4)	
20 or more	141	22.0	78.0	1(reference)	
Ever shared needles/syringes					
Yes	217	36.9	63.1	2.2(1.2-4.0)	**
No	86	20.9	79.1		
Ever shared needles/syringes in last 6 months					
Yes	104	40.4	59.6	1.3(0.8-2.3)	n.s.
No	114	33.3	66.7		

Table 7.1 (continued) Proportion of women previously imprisoned by selected variables

Variable	Total	Imprisonment Yes(%)	No(%)	OR(CI95%)	p
Sexual habits					
Ever had a regular sexual partner					
Yes	293	32.1	67.9	0.8(0.2-2.9)	n.s.
No	11	36.4	63.6		
Ever had a regular sexual HIV+ partner					
Yes	138	39.1	60.9	2.1(1.2-3.4)	**
No	152	23.7	76.3		
Ever had a regular sexual IDU partner					
Yes	257	32.7	67.3	1.1(0.6-2.6)	n.s.
No	47	29.8	70.2		
Frequency of condom use with regular sexual partner -Vaginal intercourse					
Never/sometimes	122	25.4	74.6	1.0(0.4-2.3)	n.s.
Always	35	25.7	74.3		
Ever had a casual sexual partner					
Yes	241	32.8	67.2	1.1(0.6-2.0)	n.s.
No	62	30.6	69.4		
Ever had a casual sexual HIV+ partner					
Yes	53	45.3	54.7	2.7(1.4-5.1)	**
No	186	23.7	76.3		
Ever had a casual sexual IDU partner					
Yes	156	39.7	60.3	2.1(1.3-3.4)	**
No	141	24.1	75.9		
Frequency of condom use with casual sexual partner -Vaginal intercourse					
Never/sometimes	48	29.2	70.8	0.7(0.3-1.6)	n.s.
Always	50	38.0	62.0		
Ever had a client					
Yes	140	39.3	60.7	1.8(1.1-3.0)	*
No	164	26.2	73.8		
Frequency of condom use with casual client -Vaginal intercourse					
Never/sometimes	26	38.5	61.5	0.8(0.3-2.2)	n.s.
Always	52	42.3	57.7		

Table 7.1 (continued) Proportion of previously imprisoned women by selected variables

Variable	Total	Imprisonment Yes(%)	No(%)	OR(CI95%)	p
Reproductive habits and infections					
Regular periods					
Yes	99	21.2	78.8	0.4(0.3-0.8)	**
No	205	37.6	62.4		
Age at first pregnancy					
< 18	74	44.6	55.4	1.6(0.9-2.8)	n.s.
18 or more	150	34.0	66.0		
Contraception currently					
Yes	159	30.2	69.8	0.8(0.5-1.3)	n.s.
No	140	34.3	65.7		
IUD used in last 5 years					
Yes	21	14.3	85.7	0.3(0.1-1.1)	n.s.
No	283	33.6	66.4		
Condom used in last 5 years					
Yes	247	33.2	66.8	1.3(0.7-2.4)	n.s.
No	57	28.1	71.9		
Spermicide used in last 5 years					
Yes	45	42.2	57.8	1.7(0.9-3.2)	n.s.
No	259	30.5	69.5		
Contraceptive pill used in last 5 years					
Yes	91	28.6	71.4	0.8(0.5-1.3)	n.s.
No	213	33.8	66.2		
Ever been pregnant					
Yes	230	37.4	62.6	3.1(1.6-6.1)	***
No	74	16.2	83.8		
Regular smear test					
Yes	134	30.6	69.4	0.9(0.5-1.4)	n.s.
No	168	33.9	66.1		
STD in last 5 years					
Yes	77	49.4	50.6	2.9(1.6-5.1)	***
No	196	25.5	74.5		

Table 7.1 (continued) Proportion of women previously imprisoned by selected variables

Variable	Total	Imprisonment Yes(%)	No(%)	OR(CI95%)	p
Reproductive habits and infections (continued)					
HIV +					
Yes	165	41.8	58.2	2.8(1.5-4.9)	***
No	97	20.6	79.4		
Hepatitis B in last 5 years					
Yes	72	40.3	59.7	1.7(1.0-3.0)	n.s.
No	212	28.3	71.7		
Hepatitis C in last 5 years					
Yes	89	31.5	68.5	1.0(0.6-1.7)	n.s.
No	195	31.3	68.7		
Tuberculosis in last 5 years					
Yes	45	40.0	60.0	1.6(0.8-3.0)	n.s.
No	239	29.7	70.3		
Herpes last year					
Yes	23	47.8	52.2	2.1(0.9-4.5)	n.s.
No	250	30.8	69.2		
Candidiasis last year					
Yes	43	46.5	53.5	2.1(1.1-4.0)	n.s.
No	230	29.6	70.4		
Genital warts last year					
Yes	28	57.1	42.9	3.2(1.4-7.1)	**
No	245	29.4	70.6		
Some infection last year					
Yes	148	36.5	63.5	0.6(0.4-1.0)	*
No	136	25.7	74.3		
Type of Drug Treatment					
Methadone maintenance	65	35.4	64.6	1.0(reference)	n.s.[a]
Other treatment	143	36.4	63.6	1.0(0.5-2.0)	
No treatment	96	24.0	76.0	0.6(0.3-4.5)	

3.6. Results of hierarchical logistical regression analysis

Age: Age appears to be a factor directly associated with the dependent variable, maintaining a significant relationship, with the youngest group presenting the lowest risk of having been in prison. This relationship is maintained throughout the four models, increasing in its statistical significance in the second and third models, and decreasing slightly in the final model. Interestingly, on examination of the different models, we can observe that in the first model the group of women over 35 years present an OR slightly lower than the group of 30- to 34-year-olds (2.7 and 3.3 respectively), thus in the older strata the risk of imprisonment had descended. But if we look closely, this phenomenon disappears in the third model, as we adjust for risk factors, gynecological history and infections. Furthermore, in the final model the direct relationship between age and imprisonment remains clearly evident (the older the age, the higher the risk), with the risk in respect to the group under 24 years varying from 2.9 (CI=1.3-6.6) for the group of 25- to 29-year-olds, to 4.5 (CI=1.9-10.9) for the group of 30- to 34-year olds, and 4.9 (CI=1.8-13.4) for the group of 35 years or older.

Socioeconomic status and marginalisation: The source of income is a factor directly associated with prison, although it loses significance slightly in the final model, where having an illegal source of income presents an OR=2.2 (CI=1.2-4.0) compared to having a legal source of income. Not having a fixed address, though strongly associated to imprisonment in the bivariate analysis, entered only into the second model, and with a weak significance (p=0.08). This association continues to weaken with the introduction of subsequent models. Using the oldest age group for leaving full-time studies (19 years and over) as a reference, two groups (13 or less and 16 to 18) maintain significant associations with imprisonment in the second and third models, but as we proceed, the association weakens and ceases to be significant in the final model. Having had a regular IDU sexual partner and having practiced prostitution remained out of the equation.

Risk behaviour: Of the variables selected to represent risk behaviours, only the age of beginning to inject drugs remains in the equation, with the rest remaining out of the equation. This variable loses significance slightly when we adjust for the variables of previous pregnancy and having had some STD in the previous year. When the age of beginning drug use is younger, the risk of having been in prison increases, such that in the final model, the OR for the group of 16 years or younger is 3.0 (CI=1.5-6.0) and for the 17- to 19-year-olds is 1.6 (0.8-3.1) in comparison to the group of 20 years or older.

Gynaecological background and infections: Those who have ever been pregnant are twice as likely than those who have never been pregnant to have been to prison (OR=2.2;CI=1.0-4.8). The women who have had some STD in the last year are also more likely to have been imprisoned compared to those who had not had an STD in the last year (OR=1.9;1.1-3.6).

4. Discussion

The main objective of the preceding analysis was to review the determinants of previous imprisonment amongst female IDUs. It will be remembered from Chapter 4 (Table 4.1) that 32.2 percent of the study sample reported that they had been imprisoned. As demonstrated in the bivariate analysis (Table 7.1), the more marginalised the female IDU, the more likely she is to have been to prison. This is demonstrated through the association between imprisonment and having an STD in the past year and having a casual partner who is an IDU or HIV-positive, for example (Table 7.1). It should be stressed that having a partner who is HIV-positive is *not* a cause of imprisonment, but a characteristic of very marginalised female IDUs. In the regression analysis the only marginalisation variable to maintain a direct relationship with previous imprisonment is having had an STD.

Socioeconomic status appears to play an important role in determining previous imprisonment. Claiming one's source of income as illegal or prostitution is directly associated with imprisonment. Age of leaving education and having no fixed address appear to be indirectly linked to imprisonment. Socioeconomic status, as determined by living in a poor district, was also identified as having a direct relationship with previous imprisonment amongst IDUs in a study of AIDS patients in Barcelona (Caylá et al., 1995). Previous pregnancy, which most likely represents the economic burden of children to support, is also directly associated with imprisonment. Perhaps these women are pressed into illegal activities in order to support their families.

Age and age of beginning to inject drugs both have strong, direct relationships with imprisonment. The association with age is most likely a reflection of exposure. The older the woman, the longer she's been involved in IDU and other illegal activities, the more likely it is that she has been to prison. Early injectors have been identified in other studies as more likely to engage in drug-using risk behaviours (e.g. frequency of injection, frequency of needle sharing, and use of shooting galleries) and sexual risk behaviours (amongst females, e.g. prostitution, multiple sex partners) (Battjes, Leukefeld and Pickens, 1992). Thus early injectors may represent a more hard-core group of drug users and are an important target for HIV risk-prevention programmes within prisons.

The positive associations between prison and HIV positivity as well as prison and previous TB infection (not significant) are interesting to consider. The association between HIV and TB with previous imprisonment may - but not necessarily - be the effects of imprisonment. For example, up until the beginning of the AIDS pandemic, TB was considered to be an infectious disease that was all but eliminated from the industrialised countries of Europe. However, in the past decade a number of studies have demonstrated a strong association with marginalised populations, including, for example prisons (Darbyshire, 1990). This association may, in part, be confounded by the prevalence of HIV/AIDS in these populations. For example, HIV infection has been shown to be one of the major risk factors for TB. In Barcelona (Spain), in 1993, 24.2 percent of TB cases were HIV positive and a further 15.4 percent were diagnosed with AIDS (Guelar et al., 1993). Furthermore, studies of the incidence of TB among HIV-infected persons in the United States have revealed rates 100 to 1000 times higher than in the general population (Markowitz et al., 1997). In light of these observations, it is not that surprising that the study population of female IDUs reported to have been infected by TB.

Investigations into HIV amongst female prisoners have occurred infrequently. Nevertheless, the reported prevalence of HIV among female prisoners in North America and Europe ranges from 3.3

percent in the USA (Polonsky et al., 1994) to 26.0 percent in Spain (Estébanez et al., 1990). An anonymous HIV surveillance study at the Corton Vale all female-prison in Scotland found no undisclosed cases and reported an overall HIV prevalence of 1.4 percent (Gore et al., 1997). Data from male or mixed prison populations are more frequently available. Examples include the 3.4 percent of 15,052 male prisoners from the American state of Georgia who were HIV positive (Harding, 1990); the testing of 500 consecutive entries to prison in France that found prevalence to be 13 percent (in Harding, 1990); and the screening of 30,392 Italian prisoners of whom 16.8 percent were HIV positive (in Harding, 1990). Harding (1987) estimated the overall prevalence of HIV in European prisons to be in excess of 10 percent and between 0.1 and 15 percent in 1992 (Harding and Schaller, 1992). Unfortunately, however, these studies are not directly comparable due to different methods of data collection, varying sample sizes and the nature of the prison population from which the samples were obtained (McKee, 1992).

Although Spanish prison officials insist that IDU is not a problem in Spanish prisons, it should be remembered from Table 4.2 that 32.7 percent of those who had been imprisoned reported injecting whilst in prison (Table 4.2). In fact, drug use in prison has been widely reported in other countries. For example, from a study of 559 Scottish inmates (480 males and 79 females) 7.7 percent reported IDU on at least one occasion during a period of imprisonment (Power et al., 1992). A number of surveys have been published on HIV prevalence in male Scottish prisoners, all of which have reported IDU whilst incarcerated. For example, in Edinburgh, nearly one in five prisoners reported IDU, of whom one half had injected whilst in prison (Bird et al., 1992b); in a young offenders institute 17 percent of prisoners admitted misuse of intravenous drugs, of whom a quarter reported use while in prison (Bird et al., 1992a); and, following an outbreak of hepatitis B and HIV at Glenochil Prison, an investigation reported that a quarter of IDUs had first injected inside prison (Gore et al., 1995). Similar evidence was recently reported on female Scottish prisoners, with 46 percent of inmates reporting IDU, 57 percent of these injector-inmates reporting to have injected whilst in prison, and just one woman who had first injected inside prison (Gore et al., 1997).

Unlike other IDUs, prisoners are often denied access to public health programmes, such as needle exchanges (Gore, 1993), and therefore are at more risk of sharing HIV-contaminated injecting equipment (Bath et al., 1993). In fact, Keene (1994) reported that the levels of HIV risk through IDU were higher for subjects in prison than for those out of prison on parole. Furthermore, a multifactorial analysis of 612 IDU from Berlin, Germany, revealed that the most important risk factor for HIV infection was needle-sharing in prison (Müller et al., 1995); and Turnbull, Dolan and Stimson (1992) reported that in the United Kingdom several studies have found that up to a quarter of IDUs who go to prison report that they managed to inject drugs whilst in prison and that most people who inject in prison share syringes. Finally, although no known data is available, it is likely that IDUs who first share needles whilst in prison continue to do so after release and thus imprisonment is associated with a long-term change in risk-taking behaviour.

Thus not only are prisoners who inject at particularly high risk of contracting HIV based on their out-of-prison behaviour and living circumstances, but they also engage in high-risk behaviour whilst in prison. Therefore it is critical to target HIV prevention education in prison populations, not only because there is a "captured" audience, but because this is an audience that might not be accessed otherwise. (Nearly one-quarter of those who had never had drug treatment had been to prison.) Furthermore, it is critical that prison populations also receive harm-reduction interventions, such as needle-exchange programmes, the provision of decontaminants, and the provision of condoms. In fact, in response to the severity and urgency of HIV/AIDS prevalence in prisons, the WHO recommended sweeping reforms including: the availability of condoms; needle-exchange programmes; and the provision of bleach to clean infecting equipment, if such provision is provided

for the community at large (WHO, 1993). By linking the recommendations to that provided for the community, the WHO affirmed the principle of equality, namely that the same prevention and control strategy should be applied in prisons as in other parts of society (Tomaševski, 1991). A similar approach has been recommended by other international organisations including the United Nations and the Council of Europe. Despite this consensus, there is still a difference between provision of preventive programmes in the wider society versus that for female prisoners, or more specifically for the female IDUs.

