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Key findings from the Drug Outcome Research in Scotland (DORIS) study

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KEY FINDINGS FROM THE DRUG OUTCOME RESEARCH IN SCOTLAND (DORIS) STUDY

This occasional paper brings together for the first time the key findings arising from the Drug Outcome Research in Scotland study.

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Executive Summary and Policy Implications

Introduction

This occasional paper brings together for the first time the key findings arising from the Drug Outcome Research in Scotland study.

Methods

The difficulties of conducting randomised controlled trials of drug treatment services have led to the endorsement of cohort studies (i.e. repeated follow-up interviews with a cohort of drug users receiving treatment in a range of different treatment modalities) as a pragmatic alternative research design for investigating treatment effectiveness. The DORIS study is the largest ever such cohort study of Scottish drug users, being a sample of 1007 drug users recruited from 33 drug treatment agencies (including five prisons) from across Scotland in 2001/02 and followed up at eight months (DORIS2), 16 months (DORIS3) and 33 months (DORIS4). At DORIS4, 70% of eligible respondents were re-interviewed, a follow-up rate which compares favourably with those of follow-up studies of the UK general population. The DORIS sample is almost socio-demographically identical to the population of Scottish drug users entering treatment in 2001 (and recorded in the Scottish Drugs Misuse Database). Concordance of self-reported drug use and oral fluid test data was high and attrition bias (i.e. differential loss to follow-up) was low.

The main findings and implications from the research are as follows.

Treatment Goals & Treatment Effectiveness

Finding 1: While the initiation of treatment is followed by a decline in drug consumption (heroin use in last 3 months; being currently drug free) and improvements in the severity of dependence, the bulk of these changes occurred in the first 8 months after starting treatment. Only the use of heroin in the last 3 months showed a further slight fall between DORIS3 and DORIS4.

Finding 2: Whether we define abstinence as non-use of non-prescription drugs including cannabis or apart from cannabis, residential rehabilitation treatment is more effective in promoting abstinence thirty three months on than other treatments outside prison. Ex-residential rehab clients were twice as likely as those who had undergone different treatments at baseline to be abstinent apart from cannabis (O.R. 0.45, 95% confidence interval 0.23 – 0.90, $p = 0.0164$). Having comparatively good mental health at baseline treatment was also associated with later abstinence ($p = 0.014$).

Finding 3: Methadone maintenance clients are not more likely than those in other baseline treatments to be abstinent apart from cannabis thirty-three months on (O.R. 1.15, 95% confidence interval 0.67 – 1.98, $p = 0.6165$), but they are significantly more likely to use heroin less frequently (i.e. use heroin in fewer days) than clients in other non-prison treatment groups ($p = 0.0025$).

Implications for policy: Methadone maintenance is the most effective treatment for reducing the frequency of heroin use, but it is not effective in promoting abstinence, for which goal residential rehabilitation appears to be the most effective treatment. A ‘mixed economy’ of drug treatment facilities is therefore necessary with residential rehabilitation facilities available for drug users willing and able to achieve abstinence and methadone maintenance (or similarly effective substitute prescribing) available to achieve public health harm reduction goals for others.

Treatment in Prison

Finding 1: While the community and the prison samples both experienced improvements in drug consumption and non-drug outcomes between DORIS1 and DORIS4, improvements in both categories were greater for those DORIS interviewees who received treatment outside prison.

Implications for policy: There is a need for further investigation of the reasons for these differences, although part of the explanation may reside in the next 3 findings.

Finding 2: Community-based clients received a broader range of treatment and support than their imprisoned counterparts.

Finding 3: Clients of prison drug treatment services had significantly more negative opinions of the help and support that they had received than the community based clients.

Implications for policy: While prison services in Scotland are making considerable efforts to assist their drug-using inmates, these findings suggest that consideration should be given 1) to offering greater access to a wider range of treatments within the prison setting and, 2) to investigating the reasons why prison drug treatment clients feel so negative about the help that they receive and examining how this situation might be improved.

Whether or not it is important that prison treatment clients are happy with the support they are given is a moot point. If the aim is solely to punish them for their crimes, it could be argued that clients' views are an irrelevance. However, if the aim is, at least in part, to rehabilitate them successfully, it seems reasonable to suggest that services will be more effective if clients feel positive about them and are presumably therefore more willing to engage with them.

Finding 4: Prisons face particular challenges in relation to the treatment of drug misuse. These include: the nature of prison life; the prison regime; negative staff attitudes; and certain characteristics of the prison population.

Implications for policy: On the basis of our own work and other relevant research, it is clear that the delivery of drug treatment services within a prison context is an extremely challenging task. The scale of the drug problem and the nature of the constraints that operate in prisons make the identification of realistic solutions to the challenges that they face far from easy. For example, it is difficult to see what can be done about some of those aspects of prison life that derive from the custodial imperative. An exception to this is the apparently negative attitudes of a substantial proportion of officers in mainstream halls which are likely to be counterproductive as far as prisoners' attempts to engage effectively with treatment programmes are concerned. Here there would appear to be a role for training programmes to promote more favourable attitudes.

As far as treatment is concerned, the main objective must be to increase prisoners' access to the range of treatments that are likely to be most beneficial to them. This, in turn, must mean expanding the availability of treatments which contain the flexibility and range of skills required to address the diversity and complexity of prisoners' needs. These include group work, multidisciplinary approaches, individualised treatment plans, counselling and therapeutic communities (Kothari et al 2002). However, all of these have very significant resource implications. All are resource intensive and, indeed, research tells us that they perform best the more that is invested in them (Bullock 2003).

The problem is that it is hard to see how the system, at present levels of resource, can meet the demand for those sorts of services and, as a result, some form of prioritisation is probably inevitable for the foreseeable future. The question then becomes what is the best way to determine which prisoners should receive the more complex and intensive forms of intervention? The most obvious way of doing this might be to target these interventions on the basis of either the severity of the prisoners' addiction or the severity of their offence. However, the definition and measurement of these categories is far from unproblematic. We believe that the significance of motivation for successful recovery from addiction suggests that prisoners' readiness to change could provide a more appropriate basis for the targeting of services. Some instruments already exist which could be adapted for the purpose of assessing drug users' readiness to change. Examples of the sorts of tools that might be used include the US based 'Circumstances, Motivation and Readiness Scale' (De Leon et. al. 1994) and the 'University of Rhode Island Change Assessment Scale' (DiClemente and Hughes 1990). While both of these instruments are capable of measuring motivation to change and readiness for treatment, they may require some adaptation for the UK and for prison populations.

In addition to the above, there is a case for attempting to encourage in prisoners the motivation to give up drugs through a combination of one-to-one interventions and group work, perhaps using 'motivated' prisoners as advocates and exemplars. Finally, one other thing that is abundantly clear from the literature is the importance of through-care and after-care in sustaining the positive effects of any treatment received in prison. Numerous studies, particularly in the US, have documented the importance of through-care, to manage the prisoner's transition to the community, and the provision of continuing support following release for preventing relapse (Inciardi et al 1997, Hillier et al 1999, Kothari et al 2002, Bullock 2003).

Criminality

Finding 1:

There is a strong association between participation in acquisitive crime and various drug consumption and drug consumption-related variables. This association is particularly strong as far as the actual commission of acquisitive crime is concerned although it is also present in relation to arrests for that offence. On the other hand, treatment-related variables (treatment modality received, number of previous drug treatment episodes and treatment perception score) have hardly any independent associations with acquisitive crime.

Implications for policy: These findings provide additional evidence of the reduction in crime following treatment for drug misuse found in other studies in the UK (Gossop et al 2000, 2005) and North America (Hubbard et al 1997, Simpson et al 2002). However, it appears that, insofar as drug treatment is effective in reducing rates of acquisitive crime among recovering drug addicts, it does so, not by altering their criminal activities directly, but by reducing their consumption of illegal drugs and thereby the need for them to engage in crime to sustain their habit. This

interpretation is consistent with the findings of other studies which have found drug consumption to be a better predictor of criminal activity than exposure to treatment (Gossop et al 2000, 2005, Keene 2005). This particular mechanism is also what one would expect, since drug treatment agencies do not normally seek to alter individuals' criminal behaviour directly. The message from this analysis is that anything that leads individuals to cease their use of illegal drugs will have a marked effect upon levels of acquisitive crime. There is, however, an important task for future research to investigate the extent to which improvements in drug consumption short of cessation also lead to reductions in these criminal activities.

Finding 2:

Based on the data collected at DORIS1, 18.1% of the sample reported that they had recently committed assault (21.1% of men and 12.0% of women). For male respondents three factors were independently associated with being a recent assaulter. These were; ever being physically abused; having sold or supplied drugs in the last 90 days; and having committed theft in the last 90 days. For female respondents two factors were independently associated with being a recent assaulter. These were; ever being physically abused and having slept rough or stayed in a hostel/shelter in the last 6 months.

Implications for policy: These findings indicate that those working with drug users have a potentially important role to play in addressing the violent tendencies of their clients. They are also a useful reminder that female drug users do commit assault, although less frequently than their male peers. Thus, efforts to address the problem of recent assault by drug users should not focus on men alone - particularly given additional evidence within the literature that some women enlist men to commit violence on their behalf (Denton and O'Malley 1999). Nonetheless, strategies for dealing with recent assault may need to have a gender focus. For example, recent assaults by men seem to be associated with their involvement in other criminal behaviour and may consequently best be addressed alongside their offending. In contrast, recent assaults by women seem to be associated with their own personal vulnerabilities (such as having been abused and being homeless) and may thus best be addressed as part of counselling and housing support.

Finding 3:

Only a fifth of individuals who had recently driven under the influence of drugs had ever been arrested for drug driving.

Finding 4:

Each individual who had driven under the influence of drugs had generally done so on numerous occasions and yet only been arrested an average of once.

Implications for policy: These findings provide further evidence that the detection and regulation of drug driving offences in Scotland has often lacked rigour and consistency and that there is a pressing need to develop more effective methods of detection (see also Neale *et al.*, 2001).

Finding 5:

Five factors were independently predictive of being a recent drug driver: being male; currently seeking help from a residential detoxification or rehabilitation agency; not being a recent injector; having a formal qualification; and having recently committed assault or criminal damage. Two factors were independently predictive of having ever been arrested for drug driving: being male and having recently used cocaine or crack.

Implications for policy: These findings may be helpful in terms of accurately targeting prevention strategies at those drug service clients who are most likely to drug drive. In particular, since recent cocaine and crack use were independently predictive of having ever been arrested for the activity and were also associated with recent drug driving in the univariate analyses, it might be important to give particular emphasis to targeting this growing group as far as preventive strategies are concerned.

Morbidity and Mortality

Finding 1: Based on their responses to the SF-36 questionnaire, DORIS respondents reported poorer health than the UK population as a whole on a number of dimensions: they reported much poorer mental health, more role limitations due emotional problems, more role limitations due to physical problems, lower energy and vitality, more pain, poorer social functioning, and perceived themselves to have poorer general health.

Finding 2: There was a very strong independent association between an improvement in mental health and recent abstinence from non-prescription drugs (apart from cannabis): those whose mental health score had substantially improved over 33 months (i.e. had increased their score more than one standard deviation from the mean observed change in score) were five times more likely to be recently abstinent (O.R. 0.22, 95% confidence interval, $p < 0.0001$). There was also an independent association with having had a period of employment, education or training since the previous interview and with not having experienced recent accommodation problems.

Finding 3: The DORIS sample were 12 times more likely to die than their non-drug- using peers.

Finding 4: Nearly two-fifths of the sample tested positive for HCV at 16-month follow up. The overall prevalence concealed substantial regional variations.

Implications for policy: Drug users in DORIS had high levels of co-morbidity. We have already noted (see 'Treatment Effectiveness' above) that better mental health was associated with better treatment outcomes, and it will be noted below (see Employment) that poor health may be inhibiting uptake of employment opportunities. There is thus a need to ensure that other health problems are treated alongside drug problems. The high levels of HCV prevalence foreshadow a likely very high future burden of severe liver disease in Scotland and argue the need for substantial efforts to increase HCV testing and treatment of current drug users.

Employment

Finding 1: While age, participation in criminal activity and Severity of Dependence Score were all associated with the achievement of paid employment, the strongest association was with help which individuals received from their treatment agency that focused directly on their ability to obtain a job.

Implications for policy: A key message from these findings is that assistance that is specifically employment-related is of key importance in helping recovering drug users to secure paid employment: the independent positive association with employment in our data is not with a particular treatment modality but with employment-related help from treatment services. The study therefore provides an endorsement of programmes that address the employment related needs of recovering addicts and seek to enhance their employability and facilitate their introduction to

suitable employers. While being drug free may be an important precondition for employment, it is not enough on its own. The nature and magnitude of the difficulties involved in making the transition to employment are such that specialist help is also essential.

Finding 2: A number of aspects of drug users' lives may not only act as barriers to them entering the workplace and retaining paid employment but may also preclude their successful participation in employability programmes. These include; high levels of physical and mental ill health; chaotic lifestyles; and limited previous experience of the labour market.

Implications for policy: The predominant focus of welfare to work programmes such as the New Deal is on preparing individuals for work and job placement rather than offering them support with any personal, health, life style or other problems that they may be experiencing (Dean, 2003). Exceptions are Progress2work in England and Wales and the New Futures Fund in Scotland, both of which seek to provide support and encouragement to those who are not yet ready for the New Deal. Among other things, they seek to address motivation, self-esteem, and disrupted life-styles via activities that include outreach work to prevent drop-out, working in small groups, and peer group approaches. However, while Progress2work and the New Futures Fund are much more suitable than the New Deal for hard-to-help groups, they remain in essence employability programmes aimed at moving people closer to work.

