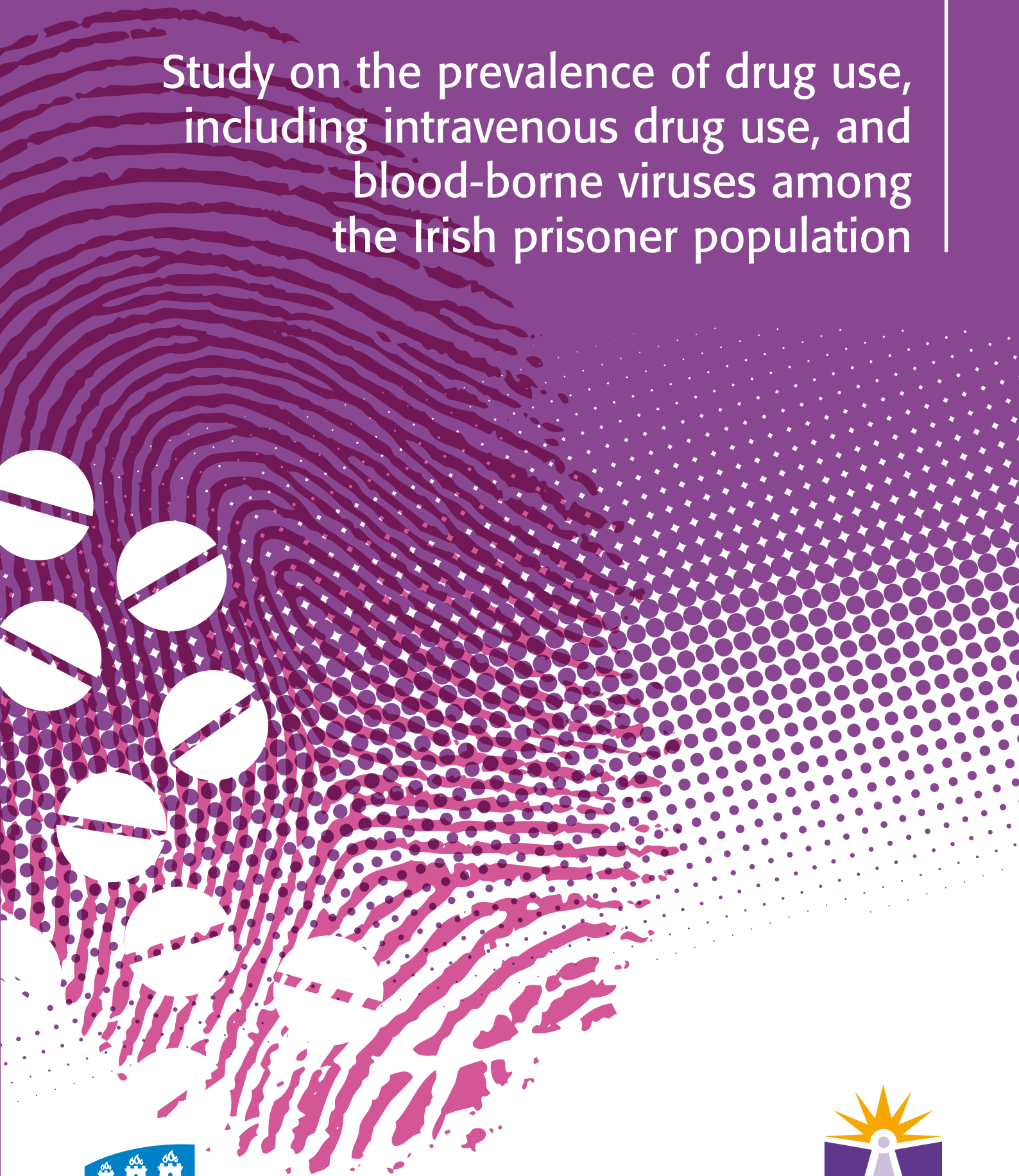
Study on the prevalence of drug use, including intravenous drug use, and blood-borne viruses among the Irish prisoner population



UCD DUBLIN

NACDA
National Advisory Committee on Drugs and Alcohol

Executive Summary

Study on the prevalence of drug use, including intravenous drug use, and blood-borne viruses among the Irish prisoner population

Background

Accurate up-to-date data on the extent of drug use and the prevalence of blood-borne viruses among the prisoner population are a necessary pre-requisite for health and social service planning and policy development. The most recent national study assessing the prevalence of blood-borne viruses, along with self-reported drug use within Irish prisons (Allwright et al., 1999), was carried out over a decade ago. This study was commissioned by the National Advisory Committee on Drugs (NACD)* in 2010 with the following objectives: to describe the nature, extent and pattern of consumption for different drugs among the prisoner population; to describe methods of drug use, including intravenous drug use, among the prisoner population; to estimate the prevalence of blood-borne viruses among the prisoner population and to identify associated risk behaviours; and to measure the uptake of individual drug treatment and harm reduction interventions (including hepatitis B vaccination) in prison.

Methods

An observational cross-sectional study, targeting all prisons and prisoners in Ireland, was carried out in early 2011. Prisoners were selected at random in proportion to the population in each prison. A detailed, validated and piloted self-completion questionnaire was administered to prisoners under the supervision of the research team. Oral fluid samples were taken for assessment of drugs of abuse and blood-borne viruses. Overall 824 prisoners participated, with a final response rate of 49.5%.

Results

Results reveal lifetime, last year and last month prevalence rates for drug use that greatly exceed those of the general population but which are broadly consistent with findings from prison studies internationally. For example, lifetime cannabis use among all prisoners was 87%, last year use was 69% and last month use was 43%. Likewise, lifetime heroin use was 43%, last year use was 30% and last month use was 11%. Women were significantly more likely to use drugs, including injecting drugs. Despite there being a high prevalence (26%) of ever injecting drugs among prisoners, last month injecting prevalence was low (2%). Prevalence of HIV was 2%. Prevalence rates for hepatitis C (13%) and hepatitis B (0.3%) were lower than expected. By far the most important factors associated with blood-borne viruses in this prison population were ever having used drugs IV and ever having shared IV drug equipment. Older age and having had a tattoo done in prison were associated with hepatitis C. Female prisoners were at greater risk of having hepatitis C and HIV and male-to-male sexual contact was confirmed as a risk factor for HIV. The need for drug treatment and harm reduction services was identified in different prison categories, with a pattern of very high uptake of services when they are available.

Summary

This study confirms that drug use, including injecting drug use, is a significant problem among prisoners in Ireland and suggests that drug-related factors are important in the acquisition of blood-borne viruses. The findings also show that prisoners who need services, such as the range of addiction services and detoxification, are very willing to use them when they are available. 'In-prison' uptake of testing and vaccination services confirms that prisons are appropriate settings for the provision of preventive, diagnostic and treatment services for drug users. It is hoped that the evidence provided in this study will facilitate service and policy development in this important area.

* In 2013 the remit of the NACD was extended to include alcohol and is now called the National Advisory Committee on Drugs and Alcohol (NACDA).

National Advisory Committee on Drugs (NACD) Research Advisory Group

Dr. Justine Horgan, Senior Researcher, NACD

Ms. Joan O'Flynn, Director NACD (from February 2011)

Ms. Susan Scally, Director, NACD (to February 2011)

Mr. Eddie Arthur, Office of Minister for Drugs (to February 2011)

Mr. Tony Geoghegan, Merchants Quay

Dr. Jean Long, Alcohol and Drug Unit, Health Research Board

Ms. Frances Nangle Connor, Director of Nursing Services, Irish Prison Service

Dairearca NiNeill, Office of Minister for Drugs (from February 2011)

Mr. Aidan O'Hora, Health Protection Surveillance Centre, Health Services Executive

Ms. Nicola Perry, Coordinator, Community Response

Mr. Julian Pugh, Social Inclusion Unit, Health Services Executive

Ms. Anna Quigley, HIV Alliance

UCD Team

Principal Investigator:	Dr. Anne Drummond Senior Lecturer, SPHPPS*
Co-Principal Investigator:	Dr. Mary Codd, Senior Lecturer, SPHPPS*
SPHPPS* Team:	Professor Cecily Kelleher, Head of School SPHPPS*
	Ms. Nora Ann Donnelly, Research Assistant
	Mr. Darren McCausland, Research Assistant
	Ms. Joanna Kozielec, Administrator (to August 2011)
	Ms. Brid O'Shea, Administrator (from August 2011)
UCD Advisors	Dr. Anna Clarke, SPHPPS*
	Dr. Jeff Connell, National Virus Reference Laboratory
	Dr. Gloria Crispino O'Connell, Centre for Support and Training in Analysis and Research
	Dr. Suzie Coughlan, National Virus Reference Laboratory
	Prof. Denis Cusack, Medical Bureau of Road Safety and Forensic & Legal Medicine, UCD School of Medicine and Medical Science
	Professor Leslie Daly, Centre for Support and Training in Analysis and Research
	Dr. Deirdre Healy, UCD Institute of Criminology
	Dr. Richie Maguire, Medical Bureau of Road Safety and UCD
	Dr. John Mehegan, SPHPPS*
	Professor Ian O'Donnell, UCD Institute of Criminology

** UCD School of Public Health, Physiotherapy and Population Science*

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Glossary of Acronyms

Study on the prevalence of drug use, including intravenous drug use, and blood-borne viruses among the Irish prisoner population

Anti-HCV	Hepatitis C Virus Antibody Test
Anti-HIV	HIV Virus Antibody Test
ASF	Adjusted Sampling Frame
BBV	Blood-Borne Virus
CI	Confidence Interval
DOA	Drug of Abuse
EIA	Enzyme Immunoassays
ELISA	Enzyme-Linked Immunosorbent Assays
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
HBsAG	Hepatitis B surface antigen test
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HIV	Human Immunodeficiency Virus
IDU	Intravenous Drug Use(r)
IPS	Irish Prison Service
MDT	Mandatory Drug Test
NACD	National Advisory Committee on Drugs
NACDA	National Advisory Committee on Drugs and Alcohol*
NSP	Needle and Syringe exchange Programme
OR	Odds Ratio
PD	Problem Drug Use
PRIS	Prisoners' IPS identity number
RAG	Research Advisory Group
SF	Sampling Frame
UCD	University College Dublin

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1.1 Background

The National Advisory Committee on Drugs (NACD)* was established in July 2000 to advise the Government in relation to the prevalence, prevention, treatment/rehabilitation and consequences of problem drug use in Ireland, based on the analysis of research findings and information. The Committee oversees the delivery of a work programme on the extent, nature, causes and effects of drug use in Ireland.

A Steering Group, set up under the auspices of the former National Drug Strategy Team, carried out an assessment of the need for prison-based needle exchange in Ireland in 2009. The primary conclusions were that prison needle-exchange constitutes a viable, effective means of addressing the drug problem and associated health risks within Irish prisons. However, it was acknowledged that data measuring the prevalence of drug use, including intravenous drug use, among the prison population is either dated or based on a proxy approach. The Steering Group therefore recommended that a study should be carried out to measure the extent of drug use, including intravenous drug use, and the prevalence of blood-borne viruses among the prisoner population before consideration is given to introducing needle exchange into a prison setting.

1.2 Aim and Objectives

Against this background the National Advisory Committee on Drugs commissioned University College Dublin (UCD) to undertake this study. The study aimed to estimate the prevalence of drug use, including intravenous drug use, among the prisoner population in Ireland in order to determine the need for drug treatment and harm reduction (including needle exchange) services in Irish prisons.

The project objectives are:

1. To describe the nature, extent and pattern of consumption for different drugs among the prisoner population;
2. To describe methods of drug use, including intravenous drug use, among the prisoner population;
3. To estimate the prevalence of blood-borne viruses among the prisoner population and to identify associated risk behaviours;
4. To measure the uptake of individual drug treatment and harm reduction interventions (including hepatitis B vaccination) in prison.

The study was jointly funded by the NACD and the Irish Prison Service.

This is the first dedicated national drug prevalence study of the prisoner population in Ireland, which includes detailed questions on thirteen individual drugs and biological sampling for drugs. It will provide a benchmark for future studies of this type.

This study did not set out to address the prevalence or the different patterns of drug use that may exist among the larger throughput of committals.

1.3 Prevalence

This is a prevalence study of drug use and of blood-borne virus status among prisoners. The definitions of lifetime, last year and last month prevalence adopted for this study are those used by the National Advisory Committee on Drugs that define prevalence as follows:

- **Prevalence** refers to the proportion of a population who have used a drug over a particular time period.
- **Lifetime prevalence** refers to the proportion of the sample that reported ever having used the named drug at the time they were surveyed. A person who records lifetime prevalence may – or may not – be currently using the drug. Lifetime prevalence should not be interpreted as meaning that people have necessarily used a drug over a period of time or that they will use the drug in the future.

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- **Last year prevalence** refers to the proportion of the sample that reported using a named drug in the year prior to the survey. For this reason, last year prevalence is often referred to as recent use.
- **Last month prevalence** refers to the proportion of the sample that reported using a named drug in the 30 day period prior to the survey. Last month prevalence is often referred to as current use. A proportion of those reporting current use may be occasional (or first-time) users who happen to have used in the period leading up to the survey – it should therefore be appreciated that current use is not synonymous with regular use.

1.4 Report Outline

This report is structured in the following manner. Chapter 2 sets the context for this study by examining the existing literature on both drug use and blood-borne viruses within prisons. A review of the literature on drug policies in prisons within Ireland and internationally is also provided. A reference list is provided at the end of the report.

Chapter 3 describes in detail the methods employed in the study. This includes the sampling strategy and procedure, development and piloting of the study materials and data collection methods, data entry and data analysis.

Chapter 4 provides a socio-demographic over-view of the sample along with a discussion of the representativeness of the sample. Following this the prevalence rates for lifetime, last year and last month drug use and injecting drug use among prisoners are presented. Chapter 4 also presents the nature and patterns of drug use including drug use initiating in prison as well as use in prison within the last year. Methods of use for different drugs are explored along with the prevalence rates for blood-borne viruses, namely hepatitis C, hepatitis B and the Human Immunodeficiency Virus (HIV). Models of the socio-demographic, behavioural and drug-related factors associated with hepatitis C, HIV and co-infection of blood-borne viruses are provided. Lastly, the need for and availability and uptake of a range of drug treatment and harm reduction services in the prison setting are described.

For comparison purposes, it should be noted that two previous national Irish studies of prison inmates have included a small number of questions about the prevalence of drug use. A prevalence study of Blood-Borne Viruses (BBVs) asked a question on last year heroin use and a question on ever injection (Allwright et al, 1999) in addition to questions associated with BBV risk behaviours, such as injecting drug use and sharing works. However, because six of the then 15 prisons were not included in that study, excluding in particular three prisons perceived as low risk for BBVs, direct comparison of results may be misleading. The general healthcare study of prisoners (Centre for Health Promotion Studies, 2000) included 13 of 15 prisons, and it is not known which two prisons were excluded. Drug questions in that study included a small number of comparable questions on cannabis, cocaine and heroin. Methodological differences, or lack of methodological detail, in published international prison drug studies also preclude direct comparison. In interpreting results therefore, while comparisons are made with previous Irish and other studies, these limitations should be borne in mind and are highlighted in Chapter 4 where appropriate. In order to provide a context for comparison, for some drugs, prevalence rates for the general population are referred to.

Chapter 5 discusses the study findings. Discussion focuses on generalisability of the findings, the prevalence and methods of drug use, prevalence of blood-borne viruses, and the uptake and utilisation of prison drug treatment and harm reduction services. Finally, the policy implications of these findings are discussed.

Tables of prevalence are provided in the appendix. These include prevalence rates and confidence intervals for total, age and gender for self-reported lifetime, last year and last month prevalence for drug use and intravenous drug use for individual drugs, and for blood-borne virus status. Tables are also provided for prevalence based on the results of oral fluid analysis for drugs and for blood-borne viruses.

A separate Technical Report contains additional detail on the methods employed and the logistics of fieldwork. The appendices of the Technical Report contain copies of advance documentation and information provided to prisoners and staff including leaflets, poster, participant information sheets, consent form and questionnaire.

2.1 Introduction

Substance abuse and associated harm from their problematic use is a major problem in prisons globally. In order to ensure evidence-based decision-making when determining the need for drug treatment and harm reduction services in Irish prisons it is necessary to have reliable up-to-date data on the extent of drug use and the prevalence of blood-borne viruses among the prisoner population. To set the context for this study it is necessary to discuss the findings from studies, both within Ireland and internationally, which have analysed both drug use and blood-borne viruses within prisons. This is done by firstly looking at substance abuse in prisons before turning to blood-borne viruses in prisons. Finally, a brief review of the literature on drug policies in prisons within Ireland and internationally is also provided.

2.2 Prisoner Health

A distinguishing feature amongst prison populations, both in Ireland and internationally, is that they are among the most socio-economically deprived communities (O'Mahony, 2002; Jenkins et al., 2005). Prison populations are characterised by high unemployment, early school leaving, poor housing and family breakdown (Sugrue, 2006). Indeed the Prison Adult Literacy Survey found that a significant number of prisoners in Ireland have virtually no literacy skills. There was also a large number of prisoners who have limited skills of a kind that would enable them to meet the challenges of modern day living (Morgan and Kett, 2003).

In tandem with experiencing socio-economic deprivation and exclusion prison populations are also known to experience poorer physical and mental health, including both acute and long standing physical and mental illness and disability, drug and alcohol dependency, sexual health problems, suicide and self-harm when compared to the general population (Hannon et al., 2007; Barry et al., 2010). The general healthcare study of the Irish prisoner population (Centre for Health Promotion Studies, NUI Galway, 2000) found that reported levels of excellent or very good health amongst prisoners (29% for males, 16% for females) which they noted were lower than that of the general population (47% of similar aged males in SLÁN). The study also found high levels of life time drug use when compared to the general population (72% for males compared to 14% for males in SLÁN), high levels of alcohol consumption (25% of males and 39% of females drank daily outside of prison) and cigarette smoking (91% of males and 100% of females).

2.3 Substance Abuse in Prison

Over the past two decades the presence of illicit drugs and the associated harm from their problematic use has changed considerably the reality of prisons throughout Europe and the rest of the world (WHO, 2005). Prison populations are well known to have personal histories of drug use and have a high concentration of injecting drug use when compared to the general population (Singleton et al., 1999; Boys et al., 2002; Lukasiewicz et al., 2007; Dolan et al., 2007). For example, in a major national survey of a random sample of all 131 prisons in England and Wales, Boys et al. (2002) found the prevalence of heroin use in UK prisons was approximately forty times what would be expected from a random population sample. It is therefore understandable that, despite methodological differences, a number of studies internationally have found relatively high rates of drug use and drug dependence within the prison population both before entering prison and within prison (Singleton et al., 1999; Sleiman, 2004; Lukasiewicz et al., 2007; Graham, 2007; Scottish Prison Service, 2008 and 2009). Table 2.2 highlights the prevalence of drug use within prisons as found from a selection of international studies. As can be seen from the table, in each study the most prevalent drug used in prison was Cannabis, followed by Benzodiazepines and Opiates. It is also possible to see that there are marginal differences in the prevalence of Benzodiazepines and Opiates reported within each study.

Table 2.1 Findings from international studies on prevalence of drug use within prisons

Author	Year	Country	Sample (n)	Drug use in prison included	Reported prevalence
Singleton et al.	1999	England & Wales	3,142	Use in prison during current sentence, not specific to any time period.	Cannabis: 36% for male remand, 46% for male sentenced, 19% for female remand, 31% for female sentenced. Methadone (non-prescribed): 1% for male remand, 2% for male sentenced, 2% for female remand, 3% for female sentenced. Benzodiazepines: not reported Heroin: 12% for male remand, 19% for male sentenced, 17% for female remand, 20% for female sentenced. Cocaine: 2% for male remand, 4% for male sentenced, 1% for female remand, 2% for female sentenced.
Sleiman	2004	Belgium	886	Ever use in prison, not specific to any time period.	Cannabis: 28.9% Methadone: 5.8% Benzodiazepines: 11.8% Heroin: 13.3% Cocaine: 11.1%
Lukasiewicz et al.	2007	France	998	Use in previous 12 months, aggregating both prior and during prison sentence use.	Cannabis: 26.7% Methadone: not reported Benzodiazepines: not reported Opiates: 2.7% Cocaine: 5.5%
Scottish Prison Service	2008	Scotland	Census of all Scottish prisoners (n not specified) 62% response rate	Use in the month prior to the survey while in prison	Proportion using each drug among those who reported having used the drug in prison: Heroin: 69% Cannabis: 66% Benzodiazepines: 45% Cocaine: 19% Methadone (non-prescribed): 17%
Scottish Prison Service	2009	Scotland	Census of all Scottish prisoners (n not specified) 62% response	Use in the month prior to the survey while in prison	Proportion using each drug among those who reported having used the drug in prison: Heroin: 70% Cannabis: 61% Cocaine: 17% Methadone (non-prescribed): 18%

In her 2001 exploratory study within the Mountjoy Prison Complex in Ireland, Dillon found that for prisoners with a history of drug use the perceived benefits of drug use were reinforced in the prison environment. Drugs were seen to alleviate some of the problems associated with prison, such as boredom and depression (Dillon, 2001). As O'Mahony (2008) describes, the specific realities of prison life mean that for many prisoners drugs are never more attractive than in prisons. The stress, idleness, boredom and ubiquitous petty coercion of prison life make the pleasure, release and oblivion provided by the opiate fix or other powerful drugs especially attractive (O'Mahony, 2008:7).

The prison environment has also been found to affect both the type of drug and method of use. In terms of the type of drug used, in the same study respondents argued that the effects of heroin and cannabis were more suited to the prison environment than stimulants (Dillon, 2001). Bullock (2003) also found a greater tendency to use depressants rather than stimulants in prisons in England, again the most frequently cited reasons for using depressants were relaxation and relief of boredom. In a study of prisons in the UK, Boys et al. (2002) found similar proportions of respondents who had ever used cannabis and heroin who also reported use in prison (64% for

cannabis, n=1,538/2,411; 62% for heroin, n=743/1203), whereas less than a quarter (24%, n=351/1,442) of those who had ever used cocaine reported having used while incarcerated. More recently, in Canada, Zakaria et al. (2010) found that the proportion of prisoners who reported cocaine as one of their most frequently used drugs declined considerably in prison compared to the community for both men (3% vs 34%) and women (6% vs 46%), whereas opiate use declined the least in prison compared to the community (7% vs 9%).

In terms of the affect the prison environment has on the method of drug use, both Dillion (2001) and Long et al. (2004) report that respondents described how low availability of heroin encouraged a shift from smoking, which was perceived as wasteful, to injecting. Similarly, Malliori et al. (1998) found that in Greece more than half (57.8%, n=153) of those who admitted drug use in prison reported injection as the route of administration. This is not to say that injecting drug use has been found to be greater in prison than in the community; a decline in the proportion of men and women who inject in prison compared to the community has been reported in a number of studies (Bullock, 2003; Poulin et al., 2007; Zakaria et al., 2010). However, given limited quantities available injecting was seen as more 'efficient'.

Considering the scarcity of injecting equipment elevated rates of sharing works in prison has been observed in a number of studies. As Malliori et al. (1998) report, injecting drug users inject less but share more in prison. The degree to which this occurs varies from study to study and there would appear to be a downward trend in the proportion sharing works over time. For example, the Malliori et al. (1998) study in Greece found that of those who injected 91.5% (n=119) were sharing works; whereas, for Koulierakis et al. (2000), again in Greece, this rate was 83% (n=145). In Scotland, Graham (2007) reported 71% (n=79) of prisoners who inject sharing works, while in Canada Werb et al. (2008) reported 60.9% (n=56) of injectors sharing works. Most recently, Zakaria et al. (2010) found 44% of those who injected in prison shared works.

Within the Irish context a number of studies between 1984 and 2000, particularly focusing on prisons within Dublin, showed that there was a continued growth in the extent of drug use, especially injecting heroin (O'Mahony, 1984; O'Mahony, 1997; Carmody and McEvoy, 1996; Allwright et al., 1999; Long et al., 2000). Reported use of heroin in these studies increased from 3.8% of prisoners in the O'Mahony study (1984) to 35.5% in the work of Long et al. (2000).

Furthermore, the more recent of these studies found higher prevalence rates for hepatitis B, hepatitis C and HIV in prisoners than in the general population (Allwright et al., 1999; Long et al., 2000). However, these studies were carried out over a decade ago. In the interim there is evidence of an increase in both the incidence and prevalence of treated drug use in the community (Alcohol and Drug Research Unit of the Health Research Board 2009a, 2009b). The European Committee for the Prevention of Torture (CPT) fifth visit to Ireland in 2010 observed that drug-misuse remains a major challenge in all of the six prisons visited. The delegation reported that management and health-care staff in most prisons visited acknowledged both the rising numbers of prisoners with a substance abuse problem and the widespread availability of drugs (CPT, 2011).

Between 2001 and 2007 no studies were conducted to estimate the prevalence of drug use in Irish prisons. A 2005 survey of the psychiatric status of Irish prisoners found that 59% (n=235) of male sentenced prisoners had a drug dependency problem and 45% (n=200) had an alcohol dependency problem based on the Severity of Dependence Questionnaire which is concerned with the psychological components of dependence (Kennedy et al., 2005). Long (2008) analysed information on drug testing, conducted to monitor drug use and response to treatment in prisons, from 2005 to 2007 as a proxy for drug use in prisons. More than 20,000 voluntary tests were carried out each year to monitor drug use and responses to treatment, however, these tests included those carried out on committals as well as existing inmates, therefore some of the positive test results could relate to drugs consumed outside of prison. It is noted that between one-third and half of those screened tested positive for at least one drug. More up-to-date information is found in the Irish Focal Point (2010) national report to the European Monitoring Centre for Drugs and Drugs Addiction (EMCDDA) on 2009 drug tests, excluding methadone, which again notes that committals are included. In Irish prisons it was found that between one-tenth and two-fifths tested positive for at least one drug.

2.4 Blood-Borne Viruses in Prisons

The link between injecting drug use and blood-borne infections is a major concern. As discussed above, prisoner populations are recognised for engaging in illicit drug use, particularly injecting drug use, both in and out of prison, placing them at increased risk of exposure to blood-borne viruses (Australian Federation of AIDS Organisations, 2007; Butler et al., 2007; Kirwan et al., 2011). Hepatitis C, hepatitis B and HIV prevalence has been found, in a number of studies, to be disproportionately higher among injecting drug prisoners than the general community. For example, Christensen et al., (2000) found that injecting drug users in prisons in Denmark have an incidence of hepatitis B and C 100 times higher than reported in the general Danish population (Christensen et al., 2000). Concurrently, Wong et al. (2006) report that the prevalence of hepatitis C in Canadian federal penitentiaries (17%-40%) are estimated to be 20 to 50 times higher than among the general Canadian population (0.8%), while HIV rates are 5 to 40 times higher (1%-8% vs 0.2%).

A number of studies have analysed independent risk factors associated with hepatitis C, hepatitis B and HIV infection amongst prisoner populations. The significance of a history of injecting drug use is quite apparent from these studies. Indeed, a history of injecting drug use is the most commonly reported risk factor (Butler et al., 1997 & 2007; Ford et al., 2000; Weild et al., 2000; Champion et al., 2004). Prior imprisonment has also been found to be independently associated with blood-borne infections (Butler et al., 1997 & 2007; Christensen et al., 2000; Guimarães et al., 2001). Guimarães et al. (2001) also found that the longer time spent in prison the greater the chance of acquiring infection. Older prisoners would appear to be more at risk, according to the multivariate models by Butler et al. (1997 & 2007). However, age was not found to be a significant predictor according to the logistic regression model cited in Christensen et al. (2000). Acquiring tattoos in prison was a risk factor, independent of a history of injecting drug use, for Hellard et al. (2007). In contrast, Butler et al. (1997), and Champion et al. (2004) found that neither tattoos in prison and sexual behaviour were significant predictors for blood-borne infections.

It is thus understandable that in many western countries prisoners have a higher prevalence of HIV, hepatitis B and hepatitis C than in the general population (Weild et al., 2000). For example, Christensen et al. (2000) found that the incidence of hepatitis B virus (HBV) and hepatitis C virus (HCV) among Danish prisoners was more than 100 times higher than the reported incidence in the general Danish population. More recently, Wong et al. (2006) report that the prevalence of hepatitis C in Canadian federal penitentiaries (17%-40%) are estimated to be 20 to 50 times higher than among the general Canadian population (0.8%), while HIV rates are 5 to 40 times higher (1%-8% vs 0.2%).

Table 2.2 highlights the prevalence of blood-borne viruses within prisons as found from a selection of international studies. The publication dates of these studies range from 1997 to 2011. While not directly comparable due to different methodologies, prevalence rates for hepatitis B range from 57.6% (antibody) in a study from Greece published in 1998 (Malliori et al., 1998) to 2.4% (antibody) from a study in Lebanon published in 2010 (Mahfoud et al., 2010).

Prevalence rates for hepatitis C range from 82% in a study in Germany published in 2006 (Stark et al., 2006) to 1.1% from the study in Northern Ireland published in 2007 (Danis et al., 2007).

Table 2.2 Findings from international studies on prevalence of blood-borne viruses within prisons

Author	Year	Country	Sample (n)	Reported prevalence
Butler et al.	1997	Australia	408	Hepatitis B: 31% (core antibody) 3.2% (surface antigen). Hepatitis C: 37% HIV: not available.
Malliori et al.	1998	Greece	544 questionnaires and 533 blood samples.	Hepatitis B: 57.6% (antibody) 6.5% (antigen). Hepatitis C: 58.2%. HIV: 0.19%.
Allwright et al.	1999	Ireland	1,205 questionnaires; 1,193 samples	Hepatitis B: 9% (antibody). Hepatitis C: 37% HIV: 2%.
Weild et al.	2000	England & Wales	3,942	Hepatitis B: 8% (antibody). Hepatitis C: 7%. HIV: 0.4%.
Ford et al.	2000	Canada	355 blood samples; 350 questionnaires	Hepatitis B: not available. Hepatitis C: 33%. HIV: 2%.
Long et al.	2000	Ireland	607	Hepatitis B: 6% (antibody). Hepatitis C: 22%. HIV: 2%.
Guimaires et al.	2001	Brazil	756	Hepatitis B: 30.6% (antigen) and 37.5% (antibody). Hepatitis C: 41%. HIV: 13.7%.
Champion et al.	2004	Scotland	612	Hepatitis B: not available. Hepatitis C: 16% (antibody). HIV: not available.
Stark et al.	2006	Germany	174	Hepatitis B: 53% (antigen and antigen). Hepatitis C: 82%. HIV: 18%.
Butler et al.	2007	Australia	672	Hepatitis B: 20% (core antibody) 24% (surface antibody) and 3% (surface antigen). Hepatitis C: 34%. HIV: 1%.
Danis et al.	2007	Northern Ireland	663 for the questionnaire and 658 samples	Hepatitis B: 0.75% (antibody). Hepatitis C: 1.1%. HIV: 0.0%.
Radun et al. Cited in Klempova & Wiessing	2008	Germany	1,582	Hepatitis B: 10.4% (antibody) and 2.5% (antigen Hepatitis C: 17.6%. HIV: 0.8%.
Mahfoud et al.	2010	Lebanon	580	Hepatitis B: 2.4% (antibody) and 2.4% (antigen). Hepatitis C: 3.4% HIV: 0.17%.
Kazi et al.	2010	Pakistan	357	Hepatitis B: 5.9% (antigen) Hepatitis C: 15.2%. HIV: 2%.
Kirwan et al.	2011	England	10,723	Hepatitis B: 13.9% (antibody) and 2.4% (antigen) Hepatitis C: 24.2%. HIV: not available.
Saiz de la Hoya et al.	2011	Spain	378	Hepatitis B: 2.6% (antigen) Hepatitis C: 22.7%. HIV: not available.

The last prevalence study of blood-borne viruses amongst the prisoner population in Ireland was conducted over a decade ago. The study was designed in two phases: a survey of sentenced prisoners (inmates) (Allwright et al., 1999) and a survey of committal prisoners (entrants) (Long et al., 2000). The Allwright et al. (1999) study found that amongst sentenced prisoners the overall prevalence of infection with hepatitis B was 9% (n=104), hepatitis C 37% (n=442) and HIV 2% (n=24). Long et al. (2000) found that among committal prisoners prevalence of hepatitis B and C was much lower, at 6% (n=37) and 22% (n=130) respectively, while HIV was the same at 2% (n=12).

Both studies found prevalence rates were considerably higher among injecting drug users. Allwright et al. (1999) found prevalence of hepatitis B was 19% (n=94), hepatitis C 81% (n=414) and HIV 4% (n=18) among injecting drug users. Long et al. (2000) found prevalence of hepatitis B was 18% (n=31), hepatitis C 72% (n=72), and HIV 6% (n=10) among (ever) injecting drug users.

Consistent with findings from international studies, Allwright et al. (1999) found a large proportion of the prison population reported a history of drug use, with 52% (n=630) reporting heroin use and 43% (n=514) reported ever injecting drugs. For those who inject, the differences in sharing practices between the community and prison would also appear to reflect findings from other international studies. Allwright et al. (1999) found just over a third (37%), of respondents had shared injecting works (needles, syringes, filters, spoons) before committal to prison, whereas, of those who injected in prison 58% had shared injecting works. Long et al. (2000) found that of injecting drug users who had previously been imprisoned, 54% (n=85) reported sharing needles while imprisoned, while 22% (n=35) of these reported to not have shared works in the month before committal.

Multivariate logistic regression analyses in both studies showed that injecting drug use was the most important predictor for both hepatitis B and C infection, whereas a history of anal sex with men was the strongest predictor of HIV in the Allwright et al. (1999) study, though the numbers testing positive for HIV were very small (n=24). After taking into account differences between respondents, Allwright et al. (1999) found those who reported ever injecting drugs were 22 times more likely to be hepatitis B positive than those who did not inject (adjusted Odds Ratio (OR) 21.6, Confidence Interval (CI) 95% 10.9–47.6), while those who reported ever injecting drugs were 81 times more likely to be hepatitis C positive (adjusted OR 80.8, CI 95% 47.9–143). Similarly, Long et al. (2000) found those committal prisoners who reported injecting drugs were 89 times more likely to have hepatitis C antibodies (adjusted OR 89.1, CI 95% 37.4–255.3) and 16 times more likely to have hepatitis B core antibodies than non-injectors (adjusted OR 15.9, CI 95% 6.5–47.6).

2.5 Drug Policy in Prison

Since the beginning of the 1990s drug treatment has increased in volume and variety in prisons throughout Europe (Kolind et al., 2010). This development is in line with the EU action plan on drugs, which emerged in response to the large number of inmates with drug and health problems, and is also consistent with international agendas on health and prisoners' rights (Bruce and Schleifer, 2008; European Monitoring Centre for Drugs and Drugs Addiction (EMCDDA), 2006a; Kerr et al., 2004, Møller et al., 2007). Harm reduction initiatives, drug-free wings and substitution treatment was made available, although cross-European differences exist (Stallwitz and Stöver, 2007).

Within the Irish context, there has been a significant improvement in medical services for the prison population over the last two decades. The Irish Prison Service (IPS) has committed considerable investment, over €8 million since 1999, towards healthcare services for prisoners (Ailbhe Jordan, Medical Independent 10th June 2010). In 2000 and 2001 the IPS introduced drug treatment service plans in addition to health care plans; the hepatitis B vaccine was made available; methadone therapy was introduced; drug-free units were expanded; and registered nurses were employed.

In 2006 the Irish Prison Service (IPS) published a drugs policy and strategy paper, "Keeping drugs out of prison", which remains the reference document for the approach being adopted by the IPS in respect of drugs in prisons. The document details how the IPS has adopted a two-pronged approach: elimination of supply and reduction of demand for drugs. To effect supply elimination, prisons have introduced body orifice security scanner chairs, detection dogs, closed circuit television cameras, random searches, controlled visits, nets over and around exercise yards, monetary control, seizure analysis, and voluntary drug testing as well as mandatory drug testing (IPS, 2006). To reduce the demand for drugs in prison the IPS has outlined three core tasks to support drug treatment and rehabilitation: identifying and engaging with drug users, providing treatment options, and ensuring continuity of treatment and care following release. In terms of treatment options, these include opiate replacement therapies (methadone maintenance), methadone detoxification and reduction programmes, information, education and awareness programmes, and mental health care (Connolly et al., 2006).

While the IPS drug treatment and harm reduction programme has grown substantially over the last two decades there is still a lack of information that would assist public authorities in evidence-based decision-making in the provision of these services. As Jürgens (2006) points out, although numerous studies have examined various policies and interventions on drug use in the general community, few have focused on drug treatment and services in prisons. What follows below is a discussion of findings from those international studies that have focused on the same type of harm reduction strategies that the IPS has introduced.

2.5.1 Substitution Treatment

Substitution treatment, mainly provided in the form of methadone maintenance, is offered to opiate-dependent drug users as a harm reduction measure, i.e. to reduce or eliminate opiate use, to control and reduce the risk of blood-borne viruses in relation to injecting drug use (hepatitis and HIV/AIDS), and to reduce mortality and decrease criminal behaviour (recidivism) after release (Stöver et al., 2006). Despite the widespread use of methadone in maintenance treatment for opioid dependence in many countries, it is a controversial treatment whose effectiveness has been disputed.

In a study in Australia, prisoners on a methadone maintenance treatment with a dose of more than 60 mg provided during the whole prison sentence were least likely to inject heroin, to share needles or to engage in HIV risk-taking behaviour (Dolan et al., 1998). Johnson et al. (2001) found that Canadian prisoners on a 12-month methadone maintenance treatment whilst incarcerated had lower levels of recidivism than heroin-using prisoners with no treatment. Similar to the above findings, in an extensive literature review of prison based substitution treatment Stallwitz and Stöver (2007) reported that substitution treatment can reduce drug use and injection within prisons. Moreover, substitution treatment can reduce injecting risk behaviours as well as drug charges and recidivism rates.

In a study of practices and policies for the provision of substitution treatment in prisons across 18 European countries Stöver et al. (2006) found that although psychosocial care was seen as a valuable and necessary part of the treatment to support the medical part of the substitution treatment in prison, it was found that such support was rarely provided. Similar comments were made about Irish prisons more recently by the CPT (European Committee for the Prevention of Torture and Inhuman or Degrading Treatment of Punishment (CPT), 2011).

In contrast, findings in other studies are not as positive. In a review of randomised controlled clinical trials of methadone maintenance therapy compared with either placebo maintenance or other non-pharmacological therapy for the treatment of opioid dependence, Mattick et al. (2009) found methadone maintenance appeared statistically significantly more effective than non-pharmacological approaches in retaining patients in treatment and in the suppression of heroin use as measured by self report and urine/hair analysis (6 RCTs, RR = 0.66 95% CI 0.56–0.78), but not statistically different in criminal activity (3 RCTs, RR=0.39; 95% CI: 0.12–1.25) or mortality (4 RCTs, RR=0.48; 95% CI: 0.10–2.39). Dolan et al. (2002) in a randomised control trial in Australia, found that methadone maintenance in a prison healthcare setting can be effective in significantly reducing heroin use (27% vs 42%), drug injection and syringe sharing, however, no group difference was measured regarding seroconversions to hepatitis C.

2.5.2 Detoxification

Detoxification is the management of withdrawal symptoms associated with the cessation of a drug of dependence. It can be managed in a number of ways, depending on the drug or drugs of dependence. Medical intervention may assist the detoxification process, particularly in the case of opiate or severe alcohol dependence. Alternatively, detoxification can be managed non-medically, through the provision of psychological support and care.

Detoxification is the most common intervention provided to drug dependent offenders who are received into custody in the UK (Department of Health et al., 2006). However, in the whole prison service in Ireland, there are only 9 detoxification beds available (in the Medical Unit in Mountjoy Prison) for those who wish to come off drugs (Irish Prison Chaplains Report, 2010; O'Keefe, 2011). According to the Irish Prison Chaplains' Annual Report (2010) this is wholly inadequate.

There is a paucity of information regarding detoxification in prison, the majority of evidence is gathered from the community setting (Dolan et al., 2007). This suggests that detoxification services should lead to other forms of support, otherwise there is a danger that prisoners who have been detoxified, and therefore have a reduced level of tolerance, may experience overdose if they return to previous doses of illicit drugs (Strang et al., 2003). Because of the narrow and short-term focus of detoxification programmes and the high frequency of relapse, the committee for the Council of Europe (2002) report on drug misusing offenders in prison and after release concluded that detoxification should not be viewed as a method of treatment alone. It is, however, an important gateway to treatment.

2.5.3 Drug-Free Wings and Units

Voluntary drug-free units or drug-free wings are a form of residential correctional treatment programme with the primary objective of rehabilitating offenders with histories of illicit drug use. Inmates residing in drug-free wings are segregated from the general prison population and pledge to abstain from drug use, usually in return for increased privileges such as recreational facilities or improved accommodation (Dolan et al., 2007).

In the Netherlands, a study by Van den Hurk (1995, cited in the Council of Europe report, 2002) drug-free units were evaluated in comparison to other forms of treatment. Findings include the fact that drugs were used less (enforced due to regular urine testing and punishment for positive urinanalysis). More interestingly, drug-free units were effective in providing continuity of care on release, with 42% of those released from such units continuing with treatment, whereas only 8% from conventional prison-based services did so.

2.5.4 Prison Needle and Syringe Exchange Programme

Switzerland was the first country to start a prison Needle and Syringe exchange Programme (NSP) in 1992. Since then, NSPs have been introduced to 12 countries in Western and Eastern Europe and in central Asia (Jürgens et al., 2009). Several models for the distribution of sterile injecting equipment have been used, including automatic dispensing machines, hand-to-hand distribution by prison healthcare staff, drug counsellors, or external community health workers, and distribution by prisoners trained as peer outreach workers.

Systematic assessments of the effects of NSPs on HIV and HCV related risk behaviours and their overall effectiveness have been undertaken in a number of studies (Jürgens et al., 2009; Stöver and Nelles, 2003; Stark et al., 2006; Dolan et al., 2003; Jacob and Stöver, 2000). Jürgens et al. (2009) note that with the exception of one prison in which sharing continued because of insufficient supply of needles and syringes, all available reports have shown that sharing of injecting equipment either ceased or substantially declined after the implementation of the NSP. Furthermore Jürgens et al. (2009) found that no new cases of HIV were reported in any of the studies reviewed. In five of the six prisons in which blood tests were done for HIV or hepatitis, no sero-conversions were observed. There were no reports of syringes being used as weapons, nor did the availability of sterile injecting equipment result in an increase in drug use (Jürgens et al., 2009).

In an assessment of prison needle-exchange for Ireland, based on international evidence of prison needle-exchange, Forde et al. (2009) argued that prison needle-exchange constitutes a viable, effective means of addressing the drug problem and associated health risks within Irish prisons. However, Forde et al. (2009) acknowledged that data measuring drug use among the prison population is either dated or a proxy approach. Therefore, they recommended that a study be commissioned to measure the extent of drug use and the prevalence of blood-borne viruses among the prisoner population.

2.5.5 Mandatory Drug Testing

Since 2007 the IPS have had the power to take mandatory drug tests (MDT) from a random sample of between 5 and 10% of Irish prisoners each month in order to monitor and deter drug-misuse. A positive test result or refusal to take the test results in sanctions being applied to that individual (IPS, 2006).

In a study of five prisons in England, Edgar and O'Donnell (1998) found that the increased risk of detection and sanctioning through MDT had a substantial positive impact on the prevalence of drug-misuse amongst prisoners. Fifty two percent of those interviewed (n=58/111) said they had desisted, reduced or altered their drug use because of the consequences that could follow if they were to test positive under MDT. However, two-thirds of the prisoners interviewed did not consider MDT to be fair and three quarters of prisoners believed MDT had increased staff prisoner tensions. Furthermore, when asked what impact MDT had had on the prison, not one prisoner, out of the one hundred and forty eight interviewed, mentioned an improvement in drug treatment.

An often-stated claim is that implementation of MDT will result in prisoners changing their use of drugs by switching from cannabis, which has a relatively long detection time in urine, to heroin which is cleared more rapidly and is far more difficult to detect (Robinson and Mirabelli, 1996; MacDonald, 1997; Edgar and O'Donnell, 1998; Hucklesby and Wilkinson, 2001). However, a major survey of prisoners carried out in England and Wales in 2001–2002 concluded that MDT testing, along with other drugs treatment strategies, had substantially reduced cannabis use in prisons, but had little effect on the use of heroin (Singleton et al., 2005). This is consistent with findings of a study on MDT of prisoners in England and Wales which reported that there was no evidence for switching from cannabis to opiate use based on an analysis of the trends in positive test results (Farrell et al., 1998).