5. Conclusions

- Those who have been to prison are a more marginalised group of women IDUs.
- The economic burden of having children, as indicated by having ever been pregnant, increases the likelihood of having been to prison.
- Early age of first injection has been linked to other risky behaviours and appears to be a determinant of imprisonment in this study.
- The relationship between HIV seropositivity and previous imprisonment, though indirect in the current study, is important to consider and to study further for reasons of prevention.
- Contrary to reports by Spanish prison officials, this study shows that injecting drug use does occur in Spanish prisons.

HIERARCHICAL LOGISTIC REGRESSION OF PREVIOUS INPRISONMENT ON RISK FACTORS

	MODEL A AGE N=304	MODEL B SOCIOECONOMIC STATUS N=304	MODEL C RISK BEHAVIOUR N=304	MODEL D GINECOLOGICAL HISTORY N=304
	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C.95%)
AGE				
Age group				
24 or less	-----	------	------	------
25-29	2.3 (1.1-4.8)*	3.2 (1.5-6.9)**	3.5 (1.6-7.8)**	2.9 (1.3-6.6)**
30-34	3.3 (1.5-7.1)**	5.4 (2.3-12.3)***	5.8 (2.4-13.7)***	4.5 (1.9-10.9)***
35+	2.7 (1.2-6.2)*	4.4 (1.8-11.1)**	6.4 (2.4-17.2)***	4.9 (1.8-13.4)**
SOCIOECONOMIC STATUS				
Age leaving education				
13 or less		3.8 (1.6-9.0)**	2.7 (1.1-6.5)*	2.4 (1.0-6.0)
14 - 15		2.0 (0.8-4.9)	1.6 (0.6-4.1)	1.3 (0.5-3.4)
16 - 18		3.1 (1.3-7.4)**	2.5 (1.0-6.2)*	2.2 (0.9-5.5)
19 +		------	------	------
Above				
No fixed adress		1.8 (0.9-3.4)	1.7 (0.9-3.2)	1.6 (0.8-3.1)
Fixed adress		------	------	------
Income				
Legal		------	------	------
Ilegal+prostitution		2.3 (1.3-4.1)**	2.3 (1.3-4.2)**	2.2 (1.2-4.0)*
RISK BEHAVIOUR				
Age injecting drugs				
16 or less			3.3 (1.7-6.4)***	3.0 (1.5-6.0)**
17 - 19			1.7 (0.8-3.4)	1.6 (0.8-3.2)
20 or more			------	------
GINECOLOGICAL HISTORY				
Previous pregnancy				
Yes				2.2 (1.0-4.8)*
No				-------
STD the past year				
Yes				1.9 (1.1-3.6)*
No				-------
-2LL	371.129	337.096	324.159	312.969
Improvement Chi-Square	11.085*	34.034***	12.059**	11.190**

a) The most parsimonious logistic regression were derived for each stage of the analysis using SPSS. For example, for Group 2 the Age variable was fixed, it could not be eliminated, whilst the new socioeconomic variables were selected through process of backward elimination.
b) * p<0.05; ** p<0.01; *** p<0.001.
c) For models B,C and D the following variables were excluded from the equation: Stage 2: Regular sexual partner IDU and Prostitution ; Stage 3: Number of clients per month, Regular partner HIV, Condom use,Heroine+cocaine injection, cocaine injection and ever sharing needles; Stage 4: Hepatitis B.

Chapter Eight

Determinants of Sharing Needles amongst Female IDUs

1. Introduction

There is a great deal of evidence that drug users in a majority of countries are modifying their risky practices. In a study conducted in the U.K., Hunter et al (1995) reported a decline in the proportion of IDUs that had shared injecting material during the six months prior to the interview over four consecutive years (from 1990 to 1993). Specifically they found a decline from 46.8 percent in 1990 to 39.3 percent in 1993. These figures are lower than those found in Berlin (Stark et al, 1990) where 88.0 percent of the women had at some time shared a needle or those found in Italy (Sasse et al., 1989) where 58.0 percent had engaged in needle sharing.

In our study 71.4 percent of the women had ever shared injection equipment, yet this proportion is reduced to almost half (34.2 percent) for those reporting equipment sharing in the six months prior to the interview. This rate is comparable to rates found by Estébanez, et al. (1996) in other E.E.C. countries: in the U.K. there was a reduction from 69.2 percent that had ever shared injection equipment to 38.5 percent who had shared in the previous six months; the reduction in Germany was from 56.4 percent to 26.9 percent; in Italy from 47.2 percent to 26.3 percent; and in France, where rates were quite a bit lower, from 34.4 percent to 10.0 percent.

Although these data provide encouraging evidence that a decline is underway in the risky behavior of IDUs, we can't forget that more than a third of the IDUs in our study were still continuing to engage in the risky practice of sharing needles. For this reason, the aim of the current chapter is to identify and characterise this residual group of women at risk and attempt to determine the direct and indirect factors associated with continuing to share needles. First, we have conducted a bivariate analysis in which we examine the relationship between the dependent variable "sharing needles in the past 6 months" and a variety of independent variables that could be considered of interest. Later we developed a multilevel logistic regression model to attempt to explain the direct and indirect determinants of our dependent variable.

2. Methods

The methods used for this study, including the bivariate and multivariate analyses, are described in Chapter 3. First, a bivariate analysis is conducted to identify significant relationships between "Sharing needles in the past 6 months" and selected independent variables. Then a multivariate analysis is conducted involving a logistic regression model with the following five groups of explanatory variables entered stepwise:

Model 1: Age
Biological age is the first explanatory variable introduced into the model in order to evaluate the effect of age on the dependent variable (sharing needles) and on the other independent variables. Previous research has identified a strong negative relationship between age and needle sharing.

Model 2: Socioeconomic status
Based on the literature, three variables were selected to define the general socioeconomic status of female IDUs: age left full-time education; source of income during past six months (illegal and prostitution versus legal); and, place of residence in past six months (no fixed abode versus abode).

Model 3: Marginalisation
In addition to socioeconomic status, five variables were chosen to characterise the extreme marginalised nature of the sample population. These variables were: age at first pregnancy (17 or less versus 18+); and four dichotomous variables: ever had clients; previous imprisonment; having a regular partner who was an IDU; and having a casual partner who was an IDU.

Model 4: Risk behaviours
Based on the literature, the following risk behaviours of sharing needles were selected for inclusion in the fourth model: ever have regular HIV-positive sexual partner; injecting in prison; cocaine injecting; heroin+cocaine injecting; age at first injection; actual regular sexual partner; regular PAP smear test; don't always use condom in vaginal intercourse with regular partner; don't always use condom in vaginal intercourse with casual partner; don't always use condom in vaginal intercourse with clients; and sample.

3. Results

First, the bivariate relationships with needle sharing in the past six months and selected independent variables are examined (see Table 8.1). Then findings from the regression analyses will be presented.

3.1. Sociodemographic characteristics and sharing needles in the past six months

Several of the sociodemographic characteristics had significant relationships with recent needle sharing. First, we found a strong association between age at the time of interview and having recently shared injection material, with those less than 25 years old more than three times more likely to have recently shared needles than the reference stratum of those 25 years old or older. We also found an association between level of education, reflected by the age of leaving school, and needle sharing. Those who left school before the age of 16 were two times more likely to have recently shared needles than those who left school after the age of 16.

The living situation of these women also proved to have a strong relationship with needle sharing. Those living at home with parents or other family members were much less likely to share needles compared to women who lived alone or with others. Furthermore those who claimed to have no fixed address were four times more likely to have recently shared needles than those with a fixed address.

The source of income is another factor possibly related with the behaviour of sharing needles. Those whose source of income is illegal or prostitution were slightly more likely to have recently shared needles than those with a legal source of income (non-significant finding).

3.2. Marginalisation variables

Amongst marginalisation variables, only previous imprisonment and the absence of drug treatment proved to have significant relationships with needle sharing. Nearly twice as many women who had been in prison engaged in recent needle sharing compared to those who had never been in prison.

The absence of prior treatment is considered to be an indicator of the degree of marginalisation of IDUs. We chose to use as a reference stratum "having received methadone maintenance treatment", as this group had the lowest proportion of having shared needles in recent months (24.6 percent). Results of the linear trend test showed that those that had received no treatment were twice as likely to have engaged in needle sharing in the last six months compared to the methadone group.

HIV status itself is not a factor likely to be associated with needle sharing in the last six months, yet a large number of those who knew of their HIV-positive status reported to have quit sharing injection material. For this reason, being HIV-positive seems to have a protective relationship with needle sharing, although the association is not statistically significant.

3.3. Drug-using habits

When drug use began at an early age (16 years old or less), we found a greater proportion of women that had recently shared injection equipment (45.7 percent) compared to 30.2 percent of those who began using drugs between the ages of 17 and 19 or 24.8 percent of those who began at the age of 20 of later. We used the latter group as reference stratum to conduct a linear trend test, finding that those of the intermediate age group had an OR of 2.0 and the youngest age group an OR of 2.6.

The use of certain non-injectable drugs such as amphetamines and benzodiazepines were associated with the habit of needle sharing with an OR of 3.4 and 1.8 respectively. But the strongest association was with those who had injected heroin in recent months, who were nearly three times more likely to have shared injection material than those who had not injected heroin. We did not find any significant relationships with the users of other types of intravenous drugs.

3.4. Sexual habits

For the analysis of sexual habits in our population, we found it worthwhile to differentiate between sexual habits with a regular partner, with a casual partner and with clients (in the case of prostitution). Having ever had a regular partner, whether HIV-positive or an IDU, did not have a significant relationship with sharing injection material. However, we did find a strong relationship with another risky behavior -- not always using condoms for vaginal penetration. In effect, those women who did not always use condoms with their regular partner were 3.5 times more likely to have shared injection material in the last 6 months.

Amongst those who had ever had a casual sexual partner, we had a similar finding. Though there was no direct association with needle sharing, there was a strong association for those women who did not always use condoms for vaginal penetration with their casual partners. This time the OR was 7.3.

We did find a positive association between having ever had sex with a client and the habit of needle sharing. Those who had ever practiced prostitution were nearly two times more likely to have shared needles than those who had never had clients. Although the age of starting into prostitution did not have a statistically significant association, we did see a clear tendency for the younger a woman began working as a prostitute the more likely she was to share needles. We also found a strong relationship between not always using condoms with clients for vaginal penetration and needle sharing, with an OR of 4.8.

3.5 Reproductive habits and infections

Using less viable methods of contraception such as "withdrawal" was related to the habit of needle sharing. We found that those who practiced withdrawal were two times more likely to have shared needles compared to those who didn't practice withdrawal.

The age of first pregnancy was strongly related to the behaviour of needle sharing. Pregnancy at a young age indicated an important degree of marginalisation and generally was accompanied by other risky behaviours. Those that had their first pregnancy at age 17 or younger were four times more likely to have shared needles than those who had their first pregnancy at the age of 18 or later.

It is evident from these results that not only are risky behaviours frequently associated but protective behaviours as well. For example, those women who had PAP smear tests taken regularly tended to share injection material in a lesser proportion (20.9 percent) than those who didn't have smear tests regularly (45.2 percent). In other words, there appears to be a protective relationship between having a regular smear test and sharing needles (OR=0.3; CI=0.2-0.5).

Having recently had an infection may be an indicator of other risk behaviours. The women who had had an infection during the past year were twice as likely to have shared needles than those who hadn't had an infection.

3.6. Origin of the sample

It appears that more of the women who attend the methadone services were reached by messages to avoid sharing injection equipment than those who don't use the methadone services. When the interview was conducted in a methadone service, the rate of women that had shared needles was 28.0 percent, whereas if the woman was interviewed in another drug service or on the street, the rate of sharing needles was over 35 percent.

3.7. Results of hierarchical logistic regression analysis

Table 8.2 presents the results of the four models. In the first model, we find that being 25 years old or older is a protective factor for the behaviour of sharing needles. In particular the group of 25- to 29-year-olds and the over 35-year-olds presented as significant protective factors, and the group of 30- to 34-year-olds did not reach significance in this first model but did become significant in the third model.

The second model adds variables representing socioeconomic status. The age of leaving school dropped out of the equation while the variables "abode" and "income" remained. The place of residence manifests itself as a variable with a great deal of influence over the behaviour of needle sharing, with those without a fixed address having an OR=5.8 (CI=3.0-11.2) compared to those with a fixed address. When the source of income was illegal or from prostitution, contrary to what was expected, a protective relationship appeared, although this factor did not become significant until the third model. Age maintained a level of significance similar to the first model.

In the third model those variables which express the degree of marginalisation of the women are added. A number of variables dropped out of the equation for lack of significance, including: having had a regular IDU sexual partner; having had a casual sexual IDU partner; not having ever received drug treatment; and having ever been in jail. The age at first pregnancy appears in this model as an influential factor in the habit of needle sharing. Those women who had their first pregnancy before the age of 18 were three times more likely to have engaged in needle sharing, than those who experienced their first pregnancy after 18. This model also introduces "ever practicing prostitution" as a risk factor with an OR=1.7. In this third model, significance is improved for age as well as for the socioeconomic variables.

In the fourth model we added other variables considered to be related to the habit of sharing injection material, including: having had a regular sexual HIV-positive partner; having injected drugs in prison; having injected cocaine; heroin or cocaine+heroin; place where subjects were recruited; and knowing one is HIV-positive. None of these variables were significant and consequently all were dropped out of the final equation.

Also included in this fourth model were variables that imply risky behaviour. These variables are: not getting a PAP smear test with regularity; not always using a condom in vaginal intercourse with a casual sexual partner; not always using a condom in vaginal intercourse with a regular sexual partner; not always using a condom in vaginal intercourse with clients; and not having a current regular sexual partner. Of these five variables, the first two appear to be important determinants. Not getting PAP smear tests with regularity carries an OR=2.3(CI=1.2-4.2) and not always using a condom in vaginal penetration with a casual partner has an OR=4.5(CI=1.6-12.7). The introduction of this new group of variables reinforces and improves the ORs of the variables from the marginalisation group, although it somewhat lowers the OR of the variable "no fixed address", and has no effect on the rest of the variables.

4. Discussion

Our study provides further evidence that IDUs are reducing their unsafe practices of sharing injection equipment. For the third of our sample which continues to share injection equipment, the bivariate and regression analyses presented in this chapter help to characterise this residual risk group by revealing a variety of related characteristics and behaviours. First of all, the younger IDUs appear to be more likely to share needles, a finding also reported by other Spanish studies (Hernández-Aguado et al., 1994; Bravo et al., 1994). One possible explanation for this is that the younger population (adolescents in particular) tend to perceive themselves as invulnerable to many health threats and are therefore more likely to engage in risk-taking behaviours. This might also explain the positive associations with other risk-taking behaviours, including not always using a condom with a casual partner, not having a regular smear test, and the use of amphetamines, benzodiazepines, and heroin injecting. Bravo et al. (1994) also noted less frequent condom use amongst IDUs who shared injecting equipment.

The regression analysis indicated that the residual risk group is quite economically oppressed and marginalised, having no fixed address and tending to have the first pregnancy at an early age. They were also more likely to have been to prison and to be prostitutes, according to the bivariate analysis. A relationship between needle sharing and prostitution was also reported by Bravo et al. (1994).