While both of these programmes have the potential to enhance employability, we would suggest that fundamental barriers such as physical and mental ill health and the chaotic lifestyle associated with drug taking need to be addressed before these programmes stand any chance of success (Richards and Morrison 2001). Ultimately, the most pressing problem facing many of those with an addiction is their constant need for drugs and the chaotic lifestyles and criminal activities associated with it. This implies that the most effective way to begin to tackle the poor employability of many addicted individuals is to increase and improve the drug treatment services currently available to them. For it is only once their dependence has been brought under control that welfare to work programmes will have any realistic chance of enhancing their employability and job prospects.

Homelessness

Finding 1: While nearly one-quarter of respondents (23%) stated that they were homeless at the time of their first (DORIS1) interview, by the time of the DORIS4 interviews, this proportion had fallen significantly to one in ten (11%).

Implications for policy: The decline in homelessness between DORIS1 and DORIS4 suggests that treatment for drug misuse can have a significant impact upon an individual's ability to secure accommodation.

Finding 2: Risk factors for homelessness included; not being in a relationship; having a positive alcohol SDS score; having injected drugs in the previous 3 months; having been in prison during the previous 6 months; not living with children; having parents who were divorced, separated or never married; not having a good relationship with a living parent or sibling; and having income from crime or illegal activities during the previous 6 months.

Implications for policy: The risk factors centre on three main areas: relationship difficulties; continuing problematic substance use; and imprisonment or involvement in illegal activities. The significance of relationship difficulties in this context is not surprising given that these will limit

the extent to which an individual can find accommodation with other family members. Similarly, the potential for the consequences of criminal involvement to contribute to accommodation instability is obvious. The finding that recent drug injection increases risk provides new statistical evidence that, amongst problem drug users entering treatment, drug-taking behaviour is itself a significant risk factor for homelessness. In consequence, enabling individuals to resist and move away from drug injection could play a crucial role in both preventing and responding to homelessness.

Parenting

Finding 1: At DORIS2, 41% of the sample had children and 20% had at least one child living with them. There was no association between retention of children and recent heroin use and level of drug dependence. However, those sample members who did retain their children were significantly more likely to show a fall in severity of drug dependence between DORIS2 and DORIS4, thirty three months on.

Finding 2: Also, there is an association with drug treatment: women (but not men) receiving baseline methadone maintenance were four and half times more likely to retain their children than women on other baseline treatments (O.R. 4.49, 95% confidence interval 1.63 – 12.34, $p = 0.036$). For both male and female parents there was a positive association between retaining one's children and living in one's own house and negative association with being a lone parent.

Implications for policy: Drug consumption and drug dependence are strongly associated with many non-drug outcomes in the DORIS data (criminality, health status, employment status, housing status), but not with retention of children. Since ability to care effectively for children will vary with drug use and dependency, the lack of association between these variables and retention of children suggests that these children's interests were not always being monitored effectively by social work services.

SECTION 1: Introduction

Pick up any newspaper on any day of the week in the U.K. and it is a fair bet that the paper will contain at least one story reporting the findings of research on some aspect of the U.K.'s drug problem. So widespread is media reporting of research on drug abuse that one could be forgiven for assuming that the scale of the research effort on illegal drugs is second only to the scale of the drug problem itself. The reality though could hardly be more different. In a review of how the UK is tackling the problem of illegal drugs the Royal College of Psychiatrists commented critically on the low level of funding for drug abuse research noting that less than one quarter of one percent of the government's drug abuse budget is actually directed at research. That figure compares unfavourably with the US where, for example, where around 4% of overall government spending on illegal drugs is thought to be targeted at research (Royal College of Psychiatrists: 2000).

As a result of the low level of funding for drug abuse research within the U.K. it is hardly surprising that there are enormous gaps in our understanding both as to the nature of the drug problem itself as well as the impact of policy and interventions aimed at tackling the drug problem. In terms of drug policy, for example, we know very little about the impact of current drug laws on individual's behaviour. Similarly, we know relatively little about those factors that influence the progression from initial use of certain drugs to repeated use of other drugs and the development of a pattern of problematic drug use. Whilst drug abuse treatment is one area where research has been undertaken most of the research carried out are small scale studies of individual treatments or services with the result that it is very difficult to compare and contrast the impact of a range of services in terms of their effectiveness. To remedy this gap in the U.K. the National Treatment Outcomes Research Study was initiated in England in 1995 with the aim of providing evidence on the effectiveness of drug abuse treatment services. This large scale research study following a cohort of addicts starting drug abuse treatment aimed to show how individuals were progressing in their contact with drug treatment services, whether they remained in contact with those services and crucially whether there was evidence of a reduction in their drug use and drug related behaviours (including drug related criminality) associated with such treatment services. The NTORS study was perhaps the single most influential drug abuse treatment study conducted within the U.K. in the period covered by the 10 Year Drug Strategy Tackling Drugs to Build a Better Britain. If there was one headline message emanating from this study it is probably summed up in the statement that "treatment works". In particular the research showed convincingly that contact with drug abuse treatment services was associated with a wide range of improvements in individual's circumstances. The positive findings of this research provided the basis for extensive government funding in England for drug abuse treatment as one of the core pillars of the drug strategy. However, useful as the NTORS study was it applied only to England. As a result the findings of the NTORS study could not in any meaningful sense be applied to Scotland and Scottish based funding organizations both governmental and charitable were unable to be guided by research as to which types of drug treatment services they might sensibly support. This situation changed in 2000 when the Robertson Trust a large West of Scotland charity decided to fund a programme of research part of the aim of which was to provide detailed information on the effectiveness of drug abuse treatment services in Scotland. In 2001, on the basis of funding provided by the Robertson Trust, the Drug Outcome in Scotland study (DORIS) began. Following a similar design to the National Treatment Outcome Research Study of regularly re-interviewing a cohort of drug abusers recruited from a wide range of drug treatment services the study aimed to establish whether drug users in treatment were progressing and whether their progress was in any sense seen to be associated with particular types of treatment services.

The Drug Outcome Research in Scotland (DORIS) study is the largest cohort study of drug users ever undertaken in Scotland, a follow-up study of 1033 drug users starting a new treatment episode in a range of drug treatment agencies (including five prisons) from across Scotland. The cohort members were first interviewed in 2001/02 and then re-interviewed eight, sixteen and thirty three months later. Additional qualitative data were also collected in a range of drug treatment facilities.

Although the study was designed, first and foremost, to provide research evidence on the effectiveness of the different kinds of drug treatment available for Scottish problem drug users. However, the DORIS dataset has well over a million data items within it and more than twenty reports have been published on the DORIS study (see the list at the end of this document), embracing not just treatment effectiveness, but also patterns of drug use, prevalence of hepatitis C virus, criminality, mental health, risk behaviour, employment patterns and homelessness. Analyses have also been conducted on particular sub-groups of the sample such as those who underwent prison-based drug treatment, sample members with families, and sample members who died.

In this occasional report we have brought together the many strands of the DORIS research to assist policymakers, practitioners, students, service-users and fellow-researchers interested in the drugs issue and tackling Scotland's drug problem.

SECTION 2: Research Methods and DORIS Sample Characteristics

It is conventionally accepted that the ‘gold standard’ research design for evaluating the effectiveness of treatment services is the randomized controlled trial (RCT), where clients/patients are randomly allocated to different treatments and effectiveness is measured by comparing the sample members’ differential progress, from pre- to post-treatment, between the different treatment services. But it is easier to conduct RCTs of the effectiveness of *new* treatments for drug users than of *existing* treatments: there are obvious ethical arguments about the inadvisability withholding currently available treatments from clients who aspire to such treatments, and drug users who don’t receive the treatment that they aspire to are likely to drop out of the trial (seeking that treatment elsewhere) and thus the trial population melts away and becomes increasingly unrepresentative. Thus, although there have been special circumstances when RCTs of drug use treatments have proceeded to successful conclusions (e.g. the Newman and Whitehill [1971] trial of methadone maintenance in Hong Kong, conducted when that treatment was first introduced into the then-colony), it has become more common to assess treatment effectiveness using a ‘cohort study’ design, where a cohort of drug users receiving treatment in facilities representing a range of different treatment modalities are followed up repeatedly to compare their post-treatment performance.

Some salient features of the study:

- The DORIS study is the largest ever cohort study of Scottish drug users
- DORIS follows a similar design to earlier cohort studies of drug use treatment, such as the DATOS study in the USA (Anglin et al, 1997) and NTORS in England (Gossop et al. 2001). It also uses some of the same questions and measures as the NTORS study.
- At each data collection sweep (baseline and three follow-ups – DORIS1, DORIS2, DORIS3 and DORIS4) DORIS interviewees supplied unnamed responses to trained face-to-face interviewers.
- The number and content of the questions asked varied slightly between each interview sweep, but the interviews typically took between an hour and two hours to complete and covered information on basic demographic background data, on the original treatment episode (that had just been embarked upon when the interviewee was recruited into the study) and on subsequent treatment episodes, on other contacts with medical and welfare services, on housing, education and employment status, on daily routines, on current drug and alcohol use, on risk behaviours, on self-reported health, on relationships, on criminality, and on interviewees’ hopes and expectations.
- At DORIS1, the first 275 interviewees were asked to provide unnamed oral fluid (saliva) samples to allow comparison of self-report and OMT test results on recent drug use.
- At DORIS3 and DORIS4, all interviewees were asked to provide unnamed oral fluid samples for hepatitis c virus (HCV) screening.

At DORIS1, 1033 persons were interviewed. However, 26 of these were interviewed in needle exchange schemes. Since there is some controversy over whether needle exchange schemes can be said to be providing drug treatment services, these 26 interviewees have been excluded from most of the analyses reported below, leaving a DORIS1 sample of 1007 interviewees. Prisoners receiving drug treatment comprised 45% (N = 448) of the sample.

A qualitative sub-study was employed to support the quantitative Drug Outcome Research in Scotland study (DORIS). The overall aim of this component of DORIS was to provide a qualitative assessment of the culture and working practices within treatment agencies in Scotland. This aspect of the research aimed to further our understanding of how and why it is that certain treatment modalities, and indeed different parts of treatment programmes within services, are more or less

effective. More specifically, the qualitative DORIS study sought to address the following questions.

- What is the level and intensity of treatment and care provided by drug agencies?
- What is the therapeutic environment provided by agencies?
- What are the goals and philosophies underpinning drug treatments?
- What is the background and training of staff in drug agencies?
- What is the nature and frequency of staff interactions with clients?
- What is the impact of staff assessment on client progress?
- What is the quality of the physical environment within which agencies operate?
- How satisfied are drug users with the treatment services received?

The case study methodology involved spending periods of between 4 and 6 weeks in individual agencies conducting observations and in-depth qualitative interviews with staff and patients. The specific methods and samples used in individual agencies are described when they are discussed in subsequent chapters.

Ethical approval for the DORIS study was given by the Multi-Centre Research Ethics Committee for Scotland. Additional approvals were given by the Scottish prison service, the medical advisor to the Registrar General and by the Privacy Advisory Committee of the General Register Office for Scotland.

The following information is relevant to judgements about the representativeness of the DORIS sample, the accuracy of the data and the generalisability of the findings:

- The sample members were recruited from 33 drug treatment sites across Scotland (including five prison drug treatment programmes). In order to have sufficient sample members to allow comparisons of treatment effectiveness between different treatment modalities, clients/patients attending residential rehabilitation centres were deliberately over-sampled. Nevertheless, the socio-demographic profile of the sample is consistent with the profile of all new drug treatment attenders reported to the Scottish Drug Misuse Database in 2001 (ISD Scotland [2002]). The sample comprises one in eleven of all drug users entering treatment in 2001.
- The participation rate was 87.7% (147 refusals). The most common reason given for refusal was lack of time.
- At third follow-up (DORIS4) at 33 months, 695 of the original sample were successfully reinterviewed. After excluding the 38 deaths in the cohort, this is a follow-up rate of 70%, which compares favourably with follow-up rates in cohort studies of the UK general population. 668 interviewees were interviewed at all four data collection sweeps.
- Where interviewees are lost to follow-up, there is a danger of attrition bias, with remaining interviewees being increasingly unrepresentative of the original sample. Univariate logistic regression of attrition bias at DORIS4 showed bias in relation to just two sample variables – those homeless at DORIS1 and those in prison at DORIS1 (see Table 1). This very limited attrition bias is to be expected: other things being equal, prisoners and the homeless can expect at least one more change of address than others in the sample.

Table 1: Attrition bias at DORIS4 follow-up

Variable	No. at DORIS1	Odds Ratio	O.R. 95% Confidence interval	p-value
Currently homeless	268	0.68	0.51 – 0.91	0.0094*
Prisoner	447	0.56	0.43 – 0.72	<0.0001*
Male (v. female)	715	1.20	0.91 – 1.59	0.1988
Married/in a relationship	514	0.88	0.68 – 1.15	0.3534
Daily heroin use in last 3 mths	260	1.39	0.95 – 2.02	0.0875
Used street methadone in last 3 mths	328	1.16	0.88 – 1.54	0.2971
Used amphetamine in last 3 mths	119	0.88	0.59 – 1.31	0.5249
Used cocaine and/or crack in last 3 mths	475	0.77	0.60 – 1.00	0.0526
Used diazepam or temazepam in the last 3 mths	778	1.19	0.089 – 1.61	0.2450
Injected in the last 3 mths	616	0.78	0.60 – 1.02	0.0695
Paid legal employment in the last 6 mths	111	1.23	0.80 – 1.89	0.3557
Ever seen a psychiatrist	511	0.94	0.73 – 1.22	0.6602
Age (per additional year)	Mean: 28	0.99	0.97 – 1.01	0.5659
Alcohol severity of dependence score (per additional unit)	Mean: 1.0	0.99	0.94 – 1.03	0.5097

*statistically significant

- Comparison of self-reported drug use in the previous 3 days and oral fluid test results of the first 275 interviewees in DORIS1 showed a high level of concordance between self-report and test results (Neale and Robertson, 2003). Concordance for methadone was 94%, for opiates - 86%, benzodiazepines - 81%, and cannabis - 80%. Moreover, interviewees were slightly more likely to over-report use than under-report use. Logistic regression showed no associations between any of 13 different variables and under-reporting of drug use. There are therefore good grounds for judging DORIS drug users' self-report data on drug consumption to be valid and reliable.
- As in the earlier DATOS and NTORS studies, the DORIS sample did not include a comparison group of drug users who did not receive treatment. There are good ethical and practical reasons for this omission, but a consequence of this kind of design is that it may over-state the treatment effectiveness of services, since many drug users who survive are likely to show long-term improvements in the level of their drug use regardless of treatment received, not least because when they entered treatment this may have been associated with a short-term crisis in their drug-taking careers. This natural tendency towards long-term improvement is known as 'regression to the mean'.
- All cohort studies may be subject to the criticism that they reflect only the historical circumstances current at the time of cohort recruitment. In respect of the DORIS study it is difficult to be specific about changes over time that might have reduced the current representativeness of the DORIS sample. Patterns of drug use seem to have changed comparatively little in Scotland since 2001. But there have been some changes in service provision. Most importantly, there was very little methadone maintenance provision in Scottish prisons in 2001 and most of the substitute prescribing for prisoners at DORIS1 was for prescriptions other than methadone.