2.6 Conclusion

In conclusion, while IPS has adopted a number of strategies to address the problem of drug abuse amongst the Irish prisoner population, this is not without challenges. As acknowledged in the IPS 2010 Annual Report (2011) the delivery of drug treatment services and ensuring continuity of care for prisoners with addiction problems continues to be a significant challenge for health-care services in prisons. Yet, as noted above, the most recent study assessing the prevalence of blood-borne viruses along with self-report drug use within Irish prisons (Allwright et al., 1999) was carried out over a decade ago. Reliable up-to-date data on the extent of drug use and the prevalence of blood-borne viruses among the prisoner population is necessary in order to ensure evidence-based decision-making when determining the need for drug treatment and harm reduction services in Irish prisons.

3.1 Study Aim and Objectives

The aim of the study is to estimate the prevalence of drug use, including intravenous drug use, among the prisoner population in Ireland in order to determine the need for drug treatment and harm reduction (including needle exchange) services for Irish prisoners.

The project objectives are:

1. To describe the nature, extent and pattern of consumption for different drugs among the prisoner population;
2. To describe methods of drug use, including intravenous drug use, among the prisoner population;
3. To estimate the prevalence of blood-borne viruses among the prisoner population and to identify associated risk behaviours;
4. To measure the uptake of individual drug treatment and harm reduction interventions (including hepatitis B vaccination) in prison.

3.2 Study Design

In order to achieve the objectives, a cross-sectional study targeting a random sample of prisoners was devised, that would allow conclusions to be drawn about drug use, blood-borne virus status and the uptake of drug treatment and harm reduction interventions across the full prison population in all prisons. The study instruments comprised a self-administered questionnaire in addition to separate oral fluid sampling for a) five drugs (cannabinoids, opiates, methadone, cocaine and benzodiazepines) and b) blood-borne viruses (hepatitis B, hepatitis C and HIV).

3.2.1 Sample Size Calculations

Calculation of the sample size for accurate estimation of a proportion (in this instance a prevalence rate) was based on:

- The size of the population from which the sample was to be drawn, based on Irish Prison Service population statistics;
- The estimated prevalence of the condition of interest, based on prevalence of drug use and any Blood-Borne Virus (BBV) status reported in a previous study of the Irish Prison population (Allwright et al., 1999);
- An acceptable margin of error for the prevalence estimate – a sample size which permits an interval of 6% (i.e. margin of +3%) was chosen; and
- The level of confidence with which the prevalence will be estimated, which was set at 95%.

3.2.2 Sampling Strategy

In the absence of any advance data that allowed the prisons to be categorised definitively as high, medium or low drug use, all prisons were included in the study. The sampling strategy was therefore to survey a random sample of the prison population proportionate to the population in each prison, to achieve a sample size of approximately 840, in order to estimate prevalence of drug use and blood-borne virus prevalence with a confidence level of 95% and a ± 3% margin of error.

The sampling frame was all inmates (sentenced and remand) currently in prison in the Republic of Ireland (2009 bed capacity 4,106: daily average occupancy 3,881). In this context, 'currently' implied current to the period in which the study was administered. Based on previous estimates of participation among prisoners, and anticipating an 80% response rate, it was calculated that 1,050 prisoners would need to be selected from the sampling frame for approach. The likely response rate took into account the response rates to similar studies among prison inmates, which vary from 62% in Northern Ireland (Danis et al., 2007) to 80% in the UK (Weild et al., 2000) to 85% in Ireland (Allwright et al., 1999). A likely response rate of 80% among inmates was used. If in the event that participation was substantially lower than 80% in the first prisons, for whatever reason, it was planned that the sample size to be chosen in subsequent prisons would be increased to ensure an adequate number for estimation

of prevalence. During fieldwork, the response rate was lower than anticipated in the first few prisons visited and the sample size was increased accordingly; this process is described below. The exception was Limerick Female Prison, which at the time of strategy development had an operational capacity of 22. For logistical reasons and in the interest of both enhancing participation and confidentiality, all inmates in this prison were surveyed. Prisoners aged < 18 years and ≥ 65 years old, hospitalised prisoners or those deemed unfit to consent or participate and prisoners deemed by the IPS to be too high a security risk were excluded. Prisoners not present on the day of the study were also excluded from random selection where this was known in advance. Following exclusions, sampling was random within prisons, proportionate to occupancy, and without replacement.

3.3 Sampling Procedure

Sampling was based on a live list of PRIS numbers (prisoners' IPS identity number), for all prisoners in custody aged 18 to 64 inclusive for each prison, provided by the IPS IT department to the Governor of each prison, on a date shortly before each visit (the sampling frame (SF) for all prisons comprised 4,474 prisoners). Because fieldwork was carried out over seven weeks, the list for each prison was generated on a rolling basis as near to the date of the visit as feasible for prison logistics purposes.

Governors excluded from the list prisoners who they deemed could not be included using the criteria provided. Political prisoners, having been notified about the study in advance by the relevant Governor, declined as a group to participate and were also excluded in advance of random sampling. In total, 485 prisoners (11%) were excluded by the Governors in advance of random sampling. Governors provided a list of non-excluded prisoners' PRIS numbers to the team. These combined lists, the adjusted sampling frame (ASF), comprised 3,989 prisoners.

A random sample was generated by the research team for each prison and the list of PRIS numbers returned to the Governor. The proportion selected by random sampling was decided on a prison by prison basis, based on the target sample number in each prison (proportionate to population size) but mediated by locally provided information about prisoner turnover, Governors' views on how likely prisoners would be to participate, and the response rate in previously visited prisons or prisons with a similar prisoner profile. The sample requested in each prison was based on the formula provided in the technical report. In six prisons it was necessary to increase the initially requested proportion in the field, and additional time or a follow-up visit to the prison was arranged if necessary. These prisons were all visited early during fieldwork: Mountjoy (increased requested sample from 27% to 41%), Wheatfield (from 34% to 52%), Portlaoise (from 47% to 60%), Cloverhill (from 42% to 50%), Dóchas (from 55% to 70%), and St. Patrick's Institution (from 53% to 71%).

The final proportion of requested randomly selected prisoners ranged from 28% to 71% of the population in individual prisons, with the exception of Limerick female prison, where all prisoners aged 18 to 64 were included in the sample because of the very small population involved. The total sample requested from all prisons was 1,989.

During fieldwork, 323 prisoners (8% of ASF) were not available to participate in the study on the day(s) of the team's visit, because of unanticipated transfer, release, temporary release, court, hospital visit, 23-hour lock up or being placed in isolation, or not being available for unspecified reasons. This included a small number of selected prisoners (10) deemed not to have sufficient English to understand what they were being asked to attend. Towards the end of fieldwork, a small number of the selected prisoners (6) who identified themselves as having previously participated in another prison were also considered unavailable for participation.

The final eligible available sample was 1,666 prisoners.

Table 3.1 Sampling frame, exclusions and final sample by prison

Prison	Sampling frame (SF) n	Excluded in advance by Governor n	Adjusted sampling frame (ASF) n	Random sample (no.) requested n	Requested sample as % of ASF %	Excluded/ not available on the day n	Final (eligible available) sample n	Final sample as % of ASF %
Arbour Hill	143	12	131	52	39.7	3	49	37.4
Castlerea	384	33	351	166	47.3	10	156	44.4
Cloverhill	414	10	404	202	50.0	49	153	37.9
Cork	309	28	281	141	50.2	22	119	42.3
Dóchas Centre	140	8	132	93	70.5	19	74	56.1
Limerick (Female)	38	–	38	38	100	14	24	63.2
Limerick (Male)	319	–	319	160	50.2	23	137	42.9
Loughan House	149	–	149	74	49.7	28	46	30.9
Midlands	548	37	511	256	50.1	58	198	38.7
Mountjoy	691	106	585	237	40.5	34	203	34.7
Portlaoise	269	54	215	130	60.5	13	117	54.4
Shelton Abbey	106	20	86	34	39.5	2	32	37.2
St. Patricks	184	71	113	80	70.8	20	60	53.1
Training Unit	113	21	92	26	28.3	–	26	28.3
Wheatfield	667	85	582	300	51.5	28	272	46.7
Total	**4,474**	**485**	**3,989**	**1,989**	**49.9**	**323**	**1,666**	**41.8**

3.4 Design and Piloting of Study Documentation and Survey Instrument

The design process comprised development and piloting of advance documentation, i.e. staff and participant information and questionnaire, and piloting of the process.

3.4.1 Documentation

Advance documentation consisted of a staff information leaflet, a prisoner letter, a prisoner leaflet and a prison poster. The staff information sheet was designed for a professional reader. The content of the staff information sheet was reviewed within the study team, before being reviewed at piloting stage by staff in Cloverhill prison, at which stage no amendments were suggested.

The draft prisoner letter and draft prisoner leaflet, prepared with the intention of being provided to all prisons and delivered to every prisoner by cell drop, were designed for a low literacy audience. The format was designed in a manner known to facilitate ease of reading for participants with reading difficulties. Comments on early drafts were invited from the NACD Research Advisory Group, the UCD study team, and then from the wider academic team within UCD. The letter and leaflet were piloted for literacy and ease of reading with three separate prisoner groups: a group of 7–10 male prisoners, facilitated by the school in Mountjoy prison; a group of ex-offenders, facilitated by the community based voluntary agency PACE (http://www.paceorganisation.ie/); and among volunteers in Cloverhill prison in advance of piloting the process. The post-pilot documentation was edited by the National Adult Literacy Agency (NALA).

3.4.2 Questionnaire

The questionnaire instrument took account of European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) requirements, with appropriate modifications for both the Irish context and the prison context. Self-administered questionnaires, in combination with saliva sample collection, had previously been successfully used with prisoner populations in Ireland (Allwright et al., 2000), England and Wales (Weild et al., 2000) and Northern Ireland (Danis et al., 2007).

Questionnaire content was developed taking account of the most up-to-date EMCDDA questions, relevant questions and wording successfully used in the most recent NACD 2006/Drug Prevalence Survey (2008), and in the most recent relevant Irish prisoner surveys (Allwright et al., 1999, Centre for Health Promotion Services, 2000). Consultation took place with the NACD Research Advisory Group. Nurse managers and addiction nurses from the Irish Prison Service provided advice on drug treatment and harm reduction options within the prison setting and the terminology in use in Irish prisons around drug use. New questions included questions that aided determination of whether participants were in prison at the time of drug use, particularly for questions on drug use in the last 12 months. A series of questions were developed on drug treatment and harm reduction services in the prison setting. The questionnaire and supporting documentation were developed in the English language. It was agreed that any selected prisoner who had a language difficulty but wanted to participate would be dealt with on a case-by-case basis.

In designing the layout and format of the questionnaire account was taken of the literacy and learning difficulty levels that might be expected among the Irish prisoner population and the advice of NALA, plain English guides and following discussion with prison teachers. The questionnaire comprised mostly closed dichotomous (mostly yes/no) and multiple choice questions, with the exception of questions such as what country participants were born in and ethnicity, or questions where participants were asked to report a number, e.g. age, number of times needles shared, etc.

Comments on early drafts were initially invited from the Research Advisory Group, the UCD study team, and then from the wider academic team within UCD, including many who had experience working with literacy-challenged populations and marginalised groups, including prisoners. Following revisions recommended by peers, the questionnaire was piloted for content as well as for literacy and ease of reading with three separate prisoner groups: a group of 7–10 male prisoners facilitated by the school in Mountjoy prison; a mixed-gender group of ex-offenders facilitated by the community based voluntary agency PACE (http://www.paceorganisation.ie/); and among volunteers in Cloverhill prison. The latter two groups provided page by page feedback. Finally, the questionnaire was piloted in real-time, along with the full process of information session, consenting, administration of the questionnaire and collection of saliva samples, in Cloverhill prison, with a group of 20 prisoners, simulating the proposed process for actual fieldwork conditions.

Questionnaire development, consultation and piloting incorporated minor revisions to language and terminology, sequence and format.

The final questionnaire collected data on:

- Demographic information;
- Drug use;
- Injecting drug use;
- Risk behaviours for BBVs;
- General health.

The final questionnaire was approved by the NACD Research Advisory Group and is provided in the Technical Report.

3.5 Piloting of Process and Information Session Documentation

Draft Standard Operating Procedures (SOPs) for labelling of samples, data collection and individual fieldworker roles were developed in advance of the pilot of the information session and data collection process. The entire data collection process was piloted in Cloverhill prison and included piloting of the process from preparation and packing of the equipment required for daily visits, to arrival at prison entrance and progression through security, through providing the information session to prisoners, consenting process, questionnaire completion, sample collection, to management of linking the questionnaires to the samples, all the way through to deconstructing the survey from samples collected, returning to UCD, secure filing of the questionnaires and dispatch of samples to the laboratory for analysis. The pilot group included participants who reported drug use and injecting drug use and who required assistance with completion of the survey due to reading difficulties.

Following the pilot process, minor amendments were made to the contents of equipment transportation cases, and to the information presentation. The SOP for data collection was amended to remove in-the-field labelling of samples, and a SOP for labelling in advance was developed. It was also decided to complete deconstruction of the survey and oral sample packs in the prison setting. One question was amended in the field and subsequently clarified for all participants.

3.6 Fieldwork

In advance of fieldwork a member of the team met individually with the Governor and/or Deputy Governor and key personnel in each prison and proposed dates and locations were agreed. A primary prison liaison person was appointed in each prison. During fieldwork the planned schedule was amended as required to take account of additional days and/or second visits required to individual prisons. The Irish Prison Service (IPS) required that fieldwork take place primarily in February and March 2011. Fieldwork commenced on 18 February 2011, and took place on a daily basis on all working weekdays up to and including 08 April 2011. Thirty seven fieldwork days were completed over 35 consecutive working days. It was necessary to have two teams in the field on three days over the 35 working day period.

The fieldwork team comprised two UCD Principal Investigators (PIs), two UCD researchers, and a panel of 10 fieldworkers recruited and trained specifically for the fieldwork phase of the project. The team included health professionals who could answer questions relating to BBVs and risk status. To facilitate entry to prisons, an application for Garda security clearance was submitted via the IPS for all fieldworkers.

In advance of each prison visit, Governors and relevant IPS staff were provided with details of proposed arrangements, in addition to staff information sheets and prisoner packs containing a brochure and letter to be delivered by cell drop, and posters to promote the study among both staff and prisoners. In one prison prisoners (Red Cross Volunteers) promoted the study among peers. Information sessions for large groups of prison staff were held where possible. Security clearance for the fieldwork team was arranged by the Governor in all prisons. Staff information was disseminated in advance of the study being notified to prisoners through a cell drop of letter and information sheet, and display of the posters in prominent places.

3.6.1 Fieldwork: Data Collection Process

On arrival in each prison the team met and briefed key IPS personnel. Each day, the senior member of the fieldwork team briefed the IPS staff assigned to go to the landings/cell areas to collect prisoners. In a small number of prisons individual prisoners were notified in advance that they had been selected to participate in the study, but in the majority of prisons selected prisoners only found out that they had been selected when approached on the day by the designated officer(s). In eight prisons, where the response rate was less than expected, the senior member of the team sought permission from prison Governors and senior staff to accompany designated IPS staff when they went to collect selected prisoners – this was permitted in three prisons.

In order to collect attendees, the randomly selected list of PRIS numbers in prison officers' possession now contained names and cell locations and prison-related information, and was collated into an attendance schedule by the IPS liaison taking into account the time available (number of days), landing locations, security, prisoner movement patterns and other logistical issues. These lists with prisoner names were not provided to the fieldwork team.

Briefing of the officers escorting prisoners included asking them:

- To inform the prisoners they had been randomly selected to participate in the voluntary and confidential study on drugs and health in prisons, about which they had received a letter and leaflet within the past few days;
- To encourage selected prisoners to attend the information session before making up their minds regarding participation;
- To encourage prisoners who had visits, school, gym, work, court, or individual appointments scheduled for that morning or afternoon to attend a later session (this was mostly possible in prisons where the schedule was greater than one day) – officers were encouraged to note these prisoners names and to return to them to ask again; and
- To note prisoners who declined to attend, but to let them know that if they changed their minds they could attend a later session.

The IPS Liaison who was overseeing the visit provided participation information at the end of the prison visit, specifically: the number of selected prisoners approached; the number of selected prisoners who declined; and the number of selected prisoners who were not available to attend (no longer in custody [released or transferred], on temporary release, in court, in hospital, unavailable for security reasons), or, late in the schedule, who had completed the study previously in a different prison. During data collection an officer, or officers, normally remained just outside the door of, or adjacent to, the room. Only one prison deemed it necessary to have officers present in the room for the information sessions, and in that case the officers sat outside the room during data collection.

Selected prisoners who came to the information session were provided with a participant information sheet and an information presentation about the process of collecting data through a) the self-administered questionnaire and b) the oral fluid samples, following which a discussion took place and questions were answered. Issues of confidentiality and anonymity were addressed and attendees were notified that because of anonymity, no individual's results would be available or identifiable to any other party. This also meant that individuals would not receive their sample results but participants were informed that blood-borne virus testing could be requested and would be facilitated through the IPS Medical Centres.

Consent forms were read out loud, explained to the group of attendees and questions were addressed. Consent form signatures or marks were witnessed and co-signed by a fieldworker, and the groups' original consent forms were placed together in a sealed envelope. Duplicate consent forms were given to prisoners to keep. The overall number of attendees who did not wish to participate was noted, however, no data was collected from them. This study did not have ethical approval to, nor would it have been appropriate, to collect any information on non-responders.

Part 2 of the information session comprised orientation to the questionnaire document. Each consenting participant was then provided with a questionnaire. Discreet assistance was provided to those who required it. It appeared that assistance was mostly required for literacy reasons or due to poor English language reading skills. All of the allocated rooms were large enough to allow privacy during this process. The average time taken to complete a questionnaire was 20 minutes.

3.6.2 Oral Fluid Sample Collection

Depending on the circumstances, sometimes during but normally immediately following completion of the questionnaire, a fieldworker approached each participant with a sample tray and a transparent A4 sized sample folder containing two oral fluid sampling kits. Each kit and associated forms were pre-coded with the same study identification number, which would become the unique 'study ID' for that participant. The fieldworker checked the participant's duplicate consent form and proceeded to collect the samples for which consent had been provided. Oral fluid samples were collected separately, using propriety drug testing kits for blood-borne viruses (BBVs) and Drugs of Abuse (DOA). The Oral Fluid Collection Devices consist of a treated, absorbent cotton fibre pad affixed to a plastic shaft (Oral Specimen Collection Pad) and a preservative solution in a plastic container (Oral Specimen Vial). The Oral Specimen Collection Pad, impregnated with a mixture of common salts and gelatin, creates a hypertonic environment that produces an osmotic gradient across the buccal and gingival mucosae. The pad was placed in contact with the gingival mucosa (between the gum and cheek) which enhances the flow of mucosal transudate onto the absorptive cotton fibres of the pad, which is left in situ for three minutes. Following collection of the oral specimen, the Oral Specimen Collection Pad was removed from the mouth and placed into the Oral Specimen Vial. The Oral Specimen Vial contains a preservative solution that inhibits the growth of oral microorganisms recovered on the Oral Specimen Collection Pad. The vial was sealed with a plastic cap and placed in the tube provided. Collected specimens can be stored at between 4° C and 37° C for 21 days.

The sample folder contained an additional study ID label, which was placed on the front page of the questionnaire following completion, making it possible to link the BBV sample, the DOA sample and the questionnaire (for those who participated in all three components) to one another without allowing the ID to be traced back to any individual participant. Once the oral fluid sample(s) were taken, the fieldworker asked permission of the participant to look through the questionnaire in case any sections had been omitted in error. This provided an opportunity for the fieldworker to clarify any areas of obvious ambiguity and to amend if necessary. In a minority of cases/sessions this step was not possible because of time and logistical constraints. Participant names or PRIS numbers were not provided to or collected by the fieldwork team and were not recorded on any data collection instrument (questionnaire or oral fluid samples) or on fieldwork logs.

At the end of each morning and afternoon session, the sample folder contents were deconstructed by at least three team members. Questionnaires, BBV and DOA samples were separated and counted and recorded in the fieldwork log. Labelling was checked for consistency and to ensure that it was in place on all components. DOA and BBV samples were sealed into the (provided) individual plastic postal envelopes, placed into appropriately labelled larger opaque plastic bags (which were labelled either DOA or BBV, and whether from the morning or afternoon session, along with the date). Questionnaires were packed in bundles by dated morning or afternoon session. Materials were transported in this manner to UCD, at the end of each day for prisons in or near to Dublin, and at the end of the fieldwork trip for prisons at a distance from Dublin. Questionnaires were securely stored in date order in UCD. BBV and DOA samples were boxed and subsequently collected on a pre-booked basis on the next working day by the laboratory's couriers. BBV samples were transported to the West of Scotland Virology Laboratory at Gartnavel General Hospital, which is part of the Scottish National Blood-Borne Virus Specialist Testing Service. DOA samples were transported to Concateno's Laboratory in Abingdon, UK.

3.6.3 Flexibility Required in Different Prisons

While the aim was to address up to 20 participants in the designated room during each morning or afternoon session, due to individual prison schedules availability of prisoners was normally limited to 10.30 to 12.00 in the mornings and 14.30 to 16.00 in the afternoons. In addition, while the allocated room(s) in all prisons could physically accommodate 20 prisoners, and in most cases a gathering of 20 was permitted by the prison, prisoners did not always arrive at the same time and often arrived sporadically in small groups. It was therefore frequently necessary to provide an information session for less than 20 attendees, and at times to have two or three information/data collection sessions within a single morning or afternoon. In a number of prisons, movement of prisoners was also restricted in order to accommodate the security arrangements needed to segregate gang members and associates. In addition, some sessions, in order to include randomly selected participants who

were segregated or on protection, were held with very small groups, and occasionally on a one-to-one basis, in locations such as segregation units, recreation areas, corridors, and staff offices. The largest number of participants from whom data was collected during a single morning or afternoon was 32; the lowest number was 0. These arrangements contributed to the need for additional days to be added to the original prison visit schedule.

3.6.4 Non-Participation

Table 3.2 Prisoners who declined to attend and declined to participate by prison

	Final eligible available sample	Declined to attend		Attended	Attendees who declined to participate		Declined Total	
	n	n	%	n	n	%	n	%
Arbour Hill	49	13	26.5	36	1	2.8	14	28.6
Castlerea	156	65	41.7	91	9	9.9	74	47.4
Cloverhill	153	98	64.1	55	4	7.3	102	66.7
Cork	119	64	53.8	55	2	3.6	66	55.5
Dóchas Centre	74	41	55.4	33	–	–	41	55.4
Limerick (Female)	24	12	50.0	12	–	–	12	50.0
Limerick (Male)	137	89	65.0	48	2	4.2	91	66.4
Loughan House	46	7	15.2	39	11	28.2	18	39.1
Midlands	198	96	48.5	102	11	10.8	107	54.0
Mountjoy	203	62	30.5	141	13	9.2	75	36.9
Portlaoise	117	91	77.8	26	4	15.4	95	81.2
Shelton Abbey	32	–	–	32	1	3.1	1	3.1
St. Patricks	60	20	33.3	40	–	–	20	33.3
Training Unit	26	–	–	26	–	–	–	–
Wheatfield	272	122	44.9	150	4	2.7	126	46.3
Total	**1,666**	**780**	**46.8**	**886**	**62**	**7.0**	**842**	**50.5**

Of the 1,666 in the final eligible available sample, 780 (47%) declined to attend the information session. Of the 886 prisoners who attended the information session, 62 (7%) declined to participate.

Stated reasons for declining to attend the information session reported by collecting officers, sometimes witnessed on landings by fieldworkers, and suggested by prisoners who did attend, included: being busy; attending the gym, school, workshop or work; mistrust, suspicion, cynicism; apathy; "Don't do drugs"; concerns re MDT (increased in prisons where MDT was taking place during the visit); and concerns re DNA.

In summary, the final effective sample was 824 (49.5%) of those selected to participate.

3.7 Oral Fluid Sample Analysis

A commercial laboratory company in the UK (Concateno) was selected to carry out analysis of oral fluid samples because they provide a full service from specimen collection devices, through logistics, to laboratory analysis for oral fluid specimen analysis for both drug metabolite testing and blood-borne virus testing. Concateno undertake drug metabolite testing in its own laboratory in England and blood-borne virus testing is carried out in the West of Scotland Virology Laboratory.

Two proprietary devices, manufactured by Orasure, were used for sample collection: *Intercept* Oral Fluid Collection device for DOA testing, and *Orasure* Oral Fluid Collection Device for BBV testing. The devices differ in product labelling and the buffer fluid solution used.

3.7.1 Oral Fluid Sample Testing for Drugs of Abuse

There are limitations to testing biological samples for drug metabolites because the actual time a particular drug will remain detectable in any biological sample from different individuals will change significantly based on a wide range of variables, including: the amount of actual drug consumed, the pharmacological properties of the drug, the amount of fluids consumed after ingestion of the drug, the amount of exercise taken after ingestion of the drug, the health of the individual, the genetic makeup of the individual, and the tolerance of the individual to the drug. Oral fluid drug testing reliability is affected by contributory factors such as the administration method of the drug (for example, when smoked or taken orally, deposits can be left in the mouth) and the variability of pH levels within oral fluid.

For drug screening purposes oral fluid testing using enzyme-linked immunosorbent assays (*ELISA*), also known as enzyme immunoassays (EIA), is appropriate. The tests works by means of a colour reaction which is produced in the presence or absence of compounds of similar physical structure to the target compound of the given assay. The intensity of the colour reaction for a given sample is compared to the intensity of the colour reaction for a calibration sample of known concentration of the target analyte. As the reaction is triggered by a structurally similar compound it is susceptible to interference (of cross-reactivity) with compounds which are structurally similar to the target compound, but not the compound itself or of the same group (e.g. opiates), therefore the result produced by this method are indicative and do not unequivocally identify the drug as present, however, the test is appropriate for screening use and the sensitivity and specificity rates for the tests completed are shown below. There is a small risk of false positives, however for non-legal and screening purposes immunoassay is very reliable. For legal purposes, positive or non-negative screening results may require a more detailed confirmation test, but screening tests are appropriate in an anonymous study, where follow-up testing of individuals is not possible. The table below shows the sensitivity and specificity for each test.

Table 3.3 Sensitivity and specificity of oral fluid drug of abuse testing

Test	Sensitivity (%)	Specificity (%)
Benzodiazepines	86	92
Cannabis	96	89
Cocaine	96	87
Opiates	93	90
Methadone	100	94

The OraSure Technologies *Intercept*® MICRO-PLATE assays can accurately and reliably detect drugs of abuse in samples collected with the Intercept Oral Specimen Collection Device. Studies have shown that there is good agreement between assay results and confirmation testing by gas chromatography/mass spectrometry (GC/MS or GC/MS/MS) (Manufacturer's information).

Individual results by Study ID were provided to UCD, individually or in small batches, by email on an intermittent basis during and after fieldwork. Collated results were provided to UCD in an Excel spread-sheet following completion of the study.

During fieldwork 70 DOA samples were misdirected within the laboratory system and did not reach the laboratory for testing. Samples were tracked to a final destination and confirmed as having been put beyond use, most likely through incineration. As the samples were completely anonymous they were not traceable to the study or to any individual who participated and no data protection issues arose. The NACD and Research Advisory Group were informed and consulted in addition to the Prison-Based Research Ethics Committee. Ultimately, following the laboratory evaluating the compatibility of the assay with the collector, and using the anonymous study ID system, it was possible to test for DOA 68 of those samples that had been provided for BBV analysis.

The laboratory have confirmed that analysis of control BBV samples matching previously tested DOA samples for drugs of abuse demonstrated that analysis of BBV samples for drugs of abuse using the DOA ELISA is a valid approach within the same limitation as the DOA immunoassay. The elapsed time and different buffer did not appear to make any difference to the analysis except for the cannabinoids (THC) assay, which was backed up by LC-MS-MS analysis to identify any false positives. As the ELISA test was not designed to be used for BBV samples there are not

equivalent sensitivity and specificity data for the BBV samples tested for DOA, although the control testing done at Abingdon only demonstrated discrepancies on the cannabinoids assay. This proved to be a scientifically valid route for analysis of 68 of the 70 BBV samples, thus minimising the loss to the study to 2 (of 782) DOA results (0.3%). In summary, the laboratory is satisfied that the DOA results on the BBV samples are valid for all of the tests.

3.7.2 Oral Fluid Sample Testing for Blood-Borne Viruses

Blood-borne virus analyses were carried out in the West of Scotland Virology Laboratory at Gartnavel General Hospital, which is part of the Scottish National Blood-Borne Virus Specialist Testing Service. It holds Clinical Pathology Association (CPA) accreditation incorporating Standards of the Medical Laboratory ISO 15189:2003. Diagnosis of hepatitis B, hepatitis C and HIV is made by taking blood from subjects and carrying out serological tests. In recent years oral fluid analysis techniques have been developed and they have been used in previous prison population studies to estimate prevalence of hepatitis B, hepatitis C and HIV. This is a more convenient and safer body fluid on which to carry out virological tests and results obtained are comparable to those obtained with blood tests.

The assays (or tests) used in this study were specific to each blood-borne virus:

- Hepatitis B: hepatitis B surface antigen test (Murex HBsAg Version 3, Murex Biotech Limited); Sensitivity 90.7%, Specificity 100%.
- Hepatitis C: Anti-HCV antibody test (modified Ortho HCV 3.0 Elisa Test System, Ortho Clinical Diagnostics); Sensitivity 83%, Specificity 93%.
- HIV: Vironostika HIV (Uni-Form II plus O, Biomerieux); Sensitivity 97.2%, Specificity 100%.

The sensitivity rate indicates the proportion of positive cases which are correctly identified by the test as positive, so for example, for HIV above, with a sensitivity rate of 97.2%, we will know that 97.2% of those that test positive for HIV are actually positive. The specificity rate indicates the proportion of negative cases which are correctly identified by the test as negative. So, for example, for hepatitis B and HIV above, with a specificity rate of 100%, we will know that 100% of those that test negative are actually negative.

In previous prison studies testing carried out for estimating prevalence of hepatitis B has used different tests. For example Kazi et al. (2010) and Saiz de la Hoya et al. (2011) tested for hepatitis B using HB surface antigen (HBs Ag). Long et al. (2000) and Butler et al. (2007) used anti-HBc (antibodies to the hepatitis B core antigen) testing. However Guimarães et al. (2001), Butler et al. (1997) and Mahfoud et al. (2010) used both anti-HBsAg and anti-HBc to estimate the prevalence. The test deemed appropriate to use in this study to establish the prevalence of current (recent or chronic) infection with hepatitis B was the anti-HBsAg test. The question of whether it was necessary to also carry out the anti-HBc (anti-core antigen) test was considered. It was possible that a small proportion of participants who are anti-HBsAg negative may be anti-HBc positive, indicating past infection. However, since these persons are unlikely to be viraemic, neither currently nor chronically infected with hepatitis B (and therefore will not be counted as prevalent cases), nor do they pose a risk of transmission, therefore, it was deemed not necessary to carry out the anti-HBc test on those who are anti-HBsAg negative in this study.

Individual results by Study ID were provided to UCD, individually or in small batches, by email on an intermittent basis during and after fieldwork. Collated results were provided to UCD in an Excel spread-sheet following completion of the study. Interpretation of BBV results was reviewed by the National Virus Reference Laboratory.

3.8 Data Entry

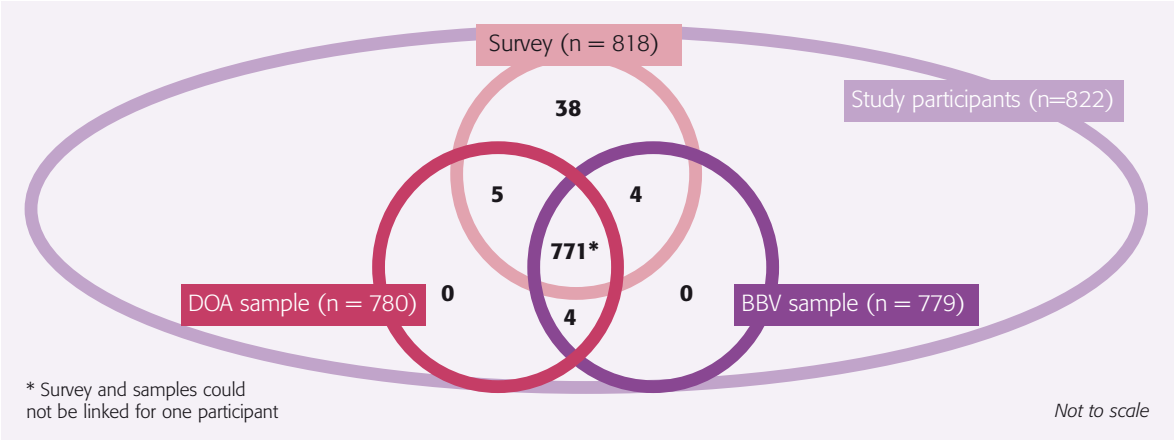
A data dictionary was compiled and a set of data entry rules was agreed. The data dictionary contained abbreviated variable names, full name of variables, definitions of variables, source(s) and coding options.

In order to facilitate accurate and speedy data entry of questionnaire data, the questionnaire form was reproduced as a web page form. The user entered data on the web form exactly as it was entered by the participant in the original questionnaire form. The output file was capable of being opened in Microsoft Excel or any other spreadsheet program. At the end of each day of data entry the set of files was removed from the desktop of the user's machine and moved to a secure (Trucrypt encrypted) location.

Double data entry of 100% of questionnaire data was carried out. In order to reduce possible errors due to data entry, each survey was captured twice using the web form, each time by a different person. This resulted in two sets of individual-output files. One of these was arbitrarily denoted as the master set and the other the copy set. Following consistency checking the corrected master set was then collated into a single spread-sheet containing all the individual survey entries for the study. An automated procedure was developed for correcting logical blanks using data processing scripts written in the PHP scripting language. This procedure for removing the logical blanks removed the bulk of the inconsistencies due to data entry. In addition, 'backfilling' of questions where prisoners had answered 'yes' to a question which implied that a previous question should have been answered 'yes' was carried out. When discrepancies due to typographical errors and logical blanks were removed the overall rate of data entry errors was 0.8% (based on all sections except for demographic data, which was analysed prior to the discrepancy checking process being automated). This means there was a rate of 99.2% consistency between the double-entered data (master and copy datasets). The outstanding errors were resolved by referring to the original data source and two researchers making joint decisions on a case-by-case basis.

3.8.1 Surveys, BBV samples and DOA Samples Included in the Study

Figure 3.1 Surveys completed and oral fluid samples collected in the study



Following preliminary analysis two of the 824 study participants were excluded as they reported that they were aged over 64 years; subsequent descriptions exclude these two cases. Figure 3.1 shows the remaining 822 eligible study participants and the study components in which they participated (survey and or BBV sample and or DOA sample).

There were 818 surveys completed. One survey was excluded (due to entirely nonsensical responses throughout the questionnaire) leaving 817 valid surveys. It is not unusual in surveys for respondents to fail to respond to individual questions – this may be an error on their part, or it may be because they do not want to answer the question. When estimating prevalence on self-reported questions the denominator for every question can be the total number of respondents to the survey, irrespective of missed items, or it can be the number of respondents to each individual item, thus having a different denominator for each item. In order to comply with EMCDDA guidelines, the NACD requested that the latter method of estimating prevalence be used in this study.

There were 780 eligible DOA oral fluid samples collected. Three samples were excluded (1 with insufficient oral fluid for testing and 2 unavailable samples) leaving 777 DOA screening results available for statistical analysis. This number (n = 777) was used for all analyses based on DOA oral fluid results and was the denominator used for estimating prevalence based on oral fluid samples. It should be noted, however, that two DOA samples had insufficient specimen to carry out the cannabis test, therefore the denominator for analysis of cannabinoids from oral fluid was 775.

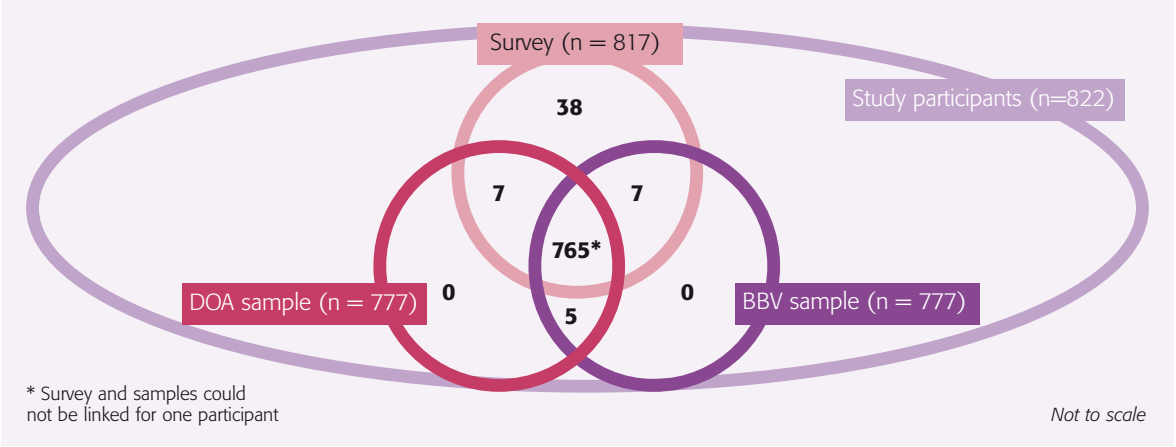
There were 779 BBV eligible BBV oral fluid samples collected. Two samples were excluded (rejected by the laboratory due to a labelling inconsistency) leaving 777 BBV sample results available for statistical analysis. This number (n=777) was the basis for all analyses of prevalence estimates based on BBV oral fluid sample test results.

There were 6 participants for whom survey and biological sampling data could not be linked, including one participant who completed a survey during a morning and provided samples in the afternoon; it was not possible to link the survey data with the biological samples because two different study IDs were used for the survey and for the DOA/BBV samples.

Concordance analysis of BBV samples with self-reported blood-borne virus status was based on the 771 participants for whom both survey results and BBV sample results are available and linkable.

Figure 3.2 shows the surveys and oral fluid samples that were available for statistical analysis.

Figure 3.2 Surveys and oral fluid samples available for statistical analysis



3.9 Data Analysis

Statistical analysis was carried out using PASW version 18, SAS version 9.1 and WinPepi 11.15. For discrete/categorical variables data were described and summarised using frequency counts and percentages. For continuous variables data were described and summarised using means, standard deviations, medians, quartiles and ranges as appropriate.

Self-reported prevalence was estimated using all those who reported drug use (i.e. responded 'Yes' to the prevalence questions) as the numerator and all those who responded to relevant survey questions as the denominator; missing values for prevalence questions were excluded from the denominator. Prevalence of BBV and DOA screening was estimated based on all those who tested positive to the relevant test as the numerator and all those who provided usable samples (n = 777) as the denominator. As described in section 3.8 the denominator for cannabis was 775 and there were no other missing values.

Confidence intervals (95%) were calculated for prevalence proportions using the Wilson Score Method without continuity correction (Wilson, 1927; Newcombe, 1998; Agresti and Coull, 1998) for drug use, injecting drug use, and blood-borne virus status (self-reported and results of oral fluid sampling). Correction of confidence intervals for finite populations was carried out (Burstein, 1975).

For comparisons between groups (e.g. male versus female) the appropriate statistical techniques were used: paired or independent t-tests or Wilcoxon Rank Sum test for comparison of means and medians/distributions respectively. For comparisons between proportions the Pearson Chi square test or Fisher's Exact Test were used as appropriate. Differences with a p value <0.05 were regarded as statistically significant.

Analysis of factors potentially predictive of blood-borne virus status was carried out using multivariate analysis for a dichotomous dependent variable, i.e. logistic regression. Odds Ratios and 95% confidence intervals are reported for variables found to be significant in multivariate analysis. These are generated from the Logistic Regression process.

Prison Drug Use Categories

A cluster analysis was performed to see if any obvious drug use classification for the prisons was naturally apparent in the data. Cluster analysis is a useful and widely used technique to probe a dataset to see if core objects in the dataset (e.g. the prisons) are naturally grouped based on some set of observations for each of these objects (e.g. the drug use level in each prison) (Kaufmann, 1990).

In this analysis we were interested in looking at the prisons according to the drugs associated with the EMCDDA definition of *recent problematic drug use* (EMCDDA, 2006). Recent problematic drug users are defined as those *who have injected or regularly used opiates, cocaine, amphetamines in the last 12 months*. This definition includes legal opiates such methadone. In this study data were not collected on 12 month frequency of use, however we used reported use of the key drugs (from this definition) in the last 12 months in individual prisons in an attempt to identify prisons which group together according to drug use of resident prisoners. Hence, from the survey data we determined the use levels in the last 12 months for prisoners in each prison for each of Heroin, Methadone, Other Opiates, Crack Cocaine, Cocaine Powder (survey Section B, questions 4 d to h inclusive) and injected Amphetamines (Section D, question 5 b) – the use level is the percentage of prisoners who answered 'yes' to the question, and excluding those who refused to answer the question. Note that this is the use level in the last 12 months regardless of whether that use was inside or outside prison.

Cluster analysis looks at how 'close' objects are to each other based on the observations. This requires a 'distance' between objects. Using a Euclidean measure, the distance between two objects A and B is defined as:

$$D_{AB} = \sqrt{\sum_i} (xi^A - xi^B)^2$$

where xi^A, xi^B are the values for the i^{th} observation for A and B respectively. In this analysis there are six observations for each prison, and the squared 'distance' between two prisons is the sum of the squares of the differences between the two prisons for each of these six observations. Other measures of 'distance' are also possible, but there is no compelling reason not to use the standard Euclidean measure in this analysis. Normally the xi are observations taken at different scales or units, and the data needs to be standardised to remove this scale dependence. In this analysis all the six observations are use levels valued between 0 and 1 so no such standardisation is necessary.

One of the primary methods for performing cluster analysis is Hierarchical (also called Agglomerative) clustering (Kaufmann et al., 1990). This is a bottom up approach: the algorithm starts by joining the 'closest' two objects to form a cluster, and successively joins the next closest objects/clusters to form the new greater cluster until the data are finally described by a single cluster. The results from hierarchical clustering are best illustrated using a dendrogram (tree diagram). The resulting dendrogram for this present analysis is shown in figure 3.3. Reading from the bottom up, each horizontal line in the tree represents an agglomeration step in the algorithm. The items grouped below this horizontal line give the cluster formed at that step of the algorithm. The data objects (i.e. prisons) are on the horizontal axis, and the distance between the clusters joined at each step on the vertical axis. A large change in vertical height in forming a cluster signifies that the cluster formed at this step is 'loose' and probably not a valid cluster. Conversely, a short vertical span for a given cluster signifies a compact cluster likely to be a true grouping in the data. Note there is no scale on the horizontal axis: this is merely an ordering of the objects to correctly display the tree structure.

The number and membership of any clusters in the data are determined by inspection of this dendrogram. The dendrogram in figure 3.3 strongly shows a four cluster solution in the data. These clusters are outlined by the different coloured rectangles overlayed on the dendrogram.

An important point to note is that the only input to this Hierarchical clustering algorithm is the distance matrix, D_{AB}, as defined above. This only gives the distance between objects (prisons), not between clusters of objects. Hence a further choice is required of how to determine this distance between clusters as they are formed, based solely on the distance between objects. Amongst the several standard methods are:

- *Complete Linkage:* The distance between two clusters is measured by the largest possible distance between observations in the two clusters. Usually clusters with similar diameters are obtained.
- *Average Linkage:* The distance between two clusters is given by the average of the distances between all the possible pairs of observations. Usually clusters with similar variances are obtained.
- *Ward's Method:* This method is based upon the concept of within sum of squares. The two clusters with the smallest between sum of squares are joined. This method is regarded as very efficient and usually finds the most compact clusters in the data.

Each of these methods generally produces slightly different dendrograms and cluster memberships. Ward's method was used to generate the dendrogram in figure 3.3. The other methods produced slightly different dendrograms but similar cluster memberships.