The relationship between not currently sharing needles and having been in methadone maintenance treatment provides evidence of the potentially positive impact drug treatment programmes can have on HIV risk behaviours. Of course the converse of this is also possible -- those most likely to share needles are an oppressed, marginalised subgroup with less access to this type of drug treatment. As other studies have suggested, this residual risk group may be better accessed through needle exchange schemes. For example, Archibald et al. (1998) found that frequent attendance at a needle exchange program was associated with borrowing used needles, and amongst women it was independently associated with frequency of injection of any drug, shooting gallery attendance and having an illegal source of income.

Reducing the needle-sharing practices in this residual risk group of female IDUs poses a major challenge to future HIV prevention programmes. In particular, programme planners may want to target the younger population with strategies to increase their perceived susceptibility to contracting HIV, especially considering that this population may be simultaneously engaged in a variety of high risk behaviours. Although data on the impact of needle exchange programs on HIV incidence are inconsistent, the fact that they attract IDUs who have high risk behaviours or unstable lifestyles makes them a potentially important venue for preventive interventions with this hard-to-reach population.

5. Conclusions

- Our data confirm that IDUs are making changes in their risky behaviours, particularly in the habit of needle sharing.

- The residual risk group of female IDUs which continues to engage in needle-sharing practices is characterised by being younger, having a lower socioeconomic status, being more marginalised, and practicing other risk-taking behaviours.

- The relationship between not always using a condom with a casual partner and recent needle sharing indicates a particularly high risk subgroup and suggests a possible route of transmission into the non-drug-using population.

- The lower rate of sharing needles among those who had received methadone maintenance treatment provides further evidence of the potential benefits of HIV risk-reduction interventions within drug programmes.

Table 8.1 Proportion of women sharing needles by selected variables

Variable	Total	Sharing needles		OR(CI.95%)	p
		Yes(%)	No(%)		
Sociodemographics					
Age					
24 or less	73	50.7	49.3	3.6(1.5-8.7)	***[a]
25 -34	182	30.7	69.3	1.5(0.7-3.5)	
35 or more	49	22.4	77.6	1(reference)	
Age leaving education					
15 or less	170	40.6	59.4	1.9(1.2-3.1)	*
16 or more	129	26.4	73.6		
Living with					
Parents or relatives	89	18.5	81.5	0.3(0.2-0.6)	***
Other/alone	212	41.0	59.0		
Abode					
No fixed address	69	60.9	39.1	4.3(2.5-7.6)	***
Fixed address	235	26.4	73.6		
Income					
Illegal+prostitution	137	37.2	62.8	1.3(0.8-2.5)	n.s.
Legal	167	31.7	68.3		
Who finances your expenses					
Yourself	182	30.2	69.8	0.6(0.4-1.0)	
Your parents	122	40.2	59.8		
Marginalisation					
Prison					
Yes	98	42.9	57.1	1.7(1.1-2.9)	*
No	206	30.1	69.9		
Injected in Prison					
Yes	32	46.9	53.1	1.3(0.5-3.0)	n.s.
No	66	40.9	59.1		
HIV +					
Yes	165	34.5	65.6	0.9(0.5-1.5)	n.s.
No	97	37.1	62.9		

Table 8.1 (continued) Proportion of women sharing needles by selected variables

Variable	Total	Sharing needles		OR(CI.95%)	p
		Yes(%)	No(%)		
Drug treatment					
Methadone	65	24.6	75.4	1(reference)	*[a]
Other treatment	143	34.3	65.7	1.6(0.8-3.3)	
None	96	40.6	59.4	2.1(1.0-4.5)	
Drug-using habits					
Age began injecting drugs					
16 or less	81	45.7	54.3	2.6(1.4-4.8)	*
17 - 19	81	39.5	60.5	2.0(1.1-3.7)	
20 or more	141	24.8	75.2	1(reference)	
Use amphetamines					
Yes	22	45.7	54.3	3.4(1.4-8.6)	*
No	222	32.2	67.8		
Use benzodiazepines					
Yes	113	42.5	57.5	1.8(1.1-2.9)	*
No	191	29.3	70.7		
Heroin injecting					
Yes	240	38.3	61.7	2.7(1.4-5.3)	**
No	67	18.8	81.3		
Cocaine injecting					
Yes	160	32.5	67.5	0.8(0.5-1.4)	n.s.
No	144	36.1	63.9		
Heroin+Cocaine injecting					
Yes	151	37.7	62.3	1.4(8.4-2.2)	n.s.
No	153	30.7	69.3		

Table 8.1 (continued) Proportion of women sharing needles by selected variables

Variable	Total	Sharing needles		OR(CI.95%)	p
		Yes(%)	No(%)		
Sexual habits					
Ever had a regular sexual partner					
Yes	293	33.4	66.6	0.4(0.1-1.4)	n.s.
No	11	65.5	45.5		
Ever had a regular sexual HIV+ partner					
Yes	137	31.9	68.1	0.8(0.5-1.3)	n.s.
No	152	37.5	62.5		
Ever had a regular sexual IDU partner					
Yes	257	34.6	65.4	1.1(0.6-2.2)	n.s.
No	47	31.9	68.1		
Frequency of condom use with regular sexual partner					
-Vaginal intercourse					
Never/sometimes	122	36.9	63.1	3.5(1.3-9.7)	*
Always	35	14.3	85.7		
-Anal intercourse					
Never/sometimes	39	38.5	61.5	6.2(0.7-53.9)	n.s.
Always	11	9.1	90.9		
-Oral intercourse					
Never/sometimes	123	38.2	61.8		n.s.
Always	3	0.0	100.0		
Ever had a casual sexual partner					
Yes	241	33.2	66.8	0.8(0.4-1.4)	n.s.
No	62	38.7	61.3		
Ever had a casual sexual HIV+ partner					
Yes	53	35.8	64.2	1.4(0.7-2.7)	n.s.
No	186	28.5	71.5		
Ever had a casual sexual IDU partner					
Yes	156	36.5	63.5	1.2(0.8-2.0)	n.s.
No	141	31.9	68.1		
Frequency of condom use with casual sexual partner					
-Vaginal intercourse					
Never/sometimes	48	54.2	45.8	7.3(2.7-19.3)	***
Always	50	14.0	86.0		

Table 8.1 (continued) Proportion of women sharing needles by selected variables

Variable	Total	Sharing needles Yes(%)	Sharing needles No(%)	OR(CI.95%)	p
Sexual habits (continued)					
-Anal intercourse					
Never/sometimes	9	22.2	77.8		n.s.
Always	6	0.0	100.0		
-Oral intercourse					
Never/sometimes	68	34.8	65.2	1.1(0.2-4.7)	n.s.
Always	9	33.3	66.7		
Ever had a client					
Yes	152	41.4	58.6	1.8(1.1-2.9)	*
No	164	28.0	72.0		
Age at first client					
17 or less	20	55.0	45.0	2.7(0.9-8.7)	*[a]
18 - 22	52	46.2	53.8	1.9(0.8-4.4)	
23 +	65	30.7	69.3	1 (reference)	
Frequency of condom use with client					
-Vaginal intercourse					
Never/sometimes	26	61.5	38.5	4.8(1.7-13.2)	**
Always	52	25.0	75.0		
-Oral intercourse					
Never/sometimes	55	40.0	60.0	1.4(0.5-4.1)	n.s.
Always	22	75.9	68.8		
-Anal intercourse					
Never/sometimes	13	46.2	53.8	1.7(0.3-10-0)	n.s.
Always	9	33.3	66.7		

Table 8.1 (continued) Proportion of women sharing needles by selected variables

Variable	Total	Sharing needles		OR(CI.95%)	p
		Yes(%)	No(%)		
Reproductive habits and infections					
Ever used condom					
Yes	257	32.3	67.7	0.6(0.3-1.1)	n.s.
No	47	44.7	55.3		
Regular periods					
Yes	99	28.3	71.7	0.7(0.4-1.1)	n.s.
No	205	37.1	62.9		
Contraception currently					
Yes	159	30.2	69.8	0.7(0.4-1.1)	n.s.
No	140	38.6	61.4		
Used withdrawal last 5 years					
Yes	123	43.1	56.9	1.9(1.2-3.1)	**
No	181	28.2	71.8		
Ever been pregnant					
Yes	230	35.7	64.3	1.3(0.7-2.3)	n.s.
No	74	29.7	70.3		
Age at first pregnancy					
17 or less	74	56.8	43.2	4.2(2.2-7.9)	***
18 +	150	24.0	76.0		

Table 8.1 (continued) Proportion of women sharing needles by selected variables

Variable	Total	Sharing needles		OR(CI.95%)	p
		Yes(%)	No(%)		
Reproductive habits and infections (continued)					
Ever have miscarriages					
Yes	66	47.0	53.0	2.0(1.1-3.5)	*
No	238	30.7	69.3		
Ever had abortions					
Yes	119	28.6	71.4	0.7(4.0-1.1)	n.s.
No	185	37.8	62.2		
Regular smear test					
Yes	134	20.9	79.1	0.3(0.2-0.5)	***
No	168	45.2	54.8		
Hepatitis B last year					
Yes	72	38.9	61.1	1.4(0.8-2.4)	n.s.
No	212	31.6	68.4		
TBC last year					
Yes	45	46.7	53.3	1.9(1.0-3.7)	*
No	239	31.0	69.0		
Some infection in last year					
Yes	148	40.5	59.5	2.0(1.2-3-4)	**
No	136	25.7	74.3		
Place where the interview was conducted					
Sample					
Drug services	107	35.5	64.5		n.s.
Methadone services	50	28.0	72.0		
On the street	147	35.4	64.6		

a:p significance of linear trend test

HIERARCHICAL LOGISTIC REGRESSION OF SHARING NEEDLES LAST 6 MONTHS ON RISK FACTORS

	MODEL A AGE N=304	MODEL B SOCIOECON. STATUS N=304	MODEL C MARGINALISATION N=304	MODEL D RISK BEHAVIOUR N=304
	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C.95%)
AGE GROUP				
24 or less	------	------	------	------
25-29	0.3 (0.2-0.7)***	0.3 (0.2-0.6)***	0.3 (0.1-0.5)***	0.2 (0.1-0.5)***
30-34	0.6 (0.3-1.1)	0.5 (0.2-1.0)	0.5 (0.2-1.0)*	0.4 (0.2-1.0)*
35+	0.3 (0.1-0.6)**	0.3 (0.1-0.6)**	0.3 (0.1-0.6)**	0.3 (0.1-0.8)**
SOCIOECONOMIC STATUS				
Abode				
No fixed adress		5.8 (3.0-11.2)***	5.3 (2.7-10.6)***	3.7 (1.9-7.1)***
Fixed adress		------	------	------
Income				
Legal		------	------	------
Ilegal+prostitution		0.6 (0.3-1.1)	0.4 (0.2-0.8)**	0.4 (0.2-0.8)**
MARGINALISATION				
Age first pregnancy				
18 +			------	------
17 or less			3.0 (1.6-5.5)***	3.7 (1.9-7.1)***
Ever had clients				
Yes			1.7 (1.0-3.2)	2.4 (1.2-4.7)
No			------	------
OTHER RISK BEHAVIOUR				
Sexo actual regular p				
Yes				0.6 (0.3-1.1)
No				-------
Regular smear tests				
Yes				-------
No				2.3 (1.2-4.2)**
Always condom casual p				
Yes				-------
No				4.5 (1.6-12.7)**
Always condom regular p				
Yes				-------
No				2.6 (0.8-8.3)
Always condom clients				
Yes				-------
No				2.3 (0.9-6.2)
-2LL	375.541	346.219	328.129	294.543
Improvement Chi-Square	15.052**	29.322***	18.090***	31.346***

a) The most parsimonious logistic regression were derived for each stage of the analysis using SPSS. For example, for Group 2 the Age variable was fixed, it could not be eliminated, whilst the new socioeconomic variables were selected trhough process of backward elimination.
b) () p<0.10; * p<0.05; ** p<0.01; *** p<0.001.
c) For models B,C and D the following variables were excluded from the model: Stage 2: Age left education; Stage 3: Casual partner IDU, Regular partner IDU, Previous imprissonment, Drug treatments; Stage 4: Regular partner HIV, Injecting in prisson, Never used condom, Sample, Cocaine injecting, Heroine injecting, To know HIV positivity, Heroine+cocaine injecting and Age first injection.

Chapter Nine

Determinants of Never Used Condoms amongst Female IDUs

1. Introduction

The sexual behaviour of female IDUs is comparable to that of non-IDUs, presenting similar attitudes and having similar problems with condom use. In all developed societies, it is assumed that it is the man who should initiate the use of a condom, making it difficult for a woman to impose her desire for one to be used. It is common to find a condom in a man's wallet, while it's unusual to find one in a women's purse, which would be considered libertine by society and by her own partner. The use of condoms with a steady partner is less frequent than with casual partners or clients, in the case of prostitution (Chapter 4: Tables 4.5, 4.6, and 4.8). Effectively, many women who use condoms regularly with their clients refuse to use them with their habitual partners, even when the partner is an IDU, thus exposing themselves to a higher risk of contracting HIV from their partner than from the practice of prostitution.

Although the last decade has seen an important reduction in certain risk behaviours of IDUs, such as needle sharing (Chapter 8), there has been less success in increasing the conduct of safe sex (Hart, 1989; McKeganey, 1990; Harris, 1990), especially the use of condoms with a steady partner. In some cases, perhaps in response to safe-sex campaigns, there has been a decrease in the number of casual partners, but rarely has there been a parallel increase in condom use (Chitwood, 1990).

In their study of women and AIDS, McCoy and Inciardi (1993) proposed a model of social determinants of sexual risk behaviours. They suggest that the social determinants include such factors as: attitudes about condom use and with whom they should be used; the extent to which drug use by the woman impedes her judgment about participating in risky behaviours; her dependence on an IDU partner for her support and that of her children; and cultural expectations about female partners during sex. The model also includes a number of other factors which have been found to be associated with unsafe sexual practices, including: limited education, financial dependency, and having child care responsibilities. The theoretical model proposed by these authors provides a useful framework for studying sexual risk taking by women.

In this chapter we have chosen to focus our study of sexual risk taking on those women who reported never using condoms in their sexual relations (n=47). It seems to us to be of vital interest to identify this residual group of risk and to analyse the characteristics and circumstances of these women in order to facilitate the design of new strategies intended to increase condom use in this group.

Thus the principal objectives of this chapter are to determine the profile of female IDUs who still have never used condoms and to identify the social determinants of not using condoms.

2. Methods

The methods used for this study, including the bivariate and multivariate analyses, are described in Chapter 3. "Never used condoms" is the dependent variable, and the logistic regression model involves the following four models of explanatory variables:

Model 1: Age
The biological age (coded into four categorical age groups: 24 or less; 25-29; 30-34; and 35+) was the sole variable used in this group in order to evaluate the effect of age on the dependent variable ("never used condoms") and on the other independent variables.

Model 2: Socioeconomic status
Three variables were selected to define the general socioeconomic status of female IDUs: age left full-time education (coded into four categorical age groups: 13 or less; 14-15; 16-18; and 19+); source of income during past six months (illegal and prostitution versus legal); and, place of residence in past six months (no fixed abode versus abode).