Below are some salient background characteristics of the 1007 interviewees at baseline:

- Sociodemographic data: 69% were male, 31% female; the mean age was 28 years (range 16 to 53 years; median 27 years); 99% were white.
- Previous treatment: only 15% had never previously undergone treatment for drug misuse (defined as: substitute drugs, or residential rehabilitation or detoxification, or counselling, or group work); 59% had previously been prescribed methadone; 67% had been prescribed another substitute drug; 54% had undergone counselling; 34% had participated in group work; 38% had been in a residential detoxification unit; and 12% had been in a residential rehabilitation unit. It is notable that 56% of respondents said that since first having a problem with drugs they had had a period where they had been completely drug free (including no prescribed substitute medication).
- Current treatment. Interviewees were interviewed at the start of their treatment and so were asked what treatment they expected to receive. 27% reported methadone treatment; 29% reported other prescribed drugs (most commonly dihydrocodeine, diazepam, temazepam, lofexidine and MXL); 12% reported residential detoxification; 12% reported residential rehabilitation; 14% reported counselling; and 6% reported group work.
- Accommodation: 26% reported that they were currently homeless.
- Education: only 6% had stayed at school beyond the age of 16 and 47% had no formal educational qualifications; 108 individuals (11%) had been on an educational or training course in previous six months, but only 3 individuals reported full attendance at that course.
- Employment: in the six months prior to interview only 107 interviewees (11%) had been in paid legal employment at any point. Asked about their usual employment pattern over the previous three years, 48% responded that they had been unemployed; 18% had been disabled from employment; 14% had mostly been in full-time employment; 11% had mostly been in prison; 6% said they had had irregular part-time work; 2% said they had regular part-time work; and 1% had been studying.
- Drug use: 88% of respondents had used heroin in the last 3 months; 74% had used cannabis; 73% had used diazepam; 39% had used dihydrocodeine; 32% had used street methadone; 28% had used crack; 27% had used cocaine; 27% had used temazepam; 22% had used ecstasy; 12% had used amphetamine; 10% had used diamorphine; and 10% buprenorphine. The mean age of first heroin consumption was 21 years and 81% said heroin was the main drug they used.
- Risk behaviours: 77% had ever injected a drug and 59% had done so in the last three months; 49% had experienced a drug overdose at some time in the past and 11% had overdosed in the past 3 months; 18% had used a needle or syringe passed on from another in the last three months; and 19% had passed on a needle or syringe to another in the past three months.
- Relationships: 50% of interviewees were single and in no relationship; 30% were single but in a relationship; and 20% were married or living with someone – 56% of these current partners were currently using illegal drugs. 60% of respondents had children, but of these only 29% had at least one child resident with them. 30% of respondents had a sibling with drug problems and a further 8% had a sibling with drug and alcohol problems.
- Health: in responses to a frequently used self-report measure of health status (SF-36), DORIS respondents reported significantly worse physical and mental health scores than are found in UK general population samples.
- Criminality: 70% of DORIS respondents had previously been sentenced and 95% had previously been arrested; 61% had appeared in court on charges in the previous six months (but recall that 45% of the sample had been interviewed in prison).

SECTION 3: Treatment Goals and Treatment Effectiveness

A key part of the DORIS analysis of drug treatment services in Scotland was to try and establish what drug users themselves were actually looking to achieve on the basis of having contacted drug treatment services involved in the DORIS research. To explore this area drug users recruited into the study were asked the following question:

What change or changes in your drug use are you hoping to achieve on the basis of contacting this agency?

1. Abstinence/drug free
2. Reduced drug use
3. Stabilisation
4. Safer drug use
5. No goals
6. Other goals

Respondents were encouraged to cite as many of the above goals as they felt applied to their own situation. In fact 76% of drug users questioned identified a single goal for their treatment; overwhelmingly that goal was to become drug free. 56% of drug users cited that becoming drug free was their sole goal from treatment. This compares with 7.4% who cited that their goal was to stabilize their drug use 7.1% who indicated their goal was to reduce their drug use and 0.7% who were contacting services in order to receive advice on safer drug use. The preponderance of drug users identifying abstinence as their primary or sole aim from treatment was evident for both male and female drug users across those treated in prison and those treated in the community and was maintained across all of the treatment types included within the DORIS research e.g. residential rehabilitation, residential de-tox, non prescription based counseling, methadone maintenance and methadone detoxification.

The finding that abstinence was the predominant goal of treatment on the part of drug users contacting drug treatment services in Scotland was one of the most controversial findings produced from the DORIS study. In response to the publication of that finding commentators from various sections of the drug treatment/drug policy world were asked to comment on their view of what the research had identified. The range of views expressed gives an indication of the sensitivity of the DORIS findings in this area:

Addicts who embrace an ultimate goal of enduring abstinence should be assisted in every way possible, but they must be advised with brutal frankness of the low prospect of success -and the grim, potentially fatal, consequences of failure. (Newman:2005)

For most clients independence and self respect will be found in the successful steps made towards abstinence (Trace: 2005)

This research tells us something that we should know already that there are people who want to stop using drugs and who are seeking help to do this. And it would seem obvious to me that if someone is consistently and clearly asking for help to

stop using drugs that a well thought out attempt at this should be facilitated as quickly as possible (Nelles 2005)

It is high time we ended the unhelpful obsession in trying to prove whether abstinence or harm reduction strategies are best. The most effective treatment will always depend on the circumstances of the individual addict: there is no one size fits all solution. (Scottish Executive: Sept 5/2005)

This article is an important contribution to the literature on drug treatment and the conclusions drawn out by McKeganey *et al* are interesting. There is indeed a long way to go before treatment services or the developers of drug policy can be said to be listening with due care and attention to the voices of service users. Services with a harm reduction focus should not see substitute prescription – for example – as the end of the road, but should be ‘prepared to enable drug users to move over time from a concern with reducing the dangers of their continued drug use towards a position where their drug use ceases’. Few would disagree that drug users should ideally have access to an array of services ‘both those which have a harm reduction focus and those that are more explicitly oriented towards abstinence’. At the same time, we are more likely to make progress towards these objectives if we stop pitching harm reduction *against* abstinence and collectively focus on developing a referral and treatment system that fits the right clients to the right services, rather than being driven by a ‘one size fits all’ ideology of whatever description. (Roberts: 2005)

On the basis of these responses it is clear that whilst some commentators were supportive of what the DORIS research had identified in relation to drug users goals from treatment, for others the general thrust of the analysis was seen as being unhelpful and somewhat conflictual in setting up what some commentators regarded as an entirely false polarity between harm reduction and abstinence. However, although in policy terms it might be claimed that abstinence and harm reduction represent two ends of the same spectrum, in terms of drug users aspirations from treatment there did indeed appear to be some opposition between these aims with the majority of drug users questioned identifying abstinence as their sole goal from treatment.

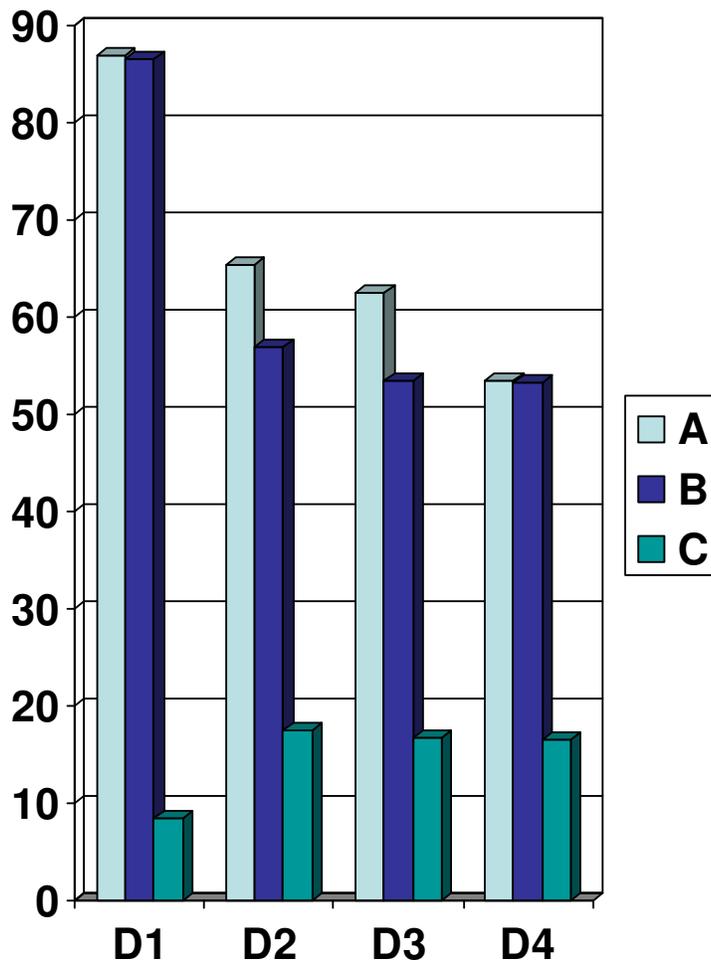
In the remainder of this chapter we look less at what the drug users in DORIS said that they were trying to get out of treatment and more at the evident impact of treatment in Scotland.

Trends in post-treatment drug use

Table 2 and the accompanying figure show trends in three different drug consumption measures over time. Firstly, changes in reports of whether or not the interviewee had used heroin in the last three months – recall that 81% of DORIS1 respondents had stated that heroin was the main drug they used. Secondly, changes in those respondents who scored 7 or more on the Severity of Dependence Scale (SDS), a validated measure of drug dependence (Gossop et al, 1995); a score of 7 or more indicates a level of dependency typical of regular heroin use. And thirdly, changes in whether or not the interviewee reports that they are currently drug free.

Table 2: Changes in Drug Consumption Variables among respondents interviewed on all 4 occasions (N=668)

Variable	Doris1	Doris2	Doris3	Doris4
A: Used heroin 3mths	581 (87%)	437 (65%)	418 (63%)	357 (53%)
B: SDS score 7+	568 (87%)	375 (57%)	355 (54%)	349 (53%)
C: Now drug-free	57 (9%)	117 (18%)	112 (17%)	111 (17%)



It can be seen that the main changes in drug consumption occurred in the first 8 months after starting treatment. Beyond eight months there is a plateau effect, with only 'use of heroin' showing a further small fall in the 17 months between DORIS3 and DORIS4.

Abstinence from drug use can be considered in a number of different ways. Abstinence can simply be defined as being totally drug free. However, assessment of the effectiveness of methadone maintenance services and other substitute prescribing may be argued to require that abstinence be so defined as to permit consumption of prescription drugs such as methadone. And some drug users who achieve abstinence from opiates may continue to smoke cannabis. Accordingly, we have examined below associations between abstinence from all drugs, abstinence from non-prescribed drugs *including* cannabis, and abstinence from non-prescribed drugs *apart* from cannabis. In all cases, a 90 day (3 month) abstinence period is used.

SDS (Severity of Dependence Scale) score offers the possibility of measure which is more fine-grained than the dichotomous measures of whether the interviewee has used heroin or not, or whether the interviewee was abstinent or not. However, there are some difficulties in the measurement of dependence (Bloor et al. forthcoming) and we have therefore adopted a second continuous measure of drug consumption, namely change in the number of days in which heroin was used in last 3 months.

Methadone Maintenance and Changes in Frequency of Heroin Use

Table 3 below shows changes in both SDS score and in frequency with which heroin was used between DORIS1 and DORIS2. It is concerned with the effectiveness of methadone maintenance treatment and excludes all those receiving treatment in prison at DORIS1 (since very few prisoners received methadone maintenance in 2001). The analysis is confined to those for whom data are available at all four sweeps (n = 498).

Table 3: Changes in frequency of heroin use and in SDS score between DORIS1 and DORIS2 for those receiving methadone maintenance

	Baseline treatment: methadone maintenance (n = 157)	All other non-prison baseline treatments grouped (n = 341)	
	Mean (std deviation)	Mean (std deviation)	p-value (2 sample t- test)
Change in SDS score DORIS1-DORIS2	4.9 (5.1)	4.4 (5.8)	0.3548
Change in days when used heroin in the last 3 months DORIS1-DORIS2	41.6 (40.5)	29.5 (41.4)	0.0025

It is clear that, although there is no significant difference between treatment groups in SDS scores, methadone-maintained clients use heroin significantly less frequently than those receiving other non-prison treatments. This significant difference is maintained at DORIS4 and this treatment effect is strongest for those receiving methadone maintenance at DORIS1 who are still in contact with the treatment agency. However, this significant difference between methadone-maintained and other treatment clients in respect of frequency of heroin use does not also carry over into comparatively fewer self-reports of acquisitive crimes committed or arrests (Bloor et al, 2008a).