It is also possible to use a top-down approach to cluster analysis, so-called Partitional Clustering. Unlike Hierarchical clustering, in Partitional clustering the number of clusters is not inferred from the results but is an input to the algorithm. The number of clusters expected, *k*, must first be chosen, and then the output of the Partitional techniques is the membership of these *k* clusters. There is no dendrogram in this approach. The different Partitional algorithms all work similarly: the objects are initially randomly partitioned into *k* clusters, and then the membership of these clusters is iteratively changed to maximise some objective measure of 'distance' between clusters. The most commonly used Partitional technique is the *k-means* algorithm (Kaufmann et al., 1990). As a further check on the results of our Hierarchical clustering we also applied k-means clustering with an input number of clusters k=4. This produced an identical cluster membership as given in the dendrogram in figure 3.3.

It is important to note that there is no best method to use in cluster analysis. The type of data in the analysis is irrelevant to the method used. What is relevant is the "shape" of the clusters, but of course this is not *a-priori* known. Where there are clearly distinct clusters, regardless of shape, all the cluster methods will give the same number of clusters and identical cluster membership. Where there is some overlap between clusters, the different methods will favour different cluster shapes, and so it is possible that the different cluster methods will give different numbers of clusters and cluster membership. Hence, in a cluster analysis, it is important to try different methods and see if there is consensus across the methods – this is true in this study. Partitional k-means and Hierarchical clustering are methods that reveal the most compact clusters in the data, so the results from these methods are generally trusted most.

When this study commenced, no model existed for categorising prison according to the drug use history of its residents. This post-hoc clustering model provides a means of categorising prisons based on prisoners' self-reported use in the previous 12 months of the six drugs included in the EMCDDA 'problem drug use' definition. This provides a way of describing drug use within the prison service at an aggregate level including all prisons, without compromising confidentiality or anonymity by naming individual prisons. It must be emphasised that this is based on self-reported drug use among those who participated in the study.

Cluster analysis is only a descriptive technique, not a statistical testing methodology. Results are very much a matter of interpretation. However, the hierarchical clustering method employed in this study strongly shows a four cluster description of the data, and the summary statistics for each cluster as reported elsewhere in this report also strongly support this four group structure in the data.

As might be expected the trend for overall percentage use of each drug increases across the levels of prison defined. The ranges are provided to assess discrimination between categories. While some overlap occurs between prisons in some drugs, the ranges demonstrate that the technique used is robust in describing prisons by level of use.

In table 3.4 the combined numbers who reported 12 month drug use in each prison in the cluster forms the numerator for the overall percent. The denominators are the combined number of participants from each prison. The range is compiled from the percent use in each individual prison in the cluster.

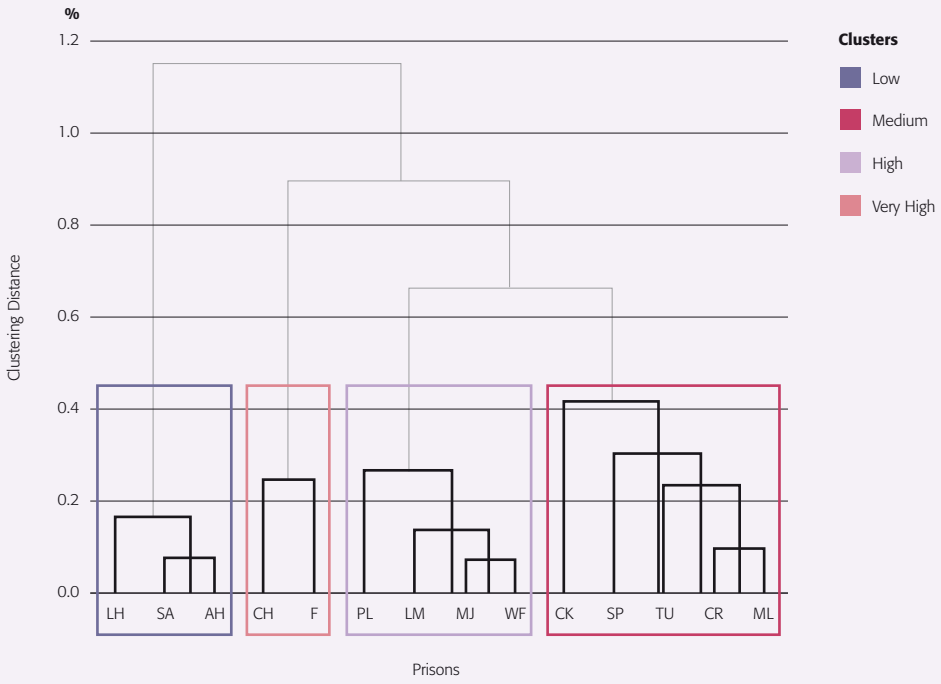
Table 3.4 Overall percent self-reported drug use in the last 12 months by cluster

	Low Use			Medium Use			High Use			Very High Use		
	n	Overall %*	Range %**	n	Overall %*	Range %**	n	Overall %*	Range %**	n	Overall %*	Range %**
Heroin	9	10.1	7–12	68	24.5	8–31	119	36.0	33–46	37	39.8	33–67
Methadone	1	1.1	1–3	28	10.0	3–15	93	27.8	20–30	45	47.9	41–67
Other Opiates	5	5.7	4–7	38	13.5	6–36	45	13.5	5–16	15	16.7	12–42
Crack Cocaine	1	1.1	0–4	22	7.9	7–11	44	13.2	5–17	25	27.5	23–28
Cocaine Powder	10	11.2	6–20	85	30.1	17–40	95	28.7	19–32	36	40.4	34–64
IV Amphetamines	0	0.0	0–0	2	0.7	0–2	7	2.1	0–4	3	3.3	0–10

* Overall % = Total numbers using drug in question/Total number of prisoners in prisons in the category.
** Range = Based on the percentage of prisoners in each prison in the category using the drug in question.

Figure 3.3 Dendrogram resulting from hierarchical clustering of prisons based on recent (12 month) 'problematic' drug use of prisoners

Cluster Dendrogram



Dendrogram resulting from hierarchical clustering (Ward's method) of prisons based on recent (12 month) problematic drug use of prisoners, inside or outside of prison. This dendrogram strongly suggests four clusters of prisons. We label these clusters Low, Medium, High and Very High based on summary statistics for these clusters reported elsewhere in the report. These cluster memberships are:

Low
(n = 91)
SA: Shelton Abbey
AH: Arbour Hill
LH: Loughan House

Medium
(n = 289)
CK: Cork
SP: St Patrick's Institution
CR: Castlerea
ML: Midlands
TU: Training Unit

High
(n = 341)
PL: Portlaoise
LM: Limerick Male
MJ: Mountjoy
WF: Wheatfiled

Very High
(n = 96)
F: Female
CH: Cloverhill

Note that both female prisons were pre-grouped as one: they showed similar statistics and are clearly distinct from the other prisons in the study. This is borne out by this cluster analysis and other descriptive statistics in this report.

Dendrogram resulting from hierarchical clustering (Ward's method) of prisons based on recent (12 month) problematic drug use of prisoners, inside or outside of prison. This dendrogram strongly suggests four clusters of prisons. We label these clusters Low, Medium, High and Very High based on summary statistics for these clusters reported elsewhere in the report. These cluster memberships are:

Low	Medium	High	Very High
(n = 91)	(n = 289)	(n = 341)	(n = 96)
SA: Shelton Abbey AH: Arbour Hill LH: Loughan House	CK: Cork SP: St Patrick's Institution CR: Castlerea ML: Midlands TU: Training Unit	PL: Portlaoise LM: Limerick Male MJ: Mountjoy WF: Wheatfiled	F: Female CH: Cloverhill

Note that both female prisons were pre-grouped as one: they showed similar statistics and are clearly distinct from the other prisons in the study. This is borne out by this cluster analysis and other descriptive statistics in this report.

4.1 Response Rates

Eight hundred and twenty four (824) prisoners took part in the study, giving an overall response rate of 49.5%. The range of response rates was from 33.3% to 100%. A detailed breakdown by prison is provided in table 4.1. Most of the prisons provided a majority response rate. Only three, Cloverhill, Limerick male and Portlaoise, had poor response rates.

Table 4.1 Response rate by prison

Prison	Final eligible available sample	Declined total		Participants	Response rate
	n	n	%	n	%
Arbour Hill	49	14	28.6	35	71.4
Castlerea	156	74	47.4	82	52.6
Cloverhill	153	102	66.7	51	33.3
Cork	119	66	55.5	53	44.5
Dóchas Centre	74	41	55.4	33	44.6
Limerick (Female)	24	12	50.0	12	50.0
Limerick (Male)	137	91	66.4	46	33.6
Loughan House	46	18	39.1	28	60.9
Midlands	198	107	54.0	91	46.0
Mountjoy	203	75	36.9	128	63.1
Portlaoise	117	95	81.2	22	18.8
Shelton Abbey	32	1	3.1	31	96.9
St. Patricks	60	20	33.3	40	66.7
Training Unit	26	–	–	26	100.0
Wheatfield	272	126	46.3	146	53.7
Total	**1,666**	**842**	**50.5**	**824**	**49.5**

The overwhelming majority of participants took part in all three components of the study (the questionnaire, biological sample for DOAs and biological sample for BBVs). A small number of participants did not take part in one or other components of the study. Participation rates for each component are provided in table 4.2. This may be interpreted as random rather than systematic error for the purposes of data interpretation.

Table 4.2 Participation in study components by prison

Prison	Attended	Declined all components	Participated in at least one component	Component Participation		
				Survey	BBV	DOA
	n	n	n	n	n	n
Arbour Hill	36	1	35	35	33	33
Castlerea	91	9	82	82	78	78
Cloverhill	55	4	51	51	45	45
Cork	55	2	53	53	51	51
Dóchas Centre	33	–	33	33	33	33
Limerick (Female)	12	–	12	12	12	12
Limerick (Male)	48	2	46	46	44	44
Loughan House	39	11	28	25	27	28
Midlands	102	11	91	91	87	89
Mountjoy	141	13	128	128	121	122
Portlaoise	26	4	22	22	16	15
Shelton Abbey	32	1	31	31	31	31
St. Patricks	40	–	40	40	38	38
Training Unit	26	–	26	26	26	26
Wheatfield	150	4	146	145	139	137
Total	**886**	**62**	**824**	**820**	**781**	**782**
Component participation rate				99.5%	94.8%	94.9%

Within Ireland the two previous inmate studies (Allwright et al., 1999 and Centre for Health Promotion Studies, 2000) achieved an 85% and 88% response rate respectively. However, while these studies asked some questions about drug use the questions were not as detailed as in the current study, and neither included a biological test for drugs and this may have been an important factor. Furthermore, both studies were carried out over a decade ago. A number of developments have taken place in the last decade in the Irish prison system that could have reduced the response rate in the present study. These include improvements in the work, school and gym facilities, the introduction of in-cell televisions (IPS, 2002, 2003 and 2004) and the introduction of continuous drug supply elimination measures (IPS, 2006). It is also possible that IPS staffing levels in 1999 facilitated a higher response rate by facilitating research team members to visit landings, explain the purpose of the study and carry out the survey in individual cells for those prisoners that initially did not wish to participate. Though a crude measure, the number of IPS staff in 1999 exceeded the number of prisoners. There was 3,073 staff for a daily average of 2,871 prisoners and 10,834 committals (IPS, 2002). In contrast in 2009/10, the number of prisoners exceeded the number of staff. There were 3,385 staff for a population of around 4,100 (CPT, 2011) and 15,425 committals (IPS, 2010). In this study, with very few exceptions, the research team could not approach selected individuals to solicit participation. While every possible resource was provided to facilitate this study it was generally not possible to visit landings or to directly recruit selected participants.

As the prevalence of lifetime, last year and last month self-reported drug use (including IV drug use), and of biologically proven drug use and blood-borne viruses are reported by prison category as well as overall, it was considered relevant to examine the response rates by prison category.

Participation was considerably lower in the 'very high' drug use prison category (38%) compared with that in the other categories (74%, 52% and 47% in the 'low', 'medium' and 'high' use prisons).

Table 4.3 Response rate by prison drug use category

	Final eligible available sample	Declined total		Participants	Response rate
	n	n	%	n	%
Low Use	127	33	26.0	94	74.0
Medium Use	559	267	47.8	292	52.2
High Use	729	387	53.1	342	46.9
Very High Use	251	155	61.8	96	38.2
Total	**1,666**	**842**	**50.5**	**824**	**49.5**

It could be suggested that this may reflect reluctance on the part of prisoners in the 'very high' use prisons to participate in a study which could reveal their drug use habits. While there is no way of ruling out that possibility, it cannot be assumed to have a 'cause and effect' relationship on study participation. There are several other potential reasons for reduced participation in these particular prisons, including:

- a higher proportion of prisoners in the 'very high' drug use prisons are likely to be in short term and pre-sentence custody (committals, remand prisoners, etc). It is known, for example, that 68% of those in the 'very high' use prisons are remand prisoners, compared with 4.9%, 8.7% and 0.25% of those in the 'high', 'medium' and 'low' use prison respectively (IPS, 2011). The three prisons in the 'very high' drug use category are the prisons with the highest proportion of remand/trial prisoners in the system (Dóchas 23%; Limerick female 19%; and Cloverhill 84%). In contrast the prisons in the 'low' drug use category comprise Arbour Hill, where the population is largely made up of long term sentenced prisoners with no remand/trial prisoners, and the open prisons Shelton Abbey and Loughan House, with virtually no remand prisoners (IPS, 2011);
- a significantly higher proportion of the prison population in the 'very high' use prisons (49.5%) had been in prison for less than three months compared with the other prison categories (10.3%, 21.3% and 17.3% in low, medium and high use prisons respectively). While prisoners in custody < 3 months also comprised a higher proportion of the sample from the 'very high' use prisons compared with the same proportion from the other categories of prison, the relative proportion was lower (12.3% vs 18.9%, 14.3% and 17.7% respectively). This substantiates the relative lack of availability of prisoners in the very high use prisons due to court appearances, solicitors' visits and interaction with other professionals compared with this group of prisoners in the other prison categories; and
- the two female prisons in Ireland are included in the 'very high' drug use category. It is known that the committal rate among female prisoners (12.4% of committals are females; 3.8% of the prison population are female) is higher than that among male prisoners (87.6% of committals are male; 96.2% of the prison population are male) (IPS, 2011). It has also been noted in the previous studies that women prisoners less likely to participate in studies than male prisoners (Allwright et al, 1999; Centre for Health Promotion Studies, 2000).

Notwithstanding the reasons for lower participation rates in the 'very high' use prisons, the potential impact of varying rates of participation on the overall prevalence rates of drug use and blood-borne viruses were considered. Overall (crude) prevalence rates for all drugs and BBVs were adjusted for participation rate by prison category. The 'weighted' prevalence rates derived were compared with the crude rates. Results of these analyses are provided in the Technical Report. It will be noted that the impact of participation rate by prison category on the overall prevalence of lifetime, 12 month and 30 day drug use is negligible. The impact of varying participation by prison category on the overall prevalence of the blood-borne viruses is also negligible.

Therefore, in the interest of ease of interpretation and comparability with previous studies, it was decided to present overall crude prevalence rates rather than weighted prevalence rates for both drugs and BBVs in this report. To our knowledge this is the first study in Ireland or the UK in which prison category has been defined as described and has been used to report use of drugs and BBVs by category.

4.2 Description of the Sample

Respondents were predominantly male (94.5%) reflecting the gender breakdown of the prisoner population. The mean age was 31 years (male 31 and female 30) and the median age was 28 years for men and women. The majority of respondents were Irish (92%), and 87% were born in Ireland.

Table 4.4 Demographics: Gender and age distribution

	All n = 817 %	Male n = 772 %	Female n = 45 %	18–24 years n = 254 %	25–34 years n = 321 %	35–64 years n = 232 %
All	100.0	94.5	5.5	31.5	39.8	28.7
Male	–	–	–	31.5	39.1	29.4
Female	–	–	–	31.1	51.1	17.8

Table 4.5 Demographics: Ethnic or cultural background

	All n = 812 %	Male n = 767 %	Female n = 45 %	18–24 years n = 254 %	25–34 years n = 318 %	35–64 years n = 231 %
White Irish	80.4	80.4	80.0	76.8	80.8	84.8
White Irish Traveller	11.1	11.2	8.9	18.5	10.1	3.9
Any other white background	3.8	3.8	4.4	2.4	3.8	5.2
Black, Asian or other, including mixed background	4.6	4.6	6.6	2.4	5.3	6.0

There was a relatively high proportion of Travellers, especially males in the 18–24 year age-group, also moderately so relative to the prevalence of Travellers in the general population, which is 1% (All Ireland Traveller Health Study team, 2010).

Table 4.6 Demographics: Educational background

	All n = 807 %	Male n = 764 %	Female n = 43 %	18–24 years n = 252 %	25–34 years n = 317 %	35–64 years n = 229 %
No schooling	3.8	4.1	0.0	2.8	3.2	6.1
Primary school education only	19.3	19.8	11.6	17.5	18.9	20.1
Some secondary education	47.3	47.8	39.5	61.1	45.4	35.8
Complete secondary education	16.6	16.2	23.3	13.9	18.0	17.9
Some third level education at college, university, IT	8.2	7.3	23.3	4.4	10.7	9.2
Complete third level education at college, university, IT	4.7	4.8	2.3	0.4	3.8	10.9

Educational background results revealed a group with much lower educational attainments than the general population, as reported in the 2006 census (CSO, 2007), with 23% of prisoners having received no schooling or primary education only (vs 19% for the general population), 47% with some secondary (vs 21% with lower secondary), 17% with completed secondary education (vs 30% with upper secondary), and 13% with some third level or completed third level (vs 31%). This educational profile is broadly consistent with results from the 1999 General Healthcare Study of the Irish Prisoner Population (Centre for Health Promotion Studies, 2000).

Table 4.7 Demographics: Length of time in prison on this occasion

	All n = 805 %	Male n = 761 %	Female n = 44 %	18–24 years n = 249 %	25–34 years n = 316 %	35–64 years n = 231 %
< 1 month	4.6	4.1	13.6	5.2	3.8	5.2
1–3 months	11.8	11.3	20.5	17.3	10.1	8.7
3–12 months	22.7	22.5	27.3	29.7	25.0	12.6
1–3 years	34.4	34.3	36.4	32.9	35.1	33.8
> 3 years	26.1	27.5	2.3	14.5	25.6	39.4
Don't know	0.4	0.4	0.0	0.4	0.3	0.4

The majority of prisoners (60%) had been in custody for more than one year and a majority had spent more than three of the past 10 years in prison (52%).

Table 4.8 Demographics: Length of time in prison in the last 10 years

	All n = 753 %	Male n = 714 %	Female n = 39 %	18–24 years n = 232 %	25–34 years n = 300 %	35–64 years n = 213 %
< 1 month	1.2	0.8	7.7	1.3	0.7	1.9
1–3 months	4.8	4.6	7.7	7.3	3.7	3.8
3–12 months	13.1	12.7	20.5	18.1	11.7	10.3
1–3 years	26.7	26.1	38.5	28.9	26.7	24.4
> 3 years	51.8	53.4	23.1	40.9	55.0	58.2
Don't know	2.4	2.4	2.6	3.4	2.3	1.4

More than one in ten of those surveyed had experienced homelessness for more than seven days in the year before the study. A significantly higher proportion of women did so than men (29% vs 11%, $p<0.01$). When analysis was confined to those who had been in prison for 12 months or less, 23% responded that they had lived on the street in the previous 12 months; in this analysis women were also significantly more likely to have experienced homelessness in the previous 12 months than men (46% vs 22%, $p<0.05$), however there was no difference by age-group.

Table 4.9 Demographics: Homelessness in the previous 12 months

	All		Male		Female		18–24 years		25–34 years		35–64 years	
	n	%	n	%	n	%	n	%	n	%	n	%
Lived on the street for more than 7 days in previous 12 months	85	12.4	74	11.4	11	28.9	29	13.6	29	10.6	27	14.1
Lived on the street for more than 7 days in previous 12 months (among those who had been in prison for 12 months or less)	63	23.4	53	21.5	10	45.5	24	21.4	23	22.1	16	30.8

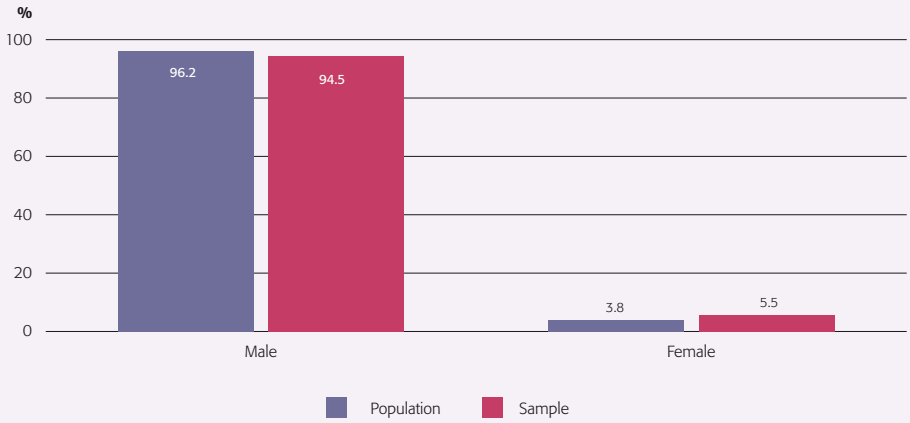
4.3 Representativeness of the Sample

Representativeness of the sample was assessed on demographic information provided by participants, and on comparable anonymous population demographic data provided by the IT department of the IPS. The IPS provided demographic data for all prisoners in custody in each prison, on the date that the list was sent to Governors for the random selection exercise, for the following variables: age, nationality (country of origin), ethnic origin and number of days in custody. Separate data was provided for male and female prisoners in Limerick prison, otherwise gender was assumed based on the prison.

It should be noted that a) prisoner movement over the time frame of the study may have resulted in some unidentifiable double-counting in the IPS population data, and that b) the total number for whom IPS demographic data were provided (4,569) exceeds the number in the sampling frame (4,474) by 2%. The latter is due to the time of day that the IPS data generated each list, i.e. lists for Governors during fieldwork were generated from live reports, reflecting the population at the exact time the report was generated, and population demographic reports for comparison purposes were generated from recorded daily statistical summaries.

The sample is strongly representative of the prison population on most demographic characteristics.

Figure 4.1 Population and sample: Gender distribution



Women are slightly over-represented. Full sample, male and female mean and median ages were all within 1 year of the corresponding population results, although women were over-represented in the 25 to 34 age-group.

There were no significant differences in age distribution across the age categories for the full population or for the male and female sub-groups, using t-tests for equality of means and Pearson chi-square test to detect significant differences in proportions.

Figure 4.2 Population and sample: Age distribution

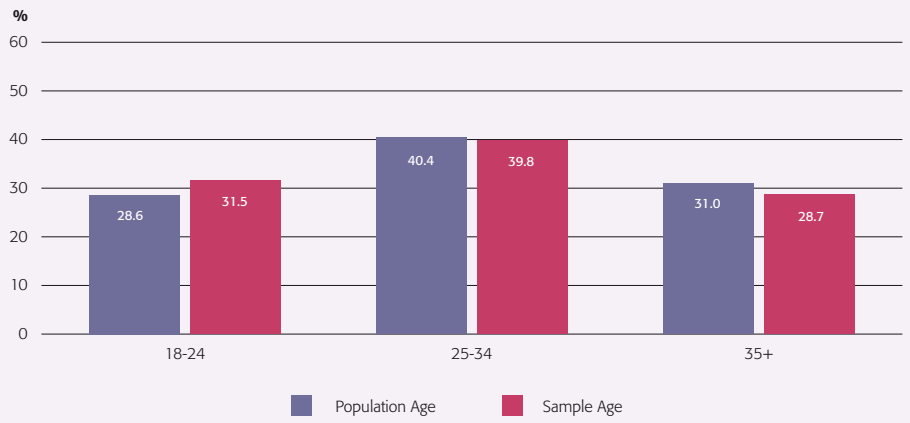
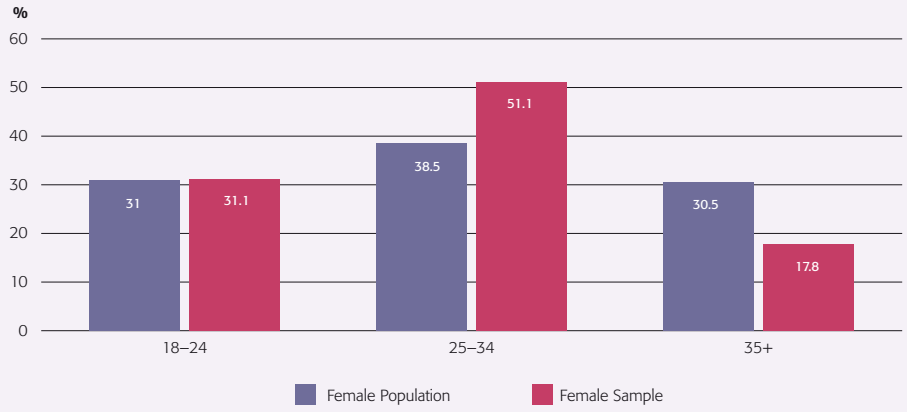


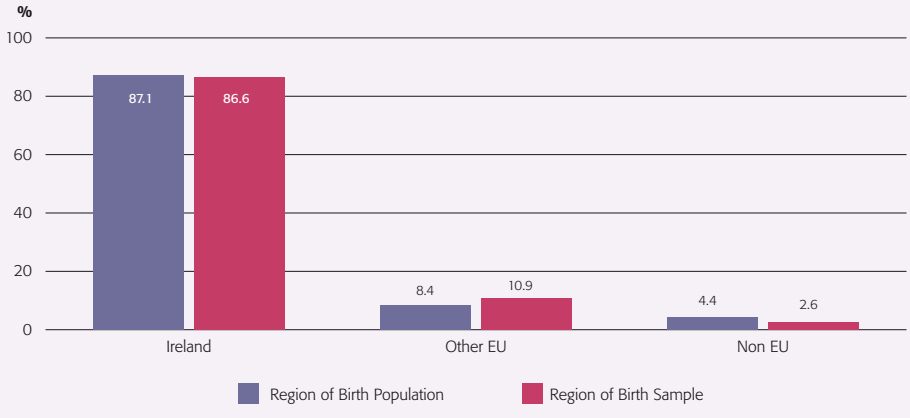
Figure 4.3 Population and sample: Male age distribution

Figure 4.4 Population and sample: Female age distribution



The overall sample, and both male and female groups sampled are representative of the population in relation to region of birth (Pearson chi-square test not significant) being Ireland or other place of birth. While non-EU females are under-represented (4.4% in the sample vs 11.5% in the population), this is likely to be due to the small numbers involved or to language difficulties.

Figure 4.5 Population and sample: Region of birth

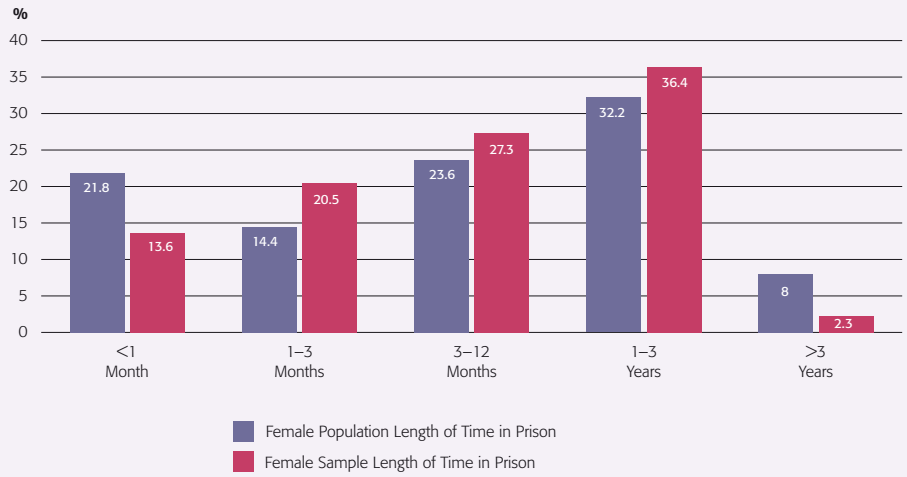


Prisoners in custody for less than one month are under-represented in the sample as previously discussed. This is not unexpected, as prisoners deemed ineligible for inclusion in the study by the Governors, or who were unavailable when escorting officers went to collect them, were more likely to have included a) people who had been in prison on remand or on very short sentences and had been released by the time data was collected, b) prisoners who were committed near to the date of the study and were either released, transferred or in court when data collection was carried out, and c) prisoners who were committed in the short timeframe between generation of the random sample and commencement of data collection. The proportions in each sentence grouping are broadly similar and the maximum difference between groups in any category is 7%.

Figure 4.6 Population and sample: Length of time in prison

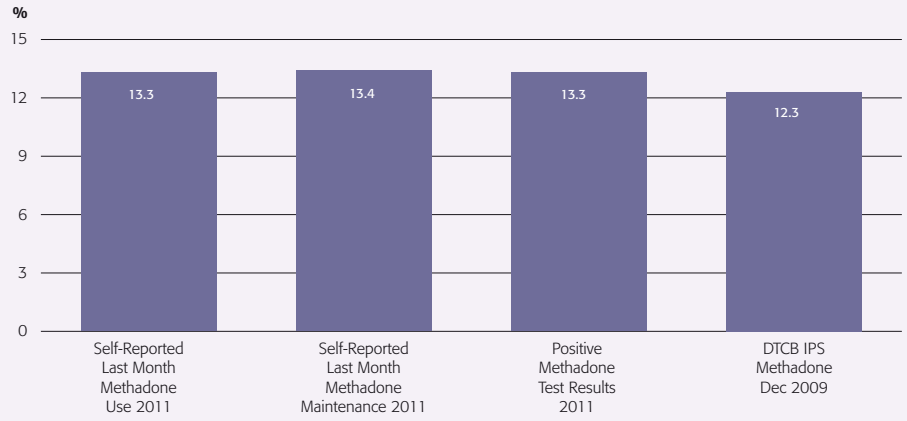
Figure 4.7 Male population and sample: Length of time in prison on this occasion

Figure 4.8 Female population and sample: Length of time in prison



The proportion of the sample that self-reported methadone use and the proportion that tested positive for methadone were consistent with the proportion of prisoners on methadone treatment reported by the Drug Treatment Centre Board (DTCB) in December 2009. In figure 4.9 the numerator for the DTCB methadone treatment proportion is the number in IPS DTCB methadone treatment at the 'end of period' January to December 2009 (496) (information provided by IPS). The denominator is the IPS 'snapshot' prison population of 4,040 in custody on 04 December 2009 (IPS 2009 Annual Report, 2010).

Figure 4.9 Methadone use



A concern in any study of this type is the potential impact of non-response on the validity of the results obtained. Non-responders may differ from responders in respects which are relevant to the outcomes of the study. In this instance the concern would be that non-responders may differ in relation to their drug use habits or BBV status. While every effort was made to ensure as high a response rate as possible (prior notification, information sessions with prison staff and prisoners, assurances of confidentiality, etc.) it must be acknowledged that this is a particularly challenging group from which to illicit co-operation. There are many reasons for this, including:

a) lack of availability due to court appearances, visitations, school, gym or work activities;
b) apathy and disillusionment with anything to do with establishment;
c) suspicion of the motivation for the study;
d) confusion with Mandatory Drug Testing in the prison; and
e) concerns about confidentiality of the data and possible repercussions and sanctions.

It is not clear, however, that these factors were unique to those who are more or less likely to be drug users or BBV positive. Therefore, it is not possible to say what impact, if any, a higher response rate would have had on the prevalence rates derived. Suffice it to say that the final sample achieved was representative of the total population of prisoners in custody at the time on all major demographic variables and on prison-related variables of length of time in custody and methadone use, and is therefore acceptable for data interpretation purposes. The demographic characteristics of the prisoner sample are also similar to that found in previous surveys (Hannon et al., 2007) and in keeping with the international scientific literature – prisoners are much more likely to be male, in their thirties, with very poor levels of education.

4.4 General Health

Table 4.10 General health: Self-reported health

	All n = 749 %	Males n = 706 %	Females n = 43 %	18–24 Years n = 235 %	25–34 Years n = 294 %	35–64 Years n = 212 %
Excellent	12.3	12.7	4.7	14.5	10.9	12.3
Very Good	27.2	27.1	30.2	30.6	26.9	24.1
Good	40.9	40.9	39.5	40.9	45.2	34.9
Fair	15.9	15.4	23.3	11.5	15.0	21.7
Poor	3.7	3.8	2.3	2.6	2.0	7.1

Male prisoners' self-rated health status had improved since the general healthcare study of the prisoner population (Centre for Health Promotion Studies, 2000), when only 28% reported excellent or very good health (vs 40% in this study) and 4% as poor (no change). For women, self-rated health had also improved; in 1999 15% of women prisoners reported excellent or very good health (vs 35% in this study) and 7% as poor (vs 2%). Despite the improvement, this is a lot lower than in SLAN 2007, where 58% rated their health as excellent or very good and 3% as poor (Morgan et al., 2009), but somewhat less positive than in the All Ireland Traveller Health Study (AITHS, 2010) where adults indicated that their health was excellent (23%) or very good (28%). There was no significant gender difference in self-rated health, however, there was an age-related difference, with older prisoners significantly more likely to rate their health as fair or poor than the other age-groups ($p<0.01$).

4.5 Extent of Consumption for Different Drugs among the Prisoner Population

Summary results are presented here for self-reported lifetime, last year and last month drug use. Full prevalence tables with confidence intervals are presented in the appendices.

4.5.1 Tobacco (Cigarettes)

Table 4.11 General health: Smoking prevalence

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Ever smoked cigarettes	725	89.7	684	89.6	41	91.1	232	91.7	288	90.6	196	86.0
Smoke cigarettes now	622	86.0	586	85.8	36	90.0	206	88.8	251	87.2	158	81.4

The vast majority (90%) of prisoners had smoked cigarettes during their lifetime and 86% were current smokers. There was no significant difference between men and women but there was a difference for age with the older age-group significantly less likely to smoke ($p<0.05$ for ever smoking and $p<0.01$ for current smoking). Smoking prevalence rates are high among Irish prisoners compared to 76% of Scottish prisoners (Scottish Prison Service, 2009), and to the general Irish population, with 48% of SLAN 2007 respondents having smoked cigarettes at some stage in their lives and 29% reporting being current smokers (Ward et al., 2009). This finding is a modest improvement on, but broadly consistent with, previous findings of the 1999 prisoner General Healthcare Study (Centre for Health Promotion Studies, 2000), which found that over 90% of prisoners had ever smoked and that over 90% were current smokers; that result compared to 31% regular smokers in the 1999 SLAN survey.

The median age for commencing smoking was 13 years (range 4–48) and among current smokers 84% smoked hand-rolled cigarettes (median per day was 20) and 24% smoked branded cigarettes (median per day was 15); 17% of current smokers smoked a combination of branded and hand-rolled.

Table 4.12 Smoking habits

	n	Median	Range	Interquartile range
Age commenced smoking	715	13	4–48	11–15
Branded cigarettes smoked per day (among current smokers)	151	20	1–60	10–20
Hand-rolled cigarettes smoked per day (among current smokers)	522	15	1–80	10–20

4.5.2 Alcohol

The vast majority (96.4%) reported that they had drunk alcohol at some stage in their life, with men significantly more likely to have done so than women (97% vs 87%, $p<0.01$).

In the year before coming into prison nearly nine out ten 10 (87.7%) of those who had ever drunk alcohol reported usually drinking alcohol in a typical week, with men significantly more likely to do so than women (88% vs 74%, $p<0.05$). This shows a moderate increase since the 1999 prisoner General Healthcare Study (men 82% and women 60%) (Centre for Health Promotion Studies, 2000).

Among those who ever drank, the median number of days that alcohol was taken in a typical week (in the year before coming into prison) was three days, and the median number of drinks taken on the days that alcohol was drunk was 12 drinks. The type of alcohol most frequently used was beer for men (80%, down from 91% in the 1999 General Prisoner Healthcare study) followed by spirits (42%, up from 31% in 1999). The type of alcohol most frequently used by women was spirits (64%, up from 44% in 1999) followed by beer (33%, down from 56% in 1999) (Centre for Health Promotion Studies, 2000).

Table 4.13 Frequency of alcohol use (among those who ever drank)

Regarding 12 months before coming into prison	n	Median	Range	Interquartile range
No. of days in a typical week alcohol was drunk	690	3	0–7	2–5
Number of drinks taken on average, on days that alcohol was taken	641	12	0–101	8–20

Patterns of drinking, in the 12 months prior to coming into prison, showed that the majority (about 70%) drink more than once a week, and that about a third drink more often than 2–3 times a week.

Table 4.14 Alcohol: Patterns of alcohol consumption

	Daily		4–5 times a week		2–3 times a week		Once a week		2–3 times a month		Once a month		< once a month		Never	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
How often alcohol was drunk	147	19.2	120	15.7	292	38.2	88	11.5	33	4.3	24	3.1	37	4.8	24	31.1
How often a specified amount of alcohol* was drunk	121	17.0	107	15.0	265	37.3	90	12.7	34	4.8	28	3.9	36	5.1	30	4.2

* equivalent of 4 pints of beer/cider or more, or 7 pub measures of spirits or one bottle of wine on one drinking occasion.

4.5.3 Drug Use: Lifetime Prevalence

Prevalence of drug use was high among prisoners for all drugs. Lifetime prevalence refers to the proportion of the sample that reported ever having used the named drug at the time they were surveyed. A person who records lifetime prevalence may – or may not – be currently using the drug. Lifetime prevalence should not be interpreted as meaning that people have necessarily used a drug over a long period of time or that they will use the drug in the future (NACD, 2011).

Lifetime prevalence for individual drugs among prisoners is shown in table 4.15. Lifetime cannabis use (87%) just falls short of lifetime smoking prevalence (90%), and was the illegal drug reported by the largest proportion, followed by cocaine powder (74%). In 1999, lifetime cannabis prevalence of 78% for male prisoners and 75% for women prisoners was reported (Centre for Health Promotion Studies, 2000). Lifetime prevalence for cannabis among the general population in 2011 was 25% (NACD, 2011). In this study, none of the individual drugs surveyed had a reported lifetime prevalence of less than 33%.

Table 4.15 Self-reported drug use: Lifetime prevalence by gender and age-group

Drug	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	708	86.9	670	87.0	38	84.4	241	94.9	297	92.5	162	70.4
Benzodiazepines	547	67.8	516	67.7	31	68.9	203	80.2	229	71.8	109	48.4
Other Sedatives or Tranquillisers	466	58.2	435	57.5	31	68.9	166	66.4	196	61.6	100	44.8
Heroin	348	43.3	319	42.1	29	64.4	94	37.8	159	50.2	90	39.7
Methadone	262	32.6	235	31.0	27	60.0	60	24.1	128	40.4	69	30.4
Other Opiates	260	32.5	241	31.9	19	42.2	54	22.0	131	41.3	72	31.7
Crack Cocaine	284	35.6	258	34.3	26	59.1	74	29.8	134	42.8	72	31.9
Cocaine Powder	600	74.2	571	74.6	29	65.9	210	83.7	262	81.9	121	53.1

Even given the small numbers, women were significantly more likely than men to have used heroin (64% vs 42%; $p<0.01$), methadone (60% vs 31%, $p<0.001$) and crack cocaine (59% vs 34%, $p<0.01$). There was no significant gender difference for any of the other drugs surveyed.

Figure 4.10 Self-reported drug use: Lifetime prevalence by gender

A pattern of lower use among older prisoners emerged for a number of drugs, with the older age-group of 35 years and above significantly less likely than age-groups 18 to 24 and 25 to 34 years respectively to have used cannabis (70% vs 95% and 93%, $p<0.001$), benzodiazepines (48% vs 80% and 72%, $p<0.001$), other sedatives or tranquillisers (45% vs 66% and 62%, $p<0.001$), or cocaine powder (53% vs 84% and 82%, $p<0.001$).

The age-group of 25–34 year olds was significantly more likely than the older or younger age-groups respectively to have used heroin (50% vs 40% and 38%, $p<0.01$), methadone (40% vs 30% and 24%, $p<0.001$), other opiates (41% vs 32% and 22%, $p<0.001$) and crack cocaine (43% vs 32% and 30%, $p<0.01$).

Table 4.16 recalls the prison drug use categories devised using cluster analysis previously described in Chapter 3. Table 4.17 then shows lifetime drug use by prison drug use category.

Table 4.16 Prison drug use categories

Low use (n = 91)	Medium use (n = 289)	High use (n = 341)	Very high use (n = 96)
Arbour Hill	Castlerea	Limerick Male	Cloverhill
Loughan House	Cork	Mountjoy	Dóchas
Shelton Abbey	Midlands	Portlaoise	Limerick Female
	St. Patrick's Institution	Wheatfield	
	Training Unit		

Note: within categories prisons are presented in alphabetical order, not in order of severity of drug use

In general, the lifetime prevalence rates across the prison drug use categories show an upwards usage history trend, among those currently resident, from low use prisons to the very high use prisons. Levels of significance for differences between the prison categories are shown in the table below.

Table 4.17 Self-reported drug use: Lifetime prevalence by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Cannabis*	71	78.9	247	85.5	307	90.0	83	87.4
Benzodiazepines***	34	38.2	195	68.7	254	74.9	64	67.4
Other Sedatives or Tranquillisers***	35	39.3	161	56.9	212	63.5	58	61.1
Heroin***	20	22.2	100	35.5	171	50.7	57	60.6
Methadone***	9	10.1	61	21.7	138	40.7	54	57.4
Other Opiates*	14	15.9	89	31.4	123	36.6	34	36.6
Crack Cocaine***	13	14.9	86	30.6	139	41.1	46	50.5
Cocaine Powder**	55	61.1	206	72.3	271	79.7	68	72.3

Chi^2 test * p<0.05, ** p<0.01, *** p<0.001

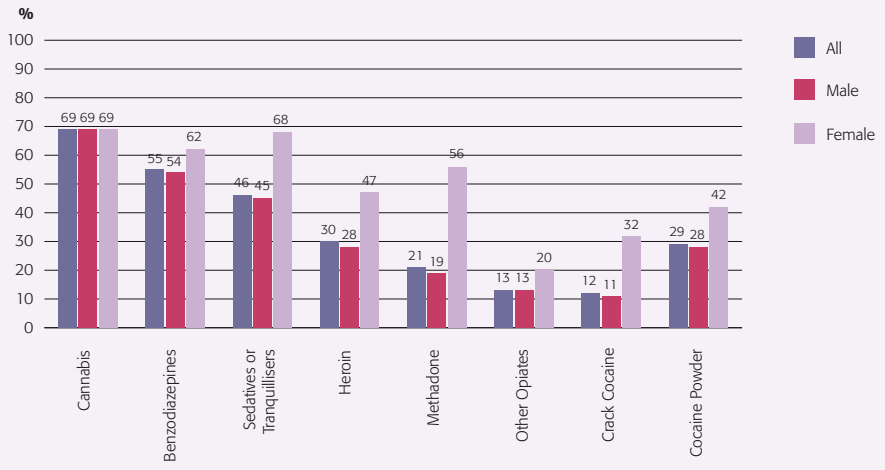
4.5.4 Drug Use: Last Year Prevalence

Last year prevalence refers to the proportion of the sample that reported using a named drug in the year prior to the survey, and is often referred to as recent use (NACD, 2011).

Table 4.18 Self-reported drug use: Last year prevalence by gender and age-group

Drug	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	N	%	n	%	n	%	n	%
Cannabis	554	68.6	523	68.6	31	68.9	210	84.0	231	72.6	105	45.7
Benzodiazepines	434	54.6	406	54.1	28	62.2	174	69.3	188	59.9	68	30.9
Other Sedatives or Tranquillisers	367	46.3	337	45.0	30	68.2	136	55.5	158	50.0	69	31.1
Heroin	233	29.5	212	28.4	21	46.7	74	29.7	112	36.0	45	20.4
Methadone	167	20.9	142	18.8	25	55.6	36	14.5	83	26.4	44	19.5
Other Opiates	103	13.0	94	12.6	9	20.0	29	11.8	52	16.6	21	9.4
Crack Cocaine	92	11.7	78	10.5	14	31.8	26	10.5	47	15.2	18	8.0
Cocaine Powder	226	28.6	208	27.8	18	41.9	96	38.9	101	32.3	26	11.8

Figure 4.11 Self-reported drug use: Last year prevalence by gender



Cannabis remains the drug used by the largest proportion (69%) for last year use, followed by benzodiazepines (55%) with no significant difference in rates of use between men and women for either of these drugs. In 1999 last year prevalence of cannabis among prisoners was approximately 63% for men and approximately 78% for women (Centre for Health Promotion Studies, 2000). Self-reported cannabis use in the last year among the general population was 6% (NACD, 2011).