Model 3: Marginalisation
In addition to socioeconomic status, six variables were chosen to characterise the extreme marginalised nature of the sample population. These variables were: age at first pregnancy (17 or less versus 18+); drug treatment received (any treatment and none versus methadone maintenance); and four dichotomous variables (yes versus no): ever had clients; previous imprisonment; having a regular partner who was an IDU; and having a casual partner who was an IDU.

Model 4: Reproductive background
Specific known reproductive circumstances that have an influence on condom use were included in the fourth model. These dichotomous variables (yes versus no) are: to have regular periods; use contraception currently; ever been pregnant; and ever had abortions.

Model 5: Risk behaviours
Specific known risk behaviours thought to be related to "never used condoms" were included in this model: ever have regular HIV+ partner; cocaine injecting; heroine+cocaine injecting; age at first injection; actual regular sexual partner; use crack; ever share needles; know HIV serology; and place where interview was conducted.

3. Results of Bivariate Analysis

The bivariate relationships between "Never used condoms" and selected independent variables are examined in Table 9.1.

3. 1. Sociodemographic characteristics and never used condoms

As expected, we found a negative association between age at the time of interview and having never used a condom. In effect, the younger the age, the greater the risk of having never used a condom. Results of the linear trend test were very significant. Those under 25 years were 4.3 times more likely to have never used condoms than those over 35 years. This excess of risk decreased sharply for the other age strata, with both the 25- to 29-year-olds and the 30- to 34-year-olds presenting an OR of 1.6 when compared to those over 34 years.

The relationship with age at the time of leaving school was again negative, but not significant. There was also no clear association with the persons with whom they live, nor the place where they live. Nor did we find a significant relationship when we looked at source of income, comparing illegal+prostitution to legal.

Knowing that it is more common for prostitutes to use condoms than other marginalised groups, we decided it was logical to regroup the source of income variables to compare illegal versus legal+prostitution. This produced a strong positive association, with illegal having an OR of 2.5 compared to the group legal+prostitution.

There was also a significant association with the variable of who finances one's expenses. When the woman is responsible for her own expenses, the risk of having never used condoms was cut in half when compared to being dependent on someone else. In this case, one must be aware of the potential for confounding, either by the age of the woman or by the fact that women who cover their own expenses may be working as prostitutes and as we just mentioned, prostitutes have a higher rate of using condoms.

3.2. Marginalisation variables

Of the three variables which we considered to be indicators of marginalisation, two (having ever been to prison and having injected in prison) were not significantly associated with having never used a condom.

Nevertheless, we found a strongly significant association between knowledge of one's HIV status and condom use. Those female IDUs who knew of their seropositivity were much less likely to have never used a condom than those who didn't know they were seronegative or had never been tested.

3.3. Drug-using habits

No significant relationships were found between condom use and age of initiating drug use.

Having used methadone in the six months prior to the interview lowered the risk of having never used a condom by one-fifth. This might be explained by the fact that the great majority of these women had been enrolled in drug or methadone treatment services during this time, which makes them more likely to have received safe-sex messages as well as to have had better access to condoms.

Considering that women who have been in methadone treatment are at a lower risk for having never used a condom (as just mentioned), we compared this group with those that received any other type of treatment and with those who never received any treatment. The group that had received other treatment presented a slight positive association though not significant, while the group that had never received any treatment presented a strong positive association with an odds ratio of 4.5 for having never used a condom. The result of the linear trend test between these groups was significant.

Those women who used crack in recent months were three times more likely to have never used a condom. These data coincide with data obtained in a Spanish study (Bravo, 1996) in which crack users, of both sexes, presented an association with not always using a condom.

Although no relationship was found with having ever shared injection material, there was a positive association with having shared in the past six months. Those who reported recent sharing of injection equipment were nearly two times more likely to have never used condoms.

3.4. Sexual habits

Having a steady sexual partner was positively associated with having never used a condom, even if the partner was an IDU. The corresponding odds ratios for these variables were 1.8 and 1.6, respectively (though non-significant). In other words, there is a greater probability of having never used a condom when one has maintained sexual relations with a stable partner, and this holds true even if the partner is an IDU. One must realise that many of these women share injection material with their partner, and consequently may consider the use of a condom unnecessary (in that they are already exposing themselves to whatever risk their partner poses). The situation changes when the stable partner is HIV-positive. In this case, the odds are halved, suggesting that knowledge of a partner's HIV positivity doubles the likelihood of condom use.

When the woman maintains sexual relations with casual partners, there is a clear increase in condom use, which is maintained for IDU partners as well. In both cases, when one had a casual partner and when this partner was an IDU, the odds ratios for having never used a condom are 0.2. When the casual partner was HIV-positive, the use of condoms was maintained equally high, with an OR=0.4. In a study conducted by Helal et al. (1995) in France, it was found that 33 percent of the subjects had never used condoms with their casual partners. Nevertheless condom use was significantly greater when the partner was seropositive (38 percent versus 12.7 percent).

As we have already mentioned, one decisive factor for the use of condoms is the practice of prostitution, which presented a strong negative association with having never used a condom (OR=0.1), in fact one of the strongest of the study.

3.5 Reproductive habits

Women with regular menstrual periods use condoms less than those who have irregular cycles. The OR for those who have regular periods is 2.8. This association demonstrates one of the principal reasons for condom use - contraception, as condoms are used more amongst women who can't trust the regularity of their cycle. This conclusion is confirmed by evidence that those women who currently use some type of contraception present a strong negative association with having never used a condom. In other words, the condom is a contraceptive method which has

been widely diffused in this population.

Those women who have ever been pregnant, as well as those who have ever had an abortion, were half as likely to have never used condoms than those who have never experienced these circumstances.

3.6. Origin of the sample

Of the women recruited in methadone services, only 6 percent had never used a condom. Therefore this stratum was selected as a reference for the linear trend test, which indicated that those recruited in other drug services were more than twice as likely to have never used a condom, while those recruited from the street were four times more likely.

Table 9.1 Proportion of women who never used condom by selected variables

Variable	Total	Ever used condom		OR(CI.95%)	p
		No (%)	Yes(%)		
Sociodemographics					
Age					
24 or less	73	27.4	72.6	4.2(1.2-15.9)	**[a]
25 - 29	110	12.7	87.3	1.6(0.5-6.3)	
30 - 34	72	12.5	87.5	1.6(0.4-6.7)	
35 +	49	8.2	91.8	1 (reference)	
Age leaving education					
13 or less	88	19.3	80.7	1.6(0.7-3.6)	n.s[a]
14 - 15	82	15.9	84.1	1.3(0.5-2.9)	
16 +	132	12.9	87.1	1(reference)	
Living with					
Parents or relatives	92	14.1	85.9	0.9(0.4-1.7)	n.s.
Other/alone	212	16.0	84.0		
Abode					
No fixed address	69	20.3	79.7	1.6(0.8-3.1)	n.s.
Fixed address	235	14.0	86.0		
Income					
Illegal	74	25.7	74.3	2.5(1.3-4.8)	**
Legal + prostitution	230	12.2	87.8		
Who finances your expenses					
Yourself	182	12.1	87.9	0.5(0.3-1.0)	*
Your parents	122	20.5	79.5		
Marginalisation					
Prison					
Yes	98	13.3	86.7	0.8(0.4-1.5)	n.s.
No	206	16.5	83.5		
Injected in Prison					
Yes	32	15.6	84.4	1.3(0.4-4.5)	n.s.
No	66	12.1	87.9		
HIV+					
Yes	166	9.0	91.0	0.3(0.2-0.7)	***
No	138	23.2	76.8		

Table 9.1 (continued) Proportion of women who never used condom by selected variables

Variable	Total	Ever used condom No(%)	Ever used condom Yes(%)	OR(CI.95%)	p
Drug-using habits					
Age started injecting drugs					
16 or less	81	16.0	84.0	1.0(0.4-2.3)	n.s.
17 -19	81	14.8	85.2	0,9(0,4-2,1)	
19 or more	141	15.6	84.4	1(reference)	
Use methadone					
Yes	72	4.2	95.8	0.2(0.1-0.6)	**
No	232	19.0	81.0		
Use crack					
Yes	46	30.4	69.6	3.0(1.4-6.1)	**
No	258	12.8	87.2		
Ever shared needles					
Yes	217	12.9	87.1	0.6(0.3-1.1)	n.s.
No	86	20.9	79.1		
Shared needles in last 6 months					
Yes	104	20.2	79.8	1.7(0.9-3.2)	n.s.
No	200	13.0	87.0		
Drug Treatment					
Methadone	65	7.7	92.3	1(reference)	***[a]
Other treatment	143	11.2	88.8	1.5(0.5-4.9)	
None	96	27.1	72.9	4.5(1.5-14.2)	
Sexual habits					
Ever had a regular sexual partner					
Yes	293	15.7	84.3	1.8(0.2-14.9)	n.s.
No	11	9.1	90.9		
Ever had a regular sexual IDU partner					
Yes	257	16.3	83.7	1.6(0.6-4.4)	n.s.
No	47	10.6	89.4		
Ever had a regular sexual HIV+ partner					
Yes	138	10.9	89.1	0.5(0.2-0.9)	*
No	152	21.1	78.9		
Ever had a casual sexual partner					
Yes	241	10.0	90.0	0.2(0.1-0.4)	***
No	62	37.1	62.9		

Table 9.1 (continued) Proportion of women who never used condom by selected variables

Variable	Total	Ever used condom No(%)	Ever used condom Yes(%)	OR(CI.95%)	p
Sexual habits (continued)					
Ever had a casual sexual IDU partner					
Yes	156	6.4	93.6	0.2(0.1-0.4)	***
No	141	26.2	73.8		
Ever had a casual sexual HIV+ partner					
Yes	53	9.4	90.6	0.4(0.1-1.0)	*
No	186	21.0	79.0		
Ever had a client					
Yes	140	4.3	95.7	0.1(0.1-0.3)	***
No	164	25.0	75.0		
Place where the interview was conducted					
Methadone services	50	6.0	94.0	1(reference)	
Drug services	107	13.1	86.9	2.4(0.6-10.9)	
On the street	147	20.4	79.6	4.0(1.1-17.4)	**[a]
Reproductive habits					
Regular periods					
Yes	99	25.3	74.7	2.8(1.5-5.3)	***
No	205	10.7	89.3		
Contraception currently					
Yes	159	8.2	91.8	0.3(0.2-0.6)	***
No	140	22.9	77.1		
Ever been pregnant					
Yes	230	12.6	87.4	0.5(0.2-0.9)	*
No	74	24.3	75.7		
Ever had abortions					
Yes	119	10.1	89.9	0.5(0.2-0.9)	*
No	185	18.9	81.1		

[a] p significance of Chi-square of Linear trend test

4. Results of Hierarchical Logistic Regression Analysis

Table 9.2 presents the odds ratios and confidence intervals of each of the variables entered into the regression model and the new odds ratios, as subsequent groups of variables are entered into the regression.

Age (Introduction of Model 1)

We found a negative association between having never used condoms and age at the time of the interview. It was the youngest group (24 or less) who were most likely to have never used condoms, with an OR of 4.2 (CI=1.4-13.3). For the other age groups the association was weaker. As we proceed to add the other models, we see that this association loses its intensity, becoming non-significant by the time the reproductive variables of Model 4 are introduced. When the risk behaviours and interaction factor are incorporated in Model 5, the value of the OR for the youngest group decreases to 1.3 (CI=0.3-5.6), no longer significant.

Socioeconomic Status (Introduction of Model 2)

For those who don't have a fixed address, the risk of having never used a condom is higher than for those who do. This association becomes stronger with successive models, such that by the final model the OR has increased more than 5 points (from 2.1 in Model 2 to 7.2 in Model 5).

The source of income (illegal+prostitution versus legal) presents a protective OR (0.5; CI=0.2-1.0), which is explained by the more frequent use of condoms among those practicing prostitution, although this association is weak and continues to weaken with successive models, becoming practically non-existent in the final model (OR=0.9;CI=0.3-2.7). The age of leaving school never entered the equation in the second model.

Marginalisation (Introduction of Model 3)

Never having had a casual IDU partner presented as a variable positively associated with the dependent variable (OR=4.4;CI=1.9-10.6). This association is maintained in subsequent models, though weakening slightly in the final one (OR=3.7;CI=1.4-9.8). We know from previous studies, that even if condom use is infrequent with a steady partner, it is more frequent with casual partners, and even more frequent with clients. (In our study condoms were always used for vaginal intercourse with the habitual partner by 22.3 percent, with the casual partner by 51.0 percent and with clients by 66.7 percent).

The variable with the strongest association with the dependent variable in the various models is the practice of prostitution. Those that don't practice prostitution present an OR of 9.3 (CI=3.3-26.7) in Model 3, increasing to 12.1 (CI=3.1-47.2) in the final model. The following variables remained out of the equation: habitual IDU partner; previous incarceration; age at first pregnancy; and having received any drug treatment.

Reproductive Background (Introduction of Model 4)

It seems evident that the regularity of the menstrual cycle creates a certain confidence in women which leads them to risk having sexual relations without contraception. Thus we found that those women with regular menstrual cycles presented an OR=2.5 (CI=1.1-5.6) for the dependent variable, compared to those who have irregular cycles. In the subsequent and final model, the level of association of this variable hardly varied (OR=2.6;CI=1.0-6.9).

Those that were not using any methods of contraception at the time of the interview presented a positive association with having never used a condom (OR=2.5;CI=1.1-5.6). This association is duplicated in the subsequent model, when we control for risk behaviours (OR=5.2;CI=1.9-14.1). This finding suggests that the condom plays an important part in the contraceptive methods utilized by this population.

Previous pregnancies appear to predispose one to use condoms, perhaps because many of these women are all too familiar with unwanted pregnancies resulting from a lack of contraceptive planning. This would also explain the positive association found between having never been pregnant and having never used condoms (OR=2.2;CI=1.0-5.0), which is maintained in the subsequent model (OR=2.1;CI=0.8-5.2).

The variable of having had a previous abortion did not enter the equation.

Risk Behaviour (Introduction of Model 5)

The proportion of women interviewed in methadone centres who never used condoms was the lowest of the three groups (6.0 percent), which is why we used this group as a reference stratum. A significant association was not found between the group of women recruited in other drug centres and the dependent variable when compared to those recruited in the methadone centres (OR=1.1;CI=0.2-5.4).

However, a strong positive association was found between those recruited in the street and the dependent variable (OR=4.5;CI=1.5-13.0). Although the women recruited in the street probably belong to a more marginalised group than those recruited in the centres, one can't discard the possibility that those recruited in the treatment centres may feel morally coerced to over-report the practice of protective behaviours (or conversely, under-report the practice of risky behaviours) either for fear of rejection by the centre, or with the intention of pleasing the centre.