Residential Rehabilitation and Abstinence

Defining abstinence as non-use of any non-prescription drugs in the last 90 days (i.e. allowing the use of substitute prescribed drugs such as methadone), we find that only 14.8% of the 668 interviewees interviewed at all four sweeps were abstinent at DORIS4 (33 months on from the original treatment episode). If we broaden the definition of abstinence further to allow cannabis use, then 29.9% of interviewees were abstinent 33 months on. A published DORIS paper (McKeganey et al. 2006) has previously drawn attention to: (a) the relatively low level of abstinence achieved by DORIS interviewees compared to that reported in the cognate English cohort study NTORS (Gossop et al. 2001); (b) the significant associations between abstinence and a range of other outcomes (arrests, committal of acquisitive crime, improved self-reported health and take-up of employment or full-time education or training); and (c) the strong association between achievement of abstinence and baseline treatment in a residential rehabilitation agency. This latter association is explored further here.

Table 4: Logistic regression analysis of factors independently associated with continuing use of non-prescribed drugs (including cannabis)

Variable	Odds ratio	OR 95% confidence interval	p-value
Residential rehab treatment at DORIS1	0.45	0.23 – 0.90	0.0233
SF-36 mental health score at DORIS1 (for each additional 5%)	1.10	1.02 – 1.19	0.0140
Currently receiving oral methadone treatment	2.93	1.46 – 5.85	0.0024
Relationship breakdown in the last 3 months	2.90	0.97 – 8.62	0.0561

$r^2 = 12.4\%$

Table 5: Logistic regression analysis of factors independently associated with continuing use of non-prescribed drugs (apart from cannabis)

Variable	Odds ratio	OR 95% confidence interval	p-value
Residential rehab treatment at DORIS1	0.49	0.28 – 0.88	0.0164
Received support from baseline treatment agency for education, training or job-seeking	0.40	0.22 – 0.74	0.0035
SF-36 mental health score at DORIS1 (for each additional 5%)	1.06	1.00 – 1.12	0.0496
Overdosed in the 3 months prior to DORIS1	0.35	0.16 – 0.78	0.0103
Relationship breakdown in the last 3 months	2.52	1.16 – 5.47	0.0192

$r^2 = 12.3\%$

Tables 4 and 5 show logistic regression analyses for abstinence from non-prescribed drugs, both including cannabis (Table 4) and apart from cannabis (Table 5), at DORIS4. Because prison-based treatment may not be regarded as commensurate with treatment outside prison, these two models are confined to the population treated outside prison at baseline. Twenty one different co-variables were inputted into the model, selection of the co-variables was an iterative process based on extensive earlier modeling of the DORIS3 data. The variables included: socio-demographic variables (age and gender), treatment modality (residential rehab, methadone maintenance and other), other treatment variables (currently receiving oral methadone, received help from baseline agency for education, training or job-seeking, treatment perception score [a measure of treatment satisfaction], not currently in treatment, still in contact with baseline treatment agency), previous treatment history (6 or more previous drug treatment episodes), pre-treatment drug-use (felt it was ‘extremely important’ to get help, needle-sharing the previous 3 months, drug overdose in the previous 3 months), accommodation problems, mental health (SF-36 mental health score at baseline, and previous attempted suicide or self-harm), and recent life-events (death of someone close to interviewee, relationship breakdown, and child taken into care). In Table 5, modeling is occurring with a larger sample and the confidence intervals on the odds ratios are generally narrower; the goodness of fit statistic (r^2 value) for both models is acceptable for data of this type.

In respect of the covariables in both models, it is likely that the importance should be discounted of ‘currently receiving oral methadone’ (in Table 4) as a variable inversely associated with abstinence; very possibly, this variable may be acting as a proxy for those interviewees continuing to experience drug use problems. The reason why experience of an overdose in the three months prior to baseline treatment should be associated with abstinence (Table 5) is unclear – perhaps the experience may aid motivation to become abstinent. Alternatively, some individuals seeking abstinence prior to recruitment in the study may have relapsed and having relapsed may be more vulnerable to overdose, due to reduced tolerance. The presence in Table 5 of the covariable ‘received support from baseline treatment agency for education, training or job-seeking’ is

indicative of the importance of ‘wrap-around’ drug services and is discussed at greater length in the subsequent section of the paper on employment outcomes. Three variables are present in both models, abstinence being negatively associated with a recent relationship breakdown, positively associated with good mental health at the time of baseline treatment, and positively associated with baseline residential rehab treatment. That is, those DORIS interviewees treated in residential rehab are, independent of other variables, more likely to be abstinent 33 months on from treatment than interviewees receiving other form of treatment in the community. We cannot entirely rule-out the possibility that the greater effectiveness of residential rehabilitation facilities is not accounted for by the selection of suitable candidates for residential rehab: it is possible that if quite different candidate covariables had been selected for the models, then residential rehab would no longer be independently associated with abstinence. However, there is little in our data to suggest that residential rehab interviewees have different pre-treatment profiles from other interviewees. For example, if we compare the SDS (severity of dependence scale) scores of residential rehab interviewees with those of other DORIS1 interviewees receiving community-based treatments, then they are nearly identical: the mean SDS score for residential rehab interviewees was 11.1 (standard deviation: 3.2), whereas for other community-based treatment interviewees it was 10.8 (standard deviation: 3.8). Selection of clients for residential rehab appears to owe more to variations in local selection practices and policies than to client characteristics.

For comparison, Tables 6 and 7 below show the results of modeling with the same outcome variables and co-variables as in the models in previous tables, but with baseline methadone maintenance treatment forced into the model.

Table 6: Further logistic regression analysis of factors independently associated with continuing use of non-prescribed drugs (including cannabis) – with methadone maintenance treatment forced into the model

Variable	Odds ratio	OR 95% confidence interval	p-value
Methadone maintenance treatment at DORIS1	0.98	0.47 – 2.03	0.9606
SF-36 mental health score at DORIS1 (for each additional 5%)	1.10	1.02 – 1.19	0.0100
Currently receiving oral methadone treatment	3.17	1.57 – 6.39	0.0012
Relationship breakdown in the last 3 months	3.19	1.07 – 9.47	0.0367

$r^2 = 10.2\%$

Table 7: Further logistic regression analysis of factors independently associated with continuing use of non-prescribed drugs (apart from cannabis) – with methadone maintenance treatment forced into the model

Variable	Odds ratio	OR 95% confidence interval	p-value
Methadone maintenance treatment at DORIS1	1.15	0.67 – 1.98	0.6165
Received support from baseline treatment agency for education, training or job-seeking	0.34	0.19 – 0.62	0.0004
SF-36 mental health score at DORIS1 (for each additional 5%)	1.06	1.00 – 1.12	0.0421
Overdosed in the 3 months prior to DORIS1	0.37	0.17 – 0.81	0.0132
Relationship breakdown in the last 3 months	2.56	1.19 – 5.53	0.0165

$r^2 = 10.4\%$

As one would expect, the covariables selected into these further models are the same as those in the earlier tables and their odds ratios are likewise very similar. But receipt of baseline methadone maintenance treatment is not independently associated with abstinence at 33 months; the only treatment variable that affects abstinence in these models is that of whether the agency provided help with education, training or job-seeking.

Thus, in the DORIS data, methadone maintenance treatment at baseline is associated with reductions in the frequency of heroin use 33 months on (Bloor et al. 2008a), while residential rehabilitation treatment is associated with abstinence from non-prescription drug use.

SECTION 4: Treatment in Prison

The question of how to deal with the problem of drug use among prisoners is a matter of major concern both nationally and internationally (Cabinet Office 1998). Research suggests that up to half of all incarcerated individuals in the UK are dependent on illegal drugs and that at least a quarter of them have injected (Marshall et al 2000). In Scotland, information from medical check-ups and urine testing reveals that more than three quarters of all people entering prison are taking illicit substances, with the majority using opiates such as heroin (Scottish Prison Service 2000). Despite this, there is a lack of good quality UK research on the effectiveness of drug treatment in prison (Bullock 2003). Most of the literature in this area is based on American prison treatment services and, although of value, US substance abuse problems and treatment services are different from those in Britain and Europe (Wexler et al 1995, Knight et al 1997, Inciardi et al 1997, Pelissier et al 1998, Federal Bureau of Prisons 2000). The research which has been carried out on the topic in the UK has also tended to focus on individual treatment modalities, for example methadone treatment (Shewan et al 1994), or specific programmes such as the Rehabilitation of Addicted Prisoners Trust's facilities for prisoners throughout England and Wales (Martin and Player 2000, Martin et al 2003).

In this chapter we report on a number of analyses based on the DORIS research which may help to enhance our knowledge of the role of prisons in the treatment of drug misuse. These include the following: a comparison of the drug-related outcomes achieved by prison and community based treatment agencies; a comparison of the nature of treatment received in prison and in community settings and clients perceptions of that treatment; and an examination of the challenges involved in delivering drug treatment in prisons.

Comparative Outcomes: Prison and Community Based Agencies

Of the 1007 DORIS1 interviewees, 448 (45%) were prisoners and 559 (55%) were receiving treatment from community-based agencies. Comparisons of key outcomes for the prison and community populations are shown in Tables 8 and 9. The samples for these analyses were confined to those interviewees who completed all 4 interviews. It can be seen from Table 8 that both the community and the prison samples experienced improvements in drug consumption outcomes between DORIS1 and DORIS4. Specifically, the proportions having used heroin in the last 90 days, having an SDS score of more than 7 increased substantially over the period for both the prison-based and community-based treatment samples. However, there was no increase over time in the proportion of those receiving prison-based treatment who were abstinent from non-prescription drugs (apart from cannabis).

Table 8: Changes in Drug Consumption Variables: Prison and Community Populations

COMMUNITY	DORIS1	DORIS4
Used heroin in last 90 days	389 (91%)	230 (54%)
SDS score of 7+	387 (94%)	226 (55%)
Now drug free (apart from cannabis)	24 (6%)	75 (18%)
PRISON		
Used heroin in last 90 days	217 (81%)	145 (54%)
SDS score of 7+	191 (75%)	131 (51%)
Now drug free (apart from cannabis)	36 (14%)	40 (15%)

Similarly, substantial improvements in non-drug variables are evident for the two samples in Table 9. Both populations show reductions in the commission of acquisitive crime in the last 90 days and in whether they were currently homeless and an increase in those having a period of full-time employment or education/training in the last 90 days.

Table 9: Changes in Non-Drug Variables: Prison and Community Populations

COMMUNITY	DORIS1	DORIS4
Acquisitive crime in last 90 days	296 (69%)	143 (34%)
Currently homeless	90 (21%)	37 (9%)
Education or job in last 90 days	90 (21%)	145 (34%)
PRISON		
Acquisitive crime in last 90 days	167 (62%)	111 (41%)
Currently homeless	73 (27%)	34 (13%)
Education or job in last 90 days	57 (21%)	73 (27%)

While both those receiving prison-based treatment and those receiving treatment outside prison show improvements over time in range of outcome variables, improvements are greater for DORIS interviewees receiving treatment outside prison (Neale and Saville, 2004).

Treatment and Support Received in Prison

In addition to their drug-related outcomes, the range of treatment which prisoners received, and their satisfaction with it, also differed from that of their counterparts who were treated in the community. Neale and Saville (2004) compared the treatment experiences of 716 drug users who had completed both the DORIS 1 and the DORIS 2 questionnaires: of those, 487 had received treatment in the community and 229 had been treated in prison. Those individuals who were in prison at DORIS 2 (162) were excluded from the analysis since their outcome measures would have been affected by their incarcerated status.

This comparison revealed that the community-based clients received a broader range of support than their imprisoned counterparts and also rated the assistance that they received significantly more positively (Table 10).

Table 10: Treatments and support received from recruitment agency between DORIS 1 and DORIS 2

Variable	Community treatment (<i>n</i> = 487) % yes	Prison treatment (<i>n</i> = 229) % yes	Chi-square tests
Treatments Received			
Methadone***	63.7	24.0	97.925
Other (non-methadone) substitute drugs***	36.8	75.1	91.683
Counselling***	76.8	31.4	136.409
Group work***	42.7	17.5	43.840
Aftercare/throughcare	15.4	10.5	3.164
Advice/information***	64.9	31.0	71.999
Assistance with housing	17.9	21.0	0.976
Help with education, training or jobseeking	16.2	17.0	0.074
Drug users' views of support received			
I have been well informed about decisions made about my treatment***	73.0	49.8	37.100
There has always been a member of staff available when I wanted to talk***	61.2	36.8	36.820
The staff have helped to motivate me to sort out my problems***	62.9	24.6	91.135
I think the staff have been good at their jobs***	75.1	46.9	54.977
I have received the help that I was looking for***	66.6	33.6	68.646
Overall, the quality of service I have received has been good/very good***	60.3	27.2	67.994
* <i>p</i> ≤0.05; ** <i>p</i> ≤0.01; *** <i>p</i> ≤0.001.			

At their DORIS 2 interview, all respondents were asked about the kinds of support that they had received from their recruitment agency. The community treatment (CT) drug users were significantly more likely to have received methadone ($p \leq 0.001$); counselling ($p \leq 0.001$); group work ($p \leq 0.001$); and advice and information ($p \leq 0.001$). In contrast, the prison treatment (PT) drug users had received more non-methadone substitute drugs, such as diazepam and dihydrocodeine ($p \leq 0.001$). There were no differences between the two groups in terms of aftercare/throughcare ($p = 0.08$); assistance with housing ($p = 0.36$); and help with education, training or jobseeking ($p = 0.83$).