There were some gender differences and in the last year women were significantly more likely than men to have used other sedatives and tranquillisers (68% vs 45%, $p<0.01$), heroin (47% vs 28%, $p=0.01$), methadone (56% vs 19%, $p<0.001$), and crack cocaine (32% vs 11%, $p<0.001$). In the previous prison study (Allwright et al., 1999) women were also found to be significantly more likely to report smoking heroin (in the last year) than men but the proportions were greater (45% for men vs 28% in this study and 60% for women vs 47% in this study). In the 1999 General Healthcare study of prisoners (Centre for Health Promotion Studies, 2000), 38% of male prisoners and 68% of female prisoners reported smoking heroin in the previous year. In that study 37% of men and 51% of women used cocaine (type not specified) in the previous year compared to 30% and 52% respectively reporting total cocaine use in this study

From an age perspective, a similar pattern to lifetime use emerged. A pattern of decreasing use as the age-group increased was shown for some drugs. Lower proportions of the older age-group of 35 years and above reported use than age-group 25 to 34 years, who in turn reported less use than 18 to 24 years for cannabis (46% vs 73% vs 84%, $p<0.001$), benzodiazepines (31% vs 60% vs 69%, $p<0.001$), other sedatives or tranquillisers (31% vs 50% vs 56%, $p<0.001$), and cocaine powder (12% vs 32% vs 39%, $p<0.001$). The age-group of 25–34 year olds was significantly more likely than the older or younger age-groups respectively to have used heroin (36% vs 20% vs 30%, $p<0.001$), methadone (26% vs 20% and 15%, $p<0.01$), other opiates (17% vs 9% vs 12%, $p<0.05$) and crack cocaine (15% vs 8% and 11%, $p<0.05$).

An overall trend of increasing drug use among residents across the prison drug use categories is again visible for last year use. This is to be expected, as a number of drugs from this table and the 12 month timeframe (heroin, methadone, other opiates, crack cocaine and cocaine powder) were used in the prison cluster model, which also included injecting amphetamines.

Table 4.19 Self-reported drug use: Last year prevalence by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Cannabis*	50	55.6	198	68.5	236	70.7	70	73.7
Benzodiazepines***	19	21.6	152	54.3	207	62.2	56	59.6
Other Sedatives or Tranquillisers***	25	28.4	117	41.8	173	52.1	52	55.9
Heroin***	9	10.1	68	24.5	119	36.0	37	39.8
Methadone***	1	1.1	28	10.0	93	27.8	45	47.9
Other Opiates	5	5.7	38	13.5	45	13.5	15	16.7
Crack Cocaine***	1	1.2	22	7.9	44	13.2	25	27.5
Cocaine Powder***	10	11.2	85	30.1	95	28.7	36	40.5

Chi^2 test * $p<0.05$, ** $p<0.01$, *** $p<0.001$

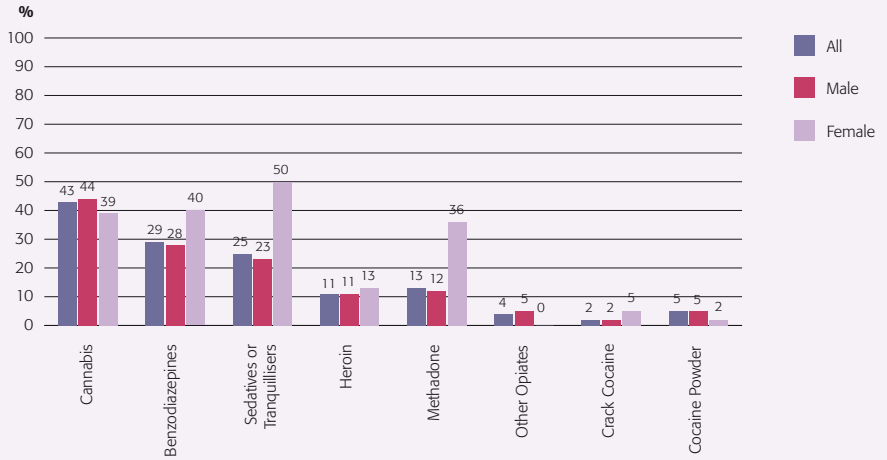
4.5.5 Drug Use: Last Month Prevalence

The NACD definition of last month prevalence refers to the proportion of the sample that reported using a named drug in the 30 day period prior to the survey, and is often referred to as current use. The NACD caution that a proportion of those reporting current use may be occasional (or first-time) users who happen to have used in the period leading up to the survey and that it should be appreciated that current use is not synonymous with regular use (NACD, 2011).

Table 4.20 Self-reported drug use: Last month prevalence by gender and age-group

Drug	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	349	43.4	332	43.7	17	38.6	128	51.2	148	46.8	67	29.4
Benzodiazepines	229	29.0	211	28.3	18	40.0	79	31.5	106	34.0	43	19.7
Other Sedatives or Tranquillisers	195	24.8	173	23.3	22	50.0	65	26.6	82	26.1	44	20.0
Heroin	87	11.1	81	11.0	6	13.3	27	10.9	40	12.9	19	8.8
Methadone	106	13.3	90	12.0	16	35.6	13	5.2	57	18.2	34	15.1
Other Opiates	35	4.4	35	4.7	0	0.0	6	2.5	17	5.4	12	5.4
Crack Cocaine	15	1.9	13	1.8	2	4.6	2	0.8	7	2.3	6	2.7
Cocaine Powder	41	5.3	40	5.4	1	2.4	11	4.6	19	6.1	10	4.6

Figure 4.12 Self-reported drug use: Last month prevalence by gender



Cannabis remains the drug used by the largest proportion (43%) for last month use, followed by benzodiazepines (29%), and other sedatives or tranquillisers (25%). Last month use of cannabis among prisoners in 1999 was approximately 43% for men and approximately 34% for women (Centre for Health Promotion Studies, 2000), and 3% of the general population report last month cannabis use (NACD, 2011). Self-reported methadone use, at 13%, is consistent with the proportion of prisoners on methadone treatment with the Drug Treatment Centre Board at the end of 2009 (12.3%, information supplied by the IPS). Thirteen percent also stated that they were on methadone maintenance within the last 30 days.

Women were significantly more likely than men to use other sedatives and tranquillisers (50% vs 23%, $p<0.001$) and methadone (36% vs 12%, $p<0.001$) but there was no gender association with any other drug.

From an age perspective, a slightly different pattern to lifetime and last year use emerged. A pattern of decreasing use as the age-group increased was shown for cannabis (29% vs 47% vs 51%, $p<0.001$), with lower proportions of the older age-group of 35 years and above reporting use than age-group 25 to 34 years, who in turn reported less use than 18 to 24 years. The age-group of 25–34 year olds was significantly more likely than the older or younger age-groups respectively to have used benzodiazepines (34% vs 20% vs 31%, $p=0.001$) and methadone (18% vs 15% and 5%, $p<0.001$). There were no significant age associations for other sedatives and tranquillisers, heroin, other opiates, crack cocaine or cocaine powder. Frequency of drug use in the last 30 days was highest for methadone, as one would expect with a daily dose, but otherwise the median frequency for individual drugs ranged from two to five times in the last month, suggesting that drug use is not a daily occurrence for the majority.

Table 4.21 Frequency of drug use in the last 30 days

Drug	n	Median	Range	Interquartile range
Cannabis	313	5	1–1000	3–10
Benzodiazepines	211	3	1–300	2–10
Sedatives or Tranquillisers	175	5	1–450	2–12
Heroin	82	2	1–60	1–5
Methadone	99	30	1–50	30–30
Other Opiates	32	4	1–90	1–10
Crack Cocaine	12	3.5	1–30	1–9
Cocaine Powder	36	2	1–30	1–4

The pattern of increasing drug use across the prison drug use categories is generally maintained for last month use, although residents in the very high drug use category prisons show lower proportions using some illegal drugs in the last 30 days than residents in the medium and or high drug use prisons. In some cases this may be a factor of small numbers.

Table 4.22 Self-reported drug use: Last month use by prison drug use category

Drug	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Cannabis*	33	36.7	121	42.2	162	48.7	33	35.1
Benzodiazepines***	11	12.5	73	26.4	113	34.0	32	34.0
Other Sedatives or Tranquillisers***	8	9.1	59	21.2	99	30.2	29	31.2
Heroin**	3	3.4	26	9.5	50	15.2	8	8.6
Methadone***	0	0.0	10	3.6	66	19.8	30	31.9
Other Opiates	3	3.4	12	4.3	18	5.4	2	2.2
Crack Cocaine*	0	0.0	1	0.4	11	3.3	3	3.3
Cocaine Powder	3	3.4	11	4.0	23	7.1	4	4.6

Chi^2 test * p<0.05, ** p<0.01, *** p<0.001

4.5.6 Drug Use: Previous 24–72 Hours (Oral Fluid Sample Testing)

Oral fluid samples were taken for drug screening. These results show evidence of drug use in the 24 to 72 hours before the sample was taken. Because random sampling lists were generated more than 72 hours before data were collected, it is unlikely that anyone randomly selected to participate was not in custody in the 72 hours prior to data collection, however, some participants may have been on temporary release or out of prison, e.g. in court, during that time period.

Table 4.23 Drug Use: Previous 24–72 hours based on positive oral fluid sample tests

Drug	All		Men		Women		18–24 years		25–34 years		35–64 years	
	n = 775		n = 730		n = 45		n = 240		n = 308		n = 212	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	31	4.0	31	4.2	0	0.0	9	3.8	14	4.5	8	3.8
	n = 777		n = 732		n = 45		n = 241		n = 309		n = 212	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines	83	10.7	74	10.1	9	20.0	25	10.4	40	12.9	18	8.5
Methadone	103	13.3	88	12.0	15	33.3	11	4.6	55	17.8	35	16.5
Opiates	2	0.3	2	0.3	0	0.0	0	0.0	1	0.3	0	0.0
Cocaine	1	0.1	1	0.1	0	0.0	0	0.0	1	0.3	0	0.0

The test with the largest proportion of positive results was methadone (13%). This proportion is consistent with self-reported methadone use among prisoners and with the proportion expected to be on methadone treatment within the prison system. Women were significantly more likely to test positive than men for methadone (33% vs 12%, $p<0.001$), and 18 to 24 year olds significantly less likely to be positive for methadone than the other age-groups (5% vs 18% and 17%, $p<0.001$). The prevalence of benzodiazepines was 11%, with women again significantly more likely to test positive than men (20% vs 10%, $p<0.05$). No women tested positive for cannabis, opiates or cocaine and there was no discernable age pattern. Prevalence rates for men for these drugs were very low (4% for cannabis and < 1% for opiates and cocaine). There were no differences by age-group for any of the other drugs.

When analysed by prison category, the distribution of positive cannabis results shows a reverse trend, with the highest use in the lower drug use prison categories. The distribution of methadone results, which is most likely to be on prescription, reflected the prison drug use categories. In addition to the known limitations of drug screening tests (results are affected by the amount of drug consumed, the amount of fluids consumed and exercise taken since ingestion of the drug, etc. outlined in section 3.7.1), it is likely that these results are mediated by whether or not the drug was on prescription (e.g. benzodiazepines and opiates) and local availability in the days preceding the research team's visit to each prison.

Table 4.24 Drug use: Positive Oral fluid test results by prison drug use category

Drug	Medium use		Low use		High use		Very High use	
	n	%	n	%	n	%	n	%
Cannabis	14	15.2	9	3.2	7	2.2	1	1.1
Benzodiazepines	10	10.9	24	8.6	36	11.4	13	14.4
Cocaine	0	0.0	0	0.0	1	0.3	0	0.0
Methadone	1	1.1	10	3.6	63	20.0	29	32.2
Opiates	1	1.1	0	0.0	1	0.3	0	0.0

4.6 Extent of Consumption for Injected Drugs

Summary results are presented here for self-reported lifetime, last year and last month injecting drug use. Full prevalence tables with confidence intervals are presented in the appendices.

4.6.1 Injecting Drug Use: Lifetime Prevalence

Prisoners were asked about their lifetime history of injecting drug use (for non-medical reasons). Recall that a person who records lifetime prevalence may, or may not, be currently using the drug. Just over a quarter of prisoners reported that they had ever injected drugs (26%). Overall lifetime prevalence of injecting drugs among prisoners in the Allwright et al. (1999) study was 43%. However, it must be noted that prisons that were regarded as low risk for BBVs were not included in the Allwright study (prevalence in medium risk prisons was 21% and in high risk prisons was 58%). This is a significant difference between that study and the current study and almost certainly accounts for the overall lower prevalence rate of 26% in this study.

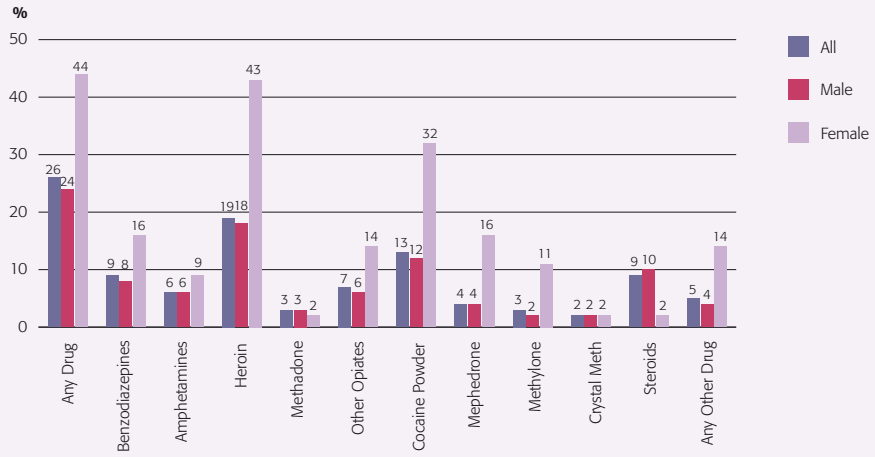
Women were significantly more likely to have a lifetime history of injecting drugs than men (44% vs 24%, $p<0.01$); this is consistent with findings in the previous inmates' study in 1999 (Allwright et al., 1999), although the proportions in that study were much higher (60% for women and 42% for men). The 25 to 34 year age-group were significantly more likely to have ever injected than the younger or older age-groups respectively (34% vs 18% and 22%, $p<0.001$).

Table 4.25 Self-reported injecting drug use: Lifetime prevalence by gender and age-group

Drug	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Any drug ever	207	25.5	187	24.4	20	44.4	46	18.2	109	34.1	51	22.2
Benzodiazepines	71	8.8	64	8.4	7	15.9	9	3.6	36	11.4	25	10.9
Amphetamines	47	5.9	43	5.7	4	9.3	7	2.8	21	6.7	18	7.9
Heroin	154	19.1	135	17.7	19	43.2	26	10.4	83	26.4	44	19.2
Methadone	22	2.8	21	2.8	1	2.3	3	1.2	9	2.9	10	4.4
Other Opiates	54	6.8	48	6.4	6	14.3	7	2.8	24	7.7	22	9.8
Cocaine Powder	104	13.0	90	11.9	14	31.8	13	5.2	56	17.8	34	14.9
Mephedrone	34	4.3	27	3.6	7	15.6	11	4.4	16	5.1	6	2.7
Methylone	20	2.5	15	2.0	5	11.1	7	2.8	9	2.9	4	1.8
Crystal Meth	13	1.6	12	1.6	1	2.2	2	0.8	5	1.6	5	2.2
Steroids	69	8.6	68	9.9	1	2.2	22	8.7	33	10.4	13	5.7
Any other drug	35	4.5	29	3.9	6	14.3	3	1.2	20	6.6	11	5.0

The injected drug reported by the largest proportion was heroin (19%) followed by cocaine powder (13%). On an individual drug basis, women were significantly more likely than men to have injected heroin (43% vs 18%, $p<0.001$), cocaine powder (32% vs 12%, $p<0.001$), mephedrone (16% vs 4%, $p<0.01$), methylone (11% vs 2%, $p<0.01$) and any other drug (14% vs 4%, $p<0.01$).

Figure 4.13 Injecting drug use: Lifetime injecting prevalence by gender



There was no significant age pattern for lifetime injecting of methadone, methylone, mephedrone, crystal meth or steroids, however, an age pattern emerged for injecting drug use for the remaining drugs surveyed. The younger age-group was significantly less likely to have injected these drugs than the older age-groups, and the group aged 25 to 34 years was more likely to have injected. Proportions for the younger, middle and older age-groups respectively and p values were: benzodiazepines (4%, 11% and 11%, $p<0.01$), amphetamines (3% vs 7% vs 8%, $p<0.05$), heroin (10%, 26% and 19%, $p<0.001$), other opiates (3%, 8% and 10%, $p<0.01$) and cocaine powder (5%, 18% and 15%, $p<0.001$) and any other drug (1% vs 7% vs 5%, $p<0.01$).

There is an increasing pattern of use by prison drug use category. While numbers are low, lifetime injecting rates are very high in the high drug use category, and for heroin reach 36%.

Table 4.26 Self-reported injecting drug use: Lifetime prevalence by prison drug use category

Drug	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Any Drug (ever injected)***	11	12.4	42	14.6	115	33.7	39	41.1
Benzodiazepines***	3	3.4	13	4.6	41	12.2	14	15.1
Amphetamines**	3	3.4	8	2.8	25	7.5	11	12.0
Heroin***	7	8.0	29	10.1	85	25.2	33	35.5
Methadone*	0	0.0	4	1.4	14	4.2	4	4.4
Other Opiates**	3	3.4	11	3.9	28	8.5	12	13.2
Cocaine Powder***	6	6.8	14	4.9	58	17.2	26	28.0
Mephedrone***	1	1.2	2	0.7	20	6.0	11	11.7
Methylone*	1	1.2	2	0.7	11	3.3	6	6.5
Crystal Meth	1	1.2	2	0.7	7	2.1	3	3.2
Steroids*	4	4.5	17	5.9	39	11.5	9	10.0
Any Other Drug***	1	1.2	4	1.4	19	5.9	11	12.1

Chi^2 test * $p<0.05$, ** $p<0.01$, *** $p<0.001$

4.6.2 Injecting Drug Use: Last Year Prevalence

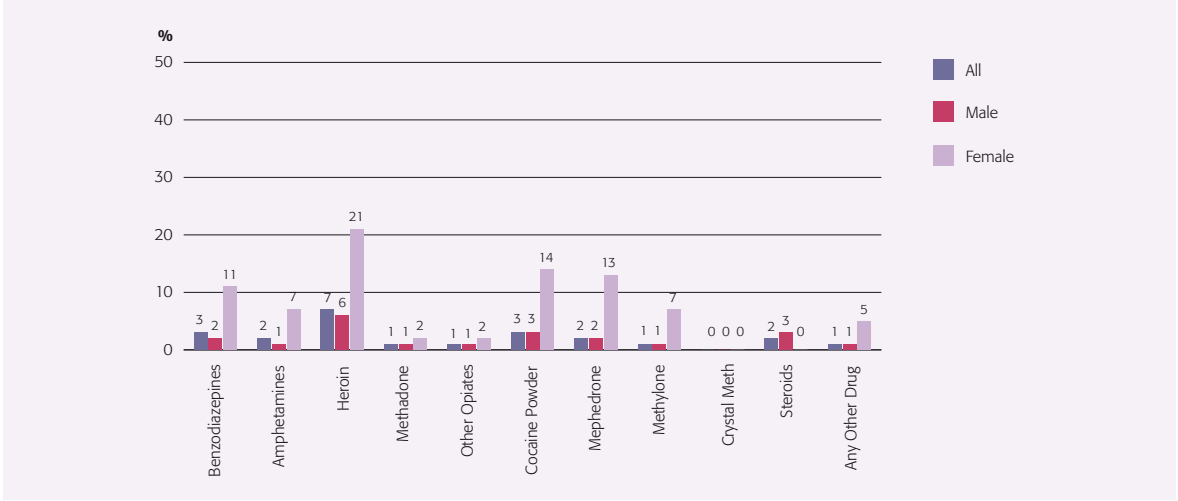
In the last year, the drug reported as injected by the largest proportion was heroin (7%) followed by cocaine powder (3%) benzodiazepines (3%) and steroids (2%). In total, 82 prisoners had injected at least one of the drugs surveyed in the last year (10.1%, 95% CI 8.4%–12.2%).

Table 4.27 Self-reported injecting drug use: Last year prevalence by gender and age-group

Drug	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines	23	2.9	18	2.4	5	11.4	7	2.8	13	4.1	3	1.3
Amphetamines	12	1.5	9	1.2	3	7.0	4	1.6	6	1.9	2	0.9
Heroin	55	6.9	46	6.1	9	20.9	20	8.0	27	8.7	8	3.6
Methadone	6	0.8	5	0.7	1	2.3	2	0.8	3	1.0	1	0.4
Other Opiates	8	1.0	7	0.9	1	2.4	2	0.8	5	1.6	1	0.5
Cocaine Powder	25	3.1	19	2.5	6	14.0	7	2.8	13	4.2	5	2.2
Mephedrone	18	2.3	12	1.6	6	13.3	7	2.8	9	2.9	2	0.9
Methylone	9	1.1	6	0.8	3	6.7	3	1.2	5	1.6	1	0.5
Crystal Meth	3	0.4	3	0.4	0	0.0	0	0.0	2	0.6	1	0.5
Steroids	19	2.4	19	2.5	0	0.0	5	2.0	12	3.8	2	0.9
Any other drug	11	1.4	9	1.2	2	4.8	2	0.8	5	1.7	4	1.8

Women were significantly more likely to have injected a number of drugs than men in the last year: most notably heroin (21% vs 6%, $p<0.001$), cocaine powder (14% vs 3%, $p=0.001$), mephedrone (13% vs 2%, $p<0.001$), methylone (7% vs 1%, $p<0.05$), amphetamines (7% vs 1%, $p<0.05$) and benzodiazepines (11% vs 2%, $p<0.01$). There were no significant differences across the age-groups.

Figure 4.14 Self-reported Injecting drug use: Last year injecting prevalence by gender



While the numbers are low in most categories, the increasing trend of drug use among respondents from low use to very high use prison categories continues for last year injecting. Once more a steep gradient is seen rising notably in the case of heroin use, however, because of low numbers and empty cells significant differences are not seen between prison categories in many cases.

Table 4.28 Self-reported injecting drug use: Last year prevalence by prison drug use category

Drug	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Benzodiazepines***	1	1.1	1	0.4	12	3.6	9	9.7
Amphetamines	0	0.0	2	0.7	7	2.1	3	3.3
Heroin***	1	1.2	10	3.5	27	8.1	17	18.7
Methadone	0	0.0	1	0.4	4	1.2	1	1.1
Other Opiates	0	0.0	0	0.0	3	0.9	5	5.6
Cocaine Powder***	0	0.0	3	1.1	13	3.9	9	10.0
Mephedrone***	0	0.0	1	0.4	8	2.4	9	9.6
Methylone	0	0.0	1	0.4	4	1.2	4	4.3
Crystal Meth	0	0.0	1	0.4	2	0.6	0	0.0
Steroids	1	1.1	5	1.8	9	2.7	4	4.3
Any Other Drug	0	0.0	0	0.0	7	2.2	4	4.4

Chi^2 test * p<0.05, ** p<0.01, *** p<0.001

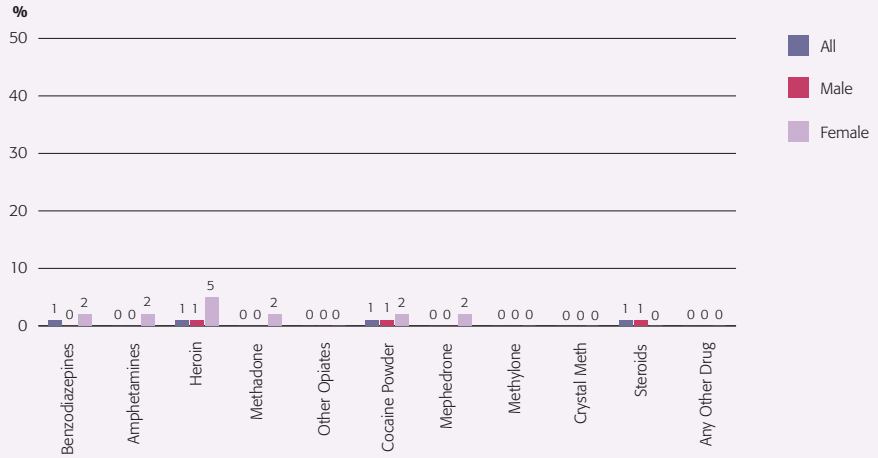
4.6.3 Injecting Drug Use: Last Month Prevalence

Recall that the NACD point out that when reviewing last month prevalence, some of those reporting current use may be occasional or first-time users who happen to have used in the period leading up to the survey, therefore current use is not necessarily synonymous with regular use (NACD, 2011).

Table 4.29 Self-reported injecting drug use: Last month prevalence by gender and age-group

Drug	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines	4	0.5	3	0.4	1	2.3	1	0.4	2	0.6	1	0.4
Amphetamines	2	0.3	1	0.1	1	2.3	1	0.4	1	0.3	0	0.0
Heroin	7	0.9	5	0.7	2	4.6	2	0.8	3	1.0	2	0.9
Methadone	3	0.4	2	0.3	1	2.3	1	0.4	2	0.6	0	0.0
Other Opiates	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Cocaine Powder	8	1.0	7	0.9	1	2.3	1	0.4	6	1.9	1	0.4
Mephedrone	2	0.3	1	0.1	1	2.2	1	0.4	1	0.3	0	0.0
Methylone	1	0.1	1	0.1	0	0.0	0	0.0	1	0.3	0	0.0
Crystal Meth	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Steroids	4	0.5	4	0.5	0	0.0	0	0.0	3	1.0	1	0.4
Any other drug	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0

Figure 4.15 Injecting drug use: Last month injecting prevalence by gender



Numbers injecting individual drugs in the last month were very low and ranged from 0 to 7 (≤ 1% of the prison population). In total, 16 prisoners had injected at least one of the drugs surveyed in the last month (2.0%, 95% CI 1.3%-3.1%). Individual drugs injected by the largest proportions were cocaine powder (1%) and heroin (0.9%) followed by benzodiazepines (0.5%) and steroids (0.5%). There were no significant differences between men and women, or across the age-groups. This was primarily because of the very small numbers involved.

Table 4.30 Drug use: Frequency of injecting drugs in last 30 days

Drug	n	Median	Range	Interquartile range
Benzodiazepines	4	25	3–40	7–38
Amphetamines	2	15	10–20	N/A
Heroin	6	22	3–60	15–38
Methadone	3	25	3–30	N/A
Other Opiates	0	–	–	–
Cocaine Powder	7	4	1–15	3–8
Mephedrone	2	8.5	2–15	N/A
Methylone	1	20	N/A	N/A
Crystal Meth	0	–	–	–
Steroids	4	8	1–50	2–41
Any Other Drug	0	–	–	–

N/A indicates that there were insufficient respondents to calculate an interquartile range

Numbers reporting use in the last 30 days were very low, but seven respondents in the high and very high drug use categories reported injecting heroin. Because of the low numbers and empty cells, significant differences are not seen between prison categories for any drug.

Table 4.31 Self-reported injecting drug use: Last month use by prison drug use category

Drug	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Benzodiazepines	0	0.0	0	0.0	2	0.6	2	2.2
Amphetamines	0	0.0	0	0.0	1	0.3	1	1.1
Heroin	0	0.0	0	0.0	3	0.9	4	4.4
Methadone	0	0.0	0	0.0	2	0.6	1	1.1
Other Opiates	0	0.0	0	0.0	0	0.0	0	0.0
Cocaine Powder	0	0.0	2	0.7	5	1.5	1	1.1
Mephedrone	0	0.0	0	0.0	1	0.3	1	1.1
Methylone	0	0.0	0	0.0	1	0.3	0	0.0
Crystal Meth	0	0.0	0	0.0	0	0.0	0	0.0
Steroids	0	0.0	2	0.7	2	0.6	0	0.0
Any Other Drug	0	0.0	0	0.0	0	0.0	0	0.0

Chi^2 test * $p<0.05$, ** $p<0.01$, *** $p<0.001$

4.7 Nature and Patterns of Consumption for Different Drugs

4.7.1 Age of First Use

The median age of first drug use ranged from 14 to 21 years, with use of cannabis commencing earliest, at a median age of 14 years, followed by benzodiazepines (median 17 years), other sedatives or tranquillisers (median 17 years) and cocaine powder with a median age of 18 years. The median age for first use of heroin or other opiates was 19 and for methadone and crack cocaine use the median commencement age was 21 years. A pattern of movement from softer drugs to harder drugs with increasing age is apparent. The range and interquartile range for age of commencement of use of each drug are provided in the table below.

Table 4.32 Age first used drugs presented in ascending order of median age

	n	Median	Range	Interquartile range
Cannabis	700	14	7–51	12–16
Benzodiazepines	524	17	9–43	15–20
Other sedatives and tranquillisers	441	17	10–50	15–21
Cocaine Powder	577	18	11–45	16–20
Heroin	328	19	11–44	16–23
Other opiates	243	19	11–40	16–22
Methadone	258	21	13–45	18–26
Crack Cocaine	275	21	12–44	19–26

The lowest median age (18 years) for initiating injecting drug use was for opiates other than heroin or methadone. Twenty years was the median age for commencing injecting the majority of drugs surveyed: benzodiazepines, amphetamines, heroin, methadone and crystal meth, followed by cocaine powder for which injecting commenced at a median age of 21 years. The median age for commencing injecting 'head shop' drugs methylone and mephedrone was 24 years. The median age for commencing steroid injection was 22 years. The range and interquartile range for age of commencement of injecting each drug are provided in the table below.

Table 4.33 Age first injected drugs presented in ascending order of median age

	n	Median	Range	Interquartile range
Other opiates	48	18	13–42	16–23
Benzodiazepines	68	20	11–31	17–23
Amphetamines	43	20	13–34	18–25
Heroin	150	20	11–42	17–24
Methadone	19	20	14–44	17–24
Crystal Meth	12	20	15–42	16–25
Any other drug	31	20	11–42	17–24
Cocaine powder	100	20.5	13–42	18–25
Steroids	65	22	16–52	19–26
Mephedrone	31	24	16–42	20–29
Methylone	20	24	13–42	19–30

Among heroin injectors, the mean age for first use of heroin was 18.2 years and the mean age for first injecting heroin was 21 years, with the mean duration of moving from smoking to injecting at 2.8 years. This is consistent with previous findings. In an Irish study of addiction service users in the community, Gervin et al. (2001), found that the mean duration of moving from smoking to injecting heroin was 2.9 years, and cited findings of a study in the London area (Griffith et al., 1994) which found the mean duration of smoking prior to first injecting to be 2.4 years. Moving to injecting heroin has been linked to earlier illicit drug use, an earlier commencement age of heroin use, and a previous history of ecstasy use (Gervin et al., 2001). The increase of injecting in prison amongst those who did not previously inject, and those who held a preference to smoke, has been reported to be due to the necessity to be more efficient with the drug (Dillon, 2001). Efficient in this context means the requirement of the greatest number of prisoners, to use the limited quantity of heroin, to the maximum effect (Dillon, 2001). Prisoners felt compelled to partake in this method even in situations where they did not wish to inject (Dillon, 2001). Long et al. (2004) found that while prisoners were not forced to partake in injecting, scarcity of the drug would determine the method of administration, the desire to reach a certain 'buzz' being a strong determining factor.

The mean duration of using prior to first injecting for other drugs was 4.8 years for benzodiazepines (mean ages 15.4 and 20.2, $p<0.001$), 2.2 years for other opiates (mean ages 20.2 and 18.0, $p=0.01$), and 2.9 years for cocaine powder (mean ages 19.0 and 21.9, $p<0.001$). For methadone injectors there was no difference in the mean ages for use or injecting. For each of the other drugs, the mean age at which injecting commenced was significantly higher than the mean age of first use.

4.7.2 Overdosing on Drugs

Table 4.34 Self-reported drug use: Overdose history

	Total		Male		Female		18–24 years		25–34 years		35–64 years	
	n	%	n	%	n	%	n	%	n	%	n	%
Ever overdosed on any drug (of all)	217	26.7	197	25.7	20	44.4	66	26.1	95	29.7	55	23.9
Ever overdosed on any drug (of IDUs)	119	57.8	103	55.4	16	80.0	22	47.8	64	59.3	32	62.7

More than a quarter (27%) of all prisoners and a majority of Injecting Drug Users (IDUs) (58%) had overdosed on drugs at some stage in their life. Women were significantly more likely than men to have overdosed (44% vs 26%, $p<0.01$) and female IDUs were significantly more likely than male IDUs to have an overdose history (80% vs 55%, $p<0.05$). A trend of increasing overdose history is visible across the prison categories in which prisoners who had ever overdosed were currently resident. No significant age associations were found.

Table 4.35 Self-reported drug use: Overdose history by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Ever overdosed	16	17.8	68	23.5	97	28.7	36	37.5

4.7.3 Drug Use in Prison

While a primary concern is addressing the health needs of prisoners who use drugs irrespective of whether they are taking them within or outside of prison, the extent to which drug use takes place in prison is also relevant for health planning purposes, because it shows the extent to which the problems are directly associated with the prison setting. Participants answered specific questions about drug use in prison, addressing whether their first use of a drug was in prison and whether drug use in the previous year included use in prison.

4.7.3.1 First Use and First Injecting Use in Prison

Taking a particular drug for the first time in prison is likely to be associated with the age at which the drug was first taken (as evidenced by cannabis), and with the point in an individual's drug taking experience that they have reached when they are ready to progress to another drug. For example, for those who reported first use of a drug in prison, it is not known on how many occasions they had been in prison before that time, or whether they just happened to be in custody when they reached the point where they were ready to take the step and this should be noted when interpreting the following results.

More than two fifths (43%) of those who had ever used heroin reported that they had taken it for the first time in prison. More than a third (38%) of those who had ever received methadone reported their first use being while in prison. Other drugs that were reported as being taken for the first time in prison, among those who had ever taken the drug, were: benzodiazepines (20%) and other sedatives or tranquillisers (28%). Less than one in 10 users reported first taking cannabis (6%), cocaine powder (5%) or crack cocaine (9%) in prison and this is likely to be associated with the age of first use for cannabis and possibly availability of cocaine in prison. Men were significantly more likely than women to report first using heroin in prison (46% vs 17%, $p<0.01$). There were no other significant gender differences, and no significant age patterns.

Table 4.36 Self-reported drug use: (Of those who have ever used) In prison when first used by gender and age-group

Drug	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	40	5.7	39	5.9	1	2.7	10	4.2	15	5.1	14	8.8
Benzodiazepines	105	19.6	101	20.0	4	12.9	32	16.0	48	21.2	24	23.1
Other Sedatives or Tranquillisers	129	28.4	123	28.9	6	20.0	42	25.9	57	29.5	29	30.2
Heroin	146	43.2	141	45.6	5	17.2	48	51.1	67	43.2	30	35.7
Methadone	99	38.4	90	39.0	9	33.3	27	45.0	48	38.7	21	30.4
Other opiates	54	21.2	53	22.5	1	5.3	7	13.0	34	26.8	13	18.3
Crack cocaine	25	8.8	23	9.0	2	7.7	7	9.5	11	8.3	7	9.7
Cocaine powder	28	4.8	28	5.0	0	0.0	5	2.4	15	5.8	8	6.8

In the previous Irish study of inmates (Allwright et al., 1999) 21% of injectors first injected in prison. In the current study, the drug injected for the first time in prison by the largest proportion of those who had ever injected it was steroids (24%, 16/69). Mephedrone and methylone were the next highest proportions (13% and 14% respectively). In all other cases 10% or less of ever injectors of the drug reported having injected it for the first time in prison. More than a fifth of women (21%) who had ever injected heroin injected it for the first time in prison; this was significantly different to men (6%, $p=0.05$). There were no other significant gender or age patterns for first use in prison among injectors.

Table 4.37 Self-reported injecting drug use: (Of those who have ever injected) In prison when first injected

Drug	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	%	n	%	
Benzodiazepines	7	10.1	5	8.1	2	28.6	0	0.0	5	14.3	2	8.3
Amphetamines	3	6.7	3	7.5	0	0.0	0	0.0	3	15.8	0	0.0
Heroin	12	8.1	8	6.2	4	21.1	1	3.9	8	10.0	3	7.1
Methadone	2	10.0	2	10.5	0	0.0	0	0.0	2	25.0	0	0.0
Other opiates	2	4.0	1	2.2	1	20.0	0	0.0	1	4.6	1	5.0
Cocaine powder	8	8.1	8	9.3	0	0.0	1	7.7	6	11.1	1	3.2
Mephedrone	4	12.5	3	12.0	1	14.3	1	9.1	2	14.3	1	16.7
Methylone	3	14.3	2	12.5	1	20.0	0	0.0	2	22.2	1	20.0
Crystal meth	1	7.1	1	7.7	0	0.0	0	0.0	1	20.0	0	0.0
Steroids	16	23.5	16	23.9	0	0.0	4	19.1	8	24.2	4	30.8
Any other drug	2	5.9	1	3.5	1	20.0	0	0.0	2	10.5	0	0.0

It should be noted that 8% of prisoners who ever injected heroin, did so for the first time in prison, therefore 92% of injectors made the move from using to injecting heroin outside of prison. This is in contrast to 43% who first used heroin (by any means) in prison. In the UK, Strang et al. (2006) found (for heroin, cocaine and amphetamines) that recency of drug use before entering prison and dependence were two key factors in persistence of drug use during imprisonment, and that persistence of heroin use in prison occurred more often than use of the other two drugs.

4.7.3.2 In-prison Drug Use: Last Year

Among those who reported that they had used drugs within the past year, for most drugs the majority reported that they had used in prison during that time period: cannabis (88%), benzodiazepines (85%), other sedatives or tranquillisers (87%), heroin (84%), methadone (87%), other opiates, (66%) and crack cocaine (52%). Men were significantly more likely than women to have used cannabis (88% vs 74%, $p<0.05$) and heroin (86% vs 62%, $p=0.01$) in this context.

Table 4.38 Self-reported drug use: (Of those who used within the last year) Did that include times when you were in prison?

Drug	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	481	87.5	458	88.3	23	74.2	176	83.8	204	89.5	93	89.4
Benzodiazepines	369	85.4	346	85.6	23	82.1	142	81.6	168	90.3	58	85.3
Other Sedatives or Tranquillisers	319	87.4	293	87.5	26	89.7	113	83.1	141	90.4	61	89.7
Heroin	192	83.8	179	86.1	13	61.9	58	78.4	96	88.1	36	81.8
Methadone	142	87.1	120	87.0	22	88.0	23	63.9	75	93.8	40	93.0
Other opiates	67	65.7	63	67.7	4	44.4	17	58.6	36	70.6	14	66.7
Crack cocaine	48	52.7	39	50.7	9	64.3	9	34.6	28	60.9	11	61.1
Cocaine powder	98	43.8	92	44.7	6	33.3	32	33.7	52	52.0	13	50.0

The numbers reporting using each drug in prison during the last year are presented below, by prison drug use category, as a proportion of all prisoners (who had answered the ever use question for the relevant drug) (table 4.39). Usage of all of the drugs shows a trend of an increase in use from low use to high use categories, but there is a decrease for in-prison use between the high use and very high use category for most drugs (the exceptions are methadone and crack cocaine).

Table 4.39 Self-reported in-prison drug use: Last year use by prison drug use category (among all prisoners)

Drug	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Cannabis*	47	68.1	168	70.6	212	78.8	54	66.7
Benzodiazepines***	18	24.3	124	51.9	182	62.3	45	51.7
Other Sedatives or Tranquillisers**	22	27.9	101	42.1	153	52.2	43	48.9
Heroin***	8	10.1	54	21.9	108	37.9	22	30.1
Methadone***	1	1.2	16	6.5	87	29.8	38	44.7
Other Opiates	4	5.1	21	9.1	35	13.6	7	9.5
Crack Cocaine***	0	0.0	10	4.6	25	10.3	13	18.6
Cocaine Powder	6	13.3	38	23.2	45	27.6	9	14.5

Chi^2 test * $p<0.05$, ** $p<0.01$, *** $p<0.001$

In the next table (4.40) the numbers reporting using each drug in prison are presented as a proportion of those who reported use of the drug within the last year. The pattern here is very different and may reflect availability of drugs in particular prison categories.

Thus for cannabis, for example, between 68% and 79% (depending on the prison category) of all prisoners in these categories reported that they had used cannabis in prison in the last year (table 4.39), but between 78% and 94% (depending on the prison category) of those who used cannabis in the last year did so in prison (table 4.40). Likewise for heroin, between 10% and 38% (depending on the prison category) of all prisoners in these categories reported that they had used heroin in prison in the past year, and between 61% and 91% (depending on the prison category) of all prisoners who used heroin in the last year reported that they had done so in prison. As previously cautioned, prevalence estimates do not provide any information about the number of times a person used in a time period, and use for some may have been a once-off event.

Table 4.40 Self-reported in-prison drug use: Last year use by prison drug use category (among those who used in the last year)

Drug	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Cannabis*	47	94.0	168	85.7	212	90.2	54	78.3
Benzodiazepines	18	94.7	124	82.7	182	87.9	45	80.4
Other Sedatives or Tranquillisers	22	88.0	101	86.3	153	89.5	43	84.3
Heroin***	8	88.9	54	83.1	108	90.8	22	61.1
Methadone	1	100.0	16	61.5	87	95.6	38	84.4
Other Opiates	4	80.0	21	56.8	35	77.8	7	46.7
Crack Cocaine	0	0.0	10	47.6	25	56.8	13	52.0
Cocaine Powder	6	60.0	38	45.2	45	47.9	9	25.0

Chi^2 test * $p<0.05$, *** $p<0.001$

Finally, the reported use of each drug was reviewed from the perspective of those who must have been in prison during the time period by virtue of their self-reported length of time in prison.

Thirty nine percent of all prisoners had been in prison for 12 months or less. Among the 61% whose length of time in prison exceeded 12 months, two thirds had taken cannabis during the past year, more than a quarter had taken heroin and one fifth had taken cocaine powder in that time period.

Five percent of all prisoners had been in prison for less than 1 month. Among the 95% whose length of time in prison exceeded a month, a similar pattern is evident.

Table 4.41 Self-reported drug use: Last year and last month use for all prisoners and for those in prison longer than a year or a month

Drug	All		In prison > 1 year		All		In prison > 1 month	
	Last year use		Last year use		Last month use		Last month use	
	n	%	n	%	n	%	n	%
Cannabis	554	68.6	322	66.7	349	43.4	325	43.2
Benzodiazepines	434	54.6	242	50.1	229	29.0	211	28.5
Other Sedatives or Tranquillisers	367	46.3	217	46.0	195	24.8	181	24.5
Heroin	233	29.5	136	28.8	87	11.1	80	10.9
Methadone	167	20.9	82	17.2	106	13.3	97	13.0
Other Opiates	103	13.0	49	10.4	35	4.4	34	4.6
Crack Cocaine	92	11.7	33	7.0	15	1.9	12	1.6
Cocaine Powder	226	28.6	95	20.3	41	5.3	35	4.8

The 2009 Scottish prison survey found that the proportion of all prisoners who reported ever taking illegal drugs in prison reduced from 58% to 45% over the period 2004–2009 (Scottish Prison Service, 2009). A fifth of Scottish prisoners (22%) reported that they had used drugs in prison in the month prior to the 2009 survey; in this study the proportion of those who were in prison during the previous month, and that reported using drugs in that period, ranged from 2% to 43% for individual drugs.

4.7.3.3 In-prison Injecting Drug Use

Of the small numbers of injectors who had injected individual drugs in prison over the past year (ranging from one to 13 for different drugs) the largest proportion was for steroids (68%, 13/19). Only nine of 56 last year heroin injectors, seven of 23 last year benzodiazepine injectors, and seven of 25 who had injected cocaine had injected in prison in the last year. Any further sub-analysis of the distribution of in-prison injecting among last year users (for example by prison category) is meaningless with such small numbers.

4.42 Self-reported injecting drug use: (Of those who injected the drug in the last year) Did that include injecting while in prison?