The groups which began injecting drugs earlier are the most marginalised and with risk behaviours more evident at every level. Thus when the age of the first injection was 16 years or less, we found a noticeably higher risk of having never used condoms if we compare it with the group who began injecting themselves at age 20 or later (OR=2.7;CI=0.9-8.0). However, the group who began injecting between ages 17 and 19, did not present a clear association compared to the reference group (OR=0.8;CI=0.2-2.3).

Amongst possible interaction effects, a significant interaction effect was identified between the variables "knowing one's serostatus" and "having ever had a steady partner". This interaction effect was entered into the final model and maintained a significant relationship with "having never used condoms". Specifically, those who knew of their <u>seronegativity</u> and who had <u>never</u>

had a steady partner presented an important risk of never having used condoms (OR=5.0;CI=1.9-13.5), compared to the rest.

Remaining out of the final equation were the following variables: use of crack in the previous six months; having ever exchanged injection material; having a steady HIV-positive partner; having injected cocaine or heroin+cocaine in the last six months; having a current steady partner and knowing (or believing to know) one's HIV status.

5. Discussion

The results of the bivariate and regression analyses help us to characterise the residual risk group of female IDUs who continue to be at high risk for HIV due to their failure to use condoms. One of the most important factors appears to be not practicing prostitution. The use of condoms seems to be a well-diffused behaviour among prostitutes in our study, at least in their relations with clients. Other studies have also noted that condom use tends to be more frequent with clients and casual partners than regular partners (Rhodes et al., 1994; Paone et al., 1995).

Another striking feature of this residual risk group who has never used condoms is that they are quite marginalised. They tend not to have a fixed address, they began injecting drugs at an early age, and they were recruited from the street. In other words, this is a subgroup which may have less access to HIV prevention information as well as less access to condoms themselves. Other studies have also documented low rates of condom use among homeless women (Nyamathi et al., 1997; Fisher et al., 1995). Future educational campaigns should be aware of the important challenge of reaching this subgroup.

Conversely, we can also interpret from the above results that those who were enrolled in any drug treatment programme were more likely to use condoms, suggesting the potential positive effect these programmes can have on other risk behaviours. Of course, this finding should be qualified by the possibility of over-reporting bias at the drug centres, as mentioned previously. Still, the potential for drug treatment programmes to be used as a venue for implementing HIV risk reduction cannot be overstated. In fact, Eldridge et al. (1997) have reported success in reducing sexual risk for HIV infection among female entrants to an inpatient substance abuse treatment centre using a brief skills training intervention.

Analysis of the reproductive history provides further insights into this subgroup. Those who have never used condoms tend not to be using any contraception, are perhaps relying on the rhythm method due to their regular periods, and have never been pregnant. Moreover condom use would appear to be a widely diffused (91.8 percent) method of contraception amongst those who reported to be currently using contraception.

Younger women originally appeared to be at higher risk for having never used condoms, but the regression analysis revealed that age was merely a marker for other more important variables, such as prostitution, ever being pregnant, irregular menstrual cycles, frequenting of drug/methadone centers, etc., which become more common over time.

A number of studies have noted that condom use is more frequent or consistent among those aware of their seropositivity when compared to those who were not aware or were seronegative (Van den Hoek, 1990; Wilson et al., 1998). Further evidence of this relationship is provided by a study carried out in Europe by Desenclos (1993), who found that IDUs who knew of their

seropositivity were three times more likely to always use a condom than those who had never been tested. They also conclude that the seronegative IDUs tend to be less accepting of condom use than other risk-reducing behaviours, such as not sharing needles. A study carried out amongst female IDUs participating in New York City syringe exchange programmes indicated that knowing one's HIV status was one of three independent predictors of consistent condom use with primary partners (Paone et al., 1995). Shedding further light on this relationship, Friedman (1994) found that condom use was quite frequent among seropositive IDUs, especially if the partner was not an IDU. The authors offered two possible explanations: the first being an altruistic desire to protect one's partner; and the second being a strong predisposition on the part of the partner to use condoms knowing that he/she is maintaining relations with someone who presents a high risk.

In our study, we also found a significant bivariate relationship between knowing one's serostatus and condom use. However, the regression analysis revealed that the interaction between knowing one's serostatus and having ever had a steady partner was a more important direct determinant of condom use. In other words, it was not merely knowing one's serostatus that determined condom use, but knowing of one's seronegativity combined with having never had a steady partner which had a direct effect on having never used a condom. This finding suggests that women who knew they were seropositive and had a steady partner were more likely to have used condoms probably to protect the steady partner.

Another important determining factor revealed in the regression analysis was never having had a casual IDU partner. Although this is not particularly useful information as a descriptor of the subgroup who has never used condoms, we can make some inferences. As the bivariate analysis revealed, condoms are more likely to be used with casual partners or clients than regular partners. The use of condoms in these situations, particularly with IDU or HIV-positive casual partners, appears to be driven by perception of risk. Unfortunately, perception of risk is lower with a known partner, even if the known partner is an IDU. Future interventions should help these women to more accurately assess the risk of not using condoms with steady partners. Furthermore, future studies could elaborate on the reasons why these women don't use condoms with a regular partner and propose appropriate strategies for correcting this problem.

Ideally, women need a form of barrier contraception which they can control, not requiring the man's participation or initiative. The female condom has emerged in recent years as a possible solution. Studies have indicated that it provides contraceptive efficacy in the same range as other barrier methods when used correctly and has shown to be acceptable amongst women and their partners, though cost remains an issue (Farr et al., 1994; Ray et al., 1995). Of course, the female condom still requires male willingness to use it making safer sex negotiation skills as important as ever. Furthermore, future studies should compare the acceptability of female condoms versus male condoms amongst steady partners.

6. Conclusions

From the simultaneous observation of the bivariate analysis and the multilevel logistic regression model we can extract the following conclusions:

- Although the use of condoms is relatively accepted with clients and casual partners, it is still not as common among stable partners, even when the partner is high risk (IDU or HIV +).
- The visit by a female IDU to a drug/methadone treatment centre apparently has a positive effect on her risk behaviours.
- The residual risk group of female IDUs which has never used condoms tends to be a marginalised group having no fixed address, having begun injecting drugs at an early age, and having been recruited from the street.
- The female IDU who knows she is seropositive and has a steady partner is more likely to use condoms.

HIERARCHICAL LOGISTIC REGRESSION OF NEVER USED CONDOM ON RISK FACTORS

	MODEL A AGE N=304	MODEL B SOCIOECON. STATUS N=304	MODEL C MARGINALISATION N=304	MODEL D REPRODUCTIVE N=304	MODEL E RISK BEHAVIOUR N=304
	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C.95%)
AGE GROUP					
24 or less	4.2 (1.4-13.3)*	4.8 (1.5-15.6)**	4.2 (1.2-14.4)*	2.7 (0.7-9.6)	1.3 (0.3-5.6)
25-29	1.6 (0.5-5.3)	1.7 (0.5-5.4)	1.9 (0.5-6.4)	1.2 (0.3-4.4)	1.1 (0.3-4.6)
30-34	1.6 (0.5-5.5)	1.6 (0.4-5.4)	1.8 (0.5-6.8)	1.7 (0.4-6.5)	1.1 (0.3-4.7)
35+	------	-------	-------	-------	-------
SOCIOECONOMIC STATUS					
Abode					
No fixed adress		2.1 (0.9-4.7)	4.9 (1.8-13.6)**	5.6 (1.8-17.3)**	7.2 (1.8-28.2)**
Fixed adress		------	------	-------	-------
Income					
Legal		------	------	-------	-------
Ilegal+prostitution		0.5 (0.2-1.0)	0.9 (0.4-2.1)	0.8 (0.3-2.1)	0.9 (0.3-2.7)
MARGINALISATION					
Casual partner IDU					
No			4.4 (1.9-10.2)***	4.7 (1.9-11.7)***	3.7 (1.4-9.8)**
Yes			------	-------	-------
Ever had clients					
No			------	-------	-------
Yes			9.3 (3.3-26.7)***	8.7 (2.7-28.2)***	12.1(3.1-47.2)***
REPRODUCTIVE BACKGROUND					
Regular periods					
Yes				2.5 (1.1-5.6)*	2.6 (1.0-6.9)
No				-------	-------
Contracepcion currently					
Yes				-------	-------
No				2.5 (1.1-5.6)*	5.2 (1.9-14.1)**
Ever been pregnant					
Yes				-------	-------
No				2.2 (1.0-5.0)	2.1 (0.8-5.2)
RISK BEHAVIOUR					
Sample					
Methadone services					-------
Drug services					1.1 (0.2-5.4)
On the street					4.5 (1.5-13.0)**
Age injecting drugs					
16 or less					2.7 (0.9-8.0)
17 - 19					0.8 (0.2-2.3)
20 or more					-------
INTERACTION					
To be seronegative and No actual regular partner					5.0 (1.9-13.5)***
-2LL	251.547	246.640	202.451	178.880	154.182
Improvement Chi-Square	10.266*	4.908	44.198***	11.810**	24.252***

a) The most parsimonious logistic regression were derived for each stage of the analysis using SPSS. For example, for Group 2 the Age variable was fixed, it could not be eliminated, whilst the new socioeconomic variables were selected trhough process of backward elimination.

b) * $p<0.05$; ** $p<0.01$; *** $p<0.001$.

c) For models B,C,D and E the following variables were excluded from the equation. Stage 2:Age left education; Stage 3: Regular sexual partner IDU. Previous imprisonment. Age first pregnancy. Previous drug treatment; Stage 4: Abortions; Stage 5: Use crack. Ever sharing needles. Regular partner HIV. Cocaine injecting. Heroine+cocaine injecting. Actual sexual regular partner. to Know HIV serology

Chapter Ten

Determinants of Never Received Treatment amongst Female IDUs

1. Introduction

This chapter introduces the topic of drug treatment. The primary issues which we wish to consider include: access to and utilisation of treatment amongst IDUs, success in treatment; and the effect of treatment on risk behaviours.

There exists little documentation of the utilisation of drug-dependency services by IDUs, although it seems that uptake is low. Of the 104 confirmed seropositive IDUs examined by Rhodes et al. (1993), 43.1 percent had never received help or treatment for drug dependency and 52.2 percent had not been formerly tested for HIV. It was also observed in London that 42 percent of heroin addicts and 75 percent of cocaine users had never received treatment for drug dependency (Strang et al., 1994). In a study carried out in Madrid amongst IDUs, only 42.0 percent of those interviewed in the street had received some type of help or treatment for drug dependency. Of these: 21.6 percent had received treatment in a municipal centre for drug dependence; 21.1 percent had received methadone treatment; 22.9 percent had been to a hospital detoxification unit; 22.9 percent had received ambulatory detoxification; and 30.0 percent had received care in the community (Zunzunegui et al., 1993). According to the results of a European study (conducted between 1989 and 1990 in 12 countries) on the knowledge, attitudes and beliefs of IDUs about measures taken for HIV prevention, the low utilisation of drug-dependency services could be due to the low opinion of these services amongst IDUs. By comparison, the direct provision of sterile injection equipment was generally welcomed (Richardson et al., 1994).

Inequalities between men and women also occur with regard to attending services and to assimilating information. A multi-site U.S. study on access to care for drug abusers with HIV reported that multiple barriers in access to service exist for drug-using women (Weissman et al., 1995). The most important barriers were cost and waiting times. The authors also noted that significantly fewer women than men received pre- and post-test counseling and were advised to get medical services after their first positive HIV test.

According to the data recorded amongst drug addicts interviewed in Madrid in 1990, women had a lower rate of uptake into drug-dependency services, although the differences were not statistically significant (Zunzunegui, 1993). About 50 percent of men and 40 percent of women in the study were recruited from drug-dependency centres, suggesting a lower rate of access and/or utilisation for these women. Although data on the use of social services amongst these

women was not recorded, it is probable that drug-dependent women have lower rates of access due, in part, to feelings of guilt and/or the fear that the state might consider removing their children.

Gender differences in the process and response to drug treatment have also been examined. As men have traditionally accounted for a higher proportion of those addicted to heroin and therefore a higher proportion of those entering treatment facilities, it has only recently been questioned whether treatment intervention methods and goals are too "male-oriented" and not appropriately geared for women. In general, women are found to be more likely to drop out of treatment than men, although when they do carry through with treatment they have similar rates of success (reviewed in Anglin et al., 1987). Studies of the factors which contribute to positive treatment outcome for women, though few, have consistently indicated that a partner's involvement in entry into treatment and continued support in attending treatment are critical (reviewed in Anglin et al., 1987).

Furthermore, a more recent study into the apparent gender paradox in drug treatment that although women have more "risk factors" associated with drug use relapse they are no more likely to relapse than men, found that women become more engaged in treatment specifically by participating more in group counseling (Fiorentine et al., 1997). They did not find support for the drug severity hypothesis (women are less likely to relapse because their drug-use histories are less severe) or the social support hypothesis (women are less likely to relapse because they have higher levels of social support, facilitating recovery). The authors attribute the differences in treatment engagement to gender norms concerning help-seeking, personal independence, strength, and control.

The relationship of drug treatment to HIV risk behaviours has not been clearly defined. First of all, most studies have failed to adequately control for differences due to selection bias between those seeking treatment and not seeking treatment as well as between those recruited at different sites of treatment. In fact, few studies have examined the differences between those who seek treatment and those who do not. Ross et al. (1993), comparing those who had never been in treatment with those who had previously been in treatment and with those currently in treatment, found that those who had never been in treatment were younger, used and injected drugs less frequently, had a lower level of HIV risk-related injecting behaviours (though no difference in risk-related sexual behaviours), and reported less involvement in the drug subculture.

Most research examining the relationship between treatment and risk behaviour has come from evaluations of methadone maintenance treatment (MMT). In general, these studies have found that MMT has a positive effect on risky drug-taking practices, though no effect on risky sexual practices. For example, Baker et al. (1995) found that those currently enrolled in MMT reported a lower frequency of injecting and a higher frequency of cleaning injection equipment with bleach than those previously or never enrolled in MMT. No differences were found in needle sharing practices or sexual risk-taking behaviour.

The overall aim of this chapter is to shed further light on the relationship between drug treatment and HIV risk-taking behaviours. First, we will examine determinants of having never attended any treatment to identify differences between those who seek or have access to treatment and

those who do not. Secondly, we will look for direct relationships between treatment and risk behaviours to estimate the potential impact of treatment on HIV risk.

2. Methods

The methods used for this study, including the bivariate and multivariate analyses, are described in Chapter 3. Drug treatment is defined broadly, including services ranging from short-term counseling to residential detoxification and rehabilitation. We have also included methadone treatment and any harm-reduction programmes, such as those which supply needles or condoms. "Never had any treatment" is the dependent variable in the multilevel logistic regression model which involves the following four models of explanatory variables:

Model 1: Age
In order to evaluate the effect of age on the dependent variable ("never had treatment") and on the other independent variables, the biological age (coded into four categorical age groups: 24 or less; 25-29; 30-34; and 35+) was the sole variable used in this group.

Model 2: Socioeconomic status
Three variables were selected to define the general socioeconomic status of female IDUs: age left full-time education (coded into four categorical age groups: 13 or less; 14-15; 16-18; and 19+); place of residence in past six months (no fixed abode versus abode); and living with children (coded into three groups: she lives with her children; she doesn't live with her children; and she has no children).