Perhaps the most striking finding from the data was that the clients of prison drug treatment services had significantly more negative opinions of the help and support that they had received than the CT drug users. This was found in respect of all aspects of the service considered. When asked their views about the support that they had received from their recruitment agency, the CT drug users were significantly more likely to report that they had been well informed about decisions regarding their treatment ($p \leq 0.001$); there had always been a member of staff available when they had wanted to talk ($p \leq 0.001$); the staff had helped motivate them to sort out their

problems ($p \leq 0.001$); the staff had been good at their jobs ($p \leq 0.001$); they had received the help that they were looking for ($p \leq 0.001$); and the overall quality of service they had received had been good/very good.

The Challenges Associated with Drug Treatment in Prison

As we have seen, individuals treated for drug misuse in prison would appear to do less well than those treated in the community. The latter receive a broader range of services, their outcomes are better and they report more positive experiences of treatment. Now, these results are disappointing because, in theory, the prevalence of drug taking among prisoners and the captive nature of the population should provide prisons with a unique and important opportunity for treatment. However, there is reason to believe that the less positive outcomes for prisons are at least partly explicable in terms of the particular challenges which prisons face in relation to treatment. It could also be argued that an understanding of these challenges might provide pointers as to how the performance of prisons might be improved.

Some of the main challenges experienced by prisons in relation to drug treatment are explored below (see also McIntosh and Saville 2006). This discussion draws partly upon the relevant research literature and partly upon research conducted in one Scottish prison as part of the qualitative component of the DORIS evaluation. In total a period of four weeks was spent within the prison conducting observations and in-depth qualitative interviews. Twenty-five semi-structured interviews were conducted, fourteen with staff and eleven with prisoners. Staff were interviewed to determine: their career background and training; changes to drug culture and drug treatment in the prison; their attitudes to drug use and drug users; their views on the treatment available in the prison; their relationships with prisoners; their roles and responsibilities; staff morale, issues and problems and service management. Prisoner interviews covered a range of issues relating to the respondents drug use and criminal history; their experiences of and views on treatment in prison; their attitude to their drug use and level of motivation to change; previous treatment experience and general views on treatment services.

Staff interviewees were selected to reflect different staff roles and responsibilities, training and experience. Prisoners were selected to represent a range of different treatment options and on the basis of availability. Prisoners were interviewed from a range of halls and were selected from both remand and sentenced prison populations. Prisoners were aged between 24 and 40 years of age with the mean age being 31.6 years of age. The primary drug of choice for all prisoners was heroin with five prisoners also reporting crack/cocaine to be their drug of choice in addition to heroin use.

Analysis of these data suggests that prisons face the following challenges in relation to the treatment of drug misuse.

1. The Nature of Prison Life

First, there are a number of respects in which prison life itself may not be conducive to the effective treatment of individuals with drug problems. For example, according to the officers and prisoners whom we interviewed, the prison environment may actually promote drug use among prisoners as a way of helping them to cope with the pains of imprisonment. There was a belief among prisoners and officers that boredom, the climate of aggression and intimidation in jail and the pain of being separated from family could promote the continued use of drugs, or even its initiation, as a coping strategy. As one prison officer said:

Believe it or not, we produce drug addicts in the jail because boredom takes over. A lot have never used drugs other than in the jail. It's sheer boredom.

According to our interviewees, this situation is compounded by the ready availability of drugs in prison and the officers and prisoners we interviewed agreed that this could significantly impede the efforts of those prisoners who were motivated to stop using drugs. Prisoners said that they experienced little difficulty in obtaining drugs if they wanted to.

I was saying to myself earlier I'm not going to touch drugs but as soon as I got in the halls you know, it's everywhere, you know what I mean. You can get it just like you can get it out on the streets basically, or nearly. You just take it anyway even if you don't want it. (Prisoner)

2. The Prison Regime

A second challenge to treatment in prison is presented by the nature of the prison regime. The primary function of a prison is to contain prisoners within a secure environment and, on the basis of our interviews with staff members, it would appear that this regime has a significant effect upon the delivery of treatment in that setting. Most significantly, it appears to limit the amount of time available for treatment. As a result of the security and space constraints within the prison, inmates can only participate in treatment for a limited period each day. According to some of the prison staff, another consequence of prisoners commuting between therapy and custodialism is that therapeutic inputs are difficult to sustain. For instance, returning prisoners to the mainstream prison environment after participating in group-work was, in their view, likely to undo any good work as well as leaving prisoners unsupported.

The other aspect of prison culture that our research suggests is of significance as far as treatment is concerned is the relationships which staff are able to establish with prisoners. Just as the prison as a whole has, of necessity, to give priority to its custodial functions, so also do most of the staff who work in treatment. As one officer explained; *'First and foremost I always see myself as a prison officer. My discipline duties will always come first.'* Importantly, according to the officers, this latter priority applied boundaries to the extent to which they could develop therapeutic relationships with prisoners. One aspect of this was a concern among officers over keeping a 'healthy distance' from the prisoners' personal problems or issues.

As a related point, not everyone was in agreement regarding the officers' suitability as facilitators of group therapies. While some officers and prisoners felt that the traditional officer-prisoner relationship could be overcome in these contexts, some prisoners reported feeling unable to relax and being reluctant to open up to officers in group situations. As a result, some of them suggested that groups would be more successful if facilitators were brought in from outside agencies. They further suggested that those facilitators should ideally have personal experience of addiction.

3. Attitudes of Prison Staff

Our research also suggests that the attitudes which prison staff hold towards drug users could have a significant impact on treatment delivery and the prisoners' experience of treatment. The drug service officers who were interviewed felt that, in contrast to the largely positive views of staff involved in treatment, there was still a long way to go in terms of changing the attitude of officers working in mainstream halls. Many of the latter were reported as retaining negative attitudes; *'I think with the majority of prison officers it's just 'put them against the wall and shoot them'.* Some of the staff whom we interviewed expressed concern that these officers' negative orientations

might reduce their motivation to a) inform prisoners of their therapeutic options or to b) encourage them to participate in treatment.

4. Characteristics of the prison population

Finally, we believe significant challenges relate to the specific characteristics of the prison population. There are two aspects to this. First, there is evidence that prisoners' needs may be more complex than those of their counterparts in the community and that the prison population may thereby be inherently more difficult to treat. For instance, research has found that, relative to non-prisoners, incarcerated drug users tend to have more psychological problems, lower educational attainment, to be less well integrated socially, to be less economically independent and to display more anti-social behaviours (Brochu et al 1999, Kline 1997). In other words, prisoners may have a wider and more complex range of problems than drug users attending community programmes. One implication of this is that any attempt to treat the prison-based drug user successfully will require an approach which utilises a range of different treatment interventions and personnel in order to address their complex needs. In other words, complex problems will require complex treatment models.

The second aspect is prisoner motivation. There is a considerable amount of research evidence that prisoners are less motivated to change their drug using habits than non-prisoners (Brochu et al 1999; Farabee et al 1993; Kline 1997; Kothari et al 2002).. Now, this observation has important implications for treatment in prison because it is well established that an important dimension of successful recovery from addiction is a high degree of motivation on the part of the drug user (McIntosh and McKeganey 2001). The problem here is that many prisoners may not yet have reached the stage in their drug-using career at which they are ready to give up drugs. This was confirmed by the views expressed by the prisoners and prison officers in our own study.

Out of a class of ten, if you've got two there that are really, really motivated to change I'd say you're doing well. You then drop down a gear where there's guys there that are 'well, I'd like to, I'd really like to but I don't know that I can'. They're not too sure about it. Then you drop down to the guys that are saying 'we'll give it a go and see what it's like'. That might motivate them once they start doing it. You'll get the other guys, the other ones, that'll just sit there, helps pass the day. You get a mix. (Prison officer)

Other officers felt that, although some prisoners were motivated during their time in prison, this was not likely to be sustained when they returned to the community.

SECTION 5: Criminality

There is a strong and well-established association between the use of illegal drugs and participation in crime, with illegal drug users exhibiting high rates of criminal behaviour of various kinds (Gossop et al 2005, Hall et al 1993, Keene 2005). A prominent feature of this association is the role of acquisitive crime in financing addiction, especially where the use of heroin and cocaine are concerned (Jarvis and Parker 1989). In consequence, a key objective of the UK Government's current strategy for tackling illegal drugs is to reduce levels of offending among drug users (Home Office 2002). In the DORIS study a number of connections between illegal drug use and criminality behaviour were explored. In particular, attention was paid to three topics of special concern to Government and the community at large: acquisitive crime, physical assaults and drug driving.

Prevalence of Criminal Activity

Unsurprisingly, new clients came to the treatment agencies with a long history of offending behaviour and protracted contact with the judicial system, indeed 45% were recruited and interviewed in prison. The overwhelming majority of DORIS interviewees (95%) had been arrested at some time, often on numerous occasions. A variety of crimes were involved in these arrests. For example, 68% of all DORIS respondents had been arrested for theft from a shop or commercial property; 66% had been arrested for breach of the peace; 57% had been arrested for assault; 33% had been arrested for handling stolen goods; 33% had been arrested for fraud, forgery or deception; 31% had been arrested for theft from a vehicle; 31% had been arrested for theft from a house or home; 29% had been arrested for theft from a person; 28% had been arrested for selling or supplying drugs; 27% had been arrested for theft of a vehicle; 24% had been arrested for criminal damage; and 10% had been arrested for drug driving (see Table 11). Other less common reasons for arrest were numerous and ranged from 'littering' to 'murder'.

Table 11: Main Reasons for Arrest

Offence	% Drug Users
Theft from a shop or commercial property	68
Breach of the peace	66
Assault	57
Handling stolen goods	33
Fraud, forgery or deception	33
Theft from a vehicle	31
Theft from a house or home	31
Theft from a person	29
Selling or supplying drugs	28
Theft of a vehicle	27
Criminal damage	24
Drug driving	10

Participation in Acquisitive Crime

As these figures show, acquisitive crime of various kinds (i.e. selling or supplying drugs, thefts of all kinds and handling stolen goods) was a major reason for DORIS clients being arrested. In addition, self-reported acquisitive crime rates were also high. In respect of the 695 interviewees for whom data were available at DORIS4, 463 (66.6%) self-reported that they had committed acquisitive crimes in the 3 months prior to DORIS1. At DORIS4, only 254 (36.5%) self-reported acquisitive crimes in the previous 3 months, a fall of 30.1% ($p < 0.0001$). At DORIS4 arrests in the last six months (for all offences) had fallen from 95.1% to 52.6% ($p < 0.0001$).

Stepwise logistic regression models were constructed to examine which co-variables were independently associated with a fall in criminality at DORIS4 (see McIntosh et al 2007). Two outcome variables were selected, these were: the commission of acquisitive crime in the last 3 months and having been arrested for acquisitive crimes since the previous interview (17 months previously). Altogether, 22 different co-variables were used in the models, embracing socio-demographic variables; (age and gender), treatment variables; (treatment modality at study baseline; treatment perception score; whether still in contact with the baseline agency; a history of six or more previous drug treatment episodes; receiving support from baseline agency for education, training or job-seeking), drug use variables; (recent heroin use; severity of drug dependency score; use of any non-prescribed drugs (including cannabis) in last 3 months; use of any non-prescribed drugs (apart from cannabis) in the last 3 months; use of a needle/syringe that may have been used by someone else in the last 3 months; having experienced a drug overdose since the last interview), family and relationship variables; (recent relationship breakdown; recent death of someone close to the respondent; having a child taken into care), and mental health variables (SF-36 mental health score at baseline and at DORIS4; recently attempted suicide or self-harm at baseline). The experience of accommodation problems was also included as was a measure of an individual's motivation to come off drugs, the latter being based on whether or not they believed at DORIS1 that it was 'extremely important' to get help with drug use. Co-variables were selected on the basis of the relevant research literature and previous modelling of DORIS3 data.

The most striking feature of the results is the enormous importance of various drug consumption and drug consumption-related variables in accounting for acquisitive crime. This association is particularly strong as far as the actual commission of acquisitive crime is concerned (Table 12) although it is also present in relation to arrests for that offence (Table 13).

Table 12: Factors Independently Associated with the Commission of Acquisitive Crime

Co-variables	Odds Ratio	Confidence Interval	p-value
Age (per additional decade)	0.50	0.35-0.70	<.0001
Used heroin in last 3 months	1.76	1.06-2.90	0.0277
Used any non-prescribed drugs apart from cannabis in the last 3 months	6.83	3.13-14.89	<.0001
Shared needle/syringe in last 3 months	2.35	1.15-4.82	0.0198

r^2 value = 26.6%

Table 13: Factors Independently Associated with being arrested for Acquisitive Crimes in Last 17 Months (since last interview)

Co-variables	Odds Ratio	Confidence Interval	p-value
Gender (male=1)	1.72	1.04-2.83	0.0338
Age (per additional decade)	0.51	0.36-0.74	0.0004
Used heroin in last 3 months	2.01	1.31-3.08	0.0013
Experienced a drug overdose since last interview	2.01	1.09-3.71	0.0253
Still in contact with baseline treatment agency	0.46	0.21-0.99	0.0472
SF-36 Mental health score at baseline	1.06	1.02-1.11	0.0065

r^2 value = 14.0%

In Table 12, those respondents who were currently abstinent - having not used any non-prescribed drug apart from cannabis in the last 3 months - were seven times less likely to have committed offences (odds ratio 6.83) than those who were still using drugs. Heroin use in the last 3 months is also independently associated both with the commission of acquisitive crime and with being arrested for it (Tables 12 and 13). Moreover, in both of the models additional drug consumption-related variables are independently related to the outcome variable (recent experience of a drug overdose in Table 13 and needle sharing in Table 12), further emphasising the central importance of the relationship between drug use and offending. In addition to the association between drug use and crime, age is also highly significant with younger respondents being independently more likely to offend or be apprehended for committing an acquisitive crime. Men are also more likely to be arrested for committing acquisitive crimes (Table 13). Finally, previously reported mental health is a significant variable in the arrest outcome model (Table 13).