Drug	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines	7	30.4	5	27.8	2	40.0	1	14.3	5	38.5	1	33.3
Amphetamines	1	10.0	1	14.3	0	0.0	0	0.0	1	20.0	0	0.0
Heroin	9	16.7	8	17.8	1	11.1	1	5.0	6	23.1	2	25.0
Methadone	2	33.3	2	40.0	0	0.0	0	0.0	2	66.7	0	0.0
Other opiates	1	12.5	1	14.3	0	0.0	0	0.0	0	0.0	1	100
Cocaine powder	7	29.1	7	38.9	0	0.0	0	0.0	5	41.7	2	40.0
Mephedrone	4	22.2	3	25.0	1	16.7	0	0.0	4	44.4	0	0.0
Methylone	2	22.2	1	16.7	1	33.3	0	0.0	2	40.0	0	0.0
Crystal meth	1	33.3	1	33.3	0	0.0	0	0.0	1	50.0	0	0.0
Steroids	13	68.4	13	68.4	0	0.0	4	80.0	7	58.3	2	100
Any other drug	1	9.1	1	11.1	0	0.0	0	0.0	1	20.0	0	0.0

Finally, the reported use of injecting each drug was reviewed from the perspective of those who must have been in prison during the time period by virtue of their self-reported length of time in prison. Among those whose length of time in prison exceeded 12 months, very small proportions had injected individual drugs in the past year – the highest proportions were for steroids (2.5%), heroin (1.9%) and cocaine powder (1.1%). The proportion reporting injection of any of the drugs surveyed in the last year among those definitely known to be in prison for greater than or equal to one year was 4.9% (n = 24, 95% CI 3.5%-7.0%).

Five percent of all prisoners had been in prison less than one month. Among those whose length of time in prison exceeded a month, less than 1% had injected any of the individual drugs surveyed (0.8% for cocaine powder). The proportion reporting injection of any of the drugs surveyed in the last month among those definitely known to be in prison for greater than or equal to one month was 1.3% (n = 10, 95% CI 0.8%-2.3%).

Table 4.43 Self-reported drug use: Last year and last month injecting use for all and for those in prison longer than that period

Drug	All Last year IDU		In prison > 1 year Last year IDU		All Last month IDU		In prison > 1 month Last month IDU	
	n	%	n	%	n	%	n	%
Benzodiazepines	23	2.9	3	0.6	4	0.5	1	0.1
Amphetamines	12	1.5	2	0.4	2	0.3	1	0.1
Heroin	55	6.9	9	1.9	7	0.9	1	0.1
Methadone	6	0.8	2	0.4	3	0.4	2	0.3
Other Opiates	8	1.0	0	0.0	0	0.0	0	0.0
Cocaine Powder	25	3.1	5	1.1	8	1.0	6	0.8
Mephedrone	18	2.3	4	0.9	2	0.3	1	0.1
Methylone	9	1.1	2	0.4	1	0.1	1	0.1
Crystal Meth	3	0.4	0	0.0	0	0.0	0	0.0
Steroids	19	2.4	12	2.5	4	0.5	4	0.5
Other drug	11	1.4	2	0.4	0	0.0	0	0.0

In the 2009 Scottish prison survey 3% of prisoners reported that they had injected in prison within the previous month. In this study the proportion was 1.3%.

These results provide evidence that current injecting drug use in prison is not a common activity. This may reflect the relatively recent increase in measures to reduce supply getting into prisons and, in the case of heroin, the recent heroin drought (Concateno, 2011; Daily Mail, 2011).

4.7.4 Prescription Drug Use in Prison

The use of prescription drugs (benzodiazepines and other sedatives and tranquillisers, methadone and other opiates – not including methadone) was highly prevalent among prisoners as shown in previous sections, and prisoners were asked where they got prescription drugs the last time they took them in prison.

The majority (56%) of those who had ever taken methadone had taken it on prescription the last time they took it in prison. In relation to benzodiazepines, other sedatives and tranquillisers and prescription opiates (other than methadone) a minority of prisoners were taking such drugs under medical supervision (10%, 15% and 9% respectively); the majority had received them from someone they knew (67%, 51% and 51% respectively) or from another source (4%, 3% and 4% respectively).

Table 4.44 Self-reported drug use: Source of drug last time they were taken in prison (among those who had ever taken the drug)

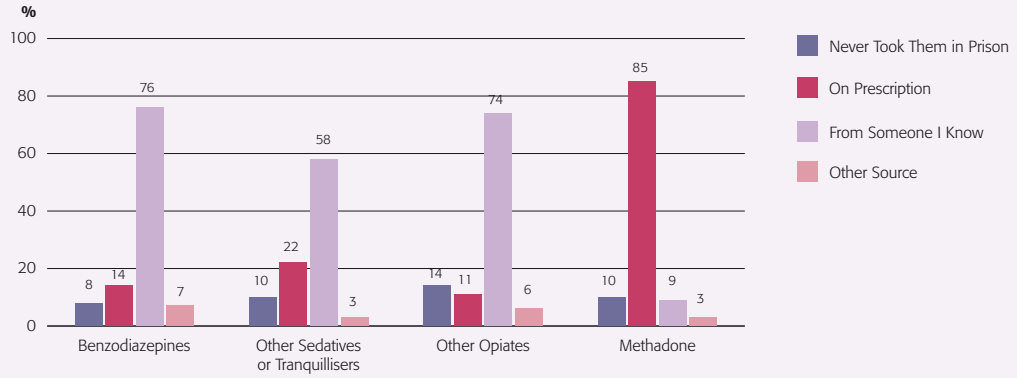
Drug	Never took them in prison		On prescription		From someone I know		Other Source	
	n	%	n	%	n	%	n	%
Benzodiazepines	105	19.2	57	10.4	366	66.9	23	4.2
Other Sedatives or tranquillisers	110	23.6	68	14.6	239	51.3	12	2.6
Opiates (other than heroin or methadone)	69	26.5	24	9.2	133	51.2	10	3.8
Methadone	56	21.4	146	55.7	42	16.0	8	3.1

The majority (85%) of those who had taken methadone in the past month had taken it on prescription the last time they took it in prison. In relation to benzodiazepines, other sedatives and tranquillisers and prescription opiates (other than methadone) a minority of prisoners who took it within the last month had done so in prison under medical supervision (14%, 22% and 11% respectively); the majority (76%, 58% and 74% respectively) had received it from someone they knew the last time they took it in prison.

Table 4.45 Self-reported drug use: Source of drug last time they were taken in prison (among those who had taken the drug in the last 30 days)

Drug	Never took them in prison		On prescription		From someone I know		Other Source	
	n	%	n	%	n	%	n	%
Benzodiazepines	18	7.9	31	13.5	175	76.4	15	6.6
Other Sedatives or tranquillisers	19	9.7	42	21.5	113	57.9	6	3.1
Opiates (other than heroin or methadone)	5	14.3	4	11.4	26	74.3	2	5.7
Methadone	10	9.5	89	84.8	9	8.6	3	2.9

Figure 4.16 Self-reported drug use: Source of drug last time they were taken in prison (among those who had taken the drug in the last 30 days)



4.8 Methods of Drug Use, including Intravenous Drug Use

4.8.1 Methods of Drug Use

The questionnaire first asked questions about drug use without specifying the method of use, and subsequently asked specifically about injecting drug use. Six drugs were included in both sections: benzodiazepines, heroin, methadone, other opiates and cocaine powder.

Table 4.46 Self-reported drug use: Methods of drug use based on ever use

Drug	Total Taking Drug		IV Only		Both IV & Other Method		IV Total		Other Method	
	n	%	n	%	n	%	n	%	n	%
Benzodiazepines	547	100.0	4	0.7	67	12.2	71	13.0	476	87.0
Heroin	348	100.0	6	1.7	148	42.5	154	44.3	194	55.7
Methadone	262	100.0	–	–	22	8.4	22	8.4	240	91.6
Other Opiates	260	100.0	4	1.5	50	19.2	54	20.8	206	79.2
Cocaine Powder	600	100.0	3	0.5	101	16.8	104	17.3	496	82.7

Based on ever use, methods other than injecting were used by the majority of users for all drugs. Less than 2% used injection as their only method of using any of the five drugs, however 44% had injected heroin, 21% other opiates and 17% cocaine powder.

Figure 4.17 Relationship between methods of benzodiazepine use

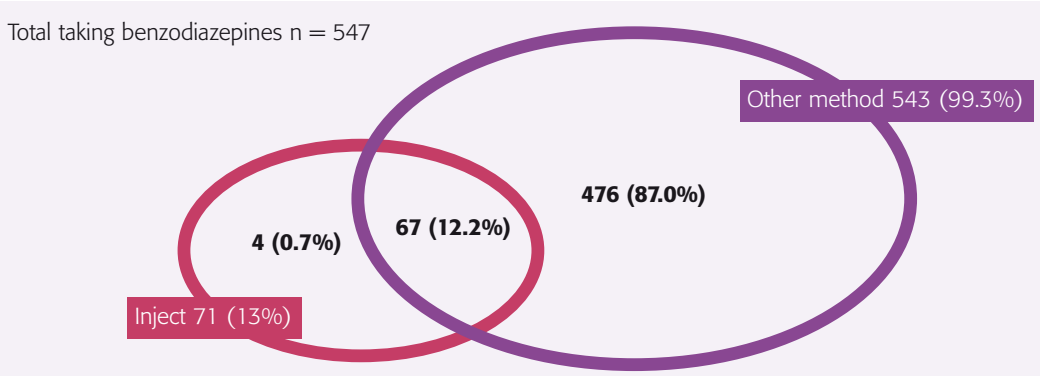


Figure 4.18 Relationship between methods of heroin use

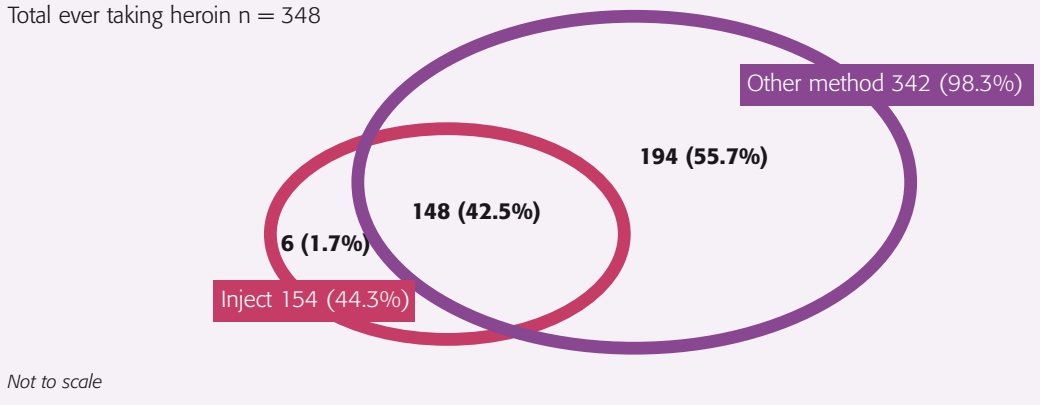


Figure 4.19 Relationship between methods of methadone use

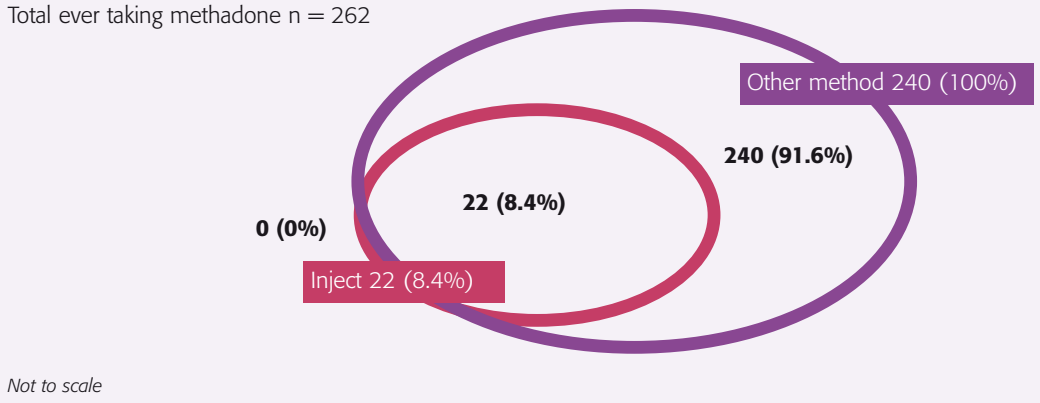


Figure 4.20 Relationship between methods of other opiates use

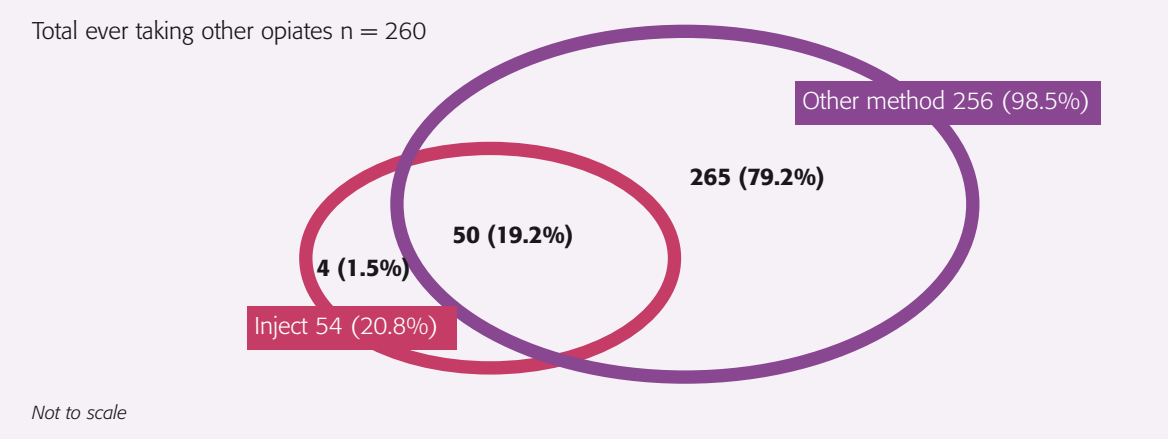
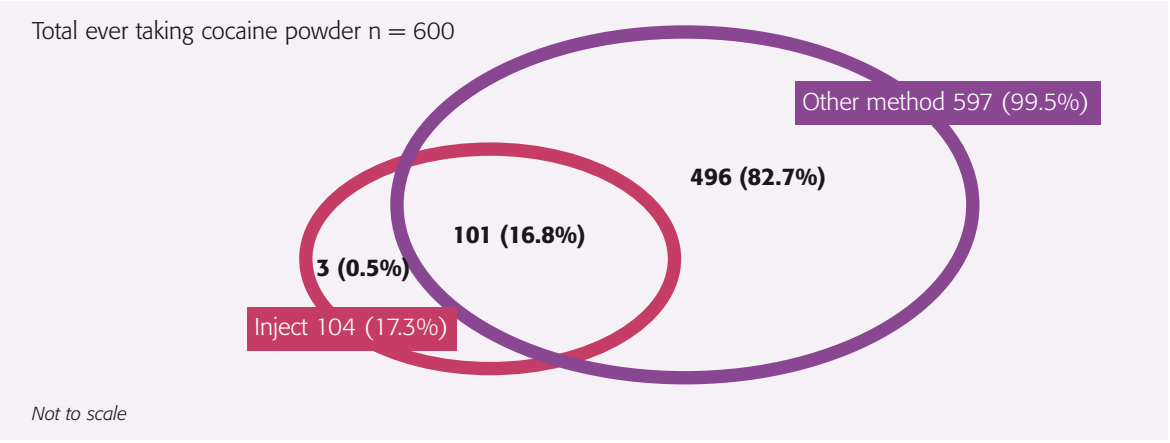
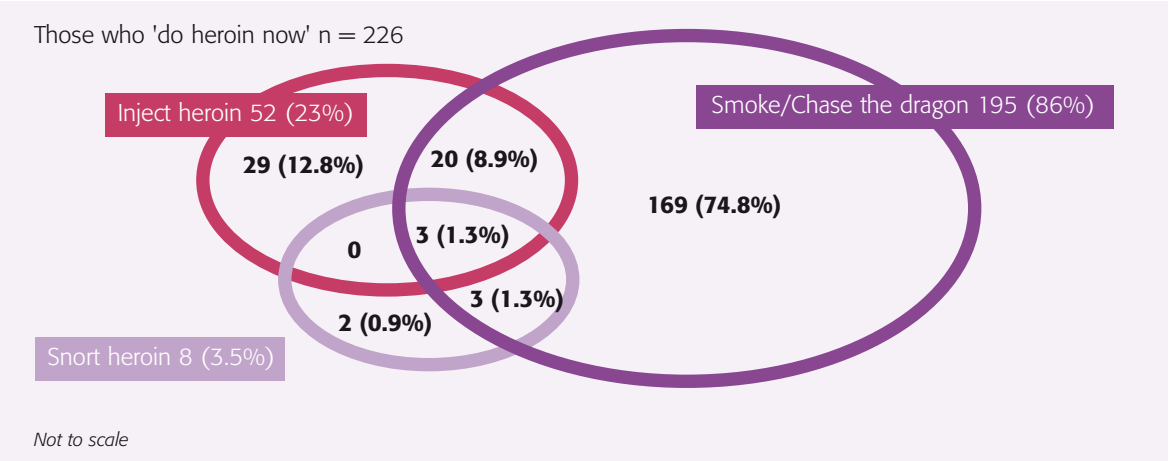


Figure 4.21 Relationship between methods of cocaine powder use



Respondents who 'do heroin now' were asked what method they used. Of the 226 prisoners who answered the question, the majority (75%) currently used smoking or 'chasing the dragon' as their only method of choice, while 13% used injecting as their only method; less than 1% snorted only. Only a very small proportion currently used all three methods of administration (1.3%), or smoked and snorted (1.3%); 9% both smoked and injected.

Figure 4.22 Methods of use for heroin among prisoners who currently do heroin



4.8.2 Sharing Works

About 13% of all prisoners reported ever sharing any works.

Table 4.47 Sharing injecting equipment

	All		Male		Female		18–24		25–34		35–64	
	n	%	n	%	n	%	n	%	n	%	n	%
Ever shared needles	84	10.8	70	9.5	14	32.6	11	4.6	43	14.4	29	12.7
Ever shared syringes	81	10.5	67	9.2	14	32.6	10	4.2	42	14.3	28	12.3
Ever shared other works	84	10.9	68	9.4	16	38.1	12	5.0	44	15.1	27	11.9
Ever shared needles or syringes or other injecting equipment	102	13.0	83	11.2	19	43.2	14	5.8	56	18.5	31	13.5

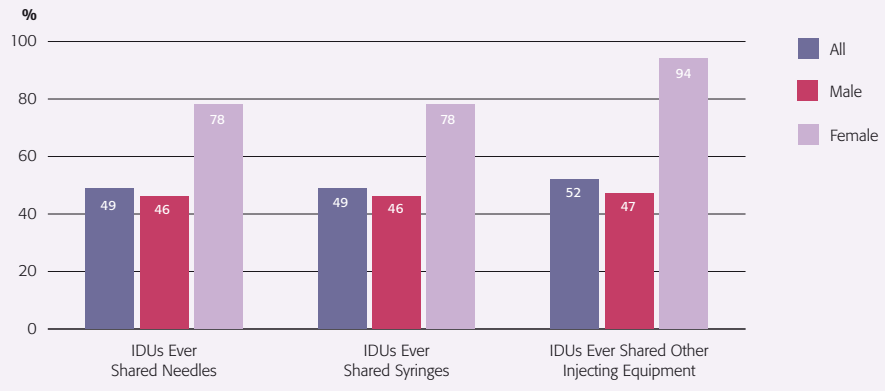
A significantly greater proportion of women shared injecting equipment than men (for needles 33% vs 10%, $p<0.001$; for syringes 33% vs 9%, $p<0.001$; and for other injecting equipment 38% vs 9%, $p<0.001$). The youngest age group (18–24 year olds) were significantly less likely to have shared needles, syringes or other works ($p<0.05$).

About half of those who reported ever injecting drugs had ever shared needles, syringes or other injecting equipment. Again a significantly greater proportion of women shared than men (for needles and syringes 78% vs 46%, $p<0.05$; for other injecting equipment 94% vs 47%, $p<0.001$, and for any of needles or syringes or other injecting equipment 53% vs 100%, $p<0.001$).

Table 4.48 Sharing injecting equipment: Sharing among injecting drug users

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Ever shared needles	84	48.8	70	45.5	14	77.8	11	33.3	43	48.9	29	58.0
Ever shared syringes	81	49.1	67	45.6	14	77.8	10	30.3	42	51.2	28	57.1
Ever shared other injecting equipment	84	51.9	68	46.9	16	94.1	12	36.4	44	55.0	27	56.3
Ever shared needles or syringes or other injecting equipment	102	58.0	83	52.9	19	100.0	14	42.4	56	61.5	31	60.8

Figure 4.23 Sharing injecting equipment: Sharing among injecting drug users



When viewed by prison drug use category, the pattern of current prison residence for IDUs who had ever shared was consistent with the low use to high use prison categories.

Table 4.49 Sharing injecting equipment: Ever shared by prison drug use category (among IDUs)

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Shared Needles	4	36.4	13	40.6	47	49.0	20	60.6
Shared Syringes	3	30.0	15	45.5	41	45.6	22	68.8
Shared Other Works*	3	30.0	14	43.8	44	49.4	23	74.2
Shared needles or syringes or other works**	4	36.4	17	48.6	53	55.2	28	82.4

Chi^2 test * $p<0.05$, ** $p<0.01$

A series of questions about sharing in the previous 30 days were asked. Among those who had ever shared needles, 9% (7/76) had used a new needle and syringe for their last injection in the last 30 days. The median number of times that injecting had taken place, among IDUs in the last 30 days was 4 (range 0–70).

Table 4.50 Injecting Drug Use: Sharing frequency among IDUs in last 30 days

	n	Median	Range	Interquartile range
Times injected in last 30 days	16	4	0–70	1–12
Sterile needles received in the last 30 days	15	2	0–300	0–20
Sterile syringes received in the last 30 days	15	1	0–300	0–10
Times re-used the last needle and syringe used in the last 30 days	18	1	0–6	0–2
No. of people from whom a used needle and syringe was received	17	0	0–4	0–0

Those who had ever shared were asked about their sharing habits in the previous month both in and out of prison. Regarding sharing needles outside of prison, 84% (42/50) of the ever sharers who responded considered the question not applicable, suggesting they had not been outside of prison in that time or that they were not current IDUs. Of the remaining eight, half shared either always or sometimes, and the other half shared rarely or never. For syringes and other works, 60% of the 10 who had shared rarely or never shared.

Table 4.51 Sharing works: Last month frequency of sharing works outside prison (among those who had ever shared)

	Always		Sometimes		Rarely		Never		Total	
	n	%	n	%	n	%	n	%	n	%
Needles	1	12.5	3	37.5	2	25.0	2	25.0	8	100.0
Syringes	1	10.0	3	30.0	2	20.0	4	40.0	10	100.0
Other Works	2	20.0	2	20.0	2	20.0	4	40.0	10	100.0

Regarding sharing in prison, more than half never shared needles or syringes in the previous month, and just under half never shared works, with between a fifth and a quarter sharing rarely. A greater proportion sometimes or always shared other works than shared needles and syringes, but the numbers concerned in all cases are very low.

Table 4.52 Sharing works: Last month frequency of sharing works in prison (among those who had ever shared)

	Always		Sometimes		Rarely		Never		Total	
	n	%	n	%	n	%	n	%	n	%
Needles	1	5.3	4	21.1	4	21.1	10	52.6	19	100.0
Syringes	1	5.0	3	15.0	5	25.0	11	55.0	20	100.0
Other Works	3	14.3	4	19.0	4	19.0	10	47.6	21	100.0

4.9 Prevalence of Blood-Borne Viruses among the Prisoner Population

4.9.1 Prevalence of Blood-Borne Viruses (BBVs)

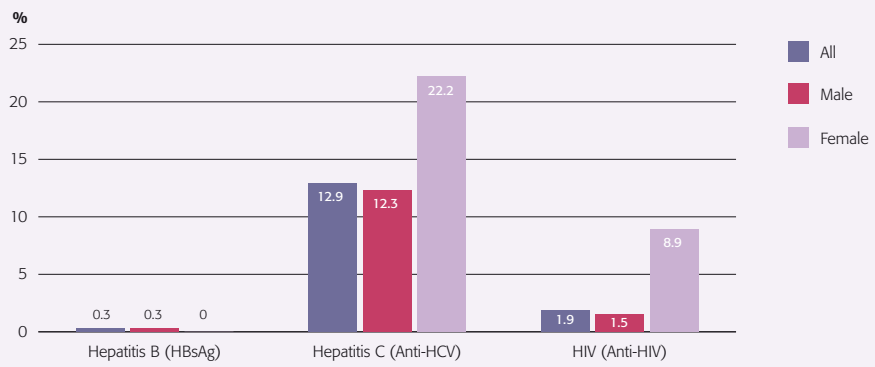
Prevalence tables with confidence intervals for proportions for a) self-reported hepatitis B, hepatitis C and HIV status and b) status based on the results of the serological analysis of oral fluid samples are presented in the appendices.

Table 4.53 Blood-borne viruses: Hepatitis B, hepatitis C and HIV self-report and oral fluid sample test results

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
Positive	n	%	n	%	n	%	n	%	n	%	n	%
Self-reported HBV status	9	1.1	9	1.2	0	0.0	2	0.8	3	1.0	3	1.4
Hepatitis B Test (HBsAg) result	2	0.3	2	0.3	0	0.0	0	0.0	1	0.3	1	0.5
Self-reported HCV status	67	8.6	60	8.1	7	15.9	2	0.8	37	12.0	27	12.4
Hepatitis C Test (Anti-HCV) result	100	12.9	90	12.3	10	22.2	7	2.9	51	16.6	41	19.0
Self-reported HIV status	11	1.4	9	1.2	2	4.6	0	0.0	5	1.6	5	2.3
HIV Test (Anti-HIV) result	15	1.9	11	1.5	4	8.9	1	0.4	6	2.0	7	3.2

Table 4.53 shows both the self-reported prevalence (based on a positive self-report for either first or last test result) and the results from oral fluid testing. Among those who reported, there was a significant difference by age-group for self-reported hepatitis C with the youngest age-group least likely to report being infected (0.8% vs 12.0% vs 12.4%, $p<0.001$). The prevalence (from oral fluid sample test results) of hepatitis B was 0.3%, hepatitis C was 12.9% and HIV 1.9%.

Figure 4.24 Blood-borne viruses: Prevalence of hepatitis B, hepatitis C and HIV (oral fluid sample test results)



Prevalence rates for hepatitis B and C in this study (0.3% and 12.9% respectively) were a lot lower than rates in the previous Irish prison study (Allwright et al., 1999), which were 9% and 37% respectively, with the rates in medium risk (for BBV) prisons at 4% and 17% respectively. Again, it should be noted that the three prisons perceived to be low risk for BBVs were excluded from that study.

The test for hepatitis B carried out in the 1999 study was hepatitis B core-antibody test, a measure of any exposure, whereas the current study investigated current infection (using hepatitis B surface antigen testing [HBsAg]), therefore the results are not directly comparable. Furthermore, one of the developments since the 1999 study was development of IPS healthcare standards for blood-borne virus testing and hepatitis B vaccination services (IPS, 2009) and it is not unexpected that these interventions would impact on prevalence. Other published estimates for prevalence of hepatitis B in prison studies using HBsAg included 3% in Australia (Butler et al., 2007), 2.5% in Germany (Radun et al., 2008) and 2.4% in the Lebanon (Mahfoud et al., 2010). Blood screening results also indicate a low prevalence in the general population. Serological surveillance screening was carried out in 2003 as part of the European Sero-Epidemiology Network project and a HBsAg prevalence of 0.1% was found in the Irish sample tested (ESEN unpublished data, cited in Murphy and Thornton, 2008a:2). The Irish Blood Transfusion Service (IBTS) tested 207,015 first time blood donors between 1997 and 2006 and found a HBsAg prevalence of 0.014% (cited in Murphy and Thornton, 2008a:2). Among IDUs prevalence of hepatitis B (using HBsAg) has been estimated at 1% (Smyth et al., 1998) and among drug users at 2% (Grogan et al., 2005).

Prevalence of hepatitis C in the previous Irish prison inmates' study (Allwright et al., 1999) was 37%. Hepatitis C prevalence (using Anti-HCV testing) in other prison studies ranged from 7% in a study of prisons in England and Wales (Weild et al., 2000) to 82% in a German study (Stark et al., 2006). In the Scottish Prison Survey (2009) 13% thought that they were positive for hepatitis C but no serological testing was carried out. A recently published estimate of prevalence of hepatitis C in the Irish population is 0.5–1.2% (Thornton et al., 2011). In Ireland prevalence of hepatitis C among injecting drug users has previously been estimated at 61.8% (Smyth et al., 1998) and among drug users at 66% (Grogan et al., 2005).

Prevalence of HIV in the previous prison study (Allwright et al.,1999) was 2% (0.8% in medium BBV-risk prisons). The prevalence rate for HIV therefore appears to have not changed, however recall that the Allwright study excluded prisons considered to be low risk for BBVs, which could inflate the estimate. Prevalence studies in other prisons have shown results ranging from 0.2% in the Lebanon (Mahfoud et al., 2010) and 0.4% in England and Wales (Weild, 2000) to 18% (Stark et al., 2006) in Germany. The Irish population prevalence is estimated to be 0.2% (UNAIDS, 2010). In previous Irish studies, prevalence of HIV among injecting drug users has been estimated at 1.2% (Smyth et al., 1998) and among drug users at 11% (Grogan et al., 2005).

Women were significantly more likely than men to be infected with HIV (8.9% vs 1.5%, $p<0.001$), and the younger age-group was significantly less likely to be infected with hepatitis C than the age-groups 25–34 and 35–64 respectively (2.9% vs 17% and 19%, $p<0.001$).

4.9.2 Concordance of Oral Fluid BBV Sample Results with Self-Reported Results

Table 4.54 Concordance between hepatitis B self-report status and hepatitis B oral fluid sample test result

Self-reported status from first and last hepatitis B test	Hepatitis B Virus Positive n (%)	antibody test (HBsAg) Negative n (%)	result Total n (%)
Self-reported positive	1 (11.1)	8 (88.9)	9 (100)
Self-reported negative	1 (0.4)	276 (99.6)	277 (100)
Did not know status	0 (0)	43 (100)	43 (100)
Not answered	0 (0)	442 (100)	442 (100)

Two participants (0.3%) tested positive for hepatitis B. Concordance of hepatitis B self-report status with HBsAg test results revealed that eight (89%) of the nine prisoners who thought that they were positive had a negative test result, and one person (0.4%) who thought they were negative had a positive test result. In this study 99.6% of those who thought they were negative actually tested negative.

Table 4.55 Concordance between hepatitis C self-report status and hepatitis C oral fluid sample test result

Self-reported status from first and last hepatitis C test	Hepatitis C Virus antibody test (Anti-HCV) result		
	Positive n (%)	Negative n (%)	Total n (%)
Self-reported positive	59 (95.2)	3 (4.8)	62 (100)
Self-reported negative	21 (8.9)	214 (91.1)	235 (100)
Did not know status	2 (6.1)	31 (93.9)	33 (100)
Not answered	18 (4.1)	423 (95.9)	441 (100)

One hundred participants tested positive for hepatitis C (13%), and 59 (95%) of those who self-reported that they were positive were in fact positive. Likewise, 91% of those who thought that they were negative tested negative.

Biological hepatitis C test results revealed that three (5%) of those who thought that they were positive had a negative test result, and 21 (9%) of those who thought they were negative had a positive test result.

Two (6%) of those who did not know their status tested positive for hepatitis C, and 18 (4%), of those who had not reported on their status had a positive result.

Table 4.56 Concordance between HIV self-report status and HIV oral fluid sample test result

Self-reported status from first and last HIV test	Anti-HIV result		
	Positive n (%)	Negative n (%)	Total n (%)
Self-reported positive	10 (90.9)	1 (9.1)	11 (100)
Self-reported negative	3 (1.0)	290 (99.0)	293 (100)
Did not know status	0 (0)	31 (100)	31 (100)
Not answered	2 (0.5)	434 (99.5)	436 (100)

Fifteen participants tested positive for HIV (1.9%). Concordance of HIV self-report status with HIV test results revealed that one (9%) of those who thought that they were positive had a negative test result, and three (1%) who thought that they were negative had a positive test result; none of those who did not know their status tested positive, although two (0.5%) of those who had not reported on their status had a positive result.

There are a number of reasons why self-reported results may not match test results, such as incorrect completion of the questionnaire, which may be due to unwillingness to report status, or be simply an oversight or a reflection of poor understanding of the question. For hepatitis B, this may reflect inclusion in the 'self-reporting' group of previous HBV infection (anti-HBc positive), which was not determined during this study. Alternatively, a number may have been acutely infected and had HBsAg detected previously, but have subsequently resolved infection and are now HBsAg negative. It is also possible for hepatitis C, that seroconversion has occurred since they received their previous test result.

When viewed by prison drug use category, a pattern of increased infectivity with increased drug use prison category is evident for hepatitis C and HIV. There is a highly significant difference in the prevalence of biologically tested HIV and hepatitis C between prison drug use categories, with increasing prevalence matching higher last year drug use. Differences in hepatitis B cannot be assessed because of the small numbers.

Table 4.57 Blood-borne virus oral fluid sample test results by prison drug use category

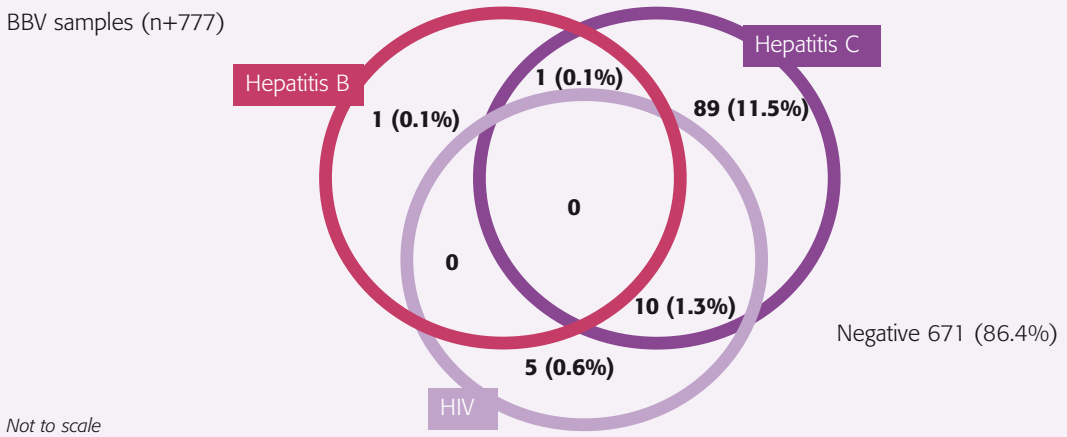
	Low use n = 89		Medium n = 278		High use n = 320		Very High use n = 90	
	n	%	n	%	n	%	n	%
HIV Test (Anti-HIV)***	0	0.0	1	0.4	8	2.5	6	6.7
Hepatitis B Test (HBsAg)	1	1.1	0	0.0	1	0.3	0	0.0
Hepatitis C Test (Anti-HCV)***	2	2.3	20	7.2	52	16.3	26	28.9

Chi2 test *** p<0.001

4.9.3 Co-infection

Fourteen percent (106/777) of prisoners had serological evidence for blood-borne virus infection. No prisoners tested positive for all three viruses, and there was no co-infection between hepatitis B and HIV. However, co-infection with hepatitis C and HIV was detected in 1.3% (10/777) of prisoners and co-infection with hepatitis B and HIV was detected in 1 participant (0.1%).

Figure 4.25 Relationship between blood-borne viruses



4.9.4 Factors Associated with Blood-Borne Viruses

4.9.4.1 Tattoos

The majority of prisoners had tattoos or borstal marks (68%; men 68%, women 78%). While the majority of those with tattoos had some done by a tattoo artist (71%, 393/556), many had them done by a friend or relative (24%, 132/556) or another prisoner (18%, 99/556); a fifth did the tattoo themselves (20%, 111/256). Over a third of those with tattoos or borstal marks had a tattoo done in prison at some stage (35%, 190/538). In the Scottish prison survey 2008, 54% reported having a tattoo, with 18% reporting receipt of a tattoo in prison (Scottish Prison Service, 2008).

Table 4.58 Tattoos/Borstal marks

	Total		Male		Female		18–24		25–34		35–64	
	n	%	n	%	n	%	n	%	n	%	n	%
Tattoos	556	68.4	521	67.8	35	77.8	167	65.7	242	75.9	142	61.7

Tattooing involves piercing of the skin and it is likely that receiving a tattoo from a non-professional and/or having tattoos done in prison involves sharing of tattoo equipment, which may or may not be clean. When exploring behaviours associated with BBVs using logistic regression, having a tattoo and having a tattoo carried out in prison were included in the analysis, which is described below.

4.9.4.2 Sexual behaviour

High risk sexual behaviour for BBVs includes men having sex with men and unsafe sex (i.e. having sex without a condom). The majority of those who had ever had sex in prison or ever had sex outside of prison did not use a condom the last time they had sex (73% in prison, 79% outside of prison). The majority rarely or never used a condom (62% in prison, 51% outside of prison).

Table 4.59 Safe sex: Condom use (among those who had ever had sex in or out of prison)

	Not applicable		Always		Sometimes		Rarely		Never		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
In prison	8	11.8	8	11.8	10	14.7	15	22.1	27	39.7	68	100.0
Outside prison	38	5.3	92	12.9	218	30.5	148	20.7	218	30.5	714	100.0

Less than 2% of men reported that they had ever had sex with other men (1.5% outside of prison, 11/714, and 0.9%, 6/701 in prison). When exploring behaviours associated with BBVs using logistic regression, which is described below, the following variables were included in the analysis: type of sexual partner, sex in prison, whether safe sex was usually practiced and the number of sexual partners in the previous 12 months.

4.9.4.3 Socio-demographic, behavioural and drug-related factors associated with Blood-Borne Viruses in the prisoner population in Ireland

A stated objective of this study was to assess the relationship of a number of socio-demographic, behavioural and drug-related factors elicited as part of the survey to the presence of biologically-confirmed blood-borne viruses among prisoners in Ireland. To that end the statistical relationship between several factors and the presence of hepatitis B, hepatitis C, HIV and co-infection with any combination of these viruses was assessed.

The socio-demographic factors examined included:

- age categorised into predefined age-groups;
- gender;
- educational level; and
- length of time in prison in last 10 years.

Behavioural factors included:

- the presence of tattoos, whether done in prison or elsewhere; and
- sexual practices, such as sexual orientation, number of sexual partners in the last year, sexual activity in prison and the frequency of practicing safe sex.

Drug-related factors included:

- prison category;
- history of IV drug use;
- the sharing of IV equipment such as needles, syringes or other works; and
- the IV drugs used and number of years using drugs IV.

It was not possible to analyse the frequency of drug use (number of times injected in the last 30 days) as only 14 respondents provided an answer to that question.

The relationship of each of these factors to the presence or absence of each of the BBVs and to the presence or absence of co-infection was analysed separately, using appropriate statistical techniques. These included the Pearson's Chi-square test or Fisher's Exact Test for categorical variables and the two-sample t-test or Wilcoxon Rank Sum (Mann Whitney U) Tests as appropriate for numerical variables, depending on their level of measurement and/or distribution.

While univariate statistical analyses as described above are valuable for suggesting relationships between dependent and independent variables individually, they are limited by the failure to take account of more than one variable at a time. Thus, multivariate analytical techniques are required to examine the potential interrelationships between dependent variables and their independent relationship(s) with the dependent variable. In this study the multivariate technique used was logistic regression, which allows for simultaneous assessment of multiple variables, both categorical and numerical, with the dependent variable. For logistic regression, categorical variables with more than two categories require particular attention. It is necessary to assign a reference category and create 'dummy' variables of the remaining categories, each of which is then assessed against the reference category for significance with the dependent variable. The variables in this dataset to which this applies were: age-group (three levels), time in prison in the past 10 years (collapsed into three levels from the data recorded) and prison category (collapsed into three levels by combining 'low' and 'medium' use prisons into one category). In each case the referent category is the lowest category. Educational level attained was collapsed into two categories: none, primary and some secondary education vs completed secondary or any higher education. Results of logistic regression are presented as p values, odds ratios (OR) and adjusted 95% confidence intervals (CI) for the estimate of 'risk'/'benefit', i.e. the OR. By definition the OR associated with the reference category of any variable is 1.0.

The relationship of the use of individual drugs intravenously with each blood-borne virus and co-infection was assessed using univariate analyses only. They were not included as independent variables in the multivariate modelling. This is because it is highly likely that the real relationship of a BBV with a drug used intravenously accrues to the IV use rather than to the drug per se.

Descriptive data for each variable and the results of univariate (p values) and multivariate analyses (p values, adjusted ORs and 95% CIs) of the socio-demographic, behavioural and drug-related factors outlined above are provided in tables 4.60, 4.61 and 4.62 for hepatitis C, HIV and BBV co-infection respectively. It was not possible to carry out meaningful statistical analyses for hepatitis B alone as there were only two participants who tested positive for hepatitis B and statistical testing returned invalid results.

Factors associated with Hepatitis C

There were 100 participants who tested positive for hepatitis C in this study. The comparisons were made between these and the 677 participants who tested negative. The following variables were significantly associated with hepatitis C in univariate analyses: older age ($p<0.001$), longer time (>3 years) in prison in the past 10 years ($p<0.001$), greater likelihood of being in a high or very high use prison ($p<0.001$), a history of IV drug use ever ($p<0.001$), the sharing of IV drug equipment ($p<0.001$), IV use of all of the drugs enquired about ($p<0.05$ to $p<0.001$), number of years using drugs IV ($p<0.001$) and the presence of tattoos ($p<0.001$), especially if acquired while in prison ($p<0.001$). Of note was that neither sexual orientation nor sexual practices appeared to relate to presence of hepatitis C. The median number of sexual partners in the past year was similar for those with and without hepatitis C.

The more interesting and important information, however, comes from the multivariate analysis. Each of the variables significant in univariate analysis (except the individual IV drugs used) was entered into the logistic model. In addition, gender, educational level attained and sexual orientation were added to the initial model as potentially important variables even though not significant in univariate analysis. Examination of the model identified several variables clearly not associated with hepatitis C. These included educational level attained, time spent in prison in last 10 years, years using drugs, existence of a tattoo and sexual orientation. The final logistic model included complete data on all remaining variables for 643 participants and identified the following variables as being independently and significantly associated with hepatitis C in this study population: **older age**, specifically age-group 25–34 [$p<0.05$, OR=3.6(1.3–9.7)] and age-group 35–64 [$p<0.001$, OR=7.8(2.7–22.5)], **female gender** [$p<0.05$, OR=4.5(1.04–20.0)], being in a **very high drug use prison** [$p<0.01$, OR=9.8(3.1–31.1)], **ever having used drugs intravenously** [$p<0.001$, OR=8.3(3.5–20.0)], ever having shared IV drug equipment [$p<0.001$,OR=4.5(2.0–10.4)] and having had a **tattoo done in prison** [$p<0.001$, OR=2.6(1.4–5.10]. It is especially noteworthy that both 'ever having used drugs IV' and 'ever having shared IV drug equipment' were independently significantly associated with hepatitis C.