Model 3: Marginalisation
In addition to socioeconomic status, three variables were chosen to characterise the extreme marginalised nature of the sample population. These variables were: age at first pregnancy (17 or less versus 18+); and two dichotomous variables (yes versus no): having a current regular sexual partner; and having a casual partner who was an IDU.

Model 4: Risk behaviours
Specific known risk behaviours that had significant associations with "never had treatment" in the bivariate analysis were included in the fourth model. Six dichotomous variables (yes versus no): ever have regular HIV-positive partner; use alcohol; cocaine injecting; heroine+cocaine injecting; never use condom; and ever sharing needles in last six months; age at first injection (coded into three groups:16 or less, 17 - 19, and 20 or more); and HIV result (coded into three groups: positive, negative, and unknown).

3. Results of the Bivariate Analysis

The bivariate relationships with drug treatment (never versus ever) and selected independent variables are examined in Table 10.1. A summary of the results of Table 10.1 are presented in the following sections.

3.1. Sociodemographic characteristics

Age is a factor strongly associated with having never had drug treatment (the linear trend test is very significant). The youngest group (age 24 or younger) was more than ten times more likely to have never had treatment when compared to the oldest group (35 years or more). The other two age groups do not present an elevated risk, both having non-significant associations. So it is the youngest group in which almost half (47.9 percent) have never received any treatment. This percentage drops sharply for subsequent age groups, with 18.2 percent for 25- to 29-year-olds, 11.1 percent for 30- to 34-year-olds, and 8.9 percent for 35 and over.

The age of leaving full-time studies did not present a clear association with the dependent variable. The linear trend test was not significant; although the highest percentage of no treatment corresponds to the group who had left their studies earliest (31.8 percent).

3.2. Marginalisation variables

In general, we observed that the group of characteristics reflecting greater marginalisation has a higher risk of having never had treatment for drug addiction. In effect, those that don't have a fixed address are twice as likely to have had no treatment compared to those who do have a fixed address. On the other hand, if a woman lives with her children, the percentage of cases without anti-drug treatment is lower (12.2 percent), than if she lives without her children (18.8 percent), and still higher if she doesn't have children (28.7 percent). It could be that having children, especially when they live at home, provides a stimulus for a woman to decide to seek treatment.

No significant associations were found between source of income or previous imprisonment and the dependent variable.

3.3. Drug-using habits

The age of beginning drug use is significantly associated with having received drug treatment. The linear trend test is significant, with the women who started earlier less likely to have never received treatment. Of the group who began using drugs at age 16 or younger, 14.8 percent had never received treatment, compared to 22.2 percent for those who began between ages 17 and 19, and 26.2 percent for those who began at age 20 or later.

Although the association between having ever shared injection material and having never had treatment is not significant, we do find a clear association when this risk behaviour was undertaken in the six months prior to the interview. Those who had recently shared needles were over two times more likely to have never received treatment.

Having injected heroin+cocaine in the six months prior to the interview nearly doubles the odds of having never attended treatment though the association doesn't quite reach significance (p=0.06).

3.4. Sexual habits

Women that have never had a regular sexual partner have a much higher rate of having never had drug treatment (54.5 percent) than those who have had a regular sexual partner (26.5 percent). Interestingly, when the regular partner is HIV-positive, the proportion that have not received treatment is almost one-third (10.9 percent) that of when the partner is not HIV-positive (34.2 percent).

A similar phenomenon occurs with casual partners, where we see that when the partner is HIV-positive or an IDU, the proportion of women who have never received treatment is significantly less.

We did not find a significant association between prostitution and the dependent variable.

3.5 Reproductive habits and infections

Having regular menstrual cycles was strongly associated with having never received treatment. Those women reporting regular periods were three times more likely to have never received treatment. This can be interpreted that those IDUs who still have regular cycles are most likely in less advanced stages of drug addiction and have experienced little physical deterioration (it is well known that the use of certain drugs, especially heroin, can alter the menstrual cycle), such that they haven't yet considered it necessary to seek treatment.

A strong relationship was also found with having ever used a condom. Those who had never used a condom were five times more likely to have never been in treatment. Of the female IDUs who had ever used a condom, 16.7 percent had never been in treatment, compared to 51.1 percent of those who have never used a condom.

No association was found between having suffered from any type of STD and not having received drug treatment.

Having had hepatitis B and hepatitis C in the past year both presented as protective factors against the dependent variable, with an OR=0.5 and 0.2 respectively. This most likely reflects the fact that in many cases the centres are detecting the hepatitis through routine physical exams while those who haven't sought treatment are probably going undetected.

As far as the relationship between HIV serology and never having had treatment, no significant differences were found between HIV-positives and HIV-negatives, while these differences are evident between both groups and those who don't know their HIV serologic status.

4. Results of the Hierarchical Logistic Regression Analysis

Table 10.2 presents the odds ratios and confidence intervals of each of the variables entered into the regression model, and the new odds ratios as subsequent groups of variables are entered into the regression.

Age (Introduction of Model 1)
Using the oldest age group as a reference, the youngest age group (24 years or less) presents significant associations with having never had treatment. This association strengthens with the introduction of successive models.

Socioeconomic status (Introduction of Model 2)
The age of leaving full-time studies does not maintain a clear association with the dependent variable until the final model, where after adjusting the model for variables representing risky behaviours, the group who quit studying at age 13 or younger presents an OR=4.0 (CI=1.2-12.6) for never having received treatment, in comparison to the age group who quit school latest.

Not having a fixed address is also a factor directly associated with the dependent variable. This association continues to strengthen in subsequent models, resulting in an OR of 3.3 (CI=1.5-7.3) in the final model.

Living with children remained out of the equation indicating that it is not directly associated with never having received treatment.

Marginalisation variables (Introduction of Model 3)
Not having had a casual IDU partner presented, inexplicably, as a factor directly associated with the dependent variable. However, in the final model, after adjusting for the variables representing risk behaviours, this association disappears.

The most marginalised group of women, who had their first pregnancy at age 17 or younger, are, paradoxically, at less risk of having never received drug treatment (OR=0.3; CI=0.1-0.9).

Risk behaviour variables (Introduction of Model 4)
As we found in the bivariate analysis, the group of women with a regular HIV-positive sexual partner have a lower probability of having never received treatment in relation to the group that had not had a regular HIV-positive partner (OR=0.4;CI=0.1-1.0).

The age of beginning to inject drugs is also directly associated with the dependent variable. Those who began injecting later (over age 20) were three times more likely to have never received treatment than those who began injecting earliest (before age 17).

Other risk behaviours, such as injecting heroin+cocaine and never having used a condom, also present a higher probability of having never received treatment (OR= 2.9 and 4.2 respectively).

Those women who don't know their HIV serostatus have a higher probability of having never received treatment than those who are HIV-positive (OR=2.9;CI=0.9-9.8).

5. Discussion

In this chapter we have examined the relationship between treatment and risk behaviours and we have attempted to identify the characteristics or factors directly and indirectly associated with having never attended treatment. Unfortunately, the limitations of the study design preclude us from making any strong conclusions, because we are unable to firmly establish the direction of the relationships we are examining. For example, in this type of study it is impossible to establish whether treatment has reduced risk behaviours or people with fewer risk behaviours have better access to treatment. So it is with these limitations in mind that we present the following findings.

In attempting to define the subpopulation which treatment programmes apparently don't reach, we found that this subgroup tended to be younger, less educated, homeless, young in their drug-using careers, and more likely to engage in recent needle sharing, less condom use and more injecting of heroin+cocaine. In other words, it would appear that the IDU women who are not being reached by drug treatment programmes are at very high risk for contracting HIV. Clearly, this is an urgent public health problem for Madrid that needs to be addressed.

Moreover, the characteristics identified in this study are not altogether different from characteristics identified in previous studies. For example, Ross et al. (1993) found that those never in treatment were younger and reported lower drug use and less involvement in the drug subculture. We also observed indirect relationships with having regular menstrual periods and not having a casual IDU partner, which might indicate lower drug use and less involvement in the drug subculture.

Baker et al. (1995) also found that those never enrolled in methadone treatment were younger (non-significant trend), started injecting later (non-significant trend), and were more likely to be homeless. Thus, on the one hand, those who have never received treatment appear to be those who are young in their drug-using careers, and their habit has not become severe enough to lead them to seek treatment. On the other hand, never having received treatment is also associated with a more marginalised lifestyle, suggesting that some of these women may not have access to treatment.

We also found that those who had never attended any treatment were more likely to have had their first pregnancy at a later age and to have not had a regular HIV-positive sexual partner. In other words, those who attended treatment were more likely to have had their first pregnancy at a young age, and the early pregnancy may have led them into treatment in an effort to protect their unborn child or to take control of their life for the sake of the child. Having had a regular HIV-positive sexual partner may indicate that these women are recognizing the risks to their health and are seeking drug treatment in attempt to save their lives. On the other hand, it could indicate

that an HIV-positive partner is concerned for his partner's health and more supportive of entry into drug treatment. Clearly male sexual partners play an important role in the drug treatment process, as has been demonstrated in previous studies (reviewed in Anglin et al., 1987).

The risk behaviours observed to have a significant relationship with treatment were: injecting heroin+cocaine; recent needle sharing; and having ever used a condom. Those who had been in treatment were less likely to report injecting heroin+cocaine in the previous six months. As the direction of this relationship cannot be determined, it is difficult to say whether drug treatment is reducing the tendency to inject heroin+cocaine or treatment programmes are simply less likely to reach those who inject heroin+cocaine. Of course, the latter needs to be considered, as injectors of heroin+cocaine have been found to engage in other HIV risk behaviours. Chitwood and Comerford (1990) found that injectors of cocaine used in combination with opiates were more likely to have multiple sex partners and high-risk injecting behaviour than cocaine-only or opiate-only injectors. Kowalewski (1990) reported that the disinhibiting effects of cocaine may predispose users to HIV infection through high-risk sexual behaviour. These findings are supported by the work of Joe & Simpson (1995) who reported that HIV risks increased as a direct function of cocaine usage level, though only for males. Among females, low-to-intermediate levels of cocaine use (less than weekly) were associated with high-risk behaviours.

Needle sharing in the previous six months was not a significant factor in the regression model, though many studies have reported reductions in needle sharing after exposure to treatment. This study may not have been able to detect a direct effect of treatment on needle sharing because of a pre-existing trend towards reducing needle sharing.

Unlike other studies, which have not found changes in sexual risk-taking, especially increases in condom use, we found that treatment was directly related to condom use. Although the study design precludes us from making assumptions about the directionality of this relationship, there is evidence from other studies that treatment programmes which implement specific sexual risk reduction interventions (such as skills training) can have success in reducing sexual risk for HIV infection among female entrants (Eldridge et al., 1997). In other words, drug treatment centres as venues for HIV risk reduction interventions can potentially have an important impact on the prevention of the spread of AIDS.

The relationship between HIV status and treatment is a bit difficult to interpret without knowing the direction of causality. In the bivariate analysis we observed a non-significant trend between being HIV-positive and ever receiving treatment. This could be explained by the fact that HIV-positives frequently begin drug treatment in the hope of improving their physical state and ability to combat the deterioration of their immune system. There was also a weaker, though positive relationship between treatment and being HIV-negative. This may indicate that many of those who have tested negative consider it a good time to quit using drugs, now while there is still time. This variable was later recoded to reflect "knowledge of HIV status" and a strong positive relationship was detected, suggesting either that knowledge of one's status prompts drug users to seek treatment or that drug treatment successfully encourages HIV testing. Of course, this relationship may also be reflecting an attitude of apathy in which the same individual who doesn't seek treatment also failed to provide a medical report on their HIV status.

Finally, although this study did not address gender differences in treatment, it seems apparent that women have an array of different needs that ought to be considered by drug treatment programmes. For example, studies have indicated that women in treatment report more medical, psychiatric, family-social, and employment problems than men (McLellan et al., 1992; Brown et al., 1993). More specifically, these needs and concerns include: reproductive health needs, such as STD detection and treatment and family planning; child care responsibilities; assertiveness training for negotiating safer sex and drug use with their partners; the involvement of male sexual partners in the treatment programme; and vocational skills training to help them re-integrate into society without having to rely on trading sex for money or financial assistance from drug-using partners.

6. Conclusions

From the simultaneous observation of the bivariate analysis and the multilevel logistic regression model we can extract the following conclusions:

- IDU women who are not being reached by drug treatment programmes tend to be younger, less-educated, homeless, less involved in the drug subculture and engaging in more high risk behaviour, such as needle sharing, injecting heroin+cocaine, and not using condoms.

- Exposure to treatment appears to be associated with more condom use, suggesting that drug treatment centres as venues for HIV risk reduction interventions can potentially have an important impact on the prevention of the spread of AIDS.

- Drug treatment is reaching IDU women who get pregnant at a young age.

- A woman's decision to seek treatment is influenced by her male partner.