It is noteworthy that the treatment-related variables (treatment modality received, number of previous drug treatment episodes and treatment perception score) have hardly any independent associations with acquisitive crime. The exception is client retention by a treatment agency which appears as a variable protecting against offending in Table 13, but, even then, the association is only just significant at the 5% level. It is probable that the reason for the lack of prominence of

treatment-related variables is the previously discussed dominance of variables related to drug consumption. In other words, the independent effect of treatment on criminality is very limited: any effect of treatment on criminality appears to be mediated entirely through treatment effects on drug use.

Physical Assault

Based on the data collected at DORIS1, another analysis describes the incidence of assaults committed by the respondents and the factors which are associated with them (Neale et al 2005). This analysis excludes the 447 drug users who were recruited from prison-based services and focuses exclusively on community treatment entrants. 'Assault' in this context is entirely self-defined and is based on respondents' responses to whether they had committed an assault in the last 3 months.

Of the 560 respondents included in the analysis, 101 (18.1%) reported that they had recently committed assault. The median number of assaults committed in the last 3 months was 2. The 101 individuals who had recently committed assault included 79 men (21.1% of all males interviewed) and 22 women (12.0% of all females interviewed).

A series of forward stepwise logistic regressions were undertaken to determine which of a range of variables were independently associated with carrying out assaults. Drawing upon the existing literature, the variables explored for associations with assault were; *demographic characteristics* (age, sex, relationship status); *drugs used in the last 90 days* (heroin, cocaine, crack, cannabis, alcohol and level of dependence on one main drug); *financial circumstances* (any income from a wage or salary in the last 6 months, any financial support from family or partner in the last 6 months, any income from prostitution in the last 6 months, being currently in debt); *personal vulnerabilities* (having slept rough or stayed in a hostel/shelter over the last 6 months, currently living in an unsafe area, having ever been physically abused, no contact with non-drug-using friends in the last 90 days); and *criminal behaviour* (having ever been arrested, having sold or supplied drugs in the last 90 days, having committed any form of theft in the last 90 days).

The results of the multivariate analyses are shown in Table 14. Taking all 560 respondents together, five factors were independently associated with being a recent assaulter ($r^2 = 18.7\%$). These were being male; crack use in the last 90 days; having slept rough or stayed in a hostel/shelter in the last 6 months; having ever been physically abused; and having sold or supplied drugs in the last 90 days.

Table 14: Factors Independently Associated with Committing Assault

Factor	Odds ratio	CI for odds ratio	p-value
All respondents (<i>n</i> = 560)			
Sex (odds for male vs. female)	3.08	1.61, 5.88	0.0007
Crack use in the last 90 days (odds for yes vs. no)	1.80	1.10, 2.96	0.0198
Slept rough or stayed in a hostel/shelter in the last 6 months (odds for yes vs. no)	1.96	1.18, 3.26	0.0091
Ever been physically abused (odds for yes vs. no)	2.31	1.33, 4.03	0.0031
Sold or supplied drugs in the last 90 days (odds for yes vs. no)	3.19	1.96, 5.21	<0.0001
Male respondents (<i>n</i> = 375)			
Ever been physically abused (odds for yes vs. no)	2.13	1.15, 3.93	0.0159
Sold or supplied drugs in the last 90 days (odds for yes vs. no)	3.63	2.10, 6.29	<0.0001
Committed theft in the last 90 days (odds for yes vs. no)	1.82	1.05, 3.18	0.0336
Female respondents (<i>n</i> = 185)			
Ever been physically abused (odds for yes vs. no)	4.78	1.04, 21.87	0.0440
Slept rough or stayed in a hostel/shelter in the last 6 months (odds for yes vs. no)	3.48	1.25, 9.73	0.0173

When the 375 male respondents were analysed on their own, three factors were independently associated with being a recent assaulter. These were; ever being physically abused; having sold or supplied drugs in the last 90 days; and having committed theft in the last 90 days ($R^2 = 15.7\%$). When the 185 female respondents were analysed on their own, two factors were independently associated with being a recent assaulter. These were; ever being physically abused and having slept rough or stayed in a hostel/shelter in the last 6 months ($R^2 = 14.6\%$).

These analyses have a number of limitations. First, assault is only one type of violence. Caution should, therefore, be exercised in generalising from the study participants to the wider drug-using population or from assault to violence more generally. In addition, all the variables included in the analysis were based on drug users' self-report data: no objective criteria were used in defining what constituted an assault and no attempt was made to ascertain the seriousness of assaults, the circumstances in which they occurred, or the nature of the relationships between the parties involved.

Drug Driving

The third major aspect of criminal behaviour addressed in the analysis of the DORIS data was drug driving. This is reported more fully elsewhere (Neale 2004). In this section we summarise the prevalence of drug driving amongst new treatment clients in Scotland and examine the correlates of this behaviour in order to establish whether, and in what ways, problem drug users entering treatment who drug drive differ from their non drug-driving counterparts. The analysis is based on data collected at the first 'baseline' interview only. Respondents interviewed in prison are excluded from the analyses since the recent driving behaviour of these individuals was inevitably affected by the length of time each of them had spent in jail prior to their interview. In consequence, the paper presents findings on the 585 drug users who were living in the community at the time they joined the study.

Of those 585 respondents, 95 (16.3%) reported that they had recently drug driven (i.e. in the last 90 days). These 95 individuals had a mean age of 28.3 years (s.d. = 6.5) and included 82 men (20.8% of all males interviewed) and 13 women (6.8% of all females interviewed). When the 95 recent drug drivers were asked on how many days they had drug driven during the 90 days prior to their interview, the mean response was 42.1 (median = 35; mode = 90). The mean number of drug-driving days was 41.8 for males (median = 35; mode = 90) and 43.9 for females (median = 45; multiple modes). Meanwhile, 52 (8.9%) of the 585 respondents reported that they had ever been arrested for drug driving. These 52 individuals had a mean age of 28.9 years (s.d. = 5.4) and included 50 men (12.7% of all males interviewed) and 2 women (1.0% of all females interviewed). When the 52 respondents who had ever been arrested for drug driving were asked how many times they had been arrested for this activity, the mean response was 1.6 (median = 1; mode = 1). The mean number of arrests was 1.7 for males (median = 1; mode = 1) and 1.0 for females (median = 1; mode = 1).

While the findings suggest that recent (last 90 days) drug driving is not an activity engaged in by a particularly large proportion of problem drug users entering treatment, those individuals who do drug drive often do so daily. Moreover, because there are an estimated 56,000 problem drug users in Scotland (Hay *et al.*, 2001), the relatively small proportion of individuals that do engage in this activity will likely account for an extremely large number of drug driving incidents over a relatively short period of time.

Data collected from the intake questionnaires on recent crimes committed were used to group respondents into those who had and those who had not drug driven in the 90 days prior to interview (i.e. those who had and those who had not 'recently' drug driven). In addition, information collected on lifetime arrests was used to classify respondents into those who had ever and those who had never been arrested for drug driving. The data were then analysed in two stages. Firstly, univariate logistic regression analyses examined associations between predictor variables and drug driving, 'recent drug driving' and 'ever arrested for drug driving' being explored separately. For these analyses, each predictor variable was considered sequentially and in isolation. The results obtained were consequently unadjusted for the effects of any of the other predictor variables.

Secondly, multivariate analyses using stepwise logistic regression were conducted—again separately for 'recent drug driving' and 'ever arrested for drug driving'. In the multivariate analyses, predictor variables were considered together in order that the effects of each individual variable could be separated from the effects of all others and the unique contribution of each variable could be examined. In this way, the multivariate analyses adjusted for all variables in the regression model and so permitted the identification of independently useful predictors. Predictor

variables were chosen to reflect demographic characteristics; recent drug use; current drug treatment; high-risk behaviour; life stability; and other criminal activities.

The univariate analyses, which compared the 95 individuals who had recently drug driven with the 490 individuals who had not recently drug driven, found that individuals who had recently drug driven were significantly more likely than the other study participants to be male; to have recently used cocaine or crack; to be seeking help from a residential detoxification or rehabilitation agency rather than a community-based one; to have a formal qualification; and to have recently committed assault or criminal damage.

Comparing the 52 individuals who had ever been arrested for drug driving with the 533 individuals who had never been arrested for drug driving, individuals who had ever been arrested were significantly more likely than other study respondents to be male and to have ever been sentenced. All other demographic characteristics and indicators of recent drug use, current drug treatment, high-risk behaviour, life stability and criminal activity were not associated with having ever been arrested for drug driving.

The results of the multivariate analyses are shown in Table 15. Five factors were independently predictive of being a recent drug driver. These were being male; currently seeking help from a residential detoxification or rehabilitation agency; not being a recent injector; having a formal qualification; and having recently committed assault or criminal damage. Only two factors were independently predictive of having ever been arrested for drug driving and these were being male and having recently used cocaine or crack.

Table 15: Factors Independently Associated with Drug Driving ^a

Factor	Odds Ratio	CI for Odds Ratio	P-value
<i>Recent Drug Drivers</i>			
Sex (Odds for Female vs Male)	0.25	(0.12, 0.51)	<0.001
Currently seeking help from a residential detoxification or rehabilitation agency (Odds for Yes vs No)	2.36	(1.29, 4.32)	<0.01
Recently ^b injected (Odds for Yes vs No)	0.52	(0.29, 0.91)	0.02
Has formal qualification (Odds for Yes vs No)	1.96	(1.15, 3.33)	0.01
Recently ^b committed assault or criminal damage (Odds for Yes vs No)	2.99	(1.71, 5.22)	<0.001
<i>Ever Arrested Drug Drivers</i>			
Sex (Odds for Female vs Male)	0.08	(0.02, 0.35)	0.001
Recent ^b cocaine or crack use (Odds for Yes vs No)	2.13	(1.10, 4.12)	0.03

^a Results are adjusted for other variables in the model, thereby generating sets of independently useful predictors

^b During the 90 days prior to interview

These data suggest that male problem drug users were more likely than their female counterparts both to have recently drug driven and to have ever been arrested for drug driving. Additionally, they indicate that men were more likely than women to have been arrested for drug driving, even when their greater levels of drug-driving behaviour were taken into account. These same findings are shown in the multivariate analyses (see Table 5). Here, odds ratios indicated that women were a quarter as likely as men to have recently drug driven but less than one tenth as likely to have ever been arrested for the activity.

The data also reveal that many respondents who had been arrested for drug driving in the past had not recently drug driven. Indeed, only about a third (36.5%) of individuals who had ever been arrested for drug driving had drug driven in the last 90 days. This highlights a number of relevant issues. Firstly, it indicates that individuals who have *recently* drug driven comprise only a small proportion of those who have *ever* drug driven. Secondly, it suggests that problem drug users who drug drive may desist (either temporarily or permanently) from this behaviour, as they grow older - and perhaps 'mature out' of the activity (see also Neale *et al.*, 2001). And thirdly, it raises the possibility that problem drug users who have been arrested for drug driving may not have exactly the same characteristics as problem drug users who drug drive but have not been caught.

One potential reason why arrested drug drivers may comprise a slightly different sub-population from drug drivers who have not been caught is policing procedures. That is, the police may find it easier to target and/or detect certain kinds of drug driver than others. Evidence that male drug drivers seem disproportionately likely to be arrested relative to their female counterparts provides some support for this hypothesis. Meanwhile, findings that a) only a fifth of individuals who had recently drug driven had ever been arrested for drug driving and b) each individual who had drug driven had generally done so on numerous occasions and yet only been arrested an average of once provide further evidence that the detection and regulation of drug driving offences in Scotland has often lacked rigour and consistency (see also Neale *et al.*, 2001).

Although the characteristics of drug users who have ever been arrested for drug driving are of general interest, it is the factors associated with recent drug driving that have the most value in terms of understanding and potentially preventing drug-driving behaviour. Being male; having recently used cocaine or crack; seeking help from a residential (rather than community-based) treatment service; not being a recent injector; having a formal qualification; and having recently committed assault or criminal damage all appear relevant in this respect. Conversely, other demographic characteristics; aspects of drug taking behaviour; current drug treatment status; risk behaviours; indicators of life stability; and criminal activity showed no significant association with recent drug driving.

SECTION 6: Morbidity and Mortality

Self-reported health

DORIS respondents were asked to complete the SF-36, a validated and reliable health status questionnaire (Ware and Sherbourne 1992) that has been widely used in community and clinic studies (including studies of drug users) in many countries. The SF-36 measures current (i.e. over the last four weeks) self-perceived health status across eight dimensions (physical functioning, social functioning, role limitations due to physical problems, role limitations due to emotional problems, mental health, energy/vitality, pain and general health perceptions) as well as giving a total score; lower scores indicate poorer health. For comparison purposes, normative data are available on UK general population scores (Jenkinson et al 1993).

Of the 1033 DORIS1 interviewees, 990 completed all the SF-36 items. Reliability, as measured by internal consistency, was high (Neale 2004b). Table 16, taken from Neale (2004b) shows the DORIS mean scores over the eight domains, compared to UK norms.

Table 16: Mean SF-36 scores at DORIS1 compared to UK normative scores reported by Jenkinson et al (1993)

	DORIS1 (n = 990)	UK normative scores (n = 4959)	
SF-36 scale	Mean (standard deviation)	Mean (standard deviation)	Difference between mean scores
Physical functioning	84.8 (20.3)	88.4 (17.9)	3.6
Social functioning	53.8 (33.4)	88.0 (19.5)	34.2
Role limitation due to physical problems	53.6 (44.0)	85.8 (29.9)	32.2
Role limitation due to emotional problems	40.6 (44.5)	82.9 (31.8)	42.3
Mental health	46.7 (23.9)	73.8 (17.2)	27.1
Energy and vitality	40.1 (22.9)	61.1 (19.6)	21.0
Pain	51.8 (32.7)	81.5 (21.6)	29.7
General health perception	47.6 (24.6)	73.5 (19.9)	25.9

It can be seen that, for each of the eight different SF-36 domains, DORIS respondents reported poorer health than a UK general population sample. And for seven of the eight domains, this difference was very substantial – a difference of more than 20 points. As Kemp and Neale (2005) pointed out in another DORIS publication (reported more fully in the section of this occasional paper on employment), these low levels of self-reported health appear to be a substantial barrier to drug users moving into gainful employment.