Table 4.60 Socio-demographic, behavioural and drug-related factors associated with hepatitis C in the prisoner population in Ireland

Characteristic	n		Hep C +ve (n=100)		Hep C -ve (n=677)		Unadjusted [abc]	Adjusted [d]		
			n	(%)	n	(%)	p value	p value	or	95% CI
Current Age (yrs)	762	18–24	7	7.1	232	35.0		Reference	1.0	
		25–34	51	51.5	256	38.6	p<0.001	p<0.05	3.6	1.3–9.7
		35–64	41	41.4	175	26.4		p<0.001	7.8	2.7–22.5
Gender	777	Male	90	90.0	642	94.8				
		Female	10	10.0	35	5.2	ns	p+0.04	4.5	1.04–20.0
Educational Level	761	None – Some 2°	71	74.0	463	69.6				
Attained		Full 2° – Higher	25	26.0	202	30.4	ns	ns*		
Time spent in Prison (preceeding 10 yrs)	695	< 1 yr	10	10.9	124	20.3		Reference	1.0	
		1–3 yrs	15	16.3	177	29.4	p<0.001	ns*		
		> 3 yrs	67	72.8	302	50.1		ns*		
Prison Category	777	Low/Medium	22	22.0	345	51.0		Reference	1.0	
(based on 12/12 drug use)		High	52	52.0	268	39.6	p<0.01	ns	1.6	0.8–3.3
		Very High	26	26.0	64	9.5	ns*	p<0.01	9.8	3.1–31.1
IV Drug Use										
History of IV Drug Use	768	Yes	83	83.0	117	17.5	p<0.001	p<0.001	8.3	3.5–20.0
Sharing IV Drug Works	739	Yes	60	63.2	39	6.1	p<0.001	p<0.001	4.5	2.0–10.4
Drugs Used IV	758	Benzodiazepines	42	42.4	26	4.0	p<0.001	**		
	755	Amphetamines	30	31.3	16	2.4	p<0.01	**		
	760	Heroin	80	80.0	69	10.5	p<0.001	**		
	754	Methadone	15	15.5	5	0.8	p<0.001	**		
	750	Other Opiates	35	37.2	17	2.6	p<0.001	**		
	759	Cocaine Powder	66	66.7	34	5.2	p<0.001	**		
	752	Mephedrone	16	16.7	14	2.1	p<0.001	**		
	751	Methylone	9	9.5	9	1.4	p<0.001	**		
	751	Crystal Meths	9	9.5	3	0.5	p<0.001	**		
	763	Steroids	14	14.4	52	7.2	p<0.05	**		
	741	Any Other Drug	20	22.5	13	2.0	p<0.001	**		
Years using Drugs IV	194		(n=81)		(n+113)					
		Median (Range)	14	(1–32)	4	(0–29)	p<0.001	ns*		
Tattoos			n	(%)	n	(%)				
Any Tattoo	768	Yes	88	88.9	437	65.3	p<0.001	ns*		
Tattoo done in Prison	752	Yes	42	45.7	139	21.1	p<0.001	p<0.01	2.6	1.4–5.1
Sexual Practices										
Sexual Orientation	736	Heterosexual	90	98.9	631	97.8	ns	ns*		
		MSM	1	1.1	14	2.2				
Sex in Prison	719	Yes	15	16.9	63	10.0	ns	**		
Safe Sex usually practiced	664	Yes	41	50.0	263	45.2	ns	**		
Sexual Partners (last 12mths)	290		(n+39)		(n=251)					
		Median (Range)	1	(0–30)	1	(0–30)	ns	**		

2 [0] = Secondary; MSM = Male-to-male sexual contact; [a] Pearson Chi-squared Test; [b] Fisher's Exact Test; [c] Wilcoxon Rank Sum (Mann W-U)Test; [d] Logistic Regression; ns* = Not significant and excluded from multivariate model following assessment; ** = Not included in multivariate model

Factors associated with HIV

There were 15 participants who tested positive for HIV in this study. The comparisons were made between these and the 762 who tested negative. The following variables were significantly associated with HIV in univariate analysis: female gender ($p<0.001$), longer time (>3 years) in prison in the last 10 years ($p<0.05$), greater likelihood of being in a very high use prison ($p<0.001$), a history of IV drug use ever ($p<0.001$), the sharing of IV drug equipment ($p<0.001$), IV use of all of the drugs enquired about ($p<0.05$ to $p<0.001$) except steroids, the number of years using drugs IV ($p<0.001$), the presence of a tattoo acquired while in prison ($p<0.05$) and certain sexual practices such as male-to-male sexual contact ($p<0.001$) and sex in prison ($p<0.05$).

Each of the variables significant in univariate analysis (except the individual IV drugs used) was entered into the logistic model. In addition, age-group, educational level attained and any tattoo were added to the initial model as potentially important variables. Examination of the model identified several variables that were not associated with HIV in this study. These included educational level attained, time spent in prison in the last 10 years, prison category and tattoos, whether acquired in prison or elsewhere. Age was retained in the final logistic model which included complete data on all remaining variables for 657 participants. The following variables emerged as independently and significantly associated with HIV: **female gender** [$p<0.05$, OR=7.8 (1.6–37.4)], **ever having used drugs intravenously** [$p<0.001$, OR=14.3 (2.8–71.4)], **ever having shared IV drug equipment** [$p<0.001$, OR=12.5 (2.9–50.0)] and **male-to-male sexual contact** [$p<0.001$, OR=3.7 (4.0–164.50)]. A particular point of note in this analysis is that 'ever having used drugs IV' and 'ever having shared IV drug equipment' are not independently associated with HIV. The values shown occurred when each was added alone to the model. They are clearly strongly correlated in relation to HIV and it was deemed appropriate to report them in this way.

It must be noted that, while this analysis was based on 657 participants, only 15 participants were HIV positive. Therefore, findings are limited by very small numbers in some categories and this also impacts on the width of the confidence intervals derived.

Table 4.61 Socio-demographic, behavioural and drug-related factors associated with HIV in the prisoner population in Ireland

Characteristic	n		Hep C +ve (n=100)		Hep C -ve (n=677)		Unadjusted [abc]	Adjusted [d]		
			n	(%)	n	(%)	p value	p value	or	95% CI
Current Age (yrs)	762	18–24	1	7.1	238	31.8		Reference	1.0	
		25–34	6	42.9	301	40.2	ns	ns	2.1	0.05–4.5
		35–64	7	50.0	209	27.9		ns	7.9	0.01–1.2
Gender	777	Male	11	73.3	721	94.6				
		Female	4	26.7	41	5.4	p<0.001	p<0.05	7.8	1.6–37.4
Educational Level	761	None – Some 2°	9	60.0	525	70.4				
Attained		Full 2° – Higher	6	40.0	221	29.6	ns	ns*		
Time spent in Prison (preceeding 10 yrs)	695	< 1 yr	1	7.1	133	19.5		Reference	1.0	
		1–3 yrs	1	7.1	191	28.1	p<0.001	ns*		
		> 3 yrs	12	85.7	357	52.4		ns*		
Prison Category	777	Low/Medium	1	6.7	366	48.0		Reference	1.0	
(based on 12/12 drug use)		High	8	53.3	312	40.9	p<0.001	ns*		
		Very High	6	40.0	84	11.0		ns*		
IV Drug Use										
History of IV Drug Use	768	Yes	12	80.0	188	25.0	p<0.001	p<0.001	14.3	28–71.4
Sharing IV Drug Works	739	Yes	10	66.7	89	12.3	p<0.001	p<0.001	12.5	29–50.0
Drugs Used IV	758	Benzodiazepines	7	46.7	61	8.2	p<0.001	**		
	755	Amphetamines	3	20.0	43	5.8	p<0.05	**		
	760	Heroin	11	73.3	138	18.5	p<0.001	**		
	754	Methadone	2	13.3	18	2.4	p<0.01	**		
	750	Other Opiates	6	40.0	46	6.3	p<0.001	**		
	759	Cocaine Powder	10	66.7	90	12.1	p<0.001	**		
	752	Mephedrone	4	30.8	26	3.5	p<0.001	**		
	751	Methylone	4	40.8	14	1.9	p<0.001	**		
	751	Crystal Meths	2	15.4	10	1.4	p<0.001	**		
	763	Steroids	2	15.4	64	8.5	ns	**		
	741	Any Other Drug	4	36.4	29	4.0	p<0.001	**		
Years using Drugs IV	194		(n+11)		(n-183)					
		Median (Range)	17	(14–30)	6	(0–32)	p<0.001	ns*		
Tattoos			n	%	n	(%)				
Any Tattoo	768	Yes	12	80.0	513	68.1	ns	ns*		
Tattoo done in Prison	752	Yes	7	50.0	174	23.6	p<0.05	ns*		
Sexual Practices										
Sexual Orientation	736	Heterosexual	10	76.9	711	98.3	p<0.001	p<0.001	3.7	4.0–164.5
		MSM	3	23.1	12	1.7				
Sex in Prison	719	Yes	4	33.3	74	10.5	p<0.01	**		
Safe Sex usually practiced	664	Yes	7	58.3	297	45.6	ns	**		
Sexual Partners (last 12mths)	290		(n=3)		(n=287					
		Median (Range)	1	(1–4)	1	(0–30)	ns	**		

2 [0] = Secondary; MSM = Male-to-male sexual contact; [a] Pearson Chi-squared Test; [b] Fisher's Exact Test; [c] Wilcoxon Rank Sum (Mann W-U)Test; [d] Logistic Regression; ns* = Not significant and excluded from multivariate model following assessment; ** = Not included in multivariate model
x Each of these variables is highly significant when modelled separately, but not simultaneously. OR's and CI's shown are from the separate models

Factors associated with BBV co-infection

There were just 11 participants who tested positive for more than one BBV in this study. The comparisons were made between these and the 766 who did not have co-infection, though some had one BBV. By definition the results were constrained by such small numbers and also by the fact that risk factors for co-infection were likely to be 'over' represented in the comparison group.

The following variables were significantly associated with co-infection in univariate analysis: longer time (>3 years) in prison in the last 10 years ($p<0.05$), greater likelihood of being in a very high use prison ($p<0.01$), a history of IV drug use ever ($p<0.001$), the sharing of IV drug equipment ($p<0.001$), IV use of all the drugs enquired about ($p<0.01$ to $p<0.001$) except steroids, the number of years using drugs IV ($p<0.001$) and the presence of a tattoo acquired while in prison ($p<0.01$). Sexual orientation or sexual practices did not appear to be related to co-infection.

Each of the variables significant in univariate analysis (except the individual IV drugs used) was entered into the logistic model. In addition, age-group, gender, educational level attained and any tattoo were added to the initial model as potentially important variables. Examination of the model identified only one variable, **ever having shared IV drug equipment** that was significantly associated with co-infection [$p<0.001$, OR=62.5 (7.5–500.0)].

It must be noted that, while this analysis was based on 658 participants, only 11 participants were BBV co-infected. Therefore, findings are limited by very small numbers and the confidence interval for the only significant factor was extremely wide.

Summary

From the multivariate analyses carried out in this study, it would appear that by far the most important factors associated with infection with blood-borne viruses in the prison population are ever having used drugs intravenously and ever having shared IV drug equipment. Older age appears to be associated with hepatitis C, as does having had a tattoo done in prison. Female prisoners appear to be at greater risk of having hepatitis C and HIV in this population and male-to-male sexual contact is confirmed as a risk factor for HIV. It is hoped that these findings will focus attention on the most important factors associated with blood-borne viruses in the prison population.

Table 4.62 Socio-demographic, behavioural and drug-related factors associated with BBVs co-infection in the prisoner population in Ireland

Characteristic	n		Co-Infection (n=11)		infection (n=766)		Unadjusted [abc]	Adjusted [d]		
			n	(%)	n	(%)	p value	p value	or	95% CI
Current Age (yrs)	762	18–24	0	0.0	239	31.8		Reference		
		25–34	5	50.0	302	40.2	ns	ns*		
		35–64	5	50.0	211	20.1		ns*		
Gender	777	Male	9	81.8	723	94.4				
		Female	2	18.2	43	5.6	ns	ns	1.1	0.22–6.0
Educational Level	761	None – Some 2°	9	81.8	525	70.0				
Attained		Full 2° – Higher	2	18.2	225	30.0	ns	ns*		
Time spent in Prison (preceeding 10 yrs)	695	< 1 yr	0	0.0	134	19.6		Reference		
		1–3 yrs	1	9.1	191	27.9	p<0.05	ns*		
		> 3 yrs	10	90.9	359	52.5		ns*		
Prison Category	777	Low/Medium	0	0.0	367	47.9		Reference		
(based on 12/12 drug use)		High	8	72.7	312	40.7	p<0.01	ns*		
		Very High	3	27.3	87	11.4	ns*			
IV Drug Use										
History of IV Drug Use	768	Yes	11	100.0	189	25.0	p<0.001	ns*		
Sharing IV Drug Works	739	Yes	10	90.9	89	12.2	p<0.001	p<0.001	62.5	7.5–500.0
Drugs Used IV	758	Benzodiazepines	7	63.6	61	8.2	p<0.001	**		
	755	Amphetamines	3	27.3	43	5.8	p<0.01	**		
	760	Heroin	11	100.0	138	18.4	p<0.001	**		
	754	Methadone	2	18.2	18	2.4	p<0.01	**		
	750	Other Opiates	6	54.6	46	6.2	p<0.001	**		
	759	Cocaine Powder	10	90.0	90	12.0	p<0.001	**		
	752	Mephedrone	4	40.0	26	3.5	p<0.001	**		
	751	Methylone	4	40.0	14	1.9	p<0.001	**		
	751	Crystal Meths	2	20.0	10	1.4	p<0.001	**		
	763	Steroids	1	10.0	65	8.6	ns	**		
	741	Any Other Drug	4	50.0	29	4.0	p<0.001	**		
Years using Drugs IV	194		(n=10)		(n=184)					
		Median (Range)	17.5	(14–32)	6	(0–31)	p<0.001	ns*		
Tattoos			n	(%)	n	(%)				
Any Tattoo	768	Yes	9	81.8	516	68.2	ns	ns*		
Tattoo done in Prison	752	Yes	6	60.0	175	23.6	p<0.01	ns*		
Sexual Practices										
Sexual Orientation	736	Heterosexual	10	100.0	711	97.9	ns	**		
		MSM								
Sex in Prison	719	Yes	1	12.5	77	10.8	ns	**		
Safe Sex usually practiced	664	Yes	5	62.5	299	45.6	ns	**		
Sexual Partners (last 12mths)	290		(n=2)		(n=288)					
		Median (Range)	1	(1–1)	1	(0–30)	ns	**		

2 [0] = Secondary; MSM = Male-to-male sexual contact; [a] Pearson Chi-squared Test; [b] Fisher's Exact Test; [c] Wilcoxon Rank Sum (Mann W-U)Test; [d] Logistic Regression; ns* = Not significant and excluded from multivariate model following assessment; ** = Not included in multivariate model

4.10 Prison Drug Treatment and Harm Reduction Services

Results throughout Chapter 4 have included an analysis by prison category for drug use. A summary of the findings of those analyses is useful at this point as the results for the prisoners' perception of their need for and use of drug treatment and harm reduction services in prison is also presented by prison drug use category. In this way the need for tailored service delivery requirements may be assessed.

In the low drug-use prison category it is notable that the lifetime (table 4.17), last year (table 4.19) and last month use (table 4.22) of cannabis is almost as high as it is in the other prison categories, as is the lifetime use of cocaine powder. In respect of all other drugs at all time points use in low drug-use prisons is substantially lower, as would be expected. It is also notable that the results of oral fluid sampling reveal that recent use (24–48 hour use) of cannabis and benzodiazepines is significantly higher in the low drug-use prisons than in any other category (table 4.24).

The gradations in use of individual drugs from the medium use to the very high use prisons show a generally increasing pattern. For lifetime use this applies to heroin, methadone, other opiates and crack cocaine (table 4.17). For last year use it applies to all drugs except benzodiazepines (table 4.19). This is hardly surprising since the use of selected drugs in the last 12 months was the basis for assigning prison category. For last month use the use increases for benzodiazepines, other sedatives and tranquillisers, methadone and crack cocaine with increasing level of prison category, and decreases in the very high use prisons for cannabis, heroin, other opiates and cocaine powder (table 4.22). The results of oral fluid testing for drugs support the trend of self-reported use of last month use of cannabis and benzodiazepines and all use of methadone (table 4.24).

In relation to IV drugs, the numbers and proportions in the low drug use prisons who ever injected (table 4.26), injected in the last year (table 4.28) or injected in the last month (table 4.31) are negligible across all 11 drugs. The proportions who used IV drugs in the medium, high and very high use prisons increases across categories almost without exception, for ever use, last year use and last month use.

Among ever IV drug users, sharing of any IV drug equipment (table 4.49) was lowest in the low drug use prisons (approximately one-third of a very few users in this category). Approximately half of ever IV drug users in medium and high use prisons shared IV drug equipment; the highest propensity to sharing occurred in the very high use prisons where over 80% of participants reported ever having shared. These data may be of value in the allocation of selected services to prisons in selected categories.

It is noteworthy that the prevalence of BBVs, specifically HIV and hepatitis C, increases across the prison categories with the highest prevalence of both being in the very high use prison category (table 4.57). The nature of this relationship between sharing of IV works and hepatitis C and HIV was examined in multivariate analysis and is reported in detail in the preceding section.

Respondents were asked a series of questions about their need for drug treatment and harm reduction services in prison, availability of the service when they needed it, and, in cases where it was available, whether they used it. Results are presented for the prison population in the table and figure below and presented by prison categories for drug use in subsequent tables and figures in this section. When interpreting these results it should be noted that prisoners can move between prisons and it is possible that some respondents were at times referring to needing a service or its availability in a prison other than that in which they were in custody during the study.

Table 4.63 Prison drug treatment and harm reduction services: Need, availability and use of services in prison

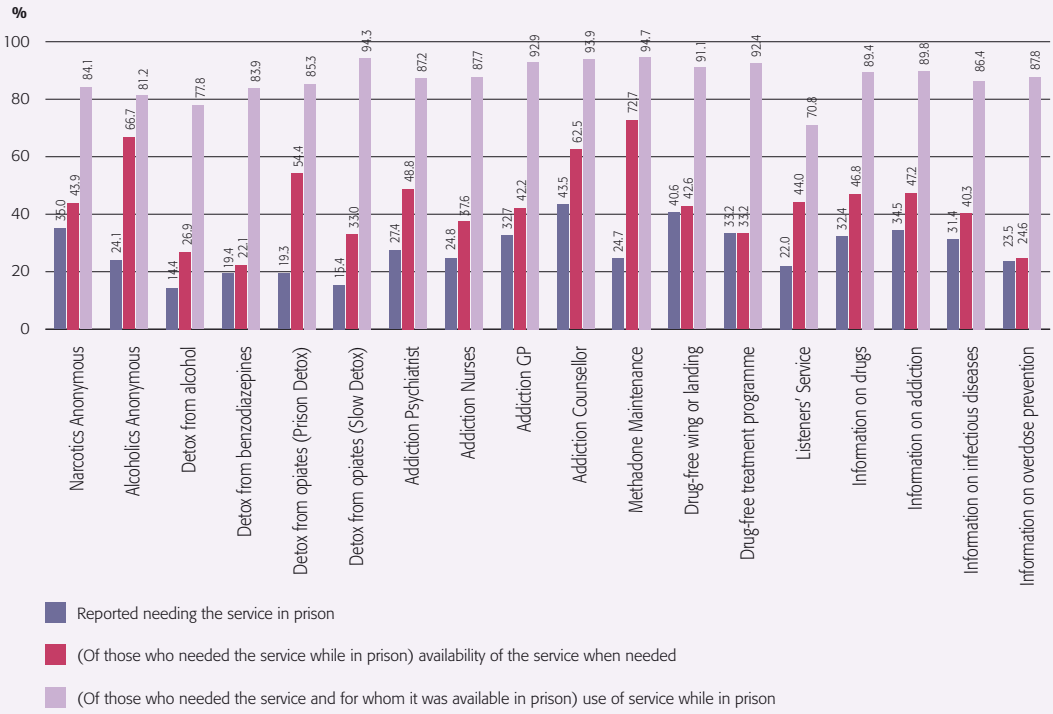
	Reported needing the service in prison		(Of those who needed the service while in prison) availability of the service when needed		(Of those who needed the service and for whom it was available in prison) use of service while in prison	
	n	%	n	%	n	%
Narcotics Anonymous	279	35.0	116	43.9	95	84.1
Alcoholics Anonymous	191	24.1	120	66.7	95	81.2
Detox from alcohol	113	14.4	28	26.9	21	77.8
Detox from benzodiazepines	154	19.4	32	22.1	26	83.9
Detox from opiates (Prison Detox)	153	19.3	80	54.4	64	85.3
Detox from opiates (Slow Detox)	120	15.4	38	33.0	33	94.3
Addiction Psychiatrist	215	27.4	99	48.8	82	87.2
Addiction Nurses	195	24.8	70	37.6	57	87.7
Addiction GP	249	32.7	100	42.2	91	92.9
Addiction Counsellor	336	43.5	202	62.5	184	93.9
Methadone Maintenance	196	24.7	136	72.7	126	94.7
Drug-free wing or landing	316	40.6	127	42.6	112	91.1
Drug-free treatment programme	253	33.2	82	33.2	73	92.4
Listeners' Service	168	22.0	70	44.0	46	70.8
Information on drugs	250	32.4	110	46.8	93	89.4
Information on addiction	266	34.5	120	47.2	106	89.8
Information on infectious diseases	242	31.4	93	40.3	76	86.4
Information on overdose prevention	180	23.5	42	24.6	36	87.8
Range		**15–44%**		**22–73%**		**71–95%**

Overall, the need for services varied across the system, ranging from a low of 14% reporting having needed detoxification from alcohol to 44% reporting having needed addiction counselling.

Those who had indicated a need for drug treatment and harm reduction services were asked whether the service was available to them. At every session in the first prison visited during fieldwork, prisoners asked that the question be qualified; the majority felt that while they may eventually gain access to a service, they often had to wait for what they considered to be unreasonable periods of time. Following review, instructions in the presentation at all subsequent sessions were amended to ask if services were available to those that needed them 'when they needed them', or within a reasonable timeframe. Availability (for those who had expressed having needed the service) varied across the services, ranging from 22% for detoxification from benzodiazepines to 73% for methadone maintenance.

Finally those who had expressed a need and who had reported the service as available were asked whether they had used the service. Uptake ranged from over 70% to 95%. This high uptake once a service is available is shown graphically in figure 4.26 below.

Figure 4.26 Prison drug treatment and harm reduction services: Need, availability and use of services in prison



Service need, availability and utilisation were reviewed using the prison categories, which were derived as described earlier and are presented in the table below.

Table 4.64 Prison drug use categories

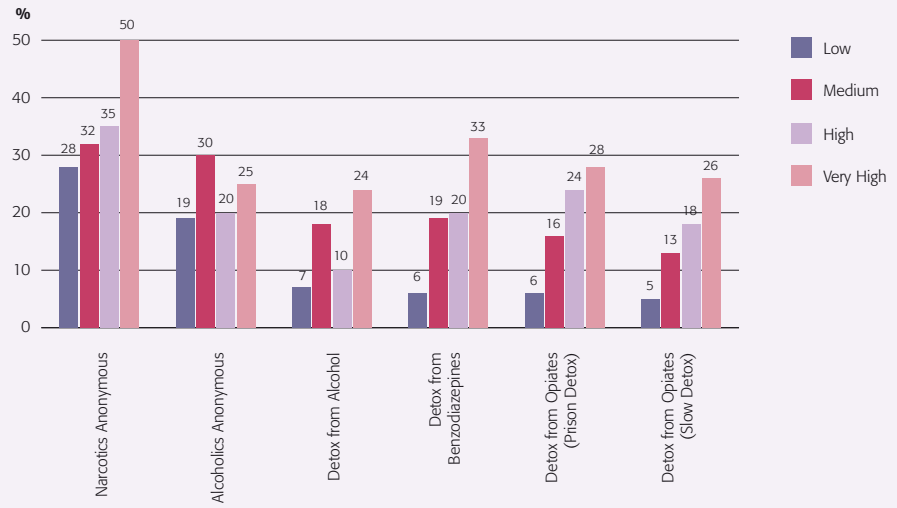
Low use (n = 91)	Medium use (n = 289)	High use (n = 341)	Very high use (n = 96)
Arbour Hill	Castlerea	Limerick Male	Cloverhill
Loughan House	Cork	Mountjoy	Dóchas
Shelton Abbey	Midlands	Portlaoise	Limerick Female
	St. Patrick's Institution	Wheatfield	
	Training Unit		

Note: within categories prisons are presented in alphabetical order, not in order of severity of drug use

Table 4.65 Prison drug treatment and harm reduction services: Need for services in prison by prison drug use category

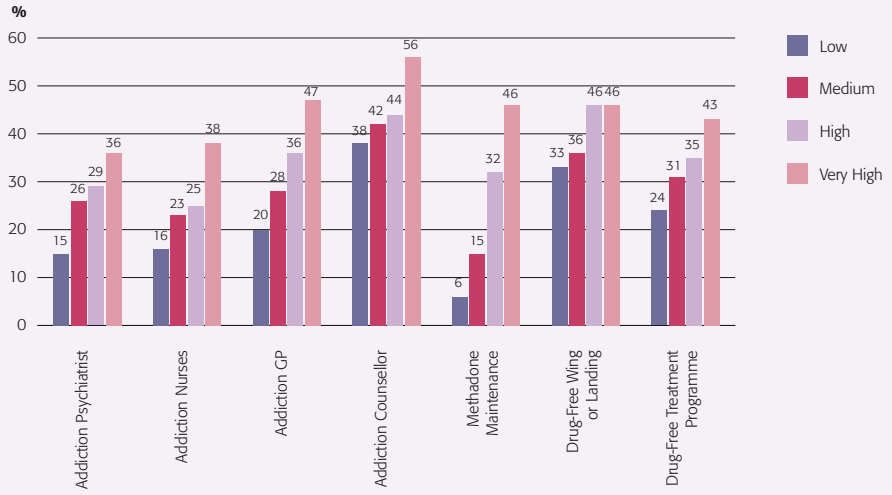
	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Narcotics Anonymous	25	28.1	91	31.9	116	35.3	47	49.5
Alcoholics Anonymous	17	19.3	85	29.8	66	20.2	23	25.0
Detox from alcohol	6	6.9	52	18.4	33	10.2	22	23.7
Detox from benzodiazepines	5	5.7	53	18.7	65	19.8	31	33.3
Detox from opiates (Prison Detox)	5	5.7	45	15.8	77	23.5	26	28.3
Detox from opiates (Slow Detox)	4	4.7	36	12.9	57	17.6	23	25.6
Addiction Psychiatrist	13	14.9	74	26.1	95	29.3	33	36.3
Addiction Nurses	14	16.1	64	22.6	82	25.4	35	38.0
Addiction GP	17	20.2	76	27.7	114	36.3	42	46.7
Addiction Counsellor	33	37.9	117	41.5	137	43.5	49	55.7
Methadone Maintenance	5	5.7	42	14.8	106	32.3	43	45.7
Drug-free wing or landing	29	33.3	100	35.5	146	45.5	41	46.1
Drug-free treatment programme	21	24.4	85	30.8	109	34.8	38	43.2
Listeners' Service	18	20.9	67	24.4	52	16.6	31	34.4
Information on drugs	21	24.1	86	30.8	104	32.9	39	43.8
Information on addiction	23	26.4	94	33.6	106	33.5	43	48.9
Information on infectious diseases	18	20.7	85	30.4	102	32.5	37	41.6
Information on overdose prevention	15	17.2	68	24.4	68	21.7	29	33.0
Range		**5–38%**		**13–42%**		**17–46%**		**24–56%**

Figure 4.27 Prison drug treatment and harm reduction services: Need for services in prison (1) by prison drug use category



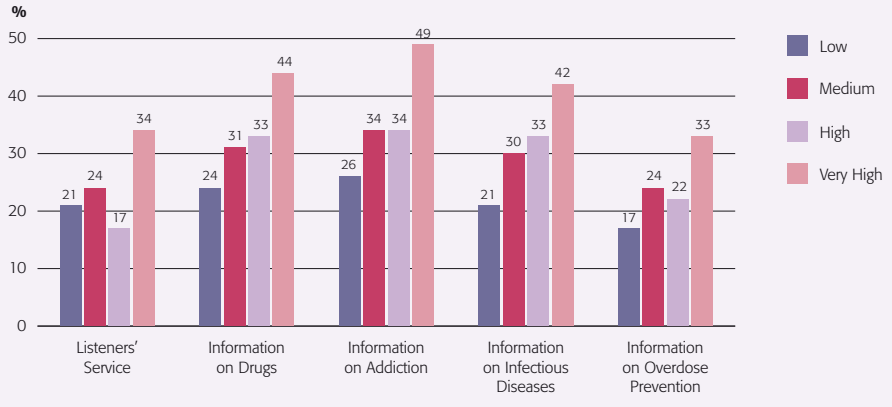
In figure 4.27 there is a clear trend of the reported need for drug treatment and harm reduction services increasing across the prison categories from low drug use prisons to higher use prisons, with the exception of the need for Alcoholics Anonymous and detoxification from alcohol. This is despite high prevalence rates for alcohol use and high median drinks taken on a drinking day in the 12 months before coming into prison, suggesting a lack of insight that excessive drinking is a problem of addiction.

Figure 4.28 Prison drug treatment and harm reduction services: Need for services in prison (2) by prison drug use category



Among addiction services, the need for addiction counselling services is relatively high across all the categories. The need for drug-free wings or landings is expressed by at least a third of prisoners resident in all prison categories, highlighting the importance of a drug-free environment to many prisoners.

Figure 4.29 Prison drug treatment and harm reduction services: Need for services in prison (3) by prison drug use category

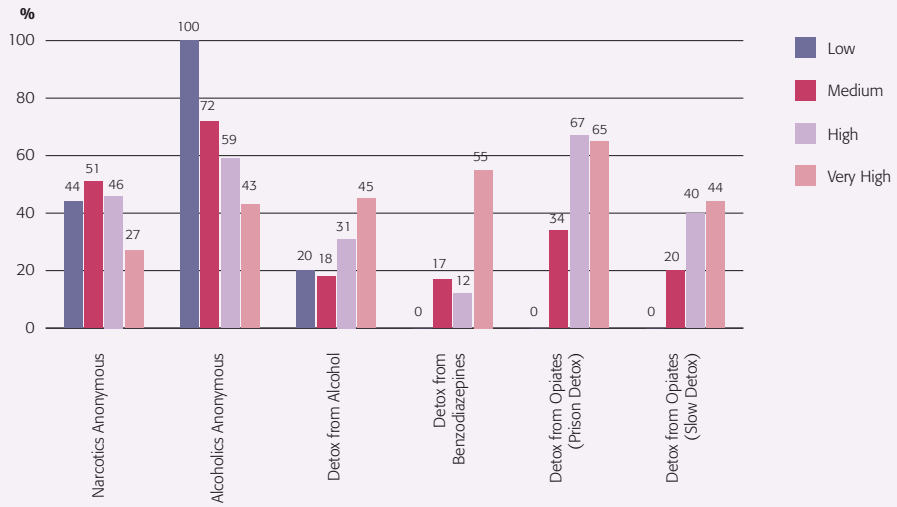


Between a fifth and a third of all prisoners expressed a need for information services, with an increasing trend from low use to very high use prison category.

Table 4.66 Prison drug treatment and harm reduction services: Reported availability of services (among those who needed them) by prison drug use category

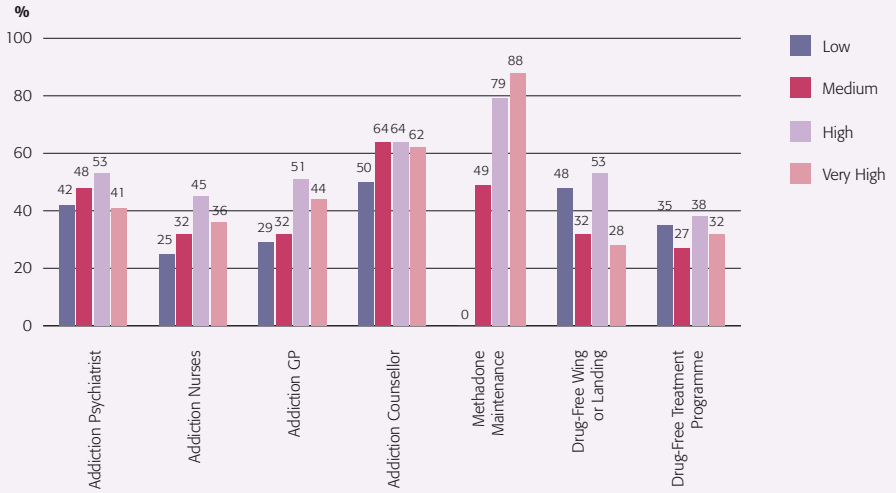
	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Narcotics Anonymous	10	43.5	44	50.6	50	45.9	12	26.7
Alcoholics Anonymous	16	100.0	59	72.0	36	59.0	9	42.9
Detox from alcohol	1	20.0	9	18.0	9	31.0	9	45.0
Detox from benzodiazepines	0	0	9	17.3	7	11.9	16	55.2
Detox from opiates (Prison Detox)	0	0	15	34.1	48	66.7	17	65.4
Detox from opiates (Slow Detox)	0	0	7	20.0	21	39.6	10	43.5
Addiction Psychiatrist	5	41.7	34	47.9	47	53.4	13	40.6
Addiction Nurses	3	25.0	20	31.7	35	44.9	12	36.4
Addiction GP	5	29.4	24	32.0	54	50.9	17	43.6
Addiction Counsellor	16	50.0	72	64.3	85	64.4	29	61.7
Methadone Maintenance	0	0	20	48.8	80	79.2	36	87.8
Drug-free wing or landing	13	48.1	30	31.9	73	52.9	11	28.2
Drug-free treatment programme	7	35.0	23	27.4	40	38.1	12	31.6
Listeners' Service	10	71.4	23	34.8	26	53.1	11	36.7
Information on drugs	6	33.3	31	38.3	53	53.0	20	55.6
Information on addiction	8	40.0	37	40.7	56	55.4	19	45.2
Information on infectious diseases	8	47.1	25	30.1	41	43.2	19	52.8
Information on overdose prevention	4	33.3	14	20.9	17	26.6	7	25.0
Range	**0–100%**		**17–72%**		**12–79%**		**25–88%**	

Figure 4.30 Prison drug treatment and harm reduction services: Reported availability of services (1) (among those who needed them) by prison drug use category



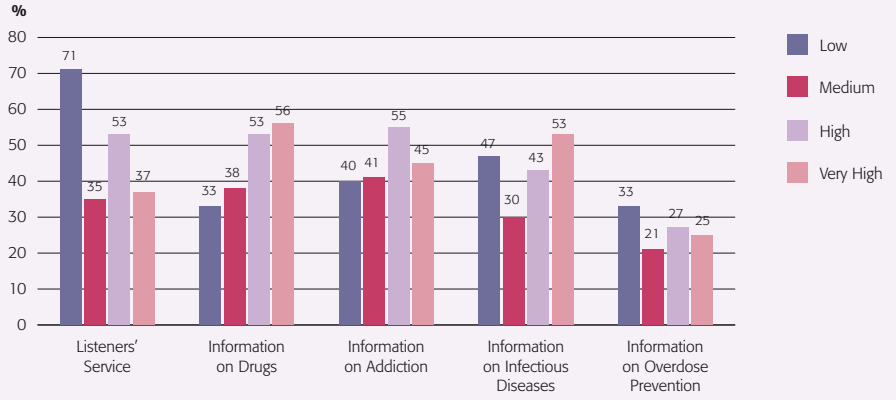
Availability of services (to those who had expressed a need) ranged from not available for some of the detoxification services in low use prisons to 100% for AA in the low use prisons.

Figure 4.31 Prison drug treatment and harm reduction services: Reported availability of services (2) (among those who needed them) by prison drug use category



There was a lot of variation in the reported availability of one-to-one services with addiction professionals. One would not necessarily expect the availability rates to follow an increasing trend from the low to very high prison drug use categories as analysis was based only on those who had expressed a need. Availability of methadone maintenance was at its peak in the high and very high use prisons (80–88%).

Figure 4.32 Prison drug treatment and harm reduction services: Reported availability of services (3) (among those who needed them) by prison drug use category



Availability of information services (to those who expressed a need) was reasonably consistent across the categories.

Table 4.67 Prison drug treatment and harm reduction services: Reported use of services when available, by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Narcotics Anonymous	9	90.0	31	73.8	45	91.8	10	83.3
Alcoholics Anonymous	14	87.5	50	87.7	27	77.1	4	44.4
Detox from alcohol	1	100.0	7	77.8	7	87.5	6	66.7
Detox from benzodiazepines	–	–	5	55.6	5	83.3	16	100.0
Detox from opiates (Prison Detox)	–	–	12	85.7	38	84.4	14	87.5
Detox from opiates (Slow Detox)	–	–	5	83.3	18	94.7	10	100.0
Addiction Psychiatrist	2	50.0	29	90.6	39	86.7	12	92.3
Addiction Nurses	2	66.7	13	72.2	30	93.8	12	100.0
Addiction GP	3	60.0	22	95.7	50	92.6	16	100.0
Addiction Counsellor	14	93.3	68	95.8	76	92.7	26	92.9
Methadone Maintenance	–	–	18	94.7	74	94.9	34	94.4
Drug-free wing or landing	13	100.0	30	100.0	62	88.6	7	70.0
Drug-free treatment programme	5	71.4	23	100.0	35	89.7	10	100.0
Listeners' Service	6	66.7	17	77.3	14	58.3	9	90.0
Information on drugs	5	100.0	26	89.7	46	86.8	16	94.1
Information on addiction	7	87.5	31	86.1	51	91.1	17	94.4
Information on infectious diseases	8	100.0	21	87.5	34	82.9	13	86.7
Information on overdose prevention	3	75.0	12	92.3	14	82.4	7	100.0
Range		**50–100%**		**56–100%**		**59–95%**		**44–100%**

Among those who reported a need for a service and who reported that it was available to them, uptake of services was very high, with uptake rarely (8/72) falling below 70% in any prison drug use category.

Figure 4.33 Prison drug treatment and harm reduction services: Reported use of services when available (1), by prison drug use category

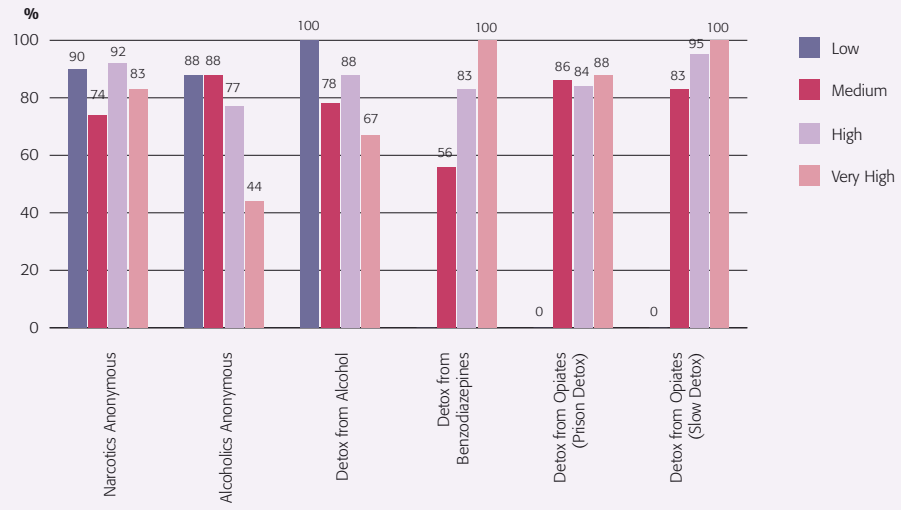


Figure 4.34 Prison drug treatment and harm reduction services: Reported use of services when available (2), by prison drug use category

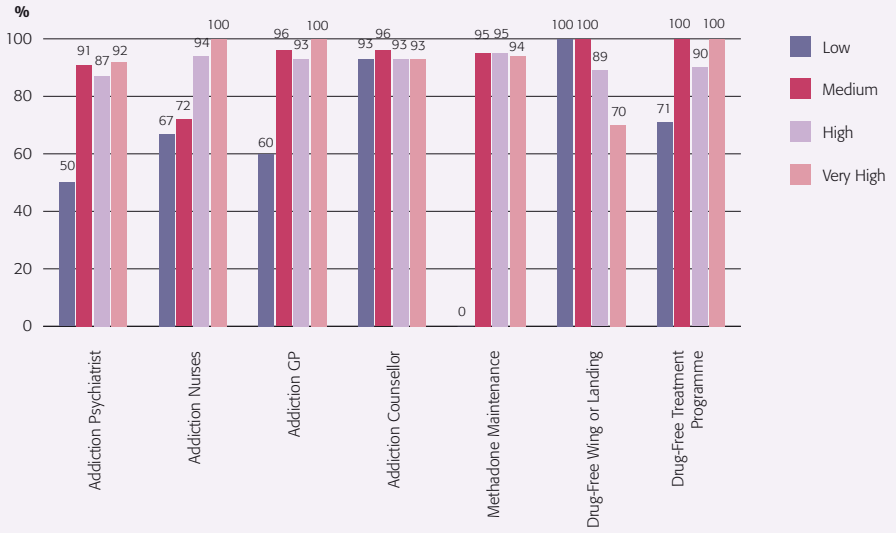
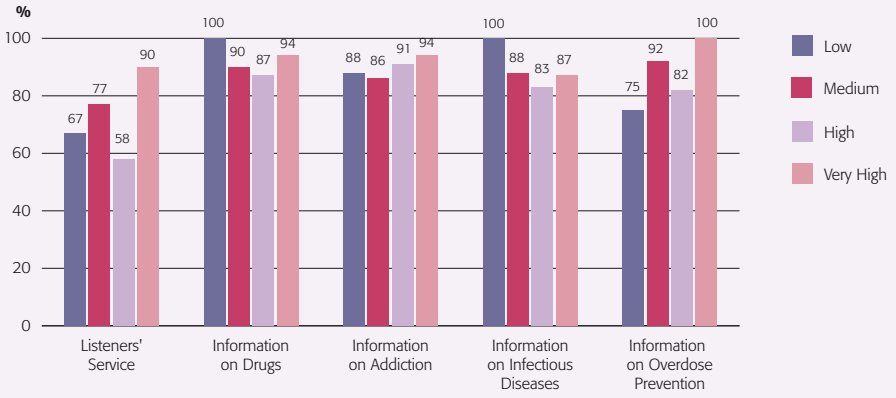


Figure 4.35 Prison drug treatment and harm reduction services: Reported use of services when available (3), by prison drug use category



The views of prisoners who had ever injected (IDUs) on their prison drug treatment and harm reduction service needs, availability and use was also analysed and are shown in the next three tables. A similar pattern of need emerges as for the general prison population, but, not unexpectedly, the proportions tend to be higher. However, when looking at availability of services, while the numbers are much lower, the proportions in the case of most services are not very different than those for the general prisoner population in any prison drug use category, suggesting a consistency in reporting of availability of services. The pattern of extremely high uptake, where services are available, persists for IDUs and is very high for the high drug use category.