Table 10.1.
Proportion of women reporting never had drug treatment by selected variables

Variable	Total	Had drug treatment		OR(CI.95%)	p
		Never(%)	Ever(%)		
Sociodemographics					
Age					
24 or less	73	47.9	52.1	10.4(3.1-37.9)*** [a]	
25 -29	110	18.2	81.8	2.5(0.7-9.2)	
30-34	72	11.1	88.9	1.4(0.4-6.0)	
35 or more	49	8.2	91.8	1(reference)	
Age leaving education					
13 or less	88	31.8	68.2	1.7(0.9-3.2)	n.s. [a]
14-15	89	12.2	87.8	0.5(0.2-1.1)	
16 or more	132	22.0	78.0	1(reference)	
Abode					
No fixed address	69	33.3	66.7	2.2(1.2-4.0)	**
Fixed address	235	18.7	81.3		
Income					
Illegal+prostitution	137	23.4	76.6	0.9(0.5-1.5)	n.s.
Legal	167	21.0	79.0		
Ever been in prison					
Yes	98	17.3	82.7	0.7(0.4-1.2)	n.s.
No	206	24.3	75.7		
Drug-using habits					
Age began injecting drugs					
16 or less	81	14.8	85.2	1(reference)	* [a]
17 - 19	81	22.2	77.8	1.6(0.7-4.0)	
20 or more	141	26.2	73.8	2.1(1.0-4.5)	
Ever shared needles/syringes					
Yes	217	19.4	80.6	0.6(0.3-1.1)	n.s.
No	86	27.9	72.1		
Ever shared needles/syringes in last 6 months					
Yes	104	26.9	73.1	2.4(1.2-4.9)	**
No	114	13.2	86.8		

Table 10.1 (continued)
Proportion of women reporting never had drug treatment by selected variables

Variable	Total	Had drug treatment		OR(CI.95%)	p
		Never(%)	Ever(%)		
Injected Heroin+Cocaine					
Yes	151	26.5	73.5	1.7(1.0-2.9)	*
No	153	17.6	82.4		
Ever used condom					
Yes	257	16.7	83.3	0.2(0.1-0.4)	***
No	47	51.1	48.9		
Sexual habits					
Ever had a regular sexual partner					
Yes	293	20.8	79.2	0.2(0.1-0.7)	*
No	11	54.5	45.5		
Ever had a regular sexual HIV+ partner					
Yes	138	10.9	89.1	0.2(0.1-0.4)	***
No	152	34.2	65.8		
Ever had a regular sexual IDU partner					
Yes	257	21.0	79.0	0.7(0.3-1.4)	n.s.
No	47	27.7	72.3		
Frequency of condom use with regular sexual partner					
Vaginal intercourse					
Never/sometimes	122	28.7	71.3	6.6(1.5-29.2)	**
Always	35	5.7	94.3		
Ever had a casual sexual partner					
Yes	241	20.7	79.3	0.7(0.4-1.3)	n.s.
No	62	27.4	72.6		
Ever had a casual sexual HIV+ partner					
Yes	138	10.9	89.1	0.2(0.1-0.4)	***
No	152	34.2	65.8		
Ever had a casual sexual IDU partner					
Yes	156	14.7	85.3	0.4(0.2-0.7)	***
No	141	30.5	69.5		

Table 10.1 (continued)
Proportion of women reporting never had drug treatment by selected variables

Variable	Total	Had drug treatment		OR(CI.95%)	p
		Never(%)	Ever(%)		
Frequency of condom use with casual sexual partner					
Vaginal intercourse					
Never/sometimes	48	18.8	81.3	0.9(0.3-2.5)	n.s.
Always	50	20.0	80.0		
Ever had a client					
Yes	140	20.0	80.0	0.8(0.5-1.4)	n.s.
No	164	23.8	76.2		
Frequency of condom use with client					
Vaginal intercourse					
Never/sometimes	26	7.7	92.3	0.2(0.0-1.0)	n.s.
Always	52	28.8	71.2		
Reproductive habits and infections					
Regular periods					
Yes	99	35.4	64.6	3.0(1.7-5.2)	***
No	205	15.6	84.4		
Age at first pregnancy					
< 18	74	18.9	81.1	1.3(0.6-2.6)	n.s.
18 or more	230	23.0	77.0		
Contraception currently					
Yes	159	26.4	73.6	1.7(1.0-3.0)	n.s.
No	140	17.1	82.9		
IUD used in last 5 years					
Yes	21	14.3	85.7	0.6(0.2-2.0)	n.s.
No	283	22.6	77.4		
Condom used in last 5 years					
Yes	247	16.6	83.4	0.2(0.1-0.4)	***
No	57	45.6	54.4		

Table 10.1 (cont) Proportion of women reporting never had drug treatment by selected variables

Variable	Total	Had drug treatment		OR(CI.95%)	p
		Never(%)	Ever(%)		
Reproductive habits and infections (continued)					
Spermicide used in last 5 years					
Yes	45	31.1	68.9	1.8(0.9-3.5)	n.s.
No	259	20.5	79.5		
Contraceptive pill used in last 5 years					
Yes	91	19.8	80.2	0.8(0.5-1.5)	n.s.
No	213	23.0	77.0		
Ever been pregnant					
Yes	230	19.6	80.4	0.6(0.3-1.0)	n.s.
No	74	29.7	70.3		
Regular smear test					
Yes	134	23.1	76.9	1.1(0.6-1.9)	n.s.
No	168	21.4	78.6		
STD in last 5 years					
Yes	77	11.7	88.3	0.4(0.2-0.9)	*
No	196	25.0	75.0		
HIV					
Positive	165	13.9	86.1	1(reference)	***[a]
Negative	97	22.7	77.3	1.8(0.9-3.6)	
Unknown	42	52.4	47.6	6.8(3.0-15.4)	
Hepatitis A in last 5 years					
Yes	8	12.5	87.5	0.5(0.1-4.5)	n.s.
No	276	20.7	79.3		
Hepatitis B in last 5 years					
Yes	72	12.5	87.5	0.5(0.2-1.0)	*
No	212	23.1	76.9		
Hepatitis C in last 5 years					
Yes	89	5.6	94.4	0.2(0.1-0.4)	***
No	195	27.2	72.8		
Tuberculosis in last 5 years					
Yes	45	20.0	80.0	1.0(0.4-2.1)	n.s.
No	239	20.5	79.5		

HIERARCHICAL LOGISTIC REGRESSION OF EVER HAD DRUG TREATMENT ON RISK FACTORS

	MODEL A AGE N=304	MODEL B SOCIOECONOMIC STATUS N=304	MODEL C MARGINALISATION N=304	MODEL D RISK BEHAVIOUR N=304
	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C. 95%)	OR (I.C.95%)
AGE				
Age group				
24 or less	-------	------	------	------
25-29	0.2 (0.1-0.5)***	0.2 (0.1-0.4)***	0.3 (0.1-0.6)***	0.2 (0.1-0.4)***
30-34	0.1 (0.1-0.3)***	0.1 (0.0-0.3)***	0.2 (0.1-0.4)	0.1 (0.0-0.4)***
35+	0.1 (0.0-0.3)****	0.1 (0.0-0.2)***	0.0 (0.0-0.2)***	0.0 (0.0-0.2)***
SOCIOECONOMIC STATUS				
Age leaving education				
13 or less		1.2 (0.5-2.9)	1.9 (0.7-5.2)	3.7 (1.2-11.2)*
14 - 15		0.3 (0.1-0.8)*	0.3 (0.1-1.2)	0.5 (0.1-1.6)
16 - 18		1.4 (0.5-3.5)	1.8 (0.6-5.1)	2.3 (0.8-6.5)
19 +		------	------	------
Fixed Adress				
Yes		2.1 (1.1-4.0)*	3.5 (1.7-7.4)***	3.2 (1.5-6.8)**
No		------	------	------
MARGINALISATION				
Casual partner IDU				
No			-----	------
Yes			0.4 (0.2-0.9)*	0.5 (0.3-1.1)
Actual regular partner				
Yes			2.2 (1.0-4.7)*	1.8 (0.8-3.7)
No			------	------
Age first pregnancy				
17 or less			0.5 (0.2-1.1)	0.4 (0.2-0.9)*
18 +			------	------
RISK BEHAVIOUR				
Regular partner HIV				
Yes				0.3 (0.1-0.7)**
No				------
Age injecting drugs				
16 or less				------
17 - 19				1.3 (0.5-3.6)
20 +				3.4 (1.3-9.1)*
Injecting heroine+cocaine				
Yes				2.5 (1.2-5.2)
No				------
-2LL	283.327	263.319	226.547	223.330
Improvement Chi-Square	37.336***	20.008***	13.425**	27.226***

a) The most parsimonious logistic regression were derived for each stage of the analysis using SPSS. For example, for Group 2 the Age variable was fixed, it could not be eliminated, whilst the new socioeconomic variables were selected trhough process of backward elimination.
b) * p<0.05; ** p<0.01; *** p<0.001.
c) For models B,C and D the following variables were excluded from the equation. Stage 2:Live with children; Stag 3: Previous imprissonment, Regular partner son Regular sexual partner IDU and prostitution; Stage 4: Ever sharing needles, Cocaine injecting, HIV positivity

Chapter Eleven

Conclusion and Policy Recommendations

1. Introduction

This chapter is divided into four sections.

The first section will provide a summary of the major research findings which have been found in the study of determinants or predictors of HIV and HIV risk behaviour in female IDUs in Madrid. The study of HIV risk behaviour included: examination of the determinants of risky sexual behaviour (lack of condom use); and risky injection practices (needle and syringe sharing). Having experienced prison and exchanged sex for drugs or money will also be summarized in relation with other risks and sociodemographic characteristics. Finally, we will summarise the role of treatment.

The second section will consider the methodological issues regarding this research and their implications.

As a consequence of this study and based on the limitations of this research, the third section will present a number of issues worthy of further research and propose new methods which should be implemented.

The final section, perhaps the most beneficial to the women IDUs and consequently to society, will consider the implications for public health and briefly outline a policy agenda based on the more relevant findings of this work, some of which may call for urgent implementation.

2. Summary of Findings

We have studied the social determinants of the risks of HIV and other diseases among a sample of IDUs in Madrid. First, considerable support was found for the relationship between poor lifestyle and risk behaviour. Even though in many cases we didn't find strongly significant statistics due to the relationships among variables that have influenced the dependent variable both directly and indirectly, the general conclusion would be that this population is in a state of high risk for both health and psychosocial problems.

Overall, many of these women were poorly educated and unemployed, had jail or prison experience, were without a fixed address, and a considerable number had worked as street-workers. The majority of them live with an IDU partner and live in an unstable situation, with a multitude of risk factors for ill health, particularly for HIV and STDs. Thus our sample indicates. in comparison with other studies, that women who continue to inject drugs are a higher risk population, in general.

One of the most pervasive factors identified by this study was having no fixed address. It was directly related to prostitution, recent needle sharing, lack of condom use, no exposure to treatment, and even maintained a direct relationship with HIV prevalence. Furthermore, we found an indirect association with previous imprisonment. Previous research has found elevated levels of HIV risk practices in homeless populations, including IDU, crack-cocaine use, sexual relations with an IDU, exchange of sex for money or drugs, multiple sexual partners, and inconsistent condom use (Fisher et al., 1995; Nyamathi et al., 1997), but little information is available on the specific risks associated with homelessness in an IDU population. Clearly this subgroup of IDUs appears to be at higher risk for HIV while being more socially isolated, with less access to drug treatment. Certainly the interpretation of these findings must be qualified by the limitations imposed by the design of this study; however, they do have important implications for future research and policy (to be discussed in subsequent sections.)

On nearly all of the characteristics examined, even when all variables were controlled in the multivariate analysis, findings indicated that first pregnancy at a younger age was a relevant predictor for risk behaviour in IDU women. There was a relationship to prostitution and sharing needles; ever being pregnant was correlated positively with previous imprisonment and negatively with high-risk sexual activity. First pregnancy at a younger age is also positively related to treatment. The IDU women that experienced their first pregnancy before age 18 may also have a lower socioeconomic status and need money to support themselves as well as their children, which may lead them into a life of prostitution or crime just to survive. Earlier studies have linked both early age of first pregnancy and prostitution to childhood sexual abuse (Zierler et al, 1992). Furthermore, early sexual experience has been identified as a factor in prostitution (James and Meyerding, 1977), and age at first coitus as a marker for risky sexual behaviour (Greenberg, Magder and Aral, 1992). The implications of these findings are that early sexual experiences, including childhood sexual abuse, can be used as markers for high-risk sexual behaviour and interventions aimed at delaying a woman's first sexual experience may lower the likelihood of later engaging in prostitution and other risky sexual practices. We did not look at the relationship with rape or sexual assault in this study, but many authors have considered this issue.

More than half (53.4 percent) started injecting drugs before the age of 20. This, without a doubt, will have an important impact on their psychological development and social behaviour as it is in this stage of life when the basis of their adult personality is established. Therefore, in these women, future behavioural problems are found with greater frequency than in those who started injecting drugs later in life.

The preceding chapters identified a number of risk factors associated with HIV infection, including the observation that female IDUs were at greatest risk of HIV infection through sexual partners who were either drug addicts and/or HIV-positive. The partner also has a great influence in the introduction of drug use to the woman. Almost half of the women questioned (49 percent) injected drugs for the first time with their regular partner. Having a steady HIV-positive partner also played a significant role in seeking treatment. This demonstrates the great influence a regular male partner has over a woman, and this influence must be taken into account when developing strategies against drug addiction. Perhaps one of the most effective measures to prevent drug addiction in women would be to persuade the drug-using partner to discourage the women from taking drugs and to inform him of the enormous influence he can have in this regard and the consequent responsibility. Furthermore, it is imperative for treatment programmes to involve the regular partner in the treatment process.

When we studied the HIV risk behaviour of sharing injection equipment, we found that those women who reported sharing habitually with partners were clearly taking high risks, just because of the frequency with which they used unsterile needles and syringes, particularly when we know that a great proportion of these partners are HIV-positive. Most studies indicate that women exchange needles more than men when both partners are at risk of HIV transmission and when needles and syringes are shared between them. However, given that the majority of women are in relationships with injectors whereas the same is not true among men, one would have to conclude that in this respect women are at higher risk of HIV.

Unlike men, very few women (1 percent) participate in drug-taking behaviour alone. This implies that women, more than men, need to feel supported by someone in making decisions of this kind, involving the transgression of a behavioural norm. This is another indication of the great difference between men and women in the drug-injecting experience. Women are seen to be more affected by prejudice than men and thus need to have someone reaffirm their behavior and push them into action. The explanation for this can be found in the roots of a society which establishes different roles according to one's sex, producing gender differences.

Women most commonly shared needles with a regular sexual partner (47.5 percent), whilst 17.8 percent shared with a male friend and 10.9 percent with a female friend. The main source of injecting equipment for women was the pharmacy or chemist, although 56.6 percent of women reported the use of needle-exchange schemes. This observation, however, probably reflects the sample characteristics of recruitment and thus any comparison with other (associated or independent) studies would be meaningless.

This leads to relevant observation that the risk for HIV among female heroin addicts is influenced by their relationship with male sexual partners. Women who were living with a drug user were less likely to use condoms. Furthermore, having an HIV-positive partner was one of the strongest determinants of HIV for the population studied, despite the fact that we found an interaction indicating that women who know that their partner is HIV-positive use more condoms than other IDU women, and this issue will be considered later.

It should also be noted that in the multivariate analysis, having shared a needle in the past six months was negatively associated with HIV prevalence, regardless of the type of partner, which may imply that those women who knew they were HIV-positive had stopped sharing needles, although such a hypothesis cannot be confirmed by these data.

When we studied the predictive factors for continuing to share needles, we found that this residual risk group was quite marginalised, as indicated by: not having a fixed address; younger age of first injecting drugs; younger age at first pregnancy; prison; and prostitution. Thus it appears that female heroin addicts who continue to engage in risky injection practices are embedded in a high-risk lifestyle.

Sexual behaviour in this population reflects the net effect of almost all of the variables. As unequivocally demonstrated (Table 5.3, Chapter 5), having a partner who is HIV-positive increases the likelihood of HIV infection. Given that nearly 50 percent of this population of female IDUs reported having a regular partner who is HIV-positive, the importance of this factor cannot be underestimated. Clearly the most important conclusion to be drawn from this study is that the sexual partners (and therefore sexual behaviour) of female IDUs are as important a

component in explaining the HIV epidemic in this population as other risk factors, including high-risk drug-taking behaviour.

As it was noted by Barnard (1992), in the sphere of sex and the negotiation of sexual encounters, with regard to heterosexual relationships, expectations of behaviour appropriate to a woman place the woman in a more disadvantaged position. First of all, both men and women are socialised into a culture which on the whole encounters difficulties in the discussion of sexual matters. This situation is further exacerbated by expectations of male dominance and female modesty. In sexual issues, women are not expected to take the lead over men. Given an existing power balance in favour of men, it may be extremely difficult for a woman to assert her desire that a condom be used. Thus in general, it is quite unusual for women to carry condoms even when they are working as a prostitute. The low rate of condom use in sexual relations with long-term partners raises a different set of issues, including the idea that condom use decreases emotional intimacy and physical closeness, and the social construction of the condom as a barrier in physical terms. Another issue is that requesting the use of a condom may imply mistrust in the relationship. Finally, as Day et al. (1993) discovered, many female sex workers find that they need to make clear the distinction between personal and commercial sex, causing them to shun the use of condoms in private relationships.