In respect of mental health, women DORIS interviewees had significantly poorer SF-36 mental health component scores than men (Neale 2004b). Half the total DORIS sample had ever seen a psychiatrist and two fifths had ever attempted suicide. Nearly half of all DORIS respondents had previously overdosed and more than one in ten had overdosed in the three months prior to baseline treatment; 19 (2.4%) respondents had overdosed on more than one occasion in the previous 3 months. In a multivariate regression analysis, a number of drug consumption variables were independently associated with recent overdosing and so were a number of recent life problems - the recent death of someone close to the interviewee, a recent relationship breakdown, and most importantly recent accommodation problems (Neale and Robertson, 2005).

Self-reported improvements in health over time were strongly associated with abstinence from illicit drugs (McIntosh et al. 2008a). At 33-month follow-up, 29.6% of the sample had been abstinent from non-prescription drugs apart from cannabis in the three months prior to interview, and in the same period 120 (29.3%) had substantially increased their SF-36 mental health score (i.e. had increased their score more than one standard deviation from the mean observed change in score). Logistic regression analysis (Table 17 below) shows a strong independent association between a substantial improvement in mental health score (defined as above) and recent abstinence from non-prescription drugs (apart from cannabis).

Table 17 – Improvement in SF-36 mental health component score at 33 months

Co-variable	Odds Ratio	O.R. 95% confidence interval	p-value
Non-abstinence from illicit drugs apart from cannabis	0.22	0.13 – 0.37	<0.0001
Recent accommodation problems	0.41	0.20 – 0.84	0.0152
Had a period of paid employment and/or full-time education or training in last 17 months	1.91	1.17 – 3.14	0.0103

$r^2=19.1\%$

The model in Table 17 is relatively well-fitted ($r^2 = 19.1\%$) for data of this type. It was modeled from 18 different possible co-variables: embracing socio-demographic variables -age and sex; treatment variables - treatment modality at study-baseline, still in contact with baseline treatment agency, a measure of treatment satisfaction (Treatment Perception Questionnaire), receiving support from the baseline agency for education, training or job-seeking, whether or not the interviewee thought it was ‘extremely important’ to get help with their drug use at baseline, and a history of six or more previous drug treatment episodes; drug use variables -a measure of drug dependency (Severity of Dependency Scale) at both baseline and at DORIS4, and whether the interviewee had experienced a drug overdose since last interview; family and relationship variables - recent relationship breakdown at DORIS4, recent death of someone close to the interviewee, and a child recently taken into care; whether or not the interviewee had accommodation problems at DORIS4; and mental health variables, namely, SF mental health score at baseline, SF mental health score at DORIS4 and recently attempted suicide or self-harm at baseline. Candidate co-variables were selected on the basis of the relevant research literature and previous modeling. It can be seen that two other co-variables, apart from recent abstinence were associated a substantial improvement in mental health score: firstly, having had a period of paid employment of full-time education/training since the last DORIS interview (17 months earlier); and secondly, not having experienced recent accommodation problems. It is notable that none of the treatment co-variables had any independent effect on mental health improvement, any effect of treatment on mental health being presumably mediated through recent abstinence.

These changes in DORIS interviewees’ health over time are not simply changes in self-reported health. Thus, interviewees who were abstinent (i.e. no non-prescription drugs apart from cannabis) at 33-month follow-up also reported significantly fewer A & E attendances (McIntosh et al. 2008a).

Hepatitis C

At DORIS3 (16-month follow-up), the 812 remaining DORIS interviewees were asked to provide oral fluid (saliva) samples for anonymous screening for HCV. All samples were tested by ELISA and positive samples were confirmed by Western Blot. There were 23 (3%) refusals and the samples of further 24 (3%) disappeared in transit. A further four (0.5%) gave samples of insufficient volume for testing and four (0.5%) gave equivocal results, leaving 757 cases. Of these 37.8% tested positive for HCV (Bloor et al. 2006). This overall prevalence figure concealed substantial regional variations, with those living in the Greater Glasgow health board area (n = 256) having a prevalence of 59%, three times the prevalence of those in the Lothians (Edinburgh and environs) health board area (n = 126) at 17.5%. These local variations in prevalence confirm earlier inter-regional differences in percentages of antibody-positive cases from different Scottish regional virology laboratories (Codere et al. 2004).

Mortality

Thirty eight members of the cohort were found to have died by 33-month follow-up, a crude death rate of 13.49 per 1,000 person years. While this mortality rate is commensurate with rates found in other cohort studies of drug users (Degenhardt et al. 2006), it is of course much higher than would have occurred in a similar age- and gender-matched Scottish population cohort. Using published Scottish mortality data for 2002, it is estimated that the DORIS cohort were 12 times more likely to die than their non-drug-using peers (Bloor et al. 2008b).

The Vital Events Branch of the General Register Office for Scotland undertook to search their records to establish what proportion of those 38 deaths were classed and reported as 'drug-related deaths'. Such deaths, which follow the definition established by the Advisory Council on the Misuse of Drugs (ACMD 2000), are deliberately narrowly confined to deaths immediately due to the pharmacological effect of the drug and therefore exclude deaths such as those from HIV/AIDS. Only 22 (58%) of the 38 deaths were reported as 'drug-related deaths' (Bloor et al. 2008b).

SECTION 7: Employment

Among the factors involved in sustaining recovery from drug dependency, the achievement of paid employment is probably one of the most important (Klee et al 2002, Room 1998, Westermeyer 1989). Certainly, research has identified a number of ways in which being in paid employment can contribute to an individual's ability to create and sustain a drug free life (Cebulla et al 2004, McIntosh and McKeganey 2001, Biernacki 1986).

In this chapter we explore a range of factors involved in facilitating or impeding recovering drug users' ability to obtain paid employment. We begin by describing the employment records of the DORIS clients from DORIS1 to DORIS4 before going on to explore the relationship between treatment and the achievement of paid employment, and the difficulties presented by the low levels of employability among drug users.

Drug Treatment and the Achievement of Paid Employment

Despite its importance for recovery, there have been few studies of the relationship between drug treatment and individuals' ability to subsequently obtain employment. A small number of studies in the US have shown positive influences of treatment on employment, with treated populations being more likely to be employed and to earn more than their untreated counterparts (Luchansky et al 2000, Wickizer et al 2000, French et al 1991). However, there is little or no work on the way in which the content of different treatment programmes affects recovering drug addicts' ability to get a job. The DORIS data provided an opportunity to address this issue by seeking to identify which aspects of the treatment process are most closely associated with the achievement of paid employment (McIntosh et al 2008b).

The achievement of paid employment was assessed at DORIS4. The employment outcome variable used in the analysis is the individual having been in paid employment at some time since their previous interview (17 months previously). Respondents were instructed to discount any 'casual' or 'cash in hand' work when making their responses. Both full-time and part-time jobs are included in the analysis. Since the outcome variable was defined in terms of employment at any time since the previous interview, the independent variables were based on the data collected at DORIS3, or earlier, in order to ensure that they preceded the assessed outcome. Three variables were based on data recorded at DORIS2 in an attempt to reduce the possibility of the respondent confusing support received from the baseline agency with that received from other sources. These were; the baseline agency helping the individual to achieve employment, employment skills or education; any other agency helping with education, training or job seeking; and, the provision of aftercare or through-care support. Information on socio-demographic variables and the client's educational background was based on data collected at DORIS1.

Stepwise logistic regression models were constructed to establish which co-variables in the data were independently associated with the outcome variable. Altogether, 25 different co-variables were used, embracing socio-demographic variables; educational background; treatment modality at study baseline; drug use variables; severity of drug dependence score at DORIS1 and DORIS3); current physical and mental health; criminal activity; family and relationship variables; housing circumstances; receiving aftercare or through-care support; specific help with training or job seeking (having a place on a training or education course; and receiving support from the index agency with education, training or job seeking. The variables used in this analysis are described in greater detail elsewhere (McIntosh et al 2008b). The Severity of Dependence Scale (SDS) is a validated scale used to measure level of drug dependency. The co-variables were selected on the basis of the relevant research literature and previous modelling of DORIS3 data.

Table 18 shows the results of this analysis. It can be seen that age was independently associated with employment, with younger respondents being more likely to get a job than older respondents. Another strong association was with the individual's participation in criminal behaviour, with those who obtained paid employment being significantly less likely to report having committed crimes in the past 3 months. The individual's Severity of Dependence Score (SDS) at previous interview (DORIS3) also had an independent effect upon employment. It is important to note here that the SDS score is a measure of the degree of psychological dependence experienced by illegal drug users, not a measure of the extent of their drug use. Nevertheless, it is possible that SDS score was appearing in the model partly as a proxy for drug use. It should be noted, however, that the variable that had the strongest association with the achievement of paid employment was the individual receiving help from their treatment agency to obtain a job, employment skills or education. In other words, assistance that focused directly on the process of obtaining employment. Treatment modality had no independent effect on employment.

Table 18 – Variables associated with the achievement of paid employment: index agencies added to model

Variable	Odds Ratio	Odds Ratio 95% Confidence Interval	P-value
Age at D1 (<25/25+)	0.61	0.39 to 0.93	0.0222
Committed crimes in last 3 months	0.47	0.26 to 0.82	0.0080
Baseline agency helped obtain job, employment skills or education	3.13	1.90 to 5.15	<0.0001
SDS score of 7 and over at DORIS3	0.50	0.32 to 0.79	0.0027
Treatment – residential rehab vs prison	1.34	0.69 to 2.60	0.7190
Treatment – methadone maintenance vs prison	1.14	0.63 to 2.07	
Treatment – other vs prison	1.32	0.79 to 2.21	

$r^2 = 13.9\%$

Employability and problem drug users

These findings are reinforced by another analysis of the DORIS data published by Kemp and Neale (2005) in which they identify and explore the way in which low levels of employability among problem drug users act as a major barrier to them entering the workplace. They question the suitability of current welfare to work programmes for problem drug users arguing that many of these individuals have an extensive array of chronic personal, health, life style, and other problems that would need to be addressed before they are in a position to take up and retain paid employment or successfully take part in New Deal and other employability programmes.

Kemp and Neale identify a number of aspects of drug users' lives that suggest they are unlikely to be able to secure and retain paid employment and, indeed, may make many of them unsuitable for welfare to work programmes as currently designed. First, the DORIS data confirm that individuals seeking treatment from community drug services had had only limited involvement with the labour market (Table 19).

Table 19: Labour market attachment at DORIS1 for those attending community drug services

Employment, Education and Training	% problem drug users
Currently has a job	4
Paid legal employment in last 6 months	13
Training or education course in last 6 months	8
Any formal qualification	58
Seen anyone about employment, training or education in last 6 months	21

(Base: 559)

Thus, problem drug users entering treatment were largely detached from the labour market, with little recent experience of full-time paid employment. In addition, many had little human capital. Two out of five had no formal qualifications. Meanwhile, only eight per cent had been on a training scheme or in education during the last six months and only one in five had seen anyone about employment, training or education during this time.

A second potential barrier to employment is that individuals entering drug treatment in Scotland exhibited high levels of physical and mental ill health. Exemplifying this, many drug users reported one or more limitations on the types of physical activity that they might be called upon to make if they were in paid work. Specifically, one in five reported that they were limited either a little or a lot in lifting or carrying groceries, almost half were limited in climbing several flights of stairs, one in five said they were limited in the extent to which they could bend, kneel or stoop, and over a third said they were limited a little or a lot in walking over a mile. When asked about whether pain had interfered with their normal work (including housework and work outside the home) within the previous four weeks, over a third said that it had done so 'quite a bit' or 'extremely'.

As well as poor physical health, many problem drug users have mental health problems, including high levels of suicidality (Klee, 1995; Neale, 2000). In the DORIS study, one in three drug users said that they felt nervous all or most of the time and nearly one in four reported feeling downhearted and low all or most of the time. In addition, half the sample reported having ever seen a psychiatrist, a quarter had ever had psychiatric medication, and two-fifths had ever attempted suicide.

A third aspect of drug users' lives that acts as a barrier to employability is the chaotic lifestyle that is characteristic of people addicted to hard drugs such as heroin. This sort of lifestyle is, arguably, incompatible with getting or retaining full-time paid jobs. In the DORIS study, nine out of ten respondents had used heroin in the ninety days prior to their interview and, of these, over a quarter were using it daily.

Half of the sample reported that they had at some time overdosed on illicit drugs and a quarter said that they had done so in the previous ninety days. Thus, problem drug users entering treatment were living unstable and often chaotic lives, preoccupied with their addiction and with finding ways to fund it. Paid employment was scarcely likely to be a priority for individuals caught up in this chaotic way of life.

Another barrier to work for many drug users is the absence of secure housing. Almost two out of five people entering community drug treatment services in the study said that they were currently homeless. Furthermore, many who were not homeless at the time of their interview had been homeless at some point in the recent past.

Table 20: Accommodation during the 6 months prior to interview

Place	% problem drug users
House or home of relatives	57
Own house/flat	49
House or home of friends	38
Hostel or shelter	18
Hospital	18
Sleeping rough	16
Bedsit/hotel/boarding house	11
Prison	16
Detoxification unit	15
Residential rehabilitation unit	9
Squat	4

(Base: 559)

Table 20 shows the percentages of respondents in various housing situations at some point during the previous six months. It reveals that high proportions of drug users had been 'visibly' homeless (for example, staying in hostels or sleeping rough) or 'hidden' homeless (such as staying with friends or relatives or living in a squat). Indeed, less than half of all respondents had lived in their own house or home.