Table 4.68 Prison drug treatment and harm reduction services: Reported need for injecting drug users by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Narcotics Anonymous	6	54.5	25	59.5	61	54.5	30	76.9
Alcoholics Anonymous	0	0.0	14	33.3	19	17.3	12	32.4
Detox from alcohol	1	9.1	15	35.7	12	11.0	10	26.3
Detox from benzodiazepines	3	27.3	15	35.7	38	33.9	21	55.3
Detox from opiates (Prison Detox)	4	36.4	18	42.9	56	50.0	18	47.4
Detox from opiates (Slow Detox)	3	27.3	13	31.0	39	35.8	19	51.4
Addiction Psychiatrist	5	45.5	22	52.4	53	48.6	19	52.8
Addiction Nurses	5	45.5	21	50.0	45	42.1	20	54.1
Addiction GP	6	54.5	23	56.1	64	59.3	23	65.7
Addiction Counsellor	8	72.7	30	71.4	66	62.3	28	82.4
Methadone Maintenance	4	36.4	20	47.6	74	65.5	30	78.9
Drug-free wing or landing	7	63.6	20	47.6	64	58.7	21	61.8
Drug-free treatment programme	7	63.6	25	59.5	57	53.3	26	74.3
Listeners' Service	3	27.3	14	33.3	26	25.0	16	45.7
Information on drugs	7	63.6	13	31.0	45	42.5	22	64.7
Information on addiction	7	63.6	18	42.9	51	48.1	24	70.6
Information on infectious diseases	5	45.5	20	47.6	48	45.3	25	73.5
Information on overdose prevention	7	63.6	17	40.5	34	32.1	21	61.8
Range		**0–64%**		**33–72%**		**11–66%**		**26–82%**

Table 4.69 Availability of drug treatment and harm reduction services in prison for injecting drug users (who said they needed them) by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Narcotics Anonymous	2	40.0	13	52.0	22	40.0	11	37.9
Alcoholics Anonymous	–	–	11	78.6	10	55.6	6	50.0
Detox from alcohol	0	0.0	3	21.4	5	45.5	6	60.0
Detox from benzodiazepines	0	0.0	1	6.7	3	8.6	11	52.4
Detox from opiates (Prison Detox)	0	0.0	7	41.2	34	65.4	12	66.7
Detox from opiates (Slow Detox)	0	0.0	3	23.1	15	41.7	9	47.4
Addiction Psychiatrist	1	25.0	9	42.9	24	49.0	11	57.9
Addiction Nurses	1	33.3	7	33.3	17	40.5	9	45.0
Addiction GP	1	16.7	6	26.1	34	56.7	13	59.1
Addiction Counsellor	3	42.9	23	76.7	39	61.9	19	67.9
Methadone Maintenance	0	0.0	9	47.4	53	76.8	25	86.2
Drug-free wing or landing	2	33.3	5	26.3	31	49.2	5	23.8
Drug-free treatment programme	2	33.3	9	36.0	18	33.3	9	34.6
Listeners' Service	1	50.0	6	42.9	13	54.2	5	33.3
Information on drugs	1	20.0	4	30.8	21	48.8	10	45.5
Information on addiction	1	20.0	7	38.9	23	46.9	11	45.8
Information on infectious diseases	2	50.0	5	25.0	21	45.7	12	50.0
Information on overdose prevention	1	20.0	4	23.5	8	25.0	7	33.3
Range		**0–43%**		**7–79%**		**9–77%**		**33–87%**

Table 4.70 Use of drug treatment and harm reduction services in prison by injecting drug users by prison drug use category

	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Narcotics Anonymous	2	100.0	8	61.5	20	95.2	9	81.8
Alcoholics Anonymous	–	–	9	81.8	6	60.0	2	33.3
Detox from alcohol	–	–	3	100.0	5	100.0	5	83.3
Detox from benzodiazepines	–	–	0	0.0	2	66.7	11	100.0
Detox from opiates (Prison Detox)	–	–	5	71.4	27	84.4	10	90.9
Detox from opiates (Slow Detox)	–	–	1	50.0	12	92.3	9	100.0
Addiction Psychiatrist	0	0.0	7	77.8	20	87.0	10	90.9
Addiction Nurses	1	100.0	4	57.1	13	92.9	9	100.0
Addiction GP	0	0.0	5	83.3	30	88.2	13	100.0
Addiction Counsellor	3	100.0	22	100.0	34	91.9	16	88.9
Methadone Maintenance	–	–	8	100.0	50	96.2	24	96.0
Drug-free wing or landing	2	100.0	5	100.0	24	80.0	3	60.0
Drug-free treatment programme	1	50.0	9	100.0	16	94.1	9	100.0
Listeners' Service	0	0.0	4	80.0	5	45.5	5	100.0
Information on drugs	1	100.0	3	100.0	19	90.5	9	90.0
Information on addiction	1	100.0	6	85.7	22	95.7	10	90.9
Information on infectious diseases	2	100.0	4	80.0	19	90.5	9	81.8
Information on overdose prevention	1	100.0	3	75.0	7	87.5	7	100.0
Range	**0–100%**		**0–100%**		**45–100%**		**33–100%**	

4.10.1 Other Harm-Reduction Services

4.10.1.1 Blood-Borne Virus Screening

About two fifths of prisoners reported that they had been tested for hepatitis B (42%), hepatitis C (43%) and HIV (44%). This appears to show a moderate improvement on the previous study (Allwright et al., 1999) when 29% had been tested for hepatitis B, 30% for hepatitis C and 38% for HIV, although it should be noted that three prisons considered low risk for BBVs were not included in that study. In Scottish prisons, 32% of prisoners reported having previously been tested for hepatitis C virus (Scottish Prison Service, 2009).

Among those who had been tested, the median number of years since they were first tested was three years (range 0–31 and interquartile range 1–8 years for hepatitis B; range 0–27 and interquartile range 1–8 years for hepatitis C; and range 0–25 and interquartile range 1–7 years for HIV); the median number of years since last tested was one year (range 0–20 years and interquartile range 1–3 years) for all three blood-borne viruses. Two thirds of those who had been tested had been in prison for their last test (hepatitis B 66%; hepatitis C 66% and HIV 67%).

4.10.1.2 Hepatitis B Vaccination

Two hundred and eighty two respondents (37%) reported that they had received one or more doses of hepatitis B vaccine and among these 67% had received all three doses (24% of all prisoners). This is a lower proportion than in the 1999 study (Allwright et al., 1999) when 48% had been vaccinated and 29% of all prisoners had received three doses. In the current study more than one in ten (13%) did not know whether they had been vaccinated or not. A higher proportion of women (55%) had received the vaccine than men (36%, marginally significant at $p=0.053$), but a lower proportion of women had completed the course than men. IDUs were significantly more likely to have been vaccinated (54%) than non-IDUs (54% vs 34%, $p<0.001$) and 72% of vaccinated IDUs had completed the full course. These latter results may be a consequence of injectors coming into contact with health services more so than non-injectors.

Table 4.71 Harm Reduction Services: Hepatitis B vaccination status

	All		Males		Females		IDUs		Non-IDUs	
	n	%	n	%	n	%	n	%	n	%
Received one or more doses of hepatitis B vaccine?	283	37.1	261	36.1	22	55.0	106	53.5	176	31.2
Vaccinated individuals who had completed a course of at least 3 injections?	187	66.8	174	67.4	13	59.1	76	72.4	110	63.2

When reviewed by the category of prison, 75% of the residents in the low drug use prisons were not vaccinated, 70% in the medium use prisons, and about 55% of those in the high and very high use prisons have not, to their knowledge, received any vaccination doses. Among those who had been vaccinated, completion rates were fairly consistent across the categories (65% to 69%).

Table 4.72 Blood-borne viruses: Hepatitis B vaccination status by prison drug use category

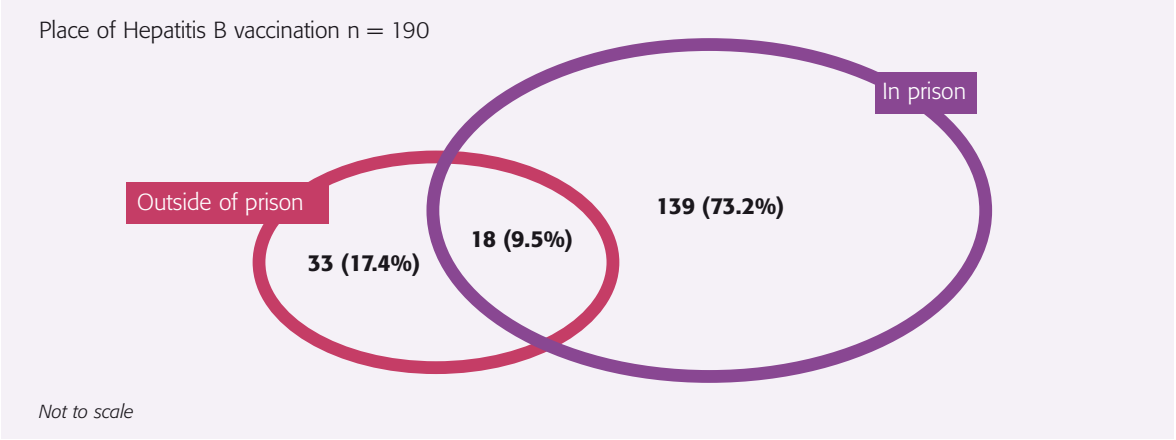
	Low use		Medium use		High use		Very High use	
	n	%	n	%	n	%	n	%
Received one or more doses of hepatitis B vaccine	20	25.0	88	31.7	138	42.6	37	45.7
(Among vaccinated) completed three doses of vaccination	13	65.0	60	69.0	90	66.2	24	64.9

Among the 190 vaccinated individuals who responded to the question about where they were vaccinated, 73% reported that they were vaccinated in prison. One in ten of those who were vaccinated received their vaccination in a combination of in prison and in the community. Among IDUs, 61% were vaccinated in prison and 6% in combined prison and community setting. Overall, results suggest that being in custody has provided an opportunity for identifying and providing vaccination to this at-risk group. In the UK, Hope et al. (2007) found that the prison vaccination programme made a substantive contribution to achieving national vaccination coverage targets among IDUs.

Table 4.73 Blood-borne viruses: Hepatitis B vaccination location (among those who were vaccinated)

	All		Males		Females		IDUs		Non-IDUs	
	n	%	n	%	n	%	n	%	n	%
In prison	139	73.2	131	74.0	8	61.5	47	61.0	92	82.1
Outside of prison	33	17.4	31	17.5	2	15.4	19	24.7	13	11.6
Combination of both	18	9.5	15	8.5	3	23.1	11	14.3	7	6.3

Figure 4.36 Blood-borne viruses: Location of hepatitis B vaccination (among those who had at least one dose of vaccination)



4.11 Summary

This chapter has identified high prevalence rates for lifetime, last year and last month drug use among prisoners. It has shown the nature and patterns of drug use including drug use initiating in prison as well as use in prison within the last year. Methods of use for different drugs have been explored with relatively high injecting drug prevalence rates, but little evidence of current injecting in prison among the prisoner population. The prevalence rates for both hepatitis B and C have reduced since last assessed and the prevalence rate for HIV has not changed. Socio-demographic, behavioural and drug-related factors significantly associated with hepatitis C, HIV and co-infection have been identified. The need for and availability of a range of drug treatment and harm reduction services in the prison setting have been described and a pattern of high uptake when services are available is evident.

5.1 Discussion

This was a meticulously planned and executed survey with clearly set out aims and objectives and overseen by a Research Advisory Group appointed by the project commissioners, NACD. It provides up to date information on drug prevalence and related morbidity for prison inmates, which is of planning relevance to the stakeholders, including prisoners themselves. This is the first time a dedicated and very detailed predominantly drug-related prevalence survey, including biological sampling for drugs, has been carried out in Ireland in a prison context. It will provide a benchmark for future similar studies. It portrays a stark picture of a highly disadvantaged section of modern Irish society and the findings are in keeping with the international scientific literature on the topic.

5.2 Generalisability of the Findings

How confident can we be in the credibility of the findings given the response rate achieved? It is worth considering this question carefully because of the importance of the survey for planning purposes. We have described in more detail in the technical report the operational factors we think were potential influences on participation. Of 1,666 eligible participants, 824 actually participated. The sample estimates were based on precision and ability to compare key groups and had sufficient power to do so. Relatively few decided not to participate (7%) once they had heard the rationale from the study team. The datasets were virtually complete, with relatively few missing values. A small number of biological samples were either not provided or lost in the laboratory system. There was no breach in confidentiality in this latter instance as samples were fully anonymised, though the NACD, the data protection commissioners and the prison based research ethics committee were informed and consulted. Individuals who gave samples can be reassured that these were used for the purpose intended, retained in an anomymised format and small numbers of missing data made no difference to the prevalence estimates.

A number of possible influences on the response rate were anticipated. Firstly, while previous Irish studies included questions about drug use, the emphasis was on either health or ill-health, whereas crucially the present study focused specifically on drug use, evidenced by its primary aim and primary funder. The last Irish prison hepatitis prevalence study (Allwright et al., 1999) included an oral fluid test for blood-borne viruses but not a test for drugs. It was anticipated that prisoners with a tendency to mistrust authority might not believe assurances about confidentiality and anonymity and might perceive that they would have more to lose in a study on drugs than in a study on health.

Secondly, the IPS introduced mandatory drug testing (MDT) under the 2007 Prison Rules. MDT is carried out on a random basis, and is not popular. MDT utilises oral fluid samples, and some prisoners may have made incorrect assumptions about the purpose of oral fluid sampling in this study.

Because these factors were known, while a response rate of 80% (slightly lower than previous Irish studies) was targeted by the study team, it was recognised from the outset this might be difficult to achieve. To obtain as high a rate as possible, every effort was made to highlight the above factors and dispel concerns transparently. To overcome the potential impact on participation, prisons were saturated with advance information (for both staff and prisoners) about the voluntary nature of each component of the study (including the drug test), and about anonymity and confidentiality, and the team engaged with Governors, Chiefs, Assistant Chief Officers, Nurse Managers, chaplains and teachers to help disseminate this message. The team tried to dispel concerns and misconceptions in advance of the study commencing and during information sessions, however, anecdotally the IPS acknowledge that prisoners now have a much greater awareness and suspicion of any swab taken for BBV or DOA because of increased exposure to issues around DNA and the use of DNA sampling in criminal cases.

While a number of studies have been carried out in prisons internationally on the prevalence of one or more blood-borne viruses, which generally included collecting data on risk behaviour such as drug use, and some studies have been carried out on drug use specifically, most studies are not directly comparable. Twelve prison studies that focused on blood-borne viruses, and nine that focused on drug use were reviewed with a range of response rates from 24% (Sleiman, 2004 in Belgium) to 94% (Radun et al., 2008, in Germany).

A number of differences were found in aspects of these studies that can affect response. There are differences in methodologies for ascertaining data, such as clinical assessment interviews (Fotiadou et al., 2004; Lukasiewicz et al., 2007), semi-structured or structured one-to-one interviews (Dye and Isaacs, 1991; Power et al., 1992), interviewer or self-administered questionnaires (Koulierakis, 2000; Sleiman, 2004; Zakaria et al., 2010), extracting data from medical records (Singleton et al., 1999; Saiz de la Hoya et al., 2011) and biological sampling (Butler et al., 1997; Malliori et al., 1998; Ford et al., 2000; Radun et al., 2008). There are also differences in the sample targeted, with seven national random samples (Power et al., 1992; Singleton et al., 1999; Koulierakis, 2000; Lukasiewicz et al., 2007; Radun et al., 2008; Zakaria et al., 2010; Saiz de la Hoya et al., 2011), and in the type of prisoner approached, whether inmates or entrants or both. Some studies lack sufficient detail on sampling procedures to make a valid comparison (Singleton et al., 1999; Power et al., 1992; Ford et al., 2000; Sleiman, 2004), and the response rate is not provided in others, or no denominator information is available (Kirwan et al., 2011; Saiz de la Hoya et al., 2011). In terms of those studies that looked specifically at drug use amongst prisoners, some did not ask about drug use in prison (Fazel et al., 2006), while others employed a measurement that was not temporally specific ('ever use in prison') and avoided asking about use within the last month, with the explicit aims of both alleviating fear of disciplinary action and of increasing participation (Power et al., 1992; Sleiman, 2004). Finally, no studies were found that collected biological samples for drug testing.

At 49.5%, the response rate in this study is lower than in two methodologically comparable previous Irish studies, both national cross-sectional studies carried out 12–13 years ago in prisons using a random sampling strategy. In a study on the prevalence of blood-borne viruses among a national sample of prison inmates, Allwright et al. (1999) achieved an 85% response rate in 1998, and the only national general healthcare study of the Irish prison population (Centre for Health Promotion Studies, 2000) achieved an 88% response rate in 1999. Each study was carried out using a methodology broadly similar to the current study (both used a self-completion questionnaire and Allwright used oral fluid sampling), and while asking about some drug-related questions, including injecting drug use, neither included a biological test for drugs. The Long et al. (2000) study of prevalence of blood-borne viruses amongst committals (entrants) to Irish prisons employed the same measurements of drug use as that of Allwright et al. (1999) and achieved a 96% response. This response rate is in line with other studies which looked specifically at committals. The Fazel et al. (2006) systematic review of substance abuse and dependence amongst prison entrants on reception into prison included thirteen studies that had a response rate above 75%, three of which were 100%; one study was excluded because of a non-participation rate of greater than 50%.

In a broadly comparable study of 8% of the prison population in eight selected prisons in England and Wales in 1998, Weild et al. (2000) achieved an 83% participation rate in a census sample of eligible prisoners; a question was asked about ever injecting drugs in prison but drug testing was not part of the study. A hepatitis C incidence study, using a cohort study design at 0 and 6 months, a self-completion survey and saliva sampling, in a single prison in Scotland in 1999/2000 achieved an 85% participation rate, but it is not clear how participants were recruited (Champion et al., 2004). Following the methodologies and adapting the survey instruments used in the Republic of Ireland and in England and Wales, Danis et al. (2007) collected data in Northern Ireland's three prisons in 2004, and achieved a 62% response rate. The lowest response rate in the Northern Ireland study was 41% in a medium security prison. In Scotland, an annual census survey of all Scottish prisoners is undertaken, and includes health questions (including BBV and drug-related questions); it achieved a response rate of 73% in 2006 (Graham, 2007), 62% in 2008 (Scottish Prison Service, 2008) and 62% in 2009 (Scottish Prison Service, 2009). A National Inmate Infectious Diseases and Risk-Behaviour Survey undertaken in Canada in 2007 (Zakaria, 2010), using a self-administered questionnaire but no biological sampling, achieved an estimated 48% response rate. Notwithstanding the differences in sampling and data being collected, there appears to be a downwards trend over time in the proportion of prisoners willing to participate in this type of research.

In a scenario of a 50% response a number of considerations must be taken into account. First, it is in fact possible that the sample is reliably representative. As outlined in detail in chapter 4, the selected sample has a demographic profile that is really remarkably similar to the known demographic profile of the prisoner population in prison during the survey period in terms of age, sex, region and prevalence of both reported and measured methadone use. The non-responders might have been unavailable for random reasons, which would not affect accuracy or generalisability, and this is what was anecdotally reported, in that prisoners were otherwise engaged, informed with short notice without having had time to think through all the implications of participating, or not interested in the topic.

Systematic bias might arise if either a) users knowingly stayed away or b) non users were more likely to turn up. This was a formidable commitment for Prisoners as they had to understand what was required, trust in the anonymity process, give information about potentially illicit behaviour that they knew was being verified and give a simultaneous biological sample. There is increasing evidence of fall-off in survey participation worldwide, even in the decade since the last round of Prisoner surveys in Ireland. The last SLAN survey rounds in 2002/3 and 2007 achieved just over a majority of respondents. The recent (2010) All Ireland Traveller Health Study (AITHS) had a remarkable 80% response rate to the general census survey but it fell to just over 50% for the birth cohort component where mothers had to agree to linkage to their health data. Accordingly this survey presents the problems seen with any health examination survey, in this context or otherwise.

We can be confident that the reported rates here are much higher than in the general population and were verified by samples, both for drugs and blood-borne viruses with a high degree of concordance. The variations seen by demographic group and type of institution are also in keeping with both the known scientific literature and what one might expect based on previous studies. Accordingly we conclude that we can be relatively robust in our interpretation of the findings. These set a benchmark against which to measure trends and to plan for focused service planning, and for any future research in this area.

5.3 Prevalence of Drug Use

The first objective was to describe the nature, extent and pattern of consumption for different drugs among the prisoner population. We report the rate of prevalence of use of individual drugs surveyed from 33% to 87%, which greatly exceeds that of the general population of comparable age. Cannabis is indeed, as expected, the most commonly reported drug, but any lifetime heroin use, at 43% overall, is very high indeed and peaks in the mid age-group of 25–34 year olds. Gender differences emerge from the outset. Women prisoners, albeit with much lower numbers incarcerated than men, are more likely to use drugs, to have used heroin or methadone, in their lifetime, in the last 12 months and the last 30 days. This translates also into differences in service needs, which we discuss further below. The directionality of this relationship is difficult to ascertain, but it has long been established that a drug lifestyle predisposes to being jailed and previous studies of Irish women prisoners show that this translates into very poor health generally (Mooney et al., 2002, Comiskey et al., 2006).

We employed a data-driven so-called dendritic classification system to categorise the prisons surveyed into groups, based on a composite measure of drugs consumption patterns, using criteria based on the EMCDDA recent problem drug use definition. To our knowledge this is the first study in Ireland or the UK in which prison category has been defined as described and has been used to report use of drugs and BBVs by category. Accordingly there are four categories of prison, with low, medium, high and very high associated drug use. Trends of prevalence can be seen then across these four categories, from the low use prisons where drugs are not an especial problem, to the two higher category groups where cannabis experience is almost ubiquitous and half or more of surveyed prisoners have had experience of heroin use. Numbers who report using drugs in the last 12 months drop off appreciably, but are still much higher than expected for the general population. Over 40% of all prisoners had used cannabis in the last 30 days, and a tenth had used heroin, again a pattern related to age, gender and type of prison. Direct comparisons of our results with other prison studies is problematic due to the methodological issues previously described and because this study probed more deeply than any previous study. From the comparisons that can be made there is no strong evidence to suggest that the drug problem in prisons is reducing. The short answer to the first objective therefore is that drugs consumption is a significant problem in our prison service, both in statistical prevalence and public health terms.

5.4 Methods of Drug Use

The second objective was to describe methods of drugs use. Again, in the literature review, we highlighted the fact that prisoner patterns differ from those of general addicts, in that smoking scarce drug material is considered more wasteful than injecting and there is a culture of sharing equipment in such injectors. We found that a quarter of prisoners had a lifetime history of drug injection, other than for medical reasons, and the predominant drug

injected was heroin. Again, the pattern peaked in the 25–34 year age-group, was more likely for the small group of women than for men and showed a strong positive trend by category of prison. Self-injection in the last 12 months was lower, and of especial importance for prison management purposes, current injection, i.e. injection in the last 30 days, was very low (2%). Whilst this might translate into an appreciable case load across the service, it would appear nonetheless that prison needle exchange schemes may not be especially warranted in this country given the relatively high rates of methadone use, which is the predominant policy strategy in place.

Prisoners reporting drug ingestion started in their teens, were introduced first to cannabis, and if heroin users, had a relatively high likelihood of having been introduced to drugs in prison. Again, this fits the pattern of drug use reported in the general population, though clearly on a higher scale than the norm. Of cannabis users in the last 12 months, high numbers reported they did so in prison and as the majority were in jail within that time period the pattern seems clear. Prison authorities should recognise that drugs, particularly cannabis, are making their way through the security checks into prison. Whilst the prevalence of drug injecting is low, there is a culture of sharing (58% among ever injectors), which could have serious health consequences for prisoners, in particular for the small group of women prisoners. How accurate are these self-report data? Certainly the figures for methadone agree with both the prisoners' self-report and objectively recorded prison service data and the concordance was high between data sources, so we can have reasonable confidence in the accuracy of the findings.

Findings on excessive alcohol use, and the high rates of use for benzodiazepines and other sedatives and tranquillisers, whether with or without prescription, also need consideration taking account of the known prevalence of substance abuse and mental health issues among prisoners (Duffy et al., 2006), and suggest that drugs other than the typical ones require intervention.

5.5 Prevalence of Blood-Borne Viruses

The third objective was to estimate the prevalence of blood-borne viruses amongst the prisoner population and to identify associated risk behaviours. Prevalence of hepatitis B and HIV, whilst clearly higher than in the general population, are still thankfully found in relatively small numbers of prisoners and in the case of hepatitis C, prevalence has certainly seemed to fall since the last surveys. This may well reflect concerted prison health policy in the interval since, which is a positive finding for service providers. There was again a high concordance rate between the self-reported data and the actual measured data, with only a small number of people misclassified in either direction. There were a small number of true positives among the missing data group but most respondents were correct in their self-assessment, especially for hepatitis B. By far the most important factors associated with blood-borne viruses in this prison population are the drug-related factors of 'ever having used drugs IV' and 'ever having shared IV drug equipment'. Other significant factors, e.g. older age and having had a tattoo done in prison associated with hepatitis C, female gender associated with hepatitis C and HIV and male-to-male sexual contact as a risk factor for HIV, fall into the socio-demographic and behavioural factors and may be less amenable to intervention.

The demographic characteristics of the prisoner population are both similar to that found in previous surveys (Hannon et al., 2007) and in keeping with the international scientific literature. Prisoners are much more likely to be male, in their thirties, with very poor levels of education and using one indicator of lifestyle disadvantage, very heavy smokers. Self-rated health is a well-established subjective indicator that relates well to objective health status and to longer-term prediction of measurable health problems. This very young population of people report relatively poor levels of health, much higher than their counterparts in the general population and when viewed as a social gradient, the worst for any social group. One particularly disadvantaged group are Irish Travellers. The recently published All Ireland Traveller health study, in a series of reports, charts the poor health expectancy of Travellers and while noting that the vast majority of the 40,000 strong population is not in prison, the present survey shows that 11% of the survey sample were in fact Travellers. This is an inordinately high representation for this population, and prison may provide an opportunity for access to healthcare and related services for this disadvantaged group, which might otherwise not engage with such services.

We cannot again assess the directionality of the relationship between being imprisoned and having limited life chances but we can be clear that these characteristics of social and lifestyle disadvantage certainly limit prospects of rehabilitation and reintegration into mainstream society following release and highlight once again the need for step-down facilities, adequate training and positive lifestyle health promotion initiatives. The rates of re-offence and re-incarceration are also problematic for prisoner populations. This reinforces the vicious, cyclical circle of the situation. Those who are disadvantaged are more likely to slip into an adverse lifestyle including exposure to drugs, in turn are at higher risk of crime and consequent imprisonment, are exposed to the drug culture in prison and face serious challenges in achieving rehabilitation afterwards.

5.6 Utilisation of Services

The fourth objective was to measure the uptake of individual drug treatment and harm reduction interventions whilst in prison. For this objective, our prison group categorisation strategy proved particularly useful, both because it assisted in precision of estimates by grouping institutions to improve sample size, helped to preserve anonymity for respondents and service providers and also because it shows that service availability and utilisation patterns differ for different institution types. We listed a number of services potentially available to prisoners. The gradations in use of individual drugs from the low use to the very high use prisons show a generally increasing pattern. Services such as methadone maintenance were much more germane to the high and very high use category prisons and in general were available, especially to the high drug-use group. However, some services, such as addiction counselling, whilst needed by 40% of prisoners, were available only 60% of the time and had almost universally high uptake when they were available. There were issues of timeliness of availability also that merit planning exploration by providers. Other types of service, such as alcoholics anonymous, displayed a relatively similar pattern of need according to category of prison, at about a fifth of respondents overall. This is not surprising, given the young age of the respondents and the high rates of binge drinking culture seen generally in Irish society. This is a problem not conceptualised strongly by prisoners as an unmet need. Participants' willingness to use services if available suggests rehabilitative solutions can be effective in reducing drug use. These data may be of value in the allocation of selected services to prisons in selected categories.

5.7 Strengths and Limitations

The strengths of this study include the fact that it was a national study involving inmates in all prisons in Ireland. Participants were selected randomly within prisons, albeit following exclusions of selected prisoners by the IPS. Cooperation from and working relationships with the IPS executive was excellent throughout the study. The comprehensive survey was based on an internationally validated set of questions, primarily from the EMCDDA, and included very detailed questions regarding lifetime, last year and last month use and injecting use of a wide range of individual drugs (thirteen in total), many of which are also asked in general population drug prevalence surveys. Results will therefore be suitable for comparison with any future prison studies that follow the EMCDDA methodology. Biological sampling for drugs of abuse has not previously been carried out in this context. Among prisoners who agreed to participate, component participation was extremely high. Despite the length and the sensitive and detailed nature of the questionnaire, completion rates were very high with minimal missing data. On analysis it became clear that prisoners engaged with the questions in a serious manner and internal consistency was very high. A trained and dedicated research team remained unchanged throughout the study.

The primary limitation of this study is likely to be the response rate, although this has been examined thoroughly and the potential impact on final results assessed in so far as possible. It must be emphasised that the final study sample was representative of the prisoner population in terms of demographic variables, length of time in prison and methadone use. The detailed account of the logistics and methods used for recruitment and sampling provided in the technical report published separately to this document will be useful for future Irish researchers in this area. It is recognised that certain relevant factors may have contributed to non-response, but it was not possible to quantify

what level of bias, if any, these introduced to the results. A limitation over which there was no control was the number of females in the sample. This is reflective of the total population of women in prison, approximately 4%. Lack of direct access to the study participants for recruitment purposes could also be regarded as a limitation, but is related to security arrangements within the current prison environment and associated IPS staff and researcher safety.

5.8 What are the Policy Implications?

Clearly, this survey was commissioned in the context of on-going policy strategy for prisons and we can only comment to the extent that we have collected the data that will help to inform that process. However some important points come to mind. Firstly, this finding of drug use in prison is both a big and a small problem, in that it clearly poses an unacceptable health hazard and yet is occurring in a contained environment of relatively few people. Ireland as a society shows strong social gradients in health inequality and we have allowed the familiar patterns of area disadvantage seen in larger more industrialised countries to become endemic in our larger urban areas. Prisoner populations reflect that more general profile of social disadvantage. The Minister for Health is leading a cross-sectoral policy strategy review at present in 2011, entitled "Your Health is your Wealth", and many of the patterns seen in prisoners, such as poor educational attainment and chronic unemployment, need to be tackled at root cause to address this life-course trajectory.

At a more specific level in relation to substance misuse, there are some signs that more concerted policing and community development strategies may be influencing drug supply, particularly of the harder drugs, and this may mean there is a real effect at play here, in that adverse drug use is peaking in the 25–34 year old group. As this study is based on the current prison 'inmate' population, this means that there are relatively few hard core users among them. While it is recognised that different patterns of drug use may exist among the larger throughput of committals (17,000 in 2010) these were not part of this study.

In relation to services within prisons, there was a demonstrated willingness on the part of surveyed prisoners to engage with relevant one to one services in prisons. The prison population thus includes a discrete sub-group of the national drug-using population, who may or may not engage with drug treatment and harm reduction services in the community. This could be capitalised upon in the 14 institutions to reach and engage those prisoners with various effective strategies, either already in place or with potential for development, such as brief intervention, motivational interviewing and cognitive behavioural therapy as well as treatment provision. In health promotion terms, empowerment to change is critical and the five key components are healthy public policy, personal skills development, community engagement, supportive environments and re-oriented services. The Health Promoting Prison concept has been advocated by the World Health Organisation (2005). Strategies such as control of drug supply, management of existing addiction and random policing of drug consumption form a necessary but only partial component of that picture. Prisoners, by contrast with the general perception by some of being uncooperative, are in fact often willing to engage effectively and it is a judgement call for service providers whether to take the carrot or stick approach to policy, e.g. voluntary surveillance rather than punitive random sampling with punishment for non-compliance.

In regard for instance to supportive environments, there are also signs in this survey that the prisoners who are not drug users would wish to be placed on drug-free wings, though this does not always happen. Effective triage strategies on prison entry could contain exposure to drugs while in prison and target more effectively those most in need. Morbidity and premature mortality are the established reality for modern prisoners in studies that have engaged in longitudinal follow-up of cohort members. Everything we have identified about the vulnerability of this group in society suggests that effective step-down intervention might help longer term health gain which would help the affected individuals and reduce the costs to society that are caused by criminality. The evidence base in the present survey should assist in that policy development.

Agresti, A. and Coull, B. A. (1998). Approximate Is Better than "Exact" for Interval Estimation of Binomial Proportions. *The American Statistician*. 52(2): 119–126.

Alcohol and Drug Research Unit of the Health Research Board (2009a). *2009 National Report (2008 data) to the EMCDDA by the Reitox National Focal Point. Ireland: new developments, trends and in-depth information on selected issues*. Dublin: Health Research Board.

Alcohol and Drug Research Unit of the Health Research Board (2009b). *Treated problem drug use in Ireland: figures for 2008 from the National Drug Treatment Reporting System*. Available from: www.hrb.ie/publications [Accessed on 29th September 2011].

All Ireland Traveller Health Study Team (2010). *All Ireland Traveller Health Study Summary of Findings*. Kelleher, C.C. (ed). Dublin: Department of Health and Children. Available from: http://www.dohc.ie/publications/aiths2010/ExecutiveSummary/AITHS2010_SUMMARY_LR_All.pdf [Accessed on 29th September 2011].

Allwright, S., Barry, J., Bradley, F., Long, J. and Thornton, L. (1999). *Hepatitis B, hepatitis C and HIV in Irish prisoners: prevalence and risk*. Dublin: The Stationery Office.

Australian Federation of AIDS Organisations (2007). *HIV and Hepatitis C in Prisons, Briefing Paper.* New South Wales: Australian Federation of AIDS Organisations.

Barry, J., Darker, C. D., Thomas, D.E., Allwright, S. P. A., O'Dowd, T. (2010). Primary medical care in Irish Prisons. *BioMed Central Health Services Research*. 10:74–80.

Boys, A., Farrell, M., Bebbington, P., Brugha, T., Coid, J., Jenkins, R., Lewis, G., Marsden, J., Meltzer, H., Singleton, N., Taylor, C. (2002). Drug use and initiation in prison: results from a national prison survey in England and Wales. *Addiction*. 97(12):1551–60.

Bruce, R. D. and Schleifer, R. A. (2008). Ethical and human rights imperatives to ensure medication-assisted treatment for opioid dependence in prisons and pre-trial detention. *International Journal of Drug Policy*. 19(1), 17–23.

Burstein, H. (1975). Finite population correction for binominal confidence limits. Journal of the American Statistical Association. 70(349): 67–69.

Bullock, T. (2003). Changing levels of drug use before, during and after imprisonment, in Ramsay, M. (ed.) *Prisoners' Drug Use and Treatment: Seven Research Studies*. Home Office Research Study 267, pp. 23–49. London: Home Office.

Butler, T. G., Dolan, K. A., Ferson, M. J., McGuinness, L. M., Brown, P. R., Robertson, P. W. (1997). Hepatitis B and C in New South Wales prisons: prevalence and risk factors. *The Medical Journal of Australia*. 166(3): 127–30.

Butler, T., Boonwaat, L., Hailstone, S., Falconer, T., Lems, P., Ginley, T., Read, V., Smith, N., Levy, M., Dore, G., Kaldor, J. (2007). The 2004 Australian prison entrants' blood-borne virus and risk behaviour survey. *Australian and New Zealand Journal of Public Health*. 31(1): 44–50.

Carmody, P., and McEvoy, M. (1996). *A study of Irish Female Prisoners.* Dublin: The Stationery Office.

Central Statistics Office (2007). *National Census 2006. Volume 10 – Education and Qualifications*. Dublin: The Stationery Office.

Centre for Health Promotion Studies, NUI Galway. (2000). *General Healthcare Study of the Irish Prison Population.* Dublin: Department of Justice, Equality and Law Reform.

Champion, J. K., Taylor, A., Hutchinson, S., Cameron, S., McMenamin, J., Mitchell, A. and Goldberg, D. (2004). Incidence of hepatitis C virus infection and associated risk factors among Scottish prison inmates: A Cohort Study. *American Journal of Epidemiology*. 159(5): 514–519.

Christensen, P. B., Krarup, H. B., Niesters, H. G. M., Norder, H. and Georgsen, J. (2000). Prevalence and incidence of bloodborne viral infections among Danish prisoners. *European Journal of Epidemiology*. 16(11):1043–1049.

Comiskey, C.M., O'Sullivan, K., and Cronly, J. (2006) *Hazardous journeys to better places, positive outcomes and negative risks associated with the care pathway before, during and after admittance to the Dóchas Centre, Mountjoy Prison, Dublin, Ireland*. Dublin: Health Service Executive.

Concateno (2011). *Concateno issues warning of potential increase in heroin deaths*. Available from: http://www.upvery.com/51795-concateno-issues-warning-of-potential-increase-in-heroin-deaths.html [Accessed 10th May 2011].

Connolly, J., Foran, S., and Long, J. (2006). Keeping drugs out of prisons: a review of the Irish Prison Service drugs policy and strategy. *Drugnet Ireland*. 18 (Summer):13–14.

Council of Europe (2002). *Drug Misusing offenders in prison and after release*. Available from: http://books.google.com/books?hl=en&lr=&id=2otFbyJPtfQC&oi=fnd&pg=PA41&dq=detoxification+in++Prisons&ots=XlWlU0K1wK&sig=swD71mlO3dlJM3YuGzjSGcEDYcE#v=onepage&q=detoxification%20in%20%20Prisons&f=false [Accessed 7th September 2011].

Daily Mail (2011). *Heroin use in UK halves in three months after failure of Afghanistan poppy crop*. Available from: http://www.dailymail.co.uk/health/article-1352121/Heroin-use-halves-months-thanks-failure-Afghanistan-poppy-crop.html [Accessed 10th May 2011].

Danis, K., Doherty, L., McCarthy, M., Carrol, J. and Kennedy, H. (2007). Hepatitis and HIV in Northern Ireland Prisons: A Cross-Sectional Study. *Eurosurveillance*. 12:9–12.

Department of Health, National Treatment Agency for Substance Misuse, Royal College of General Practicioners, Royal College of Psychiatrists, Royal Pharmaceutical Society of Great Britain (2006). *Clinical Management of Drug Dependence in the Adult Setting*. Available from: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_115004.pdf [Accessed 7th September 2011].

Dillon, L. (2001). *Drug Use Among Prisoners: An Exploratory Study*. Dublin: Health Research Board.

Dolan, K. A., Wodak, A. D., and Hall, W.D. (1998). Methadone maintenance treatment reduces heroin injection in NSW prisons. *Drug & Alcohol Review.* 17(2):153–158.

Dolan, K., Khoei,. E. F., Brentari, C., Stevens, A. (2007). *Prisons and Drugs: A global review of incarceration, drug use and drug services*. Report 12. Discussion paper. Oxford: The Beckley Foundation.

Dolan, K., Rutter, S., Wodak, A. D. (2003). Prison-based syringe exchange programmes: a review of international research and development. *Addiction*. 98(2): 153–158.

Dolan, K., Shearer, J., White, B., & Wodak, A. (2002). *A randomised controlled trial of methadone maintenance treatment in NSW prisons Technical Report No. 155*. New South Wales: National Drug and Alcohol Research Centre.

Duffy, D., Linehan, S., Kennedy, H.G. (2006). Psychiatric morbidity in the male sentenced Irish prisons population. *Irish Journal of Psychological Medicine*. 23(2): 54–62.

Dye, S. and Isaacs, C. (1991). Intravenous drug-misuse among prison inmates: implications for the spread of HIV. *British Medical Journa*l. 302: 1506.

Edgar, K. and O'Donnell, I. (1998). *Mandatory drug testing in prisons: the relationship between MDT and the level and nature of drug-misuse*. Home Office Research Study 189. London: Home Office Research and Statistics Directorate.

European Committee for the Prevention of Torture and Inhuman or Degrading Treatment of Punishment (CPT) (2011). *Report to the Government of Ireland on the visit to Ireland carried out by the European Committee for the Prevention of Torture and Inhuman or Degrading Treatment of Punishment*. Strasbourg: Council of Europe.

European Monitoring Centre for Drugs and Drug Addiction (2002). *Handbook for surveys on drug use among the general population*. EMCDDA project CT. 99. EP. 08 B, Lisbon: EMCDDA, August 2002.

European Monitoring Centre for Drugs and Drugs Addiction (EMCDDA) (2006a). *Protocol for the implementation of the EMCDDA key Indicator Drug Related Infectious Disease (DRID)* Draft Version 6 October 2006 Project CT.04. P1.337. Lisbon: EMCDDA.

European Monitoring Centre for Drugs and Drugs Addiction (EMCDDA) (2006b). *Annual report 2006: The state of the drugs problem in Europe*. Lisbon: EMCDDA.

Farrell, M., Macauley, R. and Taylor, C. (1998). *An analysis of the mandatory drug testing programme: Key findings*. London: National Addiction Centre.

Fazel, S., Bains, P., and Doll, H. (2006). Substance abuse and dependence in prisoners: a systematic review. *Addiction*. 101(2): 181–191.

Ford, P. M., Pearson, M., Sankar-Mistry, P., Stevenson, T., Bell, D. and Austin, J. (2000). HIV, Hepatitis C and risk behaviour in a Canadian medium-security federal penitentiary. *QJM: An International Journal of Medicine.* 93(2):113–119.

Forde, C., Long, J. and Davey, A. (2009). *An assessment of prison needle-exchange for Ireland*. Unpublished Report Submitted to the Oversight Forum on Drugs.

Fotiadou, M., Livaditis, M., Manou, I., Kaniotou, E., Samakouri, M., Tzavaras, N., Xenitidis, K. (2004). Self Reported Substance Misuse in Greek Male Prisoners. *European Addiction Research*. 10(2):56–60.

Friel, S., Nic Gabhainn, S., Kelleher, C. (1999). *The National Health and Lifestyles Surveys (SLAN)* and *The Irish Health Behaviour in School-Aged Children Survey (HBSC)*. Dublin: Department of Health and Children.

Gervin, M., Hughes, R., Bamford, L., Smyth, B.P. Keenan, E. (2001). Heroin smoking by 'chasing the dragon' in young opiate users in Ireland: stability and associations with use to 'come down' off 'Ecstasy'. *Journal of Substance Abuse* Treatment. 20(4):297–300.

Graham, L. (2007). *Prison health in Scotland: A health care needs assessment*. Edinburgh: Scottish Prison Service.

Grogan, L., Tiernan, M., Geogeghan, N., Smyth, B., Keenan, E. (2005). Bloodborne virus infection among drug users in Ireland: a retrospective cross-sectional survey of screening, prevalence, incidence and hepatitis B immunisation. *Irish Journal of Medical Science*. 174(2): 14–20.

Guimarães, T., Granato, C. F. H., Varella, D., Ferraz, M. L. G., Castelo, A., Kallás, G. (2001). High prevalence of hepatitis C in a Brazilian prison: Identification of risk factors for infection. *The Brazilian Journal of Infectious Diseases*. 5(3): 111–118.

Hannon, F., Friel, S., Kelleher, C.C. (2007). The relative influence of socio-demographic, lifestyle, environmental factors and co-morbidity on self rated health of the Irish prisoner population. *Irish Medical Journal*. 100(8): 59–61.

Health Protection Surveillance Centre (2011). *HIV & AIDS in Ireland 2010*. Available from: http://www.hpsc.ie/hpsc/A-Z/HepatitisHIVAIDSandSTIs/HIVandAIDS/SurveillanceReports/ [Accessed 26th September 2011].

Health Protection Surveillance Centre (2011). *HIV & AIDS Diagnoses in Ireland Supplementary Tables & Figures To end of 2010*. Available from: http://www.hpsc.ie/hpsc/A-Z/HepatitisHIVAIDSandSTIs/HIVandAIDS/SurveillanceReports/File,12654,en.pdf. [Accessed 26th September 2011].

Health Protection Surveillance Centre (2011). *Report on Hepatitis B Notifications in Quarter 1 2011 Health Protection Surveillance centre*. Available from: http://www.hpsc.ie/hpsc/A-Z/HepatitisHIVAIDSandSTIs/HepatitisB/EpidemiologicalData/HepatitisBNotificationsQuarterlyReports/File,12742,en.pdf. [Accessed 26th September 2011].

Hellard, M. E., Aitken, C. K., Hocking, J. S. (2007). Tattooing in prisons – Not such a pretty picture. *American Journal for Infection Control.* 35(7): 477–480.

Hope, V.V., Mcube, F., Hickman, M., Judd, A. and Parry, J.V. (2007). Hepatitis B vaccine uptake among injecting drug users in England 1998 to 2004; is the prison vaccination programme driving recent improvements? *Journal of Viral Hepatitis.* 14: 653–660.

Hucklesby, A. and Wilkinson, C. (2001). Drug-misuse in prisons: some comments on the prison service drug strategy. *The Howard Journal.* 40(4): 347–363.

Irish Focal Point (2010). *2010 National Report (2009 data) to the EMCDDA by the Reitox National Focal Point. Ireland: new developments, trends and in-depth information on selected issues*. Dublin: Health Research Board.

Irish Prison Chaplains Report (2010). *Irish Prison Chaplains Annual Report 2010*. Dublin: Archdiocese of Dublin. Available from: http://www.dublindiocese.ie/index.php?option=com_content&task=view&id=2180&Itemid=373 [Accessed 20th June 2011].

Irish Prison Service. (2002). *Irish Prison Service Report 1999 and 2000*. Dublin: The Stationery Office.

Irish Prison Service. (2003). *Irish Prison Service Report 2001*. Dublin: The Stationery Office.

Irish Prison Service. (2004). *Irish Prison Service Report 2003*. Dublin: The Stationery Office.

Irish Prison Service. (2006). *Keeping Drugs out of Prison. Drugs Policy and Strategy*. Longford: Irish Prison Service.

Irish Prison Service. (2009). *Health Care Standards*. Irish Prison Service. Available from: http://www.irishprisons.ie/documents/MicrosoftWord-HealthcareStandards2009.pdf200809.pdf [Accessed 12th June 2011].

Irish Prison Service. (2010). *Irish Prison Service Annual Report 2009*. Longford: Irish Prison Service.

Irish Prison Service. (2011). *Irish Prison Service Annual Report 2010*. Longford: Irish Prison Service.

Irish Prison Service. Prisoner healthcare [Internet]. Longford: Irish Prison Service. Available from: http://www.irishprisons.ie/care_and_rehabilitation-prisoner_healthcare.htm [Accessed 14th June 2011].

Jacob, J., and Stöver, H. (2000). The transfer of harm-reduction strategies into prisons: needle exchange programmes in two German prisons. *International Journal of Drug Policy*. 11(5): 325–335.

Jenkins, R., Bhugra, D., Meltzer, H., Singleton, N., Bebbington, P., Brugha, T., Coid, J., Farrell, M., Lewis, G., Paton, J. (2005). Psychiatric and social aspects of suicidal behaviour in prisons. *Psychological Medicine*. 35(2): 257–269.

Johnson, S. Van deVen, J.T.C., Grant, B.A. (2001). *Institutional Methadone Maintenance Treatment: Impact on release outcomes and institutional behaviour*. Ottawa: Correctional Service Canada.