In summary, the female IDUs in this study are particularly vulnerable to HIV infection because of their higher level of risk practices as well as their sexual behaviour with regular sexual partners. As it has been shown in the outcome of regression, the strongest determinant of HIV infection in women is to have an HIV-positive sexual partner.

When we look at the social determinants of sexual risk behaviour among female IDUs, studying in particular never using condoms, we found that, once again, the most important contributors to the model were the social marginalisation factors. In fact, the residual risk group who has never used condoms tends not to have a fixed address, began injecting drugs at an early age, and were recruited from the street. In other words, this is a subgroup which may have less access to HIV prevention information as well as less access to condoms themselves. Those who began injecting drugs earlier are the most marginalised and have risk behaviours more evident at every level. Another important determinant of never using condoms was not practicing prostitution. The use of condoms seems to be a well-diffused behaviour among prostitutes in our study, at least in their relations with clients. Other studies have also noted that condom use tends to be more frequent with clients and casual partners than with regular partners (Rhodes et al., 1994; Paone et.al,1995).

We also detected a link between sexual risk behaviour and drug-taking risk behaviour. There are significant associations between not always using condoms with casual partners, regular partners, or clients, and having shared needles in the last six months. In fact, the strong relationship between needle sharing and lack of condom use with casual partners suggests not only a particularly high-risk subgroup, but also a potential bridge for HIV transmission to the general population.

Among sociodemographic factors, previous imprisonment was a relevant determinant of HIV status. Although it didn't emerge as a significant direct determinant in the regression analysis, prison experience did show a strong relationship with HIV in the bivariate analysis and has been identified consistently as a direct determinant in earlier studies. It is evident that in the current study imprisonment is strongly associated with other factors, such as having an HIV-positive partner and history of an STD, which were significant determinants of HIV in the model. In other words, prison is an indirect determinant of HIV and is an important marker for a high-risk

population due to both their behaviour in and out of prison as well as their living situation out of prison.

In general, the environmental and socioeconomic conditions of women who engage in drug use may result in a variety of interrelated risk factors for HIV infection which result in a greater risk than the sum of the risks for each individual factor. In addition, such women usually come from socially and economically deprived backgrounds and may suffer from generally poor health due to inadequate nutrition caused by drug addiction, lower access to health services, frequent abortions, use of various types of drugs, high stress levels and exposure to violence, to name but a few. Their health may be further compromised by other social situations, including prostitution and prison.

Moreover, the relationship between drug users and prostitution is of great interest as prostitutes constitute a possible source for the heterosexual transmission of HIV from female IDUs to the general population. These data, however, did not clarify the relationship between prostitutes and drug use and, if anything, indicate that IDU prostitutes do not act as a bridge to the general population given the high rate of condom use. However, there was a significant relationship between prostitution and HIV, albeit indirect. Clearly the IDUs in this study who engaged in trading sex for drugs were more "down and out" than their counterparts who had never had sex with clients. They were more likely to report no fixed address, to have been incarcerated, to have been younger at their first pregnancy, and to lack social support.

Likewise, we have also confirmed what is already well documented: the connection between syphilis and other sexually transmitted diseases and the prevalence of HIV. This relationship is most likely a consequence of risky sexual behaviour, although there is also evidence that physical damage caused by sexually transmitted diseases, such as lesions, promote the transmission of HIV. It is also interesting to note that in the current study the rate of sexually transmitted disease was extremely high, probably as a result of poverty, social disintegration, and kind of partner, but the rate of condom use was also quite low.

3. Methodological Issues

The objective of this section is to examine the limitations of the study and to discuss the development of a new model explaining risk behaviour amongst female IDUs. The foremost conclusion of the study was that there was no apparent association between HIV status and some risk behaviours. It is likely that this is a consequence of the study's cross-sectional design, as HIV infection may have occurred before the "study period". For example, the implementation of campaigns in Spain in 1992, including testing for HIV, would have meant that women who were measured in 1995 as being HIV-positive had past risk behaviours which were changed as a result of public health intervention before and during the course of the study.

Second, the study is subject to both selection and measurement biases due to the atypical characteristics of the population. Whilst continued high-risk behaviour of the population makes it important that the results are not generalised to other groups of IDUs, it is nevertheless important to study this residual group of women as an understanding of their behaviour could result in significant changes in public health policy. Consequently, to reduce biases in the study, it was considered important to use a multi-site / multi-sampling design. This would mean that the effects of any outliers would be reduced, and that the combined data would provide insights into the behaviour of female IDUs.

Third, regression analysis in this group is limited by several factors. First, as noted above, the limitations of a cross-sectional design may result in spurious findings. This is likely in this population as behaviour has been changing in recent years. Moreover, the population is not isolated, and its characteristics are determined by a range of other factors, all of which may themselves influence behaviour. Furthermore, the correlational nature of multiple regression does not allow us to make causal inferences on the relationships between background factors and risk behaviour or dependent variables.

Given the above, although initially we analysed the model using a simple parsimonious logistic regression, it became clear that this was unsuitable in these circumstances. The objective of a parsimonious model is to identify the most *efficient* explanatory variables, which will fail to quantify socially important pathways. This is illustrated by X and Y who demonstrate that regression analysis has two objectives. The first is to be predictive, i.e., to know the best way to determine the effect of independent variables on the outcome. The second is to be estimative, i.e., to identify the relationship between the independent and dependent variables. Our aim was to use a predictive model, therefore we used a hierarchical stepwise regression because we wish to understand the relationship of <u>all</u> variables. In this model, we can look at the complexity of many variables, and examine whether they have a direct or indirect effect on the dependent variable, which would not be possible using a parsimonious model. In fact, the change in our thinking during the course of the study demonstrates the importance of using a pragmatic and flexible approach when examining outcomes in highly marginalised populations.

Finally, and as an illustration of the above, following the discovery that most of the women had changed their behaviour, we decided to introduce new research questions to identify the reasons why some had not changed their behaviour. For example, we have studied the unsafe behaviours (e.g., never use condoms). Likewise, after showing that a large number of women had previously been in prison and/or were prostitutes, we also looked at these outcomes as dependent variables.

In summary, this study has presented a methodological challenge in planning, implementing and analysing epidemiological studies of marginalised populations. In such circumstances it is important not to restrict our mind-set to purely statistical power, and be willing to explore the social context of the data that are being examined. This would include developing an understanding of the lifestyle of female IDUs and the networks within which they live.

4. Future Research Implications

As discussed above, there are major difficulties in analysing data resulting from cross-sectional studies. Indeed the particular characteristics of IDUs are further complicated by recent changes in behaviour, thereby suggesting that this design is now redundant. Furthermore, this is confounded by the problems of identifying an appropriate model that adequately describes the lifestyle of different populations of IDUs, prostitutes, prisoners, etc. It is therefore important that further methodological advances be made. For example, the use of path analysis (using LISREL) may be of help. Similarly there is a need to develop multi-dimensional models which accommodate the subtlety and complexity of the data. It is important that such models are able to take into account temporal changes in behaviour, etc.

We have found in this study that the real risk for IDU women is when their partner is an IDU. It therefore makes sense that future studies focus on the relationship between a male IDU and his

partner. For example, non-IDU female partners of male IDUs have the risk of becoming an IDU and therefore would make an excellent population to target.

Future studies should also seek to explain and further explore the relationships identified in this study between not having a fixed address, risk behaviours, and HIV prevalence in an IDU population. IDUs who are also homeless may prove to be an important target population for future HIV prevention programmes. Furthermore, researchers should also study the relationship between psychological problems and HIV risk behaviour in this population.

As we have demonstrated that imprisonment is an important predictive variable for a number of outcomes, it is important that further research be implemented to examine HIV prevalence and IDU in female prison populations. Likewise, similar studies should look at the relationship between IDU and prostitution.

Further research should examine other health issues in female IDUs, such as their nutritional status, health habits, experiences with regard to births and abortions and gynaecological health. More knowledge is needed in these areas so that appropriate strategies can be designed to improve the health status of women.

Despite extensive research into IDU, there have been very few attempts to study in an integrated way the different life events of IDUs which directly affect their behaviour. The particular nature of these studies makes it hard to assess the characteristics of the circumstances of IDU and how one interferes with the other.

There is also a need to study the relationship between sexuality and power in decision making. Such research could provide valuable insights as to how women might gain a more balanced position when it comes to making decisions about sex. Qualitative research could also be useful to discover the motives and reasons for the failure of many women to use condoms in their sexual relations even with partners they know to be HIV-positive.

More research is needed regarding the relative efficacy of different models of outreach and intervention with IDU women and the non-IDU partners of IDU men.

Additional research is required to assess the extent to which risk behaviour among identified groups of women with IDU partners or ex-addicted partners vary over time and to identify those factors affecting change.

We need more research on developing and testing protective methods that are controlled by women, including the recently introduced female condoms, spermicides, etc., and further research is needed in this area to examine the role of spermicides with petroleum in facilitating HIV transmission especially among prostitutes, despite the fact that we have not studied this issue in the current study.

The paucity of studies in gender-differences in treatment and the recent conclusions by Hodgins et al (1997) about the efficacy of single-gender treatment groups indicate the urgent need to conduct research on gender differences in treatment process as well as outcome.

More research from prospective studies could provide useful information on the nature of the relationship between, for example, pregnancy and HIV infection. Furthermore, more studies are needed to identify appropriate methods of family planning and HIV prevention for female IDUs.

Finally, it would be worthwhile to study the relationship between teenage pregnancies and socioeconomic stressors as they combine to create a higher risk environment in which risk behaviours are more readily engaged in.

5. Public Health Implications and Policy Agenda

Our study has implications both for the prevention and control of the spreading of AIDS as well as in the area of prevention of drug use and harm-reduction programmes for IDU women.

We have examined the contexts within which risk behaviour took place and the determinants of each different situation, and we have found relevant factors. First, we found that age was a critical factor in several contexts. In particular, the younger women (adolescents) were more likely to engage in risky behaviour (they continued to share needles and were more likely to have never used condoms), and they were less likely to have received any treatment. Early age of first injection (less than 16) was also a direct determinant of prison and never using condoms. Early age of first pregnancy (less than 18) was a direct determinant of prostitution and needle sharing. Thus adolescence appears to be a time of high-risk behaviour, and if certain high-risk behaviours can be delayed or avoided, women might lower their risk of future problems. Clearly intervention with this age group of female IDUs is imperative. Adolescent females, particularly those with a low level of education are in need of specific strategies to prevent drug use and pregnancy. Ideally these strategies should be implemented in schools as treatment-based strategies don't appear to reach this sub-group. Furthermore, school-based strategies need to be targeted to young teenagers, before they begin engaging in risky behaviour and before they leave school.

Second, the sexual partners appear to exert an important influence on the risk behaviours of IDU women. Almost half of the women questioned (49 percent) injected drugs for the first time with their regular partner. And, unlike men, very few women (1 percent) participate in drug- taking behaviour alone. Women most commonly shared needles with a regular sexual partner (47.5 percent), whilst 17.8 percent shared with a male friend, and 10.9 percent with a female friend.

Hence future health education should be targeted in three directions:

1) toward the sexual partners of IDU women to increase awareness of risks of HIV transmission as well as their potential influence in reducing risk behaviour of their partner;

2) toward the IDU woman herself to improve her assertiveness and safe sex negotiation skills; and

3) toward IDU couples to improve awareness about the risk of HIV transmission via heterosexual relations.

Third, the IDU women who claimed to have no fixed address may prove to be an important target group for future HIV prevention programmes. This subgroup appeared to be less likely to be reached by drug treatment programmes and exhibited a number of high-risk practices as well as a higher prevalence of HIV. Clearly, public health policy makers in Spain need to focus on finding ways to access this hard-to-reach and high-risk subgroup. Furthermore, the planners of HIV prevention programmes for this population need to take into account the psychological problems which may be prevalent in this population and which can act as barriers to adopting safe behaviours.

Another important target group for HIV prevention education and harm-reduction programmes is prison populations. As was observed in this study, injecting drug use does occur in Spanish prisons. Administrators need to acknowledge the high-risk behaviour which occurs and initiate programmes to both educate prisoners about the risks and to reduce the spread of HIV within prisons.

Another point is that the message about risk in the area of drug-taking shouldn't be focused only on heroin. As it is carried out in Spain, AIDS prevention and drug-use prevention have to begin by educating IDUs about the additional risks associated with drugs other than heroin, such as amphetamine, cocaine, etc., because heroin use is decreasing and its social image is diminishing, so an attempt should be made to prevent other epidemics of injected drugs even if they are legal.

The gender-distinct nature of many of the social determinants of risk behaviour is also reflected in sharing patterns, sexual behaviour, and gender-related attitudes. This suggests that strategies of public health should be targeted according to women's experiences of a drug-injecting lifestyle and, on a related note, their particular risks of HIV transmission. So it is necessary to: increase and improve drug-abuse treatment programmes, especially with regard to single-gender programmes; make sterile syringes and needles freely available to those who need them, together with instructions on how to clean them; and promote the use of condoms. This should include interventions in prisons where many high-risk individuals can be reached and where high-risk activities occur.

Moreover, several types of female condoms have been developed, but are not yet widely available due to a high cost; these should be made freely available as quickly as possible so that women have another option for barrier protection which they can control.

So we must recognize that the more immediate goal of HIV prevention may not be realized without addressing the broader social issues affecting these women's lives. More intervention programmes need to be carried out among female IDU prostitutes with specific reference to the use of spermicides.

Given the importance of social services to IDU and HIV-positive women, efforts should be made in improving their provision to this population. An effort must be made to try to do away with the administrative barriers and constraints. These efforts should include peer education, since health education programmes are more likely to be successful if the person delivering the intervention is someone whom the target population can identify with.

Based on the findings of this study as well as those of earlier studies, women have a range of special needs, such as reproductive health, and require more resources than do men. Unfortunately, as IDUs and therefore drug-treatment recipients have been predominately men, women's needs have gone unnoticed until now. Treatment programmes usually fall short in providing adequate resources for issues of particular concern to women, such as: meeting female gynecological and prenatal health needs; providing assistance in finding child care facilities; offering appropriate methods in family planning; offering objective counselling on options for HIV-positive pregnant IDUs--providing the most up-to-date information on possible risks for the mother and child, but always respecting the right of each woman to make the final decision; and eliminating sex stereotyping in career counseling which is detrimental to the rehabilitation process for women.

In the area of TB, hepatitis, and other STDs, clinical strategies for their control should be implemented more strongly. That is, if possible, all diagnosed hepatitis and TB patients should be monitored and studied to examine all risks associated with these diseases including the particular needs of IDUs with regard to treatment and the implementation of public health initiatives to control the spread of hepatitis and tuberculosis amongst this marginalised community of female IDUs. This should include health education, screening and vaccination programmes.

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