Jordan, A. (2010). Lights out on prison healthcare. Medical Independent 10th June. Available from: http://www.medicalindependent.ie/page.aspx?title=lights_out_on_prison_healthcare [Accessed 14th June 2011].

Jürgens, R. (2006). *Evidence for action technical papers: Effectiveness of interventions to manage HIV/AIDS in prison settings*. Geneva: World Health Organization.

Jürgens,. R., Ball, A., and Verster, A. (2009). Interventions to reduce HIV transmission related to injecting drug use in prison. *The Lancet Infectious Diseases*. 9(1): 57–66.

Kaufman L., and Rousseeuw P.J. (1990). *Finding groups in data: an introduction to Cluster Analysis*. New York: Wiley-Interscience.

Kazi, A.M., Shah, S.A., Jenkins, C.A., Shepherd, B.E. Vermund, S.H. (2010). Risk factors and prevalence of tuberculosis, human immunodeficiency virus, syphilis, hepatitis B virus and hepatitis C virus among prisoners in Pakistan. *International Journal of Infectious Diseases*. 14(3): 60–66.

Kennedy, H.G., Monks, S., Curtin, K., Wright, B., Linehan, S., Duffy, D., Teljeur, C., Kelly, A. (2005). *Mental Illness in Irish Prisoners: Psychiatric morbidity in sentenced, remanded and newly committed prisoners*. Dublin: National Forensic Mental Health Service.

Kerr, T., Wood, E., Betteridge, G., Lines, R., and Jürgens, R. (2004). Harm reduction in prisons: A 'right based analysis'. *Critical Public Health*. 14(4), 345–360.

Kirwan, P., Evans, B., Brant, L. (2011). Hepatitis C and B testing in English Prisons is low but increasing. *Journal of Public Health*. 33(2): 197–204.

Kolind, T., Frank, V.A., Dahl, H. (2010). Drug treatment or alleviating the negative consequences of imprisonment? A critical view of prison-based drug treatment in Denmark. *International Journal of Drug Policy*. 21(1): 43–48.

Koulierakis, G., Gnardellis, C., Agrafiotis, D., Power, K. (2000). HIV risk behaviour correlates among injecting drug users in Greek Prisons. *Addiction*. 95(8): 1207–1216.

Long, J. (2008). Drug tests in Irish Prisons. *Drugnet Ireland*. 26 (Summer):22–23.

Long, J., Allwright, S., Barry, J., Reaper Reynolds, S., Thornton, L., and Bradley, F. (2000). *Hepatitis B, hepatitis C and HIV in Irish Prisoners part II: prevalence and risk in committal prisoners*. Dublin: The Stationery Office.

Long, J., Allwright, S., Begley, C. (2004). Prisoners' views of injecting drug use and harm reduction in Irish prisons. *International Journal of Drug Policy*. 15(2): 139–149.

Lukasiewicz, M., Falissard, B., Michel, L., Neveu, X., Reynaud, M., Gasquet, I. (2007). Prevalence and factors associated with alcohol and drug-related disorders in prison: a French National Study. *Substance Abuse Treatment, Prevention and Policy*. 2(1):1–10.

MacDonald, M. (1997). *Mandatory drug testing in prisons*. Birmingham: Centre for Research into Quality, University of Central England in Birmingham.

Mahfoud, Z., Kassak, K., Kreidieh, K., Shamra, S., Ramia, S. (2010). Prevalence of antibodies to human immunodeficiency virus (HIV), hepatitis B and hepatitis C and risk factors in prisoners in Lebanon. *The Journal of Infection in Developing Countries*. 4(3):144–149.

Malliori, M., Sypsa, V., Psichogiou, M., Touloumi, G., Skoutelis, A., Tassopoulos, N., Hatzakis, A., and Stefanis, C. (1998). A survey of blood-borne viruses and associated risk behaviours in Greek Prisons. *Addiction*. 93(2):243–251.

Mattick, R.P., Breen, C., Kimber, J., Davoli, M. (2009). Methadone maintenance therapy versus no opioid replacement therapy for opioid dependence. *Cochrane Database of Systematic Reviews 2009*. Issue 3.

Møller, L., Stöver, H., Jürgens, R., Gatherer, A., and Nikogosian, H. (Eds.). (2007). *Health in prisons. A WHO guide to the essentials in prison health*. Copenhagen: WHO.

Mooney, M., Hannon, F., Barry, M., Friel, S., Kelleher C. (2002). Perceived quality of life and mental health status of Irish female prisoners. *Irish Medical Journal*. 95(8):241–3.

Morgan, M., and Kett, M. (2003). *The Prison Adult Literacy Survey: Results and Implications*. Dublin: Irish Prison Service.

Murphy, N. and Thornton, L. (2008a). Epidemiology of Hepatitis B in Ireland. *EPI-Insight*. 9 (9). 2–3. Available from: http://www.hpsc.ie/hpsc/EPI-Insight/Volume92008/ [Accessed 26th September 2011].

Murphy, N. and Thornton, L. (2008b). Epidemiology of hepatitis C infection in Ireland. *EPI-Insight*, 9 (7). 2–3. Available from: http://www.drugsandalcohol.ie/12916/1/EPI_Insight_2008_9%287%29_Hep_C_infection_in_Ireland.pdf [Accessed 26th September 2011].

National Advisory Committee on Drugs (NACD) and Public Health Information and Research Branch (PHIRB) (2011). *Drug Use in Ireland and Northern Ireland: First Results from the 2010/2011 Drug Prevalence Survey Bulletin 1*. Available from: http://www.nacd.ie/publications/drug_use_ireland.pdf [Accessed 1st December 2011].

National Advisory Committee on Drugs (NACD) and Drug and Alcohol Information and Research Unit (DAIRU) (2008). *Drug Use in Ireland and Northern Ireland – First Results from the 2006/2007 Drug Prevalence Survey Bulletin 1.* Available from: http://www.nacd.ie/publications/prevalence_bulletin1_results.html. [Accessed 20th September 2011].

Newcombe, R. G. (1998). Interval estimation for the difference between independent proportion: comparison of eleven methods. *Statistics in Medicine*. 17 (8): 873–890.

O'Keefe, C. (Irish Examiner 2011). *"Only 9 cells for mentally ill prisoners, claims POA" Irish Examiner* 5th May 2011. Available from: http://www.examiner.ie/ireland/only-9-cells-for-mentally-ill-prisoners-claims-poa-153514.html [Accessed 26th September 2011].

O'Mahony, P. (1984). A survey of drug abusers in Irish prisons. *Prison Information Bulletin*. (3): 11–14.

O'Mahony, P. (1997). *Mountjoy Prisoners: A Sociological and Criminological Profile*. Dublin: The Stationery Office.

O'Mahony, P. (2002). *Criminal Justice in Ireland*. Dublin: Institute of Public Administration.

O'Mahony, P. (2008). *Key issues for drugs policy in Irish prisons*. Dublin: Drug Policy Action Group.

Poulin, C., Alary, M., Lambert, G., Godin, G., Landry, S., Gagnon, H., Demers, E., Morarescu, E., Rochefort, J., and Claessens, C. (2007). Prevalence of HIV and hepatitis C virus infections among inmates of Quebec provincial prisons. *Canadian Medical Association Journal*. 177(3), 252–256.

Power, K.G., Markova, I., Rowlands, A., McKee, K.J., Anslow, P.J., and Kilfedder, C. (1992). Intravenous drug use and HIV transmission amongst inmates in Scottish Prisons. *British Journal of Addiction*. 87:35–45.

Radun, D., Weilandt, C., Eckert, J., Schüttler C.G., Weid, F.J., Kücherer, C., Hamouda, O., Cross-sectional study on Seroprevalence regarding Hepatitis B, Hepatitis C, and HIV, Risk, Behaviour, Knowledge and Attitudes about Bloodborne infections among adult prisoners in Germany – preliminary results. Cited in Klempova, D. and Wiessing, L. (2008). *2007 EU expert meetings (9–12 October) on Key Indicators 'Drug related Infectios Diseases' and 'Problem Drug Use' Meeting Report European Monitoring Centre for Drugs and Drug Addiction*. Available from: http://www.emcdda.europa.eu/html.cfm/index64548EN.html [Accessed 14th June 2011].

Robinson, D. and Mirabelli, L. (1996). *Summary of findings of the 1995 CSC national inmate survey*. Ottawa: Correctional Services of Canada.

Saiz de la Hoya, P., Marco, A., Garcia-Guerrero, J., and Rivera, A. (2011). Hepatitis C and B prevalence in Spanish prisons. *European Journal of Clinical Microbiology and Infectious Diseases*. 30(7): 857–862.

Scottish Prison Service (2008). *Prisoner Survey 2008*. Edinburgh: Scottish Prison Service. Available from: http://www.sps.gov.uk/Publications/Publication75.aspx [Accessed 14th June 2011].

Scottish Prison Service (2009). *Prisoner Survey 2009*. Edinburgh: Scottish Prison Service. Available from: http://www.sps.gov.uk/Publications/Publication79.aspx [Accessed 14th June 2011].

Singleton, A., Farrell, M., Meltzer, H. (1999). *Substance misuse among prisoners in England and Wales*. London: Office for National Statistics.

Singleton, N., Pendry, E., Simpson, T., Goddard, E., Farrell, M., Marsden, J., and Taylor, C. (2005). *The impact of mandatory drug testing in prisons*. Home Office online report 03/05 available from http://webarchive.nationalarchives.gov.uk/20110218135832/http://rds.homeoffice.gov.uk/rds/pdfs05/rdsolr0305.pdf [Accessed 20th June 2011].

Sleiman, S. (eds) (2004). *Belgian national report on drugs 2004*. Belgium: Scientific Institute of public health. Available from: http://www.drugsandalcohol.ie/11817/1/NR_2004_Belgium.pdf [Accessed 14th June 2011].

Smyth, B., Keenan, E., O'Connor, J. (1998). Bloodborne viral infections in Irish injecting drug users. *Addiction*. 93(11): 1649–1656.

Stallwitz, A. and Stöver, H. (2007). The impact of substitution treatment in prisons – A literature review. *International Journal of Drug Policy*. 18(6):464–474.

Stark, K., Herrmann, U., Ehrhardt, S., Bienzle, U. (2006). A syringe exchange programme in prison as prevention strategy against HIV infection and hepatitis B and C in Berlin, Germany. *Epidemiology and Infection*. 134(4): 814–819.

Statutory Instrument 252 of 2007. *Prison Rules 2007*. Dublin: The Stationery Office.

Stöver, H., and Nelles, J. (2003). Ten years of experience with needle and syringe exchange in European Prisons. *International Journal of Drug Policy*. 14 (5–6): 437–444.

Stöver, H., Casselman, J., Hennebel, L. (2006). Substitution treatment in European prisons: A study of policies and practices in 18 European countries. *International Journal of Prisoner Health*. 2(1):3–12.

Strang, J., Gossop, M., Heuston, J., Green, J., Whiteley, C., Maden, A., (2006). Persistence of drug use during imprisonment: relationship of drug type, recency of use and severity of dependence to use of heroin, cocaine and amphetamine in prison. *Addiction*. 101(8): 112–1132.

Strang, J., McCambridge, J., Best, D., Beswick, T., Bearn, J., Rees, S., and Gossop, M. (2003). Loss of tolerance and overdose mortality after inpatient opiate detoxification. *British Medical Journal*. 326 (7396): 959–960.

Sugrue, K. (2006). Why prison fails. In Corcoran, M. and Peillon, M. (Eds) (2006) *Uncertain Ireland – a sociological chronicle* 2003–2004. Dublin: Institute of Public Administration.

Thornton, L., Murphy, N., Jones, L., Connell, J., Doodley, S., Gavin, S., Hunter, K. and Brennan, A. (2011). Determination of the burden of hepatitis C virus infection in Ireland. *Epidemiological Infection*. 19: 1–8.

UNAIDS (2010). *Global Report: UNAIDS Report on the Global AIDS epidemic 2010*. Available from: http://www.unaids.org/documents/20101123_GlobalReport_em.pdf [Accessed 25th October 2011].

Ward, M., McGhee, H., Morgan, K., Van Letnte, E., Layte, R., Barry, M., Waston, D., Shelley, E. and Perry, I. (2009). *SLAN 2007: Survey of Lifestyle, Attitudes and Nutrition in Ireland. 'One Island – One Lifestyle?' Health and Lifestyles in the Republic of Ireland and Northern Ireland: Comparing the population surveys SLAN 2007 and NIHSWS 2005*. Department of Health and Children. Dublin: The Stationery Office.

Weild, A., Gill, O., Bennett, D., Livingstone, S., Parry, J. and Curran, L. (2000). Prevalence of HIV, hepatitis B and hepatitis C antibodies in prisoners in England and Wales: a national survey. *Communicable Disease and Public Health*. 3(2):121–6.

Werb, D., Kerr, T., Small, W., Li, K., Montaner, J., Wood, E. (2008). HIV risks associated with incarceration among injection drug users: implications for prison-based public health strategies. *Journal of Public Health.* 30(2): 126–132.

WHO (2005). *Status Paper on Prisons, Drugs and Harm Reduction*. WHO Regional office for Europe: Denmark.

Wilson, E. B. (1927). Probable Inference, the Law of Succession, and Statistical Inference. *Journal of the American Statistical Association*. 22 (158): 209–212.

Wong, T., Archibald, C., Arthur, J., Choudhi, Y., Donaldson, T., Paquette, D., Potts, J., Smith, M., Tolton, S. (2006). *Prison needle exchange: Review of the evidence*. Ottawa: Public Health Agency of Canada.

Zakaria, D., Thompson, J.M., Jarvis, A. and Borgotta, F. (2010). *Summary of Emerging Findings from the 2007 National Inmate Infectious Diseases and Risk-Behaviours Survey*. Correctional Service of Canada. Available from: http://www.csc-scc.gc.ca/text/rsrch/reports/r211/r211-eng.pdf [Accessed 10th October 2011].

Please note for all age-group sub-categories that 10 participants did not provide their age.

Table A.1 NACD Irish Prison Study 2011: Lifetime Prevalence of Tobacco (Cigarettes) and Alcohol use

	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cigarettes (tobacco)	n = 808		n = 763		n = 45		n = 253		n = 318		n = 228	
Prevalence	725	89.7	684	89.6	41	91.1	232	91.7	288	90.6	196	86.0
Upper 95% CI		91.5		91.4		96.0		94.3		93.1		89.6
Lower 95% CI		87.7		87.5		80.7		88.0		87.2		81.3
Alcohol	n = 806		n = 761		n = 45		n = 252		n = 317		n = 227	
Prevalence	777	96.4	738	97.0	39	86.7	249	98.8	303	95.6	216	95.2
Upper 95% CI		97.4		97.9		93.0		99.6		97.2		97.1
Lower 95% CI		95.0		95.6		75.4		96.8		93.0		91.8

In prevalence tables A2 to A7 below 'other opiates' refers to having taken opiates other than heroin or methadone. These were described to participants as 'Diffs, Dikes, Peach, Napps, Pethidine, DF's, Morphine, Opium or Codeine'.

Table A.2 NACD Irish Prison Study 2011: Self-reported Lifetime Prevalence of Drug Use

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	**n = 815**		**n = 770**		**n = 45**		**n = 254**		**n = 321**		**n = 230**	
Prevalence	708	86.9	670	87.0	38	84.4	241	94.9	297	92.5	162	70.4
Upper 95% CI		88.8		89.0		91.4		96.8		94.7		75.5
Lower 95% CI		84.6		84.7		72.9		91.8		89.4		64.8
Sedatives or Tranquillisers	**n = 808**		**n = 763**		**n = 45**		**n = 253**		**n = 320**		**n = 225**	
Prevalence	572	70.8	540	70.8	32	71.1	210	83.0	239	74.7	117	52.0
Upper 95% CI		73.6		73.6		81.0		86.7		78.8		57.9
Lower 95% CI		67.9		67.7		58.5		78.4		70.1		46.0
Benzodiazepines only	**n = 807**		**n = 762**		**n = 45**		**n = 253**		**n = 319**		**n = 225**	
Prevalence	547	67.8	516	67.7	31	68.9	203	80.2	229	71.8	109	48.4
Upper 95% CI		70.6		70.7		79.1		84.3		76.0		54.4
Lower 95% CI		64.8		64.6		56.2		75.4		67.1		42.5
Sedatives or Tranquillisers (excl. Benzos)	**n = 801**		**n = 756**		**n = 45**		**n = 250**		**n = 318**		**n = 223**	
Prevalence	466	58.2	435	57.5	31	68.9	166	66.4	196	61.6	100	44.8
Upper 95% CI		61.2		60.7		79.1		71.4		66.4		50.9
Lower 95% CI		55.0		54.3		56.2		60.9		56.7		39.0
Heroin	**n = 803**		**n = 758**		**n = 45**		**n = 249**		**n = 317**		**n = 227**	
Prevalence	348	43.3	319	42.1	29	64.4	94	37.8	159	50.2	90	39.7
Upper 95% CI		46.5		45.3		75.3		43.3		55.2		45.6
Lower 95% CI		40.3		38.9		51.7		32.5		45.2		34.0
Methadone	**n = 803**		**n = 758**		**n = 45**		**n = 249**		**n = 317**		**n = 227**	
Prevalence	262	32.6	235	31.0	27	60.0	60	24.1	128	40.4	69	30.4
Upper 95% CI		35.6		34.1		71.4		29.2		45.4		36.2
Lower 95% CI		29.8		28.1		47.3		19.7		35.6		25.2
Other Opiates	**n = 800**		**n = 755**		**n = 45**		**n = 246**		**n = 317**		**n = 227**	
Prevalence	260	32.5	241	31.9	19	42.2	54	22.0	131	41.3	72	31.7
Upper 95% CI		35.5		35.0		54.9		27.0		46.3		37.5
Lower 95% CI		29.6		29.0		30.6		17.7		36.5		26.5
Crack Cocaine	**n = 797**		**n = 753**		**n = 44**		**n = 248**		**n = 313**		**n = 226**	
Prevalence	284	35.6	258	34.3	26	59.1	74	29.8	134	42.8	72	31.9
Upper 95% CI		38.7		37.4		70.7		35.2		47.9		37.7
Lower 95% CI		32.7		31.3		46.2		25.0		37.9		26.6
Cocaine Powder	**n = 809**		**n = 765**		**n = 44**		**n = 251**		**n = 320**		**n = 228**	
Prevalence	600	74.2	571	74.6	29	65.9	210	83.7	262	81.9	121	53.1
Upper 95% CI		76.8		77.3		76.7		87.4		85.4		58.9
Lower 95% CI		71.3		71.7		53.0		79.1		77.7		47.1
Cocaine (including Crack and Powder)	**n = 810**		**n = 766**		**n = 44**		**n = 251**		**n = 320**		**n = 229**	
Prevalence	605	74.7	574	74.9	31	70.5	211	84.1	265	82.8	122	53.3
Upper 95% CI		77.3		77.6		80.5		87.7		86.2		59.1
Lower 95% CI		71.9		72.0		57.6		79.5		78.7		47.3

Table A.3 NACD Irish Prison Study 2011: Self-reported Last Year Prevalence of Drug Use

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	**n = 808**		**n = 763**		**n = 45**		**n = 250**		**n = 318**		**n = 230**	
Prevalence	554	68.6	523	68.6	31	68.9	210	84.0	231	72.6	105	45.7
Upper 95% CI		71.4		71.5		79.1		87.7		76.9		51.6
Lower 95% CI		65.6		65.5		56.2		79.4		67.9		39.9
Sedatives or Tranquillisers	**n = 797**		**n = 753**		**n = 44**		**n = 250**		**n = 316**		**n = 221**	
Prevalence	472	59.2	442	58.7	30	68.2	185	74.0	200	63.3	81	36.7
Upper 95% CI		62.3		61.9		78.6		78.6		68.0		42.7
Lower 95% CI		56.1		55.5		55.3		68.8		58.3		31.1
Benzodiazepines	**n = 795**		**n = 750**		**n = 45**		**n = 251**		**n = 314**		**n = 220**	
Prevalence	434	54.6	406	54.1	28	62.2	174	69.3	188	59.9	68	30.9
Upper 95% CI		57.7		57.4		73.4		74.2		64.7		36.8
Lower 95% CI		51.4		50.9		49.5		63.9		54.8		25.6
Sedatives or Tranquillisers (excl. Benzos)	**n = 793**		**n = 749**		**n = 44**		**n = 245**		**n = 316**		**n = 222**	
Prevalence	367	46.3	337	45.0	30	68.2	136	55.5	158	50.0	69	31.1
Upper 95% CI		49.5		48.3		78.6		61.0		55.0		36.9
Lower 95% CI		43.1		41.8		55.3		49.9		45.0		25.8
Heroin	**n = 791**		**n = 746**		**n = 45**		**n = 249**		**n = 311**		**n = 221**	
Prevalence	233	29.5	212	28.4	21	46.7	74	29.7	112	36.0	45	20.4
Upper 95% CI		32.4		31.5		59.1		35.1		41.0		25.7
Lower 95% CI		26.7		25.6		34.7		24.9		31.3		16.0
Methadone	**n = 799**		**n = 754**		**n = 45**		**n = 249**		**n = 314**		**n = 226**	
Prevalence	167	20.9	142	18.8	25	55.6	36	14.5	83	26.4	44	19.5
Upper 95% CI		23.6		21.5		67.4		18.9		31.1		24.7
Lower 95% CI		18.5		16.4		43.0		11.0		22.3		15.2
Other Opiates	**n = 793**		**n = 748**		**n = 45**		**n = 246**		**n = 313**		**n = 224**	
Prevalence	103	13.0	94	12.6	9	20.0	29	11.8	52	16.6	21	9.4
Upper 95% CI		15.3		14.9		32.0		16.0		20.7		13.5
Lower 95% CI		11.0		10.6		12.0		8.7		13.2		6.5
Crack Cocaine	**n = 790**		**n = 746**		**n = 44**		**n = 247**		**n = 309**		**n = 224**	
Prevalence	92	11.7	78	10.5	14	31.8	26	10.5	47	15.2	18	8.0
Upper 95% CI		13.9		12.7		44.7		14.5		19.2		12.0
Lower 95% CI		9.8		8.6		21.4		7.6		11.9		5.4
Cocaine Powder	**n = 791**		**n = 748**		**n = 43**		**n = 247**		**n = 313**		**n = 221**	
Prevalence	226	28.6	208	27.8	18	41.9	96	38.9	101	32.3	26	11.8
Upper 95% CI		31.5		30.8		54.9		44.5		37.2		16.3
Lower 95% CI		25.8		25.0		30.0		33.6		27.8		8.4
Cocaine (including Crack and Powder)	**n = 794**		**n = 750**		**n = 44**		**n = 247**		**n = 314**		**n = 223**	
Prevalence	248	31.2	225	30.0	23	52.3	100	40.5	114	36.3	31	13.9
Upper 95% CI		34.2		33.1		64.5		46.1		41.3		18.6
Lower 95% CI		28.4		27.1		39.7		35.1		31.6		10.3

Table A.4 NACD Irish Prison Study 2011: Self-reported Last Month Prevalence of Drug Use

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis	**n = 804**		**n = 760**		**n = 44**		**n = 250**		**n = 316**		**n = 228**	
Prevalence	349	43.4	332	43.7	17	38.6	128	51.2	148	46.8	67	29.4
Upper 95% CI		46.5		46.9		51.5		56.7		51.9		35.1
Lower 95% CI		40.3		40.5		27.3		45.6		41.9		24.3
Sedatives or Tranquillisers	**n = 794**		**n = 750**		**n = 44**		**n = 250**		**n = 315**		**n = 219**	
Prevalence	273	34.4	251	33.5	22	50.0	95	38.0	119	37.8	55	25.1
Upper 95% CI		37.5		36.6		62.4		43.6		42.8		30.8
Lower 95% CI		31.5		30.5		37.6		32.8		33.1		20.2
Benzodiazepines	**n = 791**		**n = 746**		**n = 45**		**n = 251**		**n = 312**		**n = 218**	
Prevalence	229	29.0	211	28.3	18	40.0	79	31.5	106	34.0	43	19.7
Upper 95% CI		31.9		31.3		52.7		36.9		38.9		25.1
Lower 95% CI		26.2		25.4		28.6		26.6		29.4		15.4
Sedatives or Tranquillisers (excl. Benzos)	**n = 788**		**n = 744**		**n = 44**		**n = 244**		**n = 314**		**n = 220**	
Prevalence	195	24.8	173	23.3	22	50.0	65	26.6	82	26.1	44	20.0
Upper 95% CI		27.6		26.1		62.4		32.0		30.8		25.3
Lower 95% CI		22.1		20.6		37.6		22.0		22.0		15.6
Heroin	**n = 785**		**n = 740**		**n = 45**		**n = 248**		**n = 310**		**n = 217**	
Prevalence	87	11.1	81	11.0	6	13.3	27	10.9	40	12.9	19	8.8
Upper 95% CI		13.3		13.2		24.5		14.9		16.7		12.9
Lower 95% CI		9.3		9.1		7.1		7.9		9.9		5.9
Methadone	**n = 798**		**n = 753**		**n = 45**		**n = 249**		**n = 314**		**n = 225**	
Prevalence	106	13.3	90	12.0	16	35.6	13	5.2	57	18.2	34	15.1
Upper 95% CI		15.6		14.2		48.3		8.4		22.4		20.0
Lower 95% CI		11.3		10.0		24.8		3.3		14.6		11.3
Opiates other than heroin or methadone	**n = 791**		**n = 746**		**n = 45**		**n = 245**		**n = 313**		**n = 223**	
Prevalence	35	4.4	35	4.7	0	0.0	6	2.5	17	5.4	12	5.4
Upper 95% CI		5.9		6.3		6.8		5.0		8.3		8.9
Lower 95% CI		3.3		3.5		0.0		1.2		3.6		3.3
Crack Cocaine	**n = 788**		**n = 744**		**n = 44**		**n = 247**		**n = 308**		**n = 223**	
Prevalence	15	1.9	13	1.8	2	4.6	2	0.8	7	2.3	6	2.7
Upper 95% CI		3.0		2.9		13.7		2.7		4.4		5.5
Lower 95% CI		1.2		1.1		1.5		0.3		1.2		1.3
Cocaine Powder	**n = 781**		**n = 739**		**n = 42**		**n = 242**		**n = 310**		**n = 219**	
Prevalence	41	5.3	40	5.4	1	2.4	11	4.6	19	6.1	10	4.6
Upper 95% CI		6.9		7.1		11.1		7.6		9.1		7.9
Lower 95% CI		4.0		4.1		0.5		2.7		4.1		2.7
Cocaine (including Crack and Powder)	**n = 783**		**n = 740**		**n = 43**		**n = 242**		**n = 310**		**n = 221**	
Prevalence	45	5.8	43	5.8	2	4.7	11	4.6	20	6.5	13	5.9
Upper 95% CI		7.4		7.6		14.1		7.6		9.5		9.5
Lower 95% CI		4.4		4.5		1.6		2.7		4.4		3.7

Table A.5 NACD Irish Prison Study 2011: Self-reported Lifetime Prevalence of Injecting Drug Use

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Any drug		**n=813**		**n= 768**		**n=45**		**n=253**		**n=320**		**n=230**
Prevalence	207	25.5	187	24.4	20	44.4	46	18.2	109	34.1	51	22.2
Upper 95% CI		28.3		27.2		57.0		22.9		38.9		27.5
Lower 95% CI		22.9		21.7		32.6		14.3		29.5		17.7
Benzodiazepines		**n=804**		**n=760**		**n=44**		**n=250**		**n=315**		**n=229**
Prevalence	71	8.8	64	8.4	7	15.9	9	3.6	36	11.4	25	10.9
Upper 95% CI		10.8		10.4		27.6		6.4		15.1		15.2
Lower 95% CI		7.2		6.8		8.8		2.1		8.6		7.8
Amphetamines		**n=799**		**n=756**		**n=43**		**n=249**		**n=313**		**n=227**
Prevalence	47	5.9	43	5.7	4	9.3	7	2.8	21	6.7	18	7.9
Upper 95% CI		7.6		7.4		20.0		5.4		9.8		11.8
Lower 95% CI		4.6		4.4		4.3		1.5		4.6		5.3
Heroin		**n=805**		**n=761**		**n=44**		**n=251**		**n=315**		**n=229**
Prevalence	154	19.1	135	17.7	19	43.2	26	10.4	83	26.4	44	19.2
Upper 95% CI		21.7		20.4		56.0		14.3		31.0		24.3
Lower 95% CI		16.8		15.4		31.3		7.5		22.2		15.0
Methadone		**n=799**		**n=756**		**n=43**		**n=248**		**n=315**		**n=226**
Prevalence	22	2.8	21	2.8	1	2.3	3	1.2	9	2.9	10	4.4
Upper 95% CI		4.0		4.1		10.8		3.3		5.1		7.7
Lower 95% CI		1.9		1.9		0.5		0.5		1.6		2.6
Opiates other than heroin or methadone		**n=793**		**n=751**		**n=42**		**n=248**		**n=310**		**n=225**
Prevalence	54	6.8	48	6.4	6	14.3	7	2.8	24	7.7	22	9.8
Upper 95% CI		8.6		8.2		26.2		5.4		11.0		14.0
Lower 95% CI		5.4		5.0		7.5		1.5		5.5		6.8

Table A.5 NACD Irish Prison Study 2011: Self-reported Lifetime Prevalence of Injecting Drug Use

	All		Males		Females		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%				
Cocaine Powder		**n=803**		**n=759**		**n=44**		**n=250**		**n=314**		**n=229**
Prevalence	104	13.0	90	11.9	14	31.8	13	5.2	56	17.8	34	14.9
Upper 95% CI		15.2		14.1		44.7		8.3		22.0		19.6
Lower 95% CI		11.0		9.9		21.4		3.3		14.3		11.1
Mephedrone		**n=797**		**n=752**		**n=45**		**n=250**		**n=313**		**n=224**
Prevalence	34	4.3	27	3.6	7	15.6	11	4.4	16	5.1	6	2.7
Upper 95% CI		5.8		5.0		27.0		7.4		7.9		5.5
Lower 95% CI		3.2		2.6		8.7		2.7		3.3		1.3
Methylone		**n=794**		**n=749**		**n=45**		**n=250**		**n=312**		**n=222**
Prevalence	20	2.5	15	2.0	5	11.1	7	2.8	9	2.9	4	1.8
Upper 95% CI		3.7		3.2		21.8		5.4		5.2		4.3
Lower 95% CI		1.7		1.3		5.5		1.5		1.6		0.8
Crystal Meth		**n=795**		**n=750**		**n=45**		**n=250**		**n=312**		**n=223**
Prevalence	13	1.6	12	1.6	1	2.2	2	0.8	5	1.6	5	2.2
Upper 95% CI		2.7		2.7		10.3		2.7		3.5		4.9
Lower 95% CI		1.0		1.0		0.5		0.3		0.8		1.1
Steroids		**n=807**		**n=762**		**n=45**		**n=253**		**n=317**		**n=227**
Prevalence	69	8.6	68	8.9	1	2.2	22	8.7	33	10.4	13	5.7
Upper 95% CI		10.5		11.0		10.3		12.4		13.9		9.2
Lower 95% CI		7.0		7.3		0.5		6.1		7.8		3.6
Any Other Drug		**n=784**		**n=742**		**n=42**		**n=248**		**n=304**		**n=222**
Prevalence	35	4.5	29	3.9	6	14.3	3	1.2	20	6.6	11	5.0
Upper 95% CI		6.0		5.4		26.2		3.3		9.7		8.4
Lower 95% CI		3.3		2.8		7.5		0.5		4.5		3.0

Table A.6 NACD Irish Prison Study 2011: Self-reported Last Year Prevalence of Injecting Drug Use

	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines		**n=803**		**n=759**		**n=44**		**n=250**		**n=315**		**n=228**
Prevalence	23	2.9	18	2.4	5	11.4	7	2.8	13	4.1	3	1.3
Upper 95% CI		4.1		3.6		22.3		5.4		6.7		3.6
Lower 95% CI		2.0		1.6		5.7		1.5		2.6		0.5
Amphetamines		**n=797**		**n=754**		**n=43**		**n=249**		**n=312**		**n=226**
Prevalence	12	1.5	9	1.2	3	7.0	4	1.6	6	1.9	2	0.9
Upper 95% CI		2.5		2.2		17.1		3.8		3.9		3.0
Lower 95% CI		0.9		0.7		2.8		0.7		1.0		0.3
Heroin		**n=797**		**n=754**		**n=43**		**n=251**		**n=311**		**n=225**
Prevalence	55	6.9	46	6.1	9	20.9	20	8.0	27	8.7	8	3.6
Upper 95% CI		8.7		7.9		33.4		11.6		12.0		6.6
Lower 95% CI		5.5		4.7		12.5		5.5		6.3		1.9
Methadone		**n=798**		**n=755**		**n=43**		**n=248**		**n=315**		**n=225**
Prevalence	6	0.8	5	0.7	1	2.3	2	0.8	3	1.0	1	0.4
Upper 95% CI		1.6		1.5		10.8		2.7		2.6		2.3
Lower 95% CI		0.4		0.3		0.5		0.3		0.4		0.1
Opiates other than heroin or methadone		**n=789**		**n=748**		**n=41**		**n=248**		**n=308**		**n=223**
Prevalence	8	1.0	7	0.9	1	2.4	2	0.8	5	1.6	1	0.5
Upper 95% CI		1.9		1.8		11.4		2.7		3.6		2.3
Lower 95% CI		0.6		0.5		0.5		0.3		0.8		0.1
Cocaine Powder		**n=797**		**n=754**		**n=43**		**n=250**		**n=313**		**n=224**
Prevalence	25	3.1	19	2.5	6	14.0	7	2.8	13	4.2	5	2.2
Upper 95% CI		4.5		3.8		25.6		5.4		6.7		4.9
Lower 95% CI		2.2		1.7		7.4		1.5		2.6		1.0
Mephedrone		**n=796**		**n=751**		**n=45**		**n=250**		**n=312**		**n=224**
Prevalence	18	2.3	12	1.6	6	13.3	7	2.8	9	2.9	2	0.9
Upper 95% CI		3.4		2.7		24.5		5.4		5.2		3.0
Lower 95% CI		1.5		1.0		7.1		1.5		1.6		0.3

Table A.6 NACD Irish Prison Study 2011: Self-reported Last Year Prevalence of Injecting Drug Use

	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Methylone		n=795		n=750		n=45		n=250		n=312		n=223
Prevalence	9	1.1	6	0.8	3	6.7	3	1.2	5	1.6	1	0.5
Upper 95% CI		2.1		1.7		16.4		3.2		3.5		2.3
Lower 95% CI		0.6		0.4		2.7		0.5		0.8		0.1
Crystal Meth		n=795		n=750		n=45		n=250		n=312		n=223
Prevalence	3	0.4	3	0.4	0	0.0	0	0.0	2	0.6	1	0.5
Upper 95% CI		1.0		1.1		6.8		1.4		2.2		2.3
Lower 95% CI		0.2		0.2		0.0		0.0		0.2		0.1
Steroids		n=805		n=760		n=45		n=252		n=317		n=226
Prevalence	19	2.4	19	2.5	0	0.0	5	2.0	12	3.8	2	0.9
Upper 95% CI		3.5		3.8		6.8		4.3		6.3		3.0
Lower 95% CI		1.6		1.7		0.0		1.0		2.3		0.3
Any Other Drug		n=783		n=741		n=42		n=248		n=303		n=222
Prevalence	11	1.4	9	1.2	2	4.8	2	0.8	5	1.7	4	1.8
Upper 95% CI		2.4		2.2		14.4		2.7		3.6		4.3
Lower 95% CI		0.8		0.7		1.6		0.3		0.8		0.8

Table A.7 NACD Irish Prison Study 2011: Self-reported Last Month Prevalence of Injecting Drug Use

	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines		**n=802**		**n=758**		**n=44**		**n=249**		**n=315**		**n=228**
Prevalence	4	0.5	3	0.4	1	2.3	1	0.4	2	0.6	1	0.4
Upper 95% CI		1.2		1.1		10.6		2.1		2.1		2.3
Lower 95% CI		0.2		0.2		0.5		0.1		0.2		0.1
Amphetamines		**n=797**		**n=753**		**n=44**		**n=249**		**n=311**		**n=227**
Prevalence	2	0.3	1	0.1	1	2.3	1	0.4	1	0.3	0	0.0
Upper 95% CI		0.9		0.7		10.6		2.1		1.7		1.5
Lower 95% CI		0.1		0.0		0.5		0.1		0.1		0.0
Heroin		**n=794**		**n=750**		**n=44**		**n=249**		**n=309**		**n=226**
Prevalence	7	0.9	5	0.7	2	4.6	2	0.8	3	1.0	2	0.9
Upper 95% CI		1.7		1.5		13.7		2.7		2.7		3.0
Lower 95% CI		0.5		0.3		1.5		0.3		0.4		0.3
Methadone		**n=797**		**n=754**		**n=43**		**n=248**		**n=314**		**n=225**
Prevalence	3	0.4	2	0.3	1	2.3	1	0.4	2	0.6	0	0.0
Upper 95% CI		1.0		0.9		10.8		2.1		2.2		1.5
Lower 95% CI		0.2		0.1		0.5		0.1		0.2		0.0
Opiates other than heroin or methadone		**n=788**		**n=747**		**n=41**		**n=247**		**n=308**		**n=223**
Prevalence	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upper 95% CI		0.4		0.5		7.5		1.4		1.1		1.6
Lower 95% CI		0.0		0.0		0.0		0.0		0.0		0.0
Cocaine Powder		**n=796**		**n=752**		**n=44**		**n=248**		**n=313**		**n=225**
Prevalence	8	1.0	7	0.9	1	2.3	1	0.4	6	1.9	1	0.4
Upper 95% CI		1.9		1.8		10.6		2.1		3.9		2.3
Lower 95% CI		0.6		0.5		0.5		0.1		1.0		0.1
Mephedrone		**n=796**		**n=751**		**n=45**		**n=250**		**n=312**		**n=224**
Prevalence	2	0.3	1	0.1	1	2.2	1	0.4	1	0.3	0	0.0
Upper 95% CI		0.9		0.7		10.3		2.1		1.7		1.6
Lower 95% CI		0.1		0.0		0.5		0.1		0.1		0.0
Methylone		**n=794**		**n=749**		**n=45**		**n=250**		**n=311**		**n=223**
Prevalence	1	0.1	1	0.1	0	0.0	0	0.0	1	0.3	0	0.0
Upper 95% CI		0.7		0.7		6.8		1.4		1.7		1.6
Lower 95% CI		0.0		0.0		0.0		0.0		0.1		0.0
Crystal Meth		**n=796**		**n=751**		**n=45**		**n=250**		**n=312**		**n=224**
Prevalence	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upper 95% CI		0.4		0.5		6.8		1.4		1.1		1.6
Lower 95% CI		0.0		0.0		0.0		0.0		0.0		0.0
Steroids		**n=805**		**n=760**		**n=45**		**n=252**		**n=317**		**n=226**
Prevalence	4	0.5	4	0.5	0	0.0	0	0.0	3	1.0	1	0.4
Upper 95% CI		1.2		1.3		6.8		1.4		2.6		2.3
Lower 95% CI		0.2		0.2		0.0		0.0		0.4		0.1
Any Other Drug		**n=782**		**n=740**		**n=42**		**n=248**		**n=302**		**n=222**
Prevalence	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upper 95% CI		0.5		0.5		7.3		1.4		1.2		1.6
Lower 95% CI		0.0		0.0		0.0		0.0		0.0		0.0

Table A.8 NACD Irish Prison Study 2011: Self-reported Prevalence of HIV, hepatitis B and hepatitis C*

	All		Male		Female		18–24 Years		25–34 Years		35–64 Years	
	n	%	n	%	n	%	n	%	n	%	n	%
Hepatitis B	**n = 793**		**n = 749**		**n = 44**		**n = 248**		**n = 314**		**n = 222**	
Prevalence	9	1.1	9	1.2	0	0.0	2	0.8	3	1.0	3	1.4
Upper 95% CI		2.1		2.2		7.0		2.7		2.6		3.7
Lower 95% CI		0.6		0.7		0.0		0.3		0.4		0.5
Hepatitis C	**n = 781**		**n = 737**		**n = 44**		**n = 245**		**n = 309**		**n = 218**	
Prevalence	67	8.6	60	8.1	7	15.9	2	0.8	37	12.0	27	12.4
Upper 95% CI		10.6		10.2		27.6		2.7		15.7		17.0
Lower 95% CI		7.0		6.5		8.8		0.3		9.1		8.9
HIV	**n = 777**		**n = 733**		**n = 44**		**n = 243**		**n = 309**		**n = 216**	
Prevalence	11	1.4	9	1.2	2	4.6	0	0.0	5	1.6	5	2.3
Upper 95% CI		2.4		2.2		13.7		1.4		3.6		5.1
Lower 95% CI		0.8		0.7		1.5		0.0		0.8		1.1

* Based on those who tested positive to either their first or their last test

Table A.9 NACD Irish Prison Study 2011: Prevalence of HIV, hepatitis B and hepatitis C based on Oral Fluid Sample Testing

	All n = 777		Male n = 732		Female n = 45		18–24 Years n = 239		25–34 Years n = 307		35–64 Years n = 216	
	n	%	n	%	n	%	n	%	n	%	n	%
Hepatitis B (HBsAg)												
Prevalence	2	0.3	2	0.3	0	0.0	0	0.0	1	0.3	1	0.5
Upper 95% CI		0.9		0.9		6.8		1.4		1.7		2.4
Lower 95% CI		0.1		0.1		0.0		0.0		0.1		0.1
Hepatitis C (Anti-HCV)												
Prevalence	100	12.9	90	12.3	10	22.2	7	2.9	51	16.6	41	19.0
Upper 95% CI		15.2		14.7		34.4		5.6		20.8		24.3
Lower 95% CI		10.9		10.3		13.7		1.6		13.2		14.7
HIV (Anti-HIV)												
Prevalence	15	1.9	11	1.5	4	8.9	1	0.4	6	2.0	7	3.2
Upper 95% CI		3.1		2.6		19.1		2.2		4.0		6.3
Lower 95% CI		1.2		0.9		4.1		0.1		1.0		1.7

Table A.10 NACD Irish Prison Study 2011: Prevalence of Drug Use in the 24–72 Hours Prior to the Study Based on Oral Fluid Sample Testing*

	All n = 775		Male n = 730		Female n = 45		18–24 Years n = 240		25–34 Years n = 308		35–64 Years n = 212	
	n	%	n	%	n	%	n	%	n	%	n	%
Cannabis												
Prevalence	31	4.0	31	4.2	0	0.0	9	3.8	14	4.5	8	3.8
Upper 95% CI		5.5		5.8		6.8		6.7		7.2		7.0
Lower 95% CI		2.9		3.1		0.0		2.1		2.9		2.1

	All n = 777		Male n = 732		Female n = 45		18–24 Years n = 241		25–34 Years n = 309		35–64 Years n = 212	
	n	%	n	%	n	%	n	%	n	%	n	%
Benzodiazepines												
Prevalence	83	10.7	74	10.1	9	20.0	25	10.4	40	12.9	18	8.5
Upper 95% CI		12.8		12.3		32.0		14.4		16.8		12.7
Lower 95% CI		8.9		8.3		12.0		7.4		9.9		5.7
Methadone												
Prevalence	103	13.3	88	12.0	15	33.3	11	4.6	55	17.8	35	16.5
Upper 95% CI		15.6		14.4		46.0		7.7		22.1		21.7
Lower 95% CI		11.2		10.0		22.8		2.7		14.3		12.4
Opiates												
Prevalence	2	0.3	2	0.3	0	0.0	0	0.0	1	0.3	0	0.0
Upper 95% CI		0.9		0.9		6.8		1.4		1.7		1.6
Lower 95% CI		0.1		0.1		0.0		0.0		0.1		0.0
Cocaine												
Prevalence	1	0.1	1	0.1	0	0.0	0	0.0	1	0.3	0	0.0
Upper 95% CI		0.7		0.7		6.8		1.4		1.7		1.6
Lower 95% CI		0.0		0.0		0.0		0.0		0.1		0.0

* Oral fluid tests can detect the presence of drug metabolites for drugs taken up to 72 hours prior to the survey

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NACDA
National Advisory Committee on Drugs and Alcohol

National Advisory Committee on Drugs and Alcohol (NACDA)
Hawkins House
Hawkins St
Dublin 2

Tel: 00 353 1 635 4283
Email: nacda@nacda.ie
Web: www.nacda.ie

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