SECTION 8: Homelessness

It has been shown that around 40% of British homeless people are problem drug users (Fountain et al 2003, Kershaw et al 2000). However, while previous research has demonstrated that the prevalence of drug use among homeless people is very high, it has provided less information about levels of homelessness among problematic drug users. Moreover, the research that has been conducted to date has not sought to investigate whether the characteristics and needs of drug users who are homeless differ from drug users who are securely housed. In addition, a lack of longitudinal data has made it difficult to explore in any depth the nature and direction of the relationships which exist between homelessness and drug dependence (Johnson et al 1997).

This chapter explores three aspects of homelessness in the DORIS cohort: the prevalence of homelessness; key risk factors for homelessness; and trigger events which are associated with movements into or out of homelessness (see Kemp and Neale 2006). The analysis is based on the data collected at DORIS1 and DORIS2.

Prevalence of Homelessness

Analysis of the DORIS data revealed a very high prevalence of self-defined homelessness among problem drug users approaching drug treatment services in Scotland. Nearly one-quarter of respondents (23%) stated that they were homeless at the time of their first (DORIS1) interview. However, by the time of the DORIS4 interviews, this proportion had fallen significantly to one in ten (11%).

Linking the DORIS1 with the DORIS2 survey data showed that there was considerable movement into and out of homelessness during the 8 months between the two interview dates. Consequently, the prevalence of homelessness over the 8-month period covered by the current analysis was substantially higher than the prevalence at either survey date. Altogether, over one-third (36%) of the sample were homeless at either DORIS1 or DORIS2.

Risk Factors for Homelessness

Using cross-sectional data from the DORIS1 questionnaire, exploratory univariate analyses were conducted to ascertain whether or not there were any statistically significant differences between the characteristics of four groups at study intake: the never homeless (not homeless at DORIS1 and DORIS2); homeless entrants (became homeless between DORIS1 and DORIS2); continuing homeless (homeless at DORIS1 and DORIS2); and homeless leavers (homeless at DORIS1 but had found accommodation by DORIS2). These univariate analyses focused on variables which previous studies (e.g. Fitzpatrick et al 2000) had indicated were likely to be risk factors for homelessness, including: demographic characteristics; drug taking behaviour; accommodation status; family/social capital factors; socioeconomic circumstances; and health (see Table 21).

Table 21: Risk Factors for Homelessness at DORIS_1 by Homelessness Group (all 877 respondents) ¹

Variable	Never Homeless (n=564)	Homeless Entrants (n=102)	Homeless Leavers (n=118)	Continuing Homeless (n=93)	P-value (Chi-Square or ANOVA)
Demographic characteristics					
<i>Mean (sd) Age (years)</i>	28.3 (6.4)	27.8 (5.8)	27.7 (5.7)	27.2 (6.3)	0.398
<i>Male</i>	67.4	69.6	75.4	72.0	0.336
<i>Currently in a relationship</i>	53.3	52.9	31.6	41.9	0.0001
Drug use					
<i>Mean (sd) Severity of Dependence Scale score for main drug</i>	10.4 (3.9)	10.6 (4.1)	10.9 (3.6)	11.4 (3.3)	0.095
Severity of Dependence Scale score for alcohol is higher than zero	10.5	16.7	18.8	19.6	0.012
Injected drugs in last 90 days	53.9	61.8	66.1	72.0	0.002
Accommodation					
Imprisonment during last 6 months	43.6	63.7	65.3	55.9	<0.0001
Currently living with child/ren	28.2	26.5	8.5	10.8	<0.0001
Family/ social capital					
Parent/s have or had a drug or alcohol problem	50.2	50.0	59.1	58.1	0.203
Parents divorced, separated or never married	47.6	61.8	52.6	55.6	0.045
Good relationship with at least one living parent or sibling	77.1	72.5	64.4	65.6	0.008
Has friends who can often be relied on	36.9	37.3	31.4	34.4	0.690
Socio-economic circumstances					
Has a formal qualification	54.1	51.0	50.8	53.8	0.884
Paid legal employment in last 6 months	12.9	11.8	5.9	7.5	0.100
Income from crime or illegal activities in last 6 months	58.9	72.5	78.0	82.8	<0.0001
Health					
Ever been physically or sexually abused	36.7	37.3	40.5	43.5	0.585
General health is currently good, very good or excellent	38.7	37.3	35.6	35.5	0.880
Ever seen a psychiatrist or had psychiatric medication	49.1	52.9	51.3	59.1	0.331
Been to an A & E department in last 6 months	30.5	36.3	39.8	39.8	0.093

¹Columns report percentages of 'yes' responses unless otherwise stated

The findings revealed that the four groups of respondents were indeed different in several important respects. For example, compared to the never homeless, higher percentages of the three homeless groups (i.e. homeless entrants, continuing homeless and homeless leavers) had positive alcohol SDS scores; had recently injected; had recently been imprisoned; had parents who were divorced, separated or never married; and had recent illicit income (Table 21).

Risk factors for homelessness among problem drug users were further examined by conducting multivariate analyses using stepwise logistic regression with the same variables taken from the DORIS1 questionnaire which were used in the univariate analyses. The results are shown in Table 22.

Table 22: Stepwise Multivariate Logistic Regression Analyses examining Risk Factors for Homelessness¹

Factor:	Odds Ratio (95% CI)	P-value
<i>Homeless at DORIS_1 (n = 268) vs Not homeless at DORIS_1 (n = 764)</i>		
In a relationship at DORIS_1	0.62 (0.45, 0.86)	0.004
Imprisonment during 6 months prior to DORIS_1	1.70 (1.25, 2.33)	0.0008
Living with children at DORIS_1	0.31 (0.19, 0.51)	<0.0001
Good relationship with a living parent or sibling at DORIS_1	0.55 (0.40, 0.77)	0.0005
Income from crime or illegal activities during 6 months prior to DORIS_1	1.86 (1.31, 2.65)	0.0006
Experienced physical or sexual abuse prior to DORIS_1	1.39 (1.01, 1.90)	0.041
Treatment in an A&E department during 6 months prior to DORIS_1	1.50 (1.10, 2.06)	0.011
<i>Ever homeless (n = 313) vs Never homeless (n = 564)</i>		
In a relationship at DORIS_1	0.67 (0.48, 0.92)	0.013
<u>Alcohol SDS score at DORIS_1 is higher than zero</u>	1.76 (1.14, 2.71)	0.011
Injected drugs in 90 days prior to DORIS_1	1.40 (1.01, 1.96)	0.045
<u>Imprisonment during 6 months prior to DORIS_1</u>	2.22 (1.62, 3.02)	<0.0001
Living with children at DORIS_1	0.62 (0.41, 0.93)	0.020
Parents divorced, separated or never married at DORIS_1	1.38 (1.02, 1.86)	0.038
Good relationship with living parent or sibling at DORIS_1	0.64 (0.46, 0.90)	0.011
Income from crime or illegal activities in 6 months prior to DORIS_1	1.95 (1.37, 2.76)	0.0002

¹ Results are adjusted for all other variables in the model to generate sets of independently useful covariates

The first set of logistic regressions compared the characteristics of people who were homeless at DORIS1 with those who were not homeless at DORIS1. This analysis found that seven factors were associated with drug users being homeless at the start of the study. Those who were homeless were significantly more likely than other respondents not to be in a relationship; to have been in prison during the previous 6 months; not to be living with children; not to have a good relationship with a living parent; to have had income from crime or illegal activities during the previous 6 months; to have experienced physical or sexual abuse at some point in their lives; and to have been treated in an accident and emergency department during the previous 6 months.

Because some respondents who were not homeless at DORIS1 had become homeless by DORIS2, further insights into homelessness risk factors were gained by conducting a second multivariate analysis that compared those who were homeless at one or both surveys (the ever homeless) with those who were not homeless at either survey (the never homeless). This analysis found that eight factors were associated with ever being homeless. Respondents who had been homeless at either DORIS1 or DORIS2 were significantly more likely not to be in a relationship; to have a positive alcohol SDS score; to have injected drugs in the previous 3 months; to have been in prison during the previous 6 months; not to be living with children; to have parents who were divorced, separated or never married; not to have a good relationship with a living parent or sibling; and to have income from crime or illegal activities during the previous 6 months.

Trigger Events for Homelessness

The longitudinal nature of the DORIS data meant that, in addition to examining risk factors, it was possible to investigate 'trigger' events which might be associated with entry into, or exit from, homelessness among problem drug users entering treatment. This analysis was also undertaken in two stages: First, exploratory univariate analyses were conducted to look for potential associations in the data; and secondly, multivariate analyses using stepwise logistic regression were undertaken to identify sets of significant covariates.

Univariate analyses revealed that, compared to the other three groups, homeless entrants were more likely to have had a relationship breakdown and lost residency of their children between DORIS1 and 2. Meanwhile, higher percentages of homeless entrants and the continuing homeless had had recent family problems prior to DORIS2 compared to the never homeless and homeless leavers (Table 23).

Table 23: Trigger Factors for Homelessness at DORIS_2 by Homelessness Group (all 877 respondents)¹

Variable	Never Homeless (n=564)	Homeless Entrants (n=102)	Homeless Leavers (n=118)	Continuing Homeless (n=93)	P-value (Chi-Square or ANOVA)
Demographic characteristics					
Relationship breakdown experienced between DORIS_1 & 2	19.4	31.4	13.0	23.1	0.007
Drug use					
Increase in Severity of Dependence Scale score for main drug between DORIS_1 & 2	24.8	27.5	23.1	24.4	0.909
Increase in Severity of Dependence Scale score for alcohol between DORIS_1 & 2	12.1	10.9	9.4	15.2	0.619
Increase in frequency of drug injection between DORIS_1 & 2	15.4	18.6	20.3	15.1	0.529
Received prescribed methadone between DORIS_1 & 2	67.9	61.4	65.5	75.0	0.227
Problems securing support from a drug agency during 90 days prior to DORIS_2	19.2	22.5	19.8	22.2	0.816
Accommodation					
Released from prison during 6 months prior to DORIS_2	28.6	31.7	36.0	32.6	0.434
Was living with child/ren at DORIS_1 but not at DORIS_2	9.8	20.6	6.8	8.6	0.004
Family/ social capital					
Family problems experienced during 90 days prior to DORIS_2	35.8	50.5	34.5	50.5	0.003
Socio-economic circumstances					
Recent paid legal employment prior to DORIS_1 but not prior to DORIS_2	8.2	7.8	4.2	3.2	0.200
Received illegal income prior to DORIS_2 but not prior to DORIS_1	7.1	9.8	5.1	6.5	0.589
Health					
Worse general health at DORIS_2 than at DORIS_1	9.1	15.7	8.5	14.0	0.114
Seen a psychiatrist or had psychiatric medication between DORIS_1 and 2	21.9	22.5	23.7	26.1	0.829

¹Columns report percentages of 'yes' responses

In order to identify associated trigger events for homelessness, logistic regression analyses were conducted using age and gender, plus all the life-event variables already documented in Table 3. The first regression compared the homeless leavers with the continuing homeless; the second regression compared the homeless entrants with the never homeless; and the third regression compared the homeless entrants with the homeless leavers. The results are shown in Table 24.

Table 24: Stepwise Multivariate Logistic Regression Analyses examining Triggers Factors for Homelessness¹

Factor:	Odds Ratio (95% CI)
<i>Homeless leavers (n = 118) vs Continuing homeless (n = 93)</i>	
Family problems in 90 days prior to DORIS_2	0.43 (0.24, 0.79)
<i>Homeless entrants (n = 102) vs Never homeless (n = 564)</i>	
Lost residency of children between DORIS_1 and DORIS_2	2.28 (1.27, 4.08)
Family problems in 90 days prior to DORIS_2	1.88 (1.21, 2.94)
Worsening general health between DORIS_1 and DORIS_2	2.17 (1.15, 4.09)
<i>Homeless entrants (n = 102) vs Homeless leavers (n = 118)</i>	
Relationship breakdown between DORIS_1 and DORIS_2	3.02 (1.46, 6.26)
<u>Family problems in 90 days prior to DORIS_2</u>	1.93 (1.07, 3.50)

¹ Results are adjusted for all other variables in the model to generate sets of independently useful covariates

The analysis comparing the homeless entrants and the never homeless found that three factors were associated with becoming homeless between the two surveys. Homeless entrants were more likely to have lost residency of a child or children between DORIS1 and 2; to have had family problems in the 3 months prior to DORIS2; and to have experienced worsening general health between DORIS1 and 2. The analysis comparing the homeless leavers and the continuing homeless found that only one factor was associated with exiting homelessness and this was *not* having family problems in the 3 months prior to DORIS2. Finally, the analysis comparing the homeless entrants and the homeless leavers found that two factors were associated with being a homeless entrant as opposed to a leaver: Homeless entrants were more likely than leavers to have experienced a relationship breakdown between DORIS1 and DORIS2; and they were also more likely to have had family problems in the 3 months prior to DORIS2.

These findings clearly confirm that homelessness is a common experience among problem drug users entering treatment, and therefore, an important issue for policy and practice. Moreover, the data provide the first clear evidence of the actual size of the problem. The DORIS data have also shown that various factors are associated with the risk of problematic drug users becoming homeless. Some of these risk factors – such as experience of physical or sexual abuse or having recently been imprisoned – have already been shown to be applicable to homeless people in general (Anderson et al 1993, Fitzpatrick et al 2000). Others – such as recent treatment in an accident and emergency department, problematic alcohol use, or recent income from crime or illegal activities – may also be relevant to homeless people who are not problem drug users. Although the focus was on risks, the survey data have also indirectly highlighted some important factors which may 'protect' problem drug users from homelessness. These include being in a relationship, living with children, and having a good relationship with a parent or sibling.

SECTION 9: Parenting

Since 45% of the DORIS sample were recruited in prison-based treatment facilities and since some of these prisoners would normally be living in households with their children on completion of their sentences, analyses of parenting are based on the DORIS2 data (8 months on from DORIS1, by which time the DORIS1 prisoners had been released) n = 859, and analyses of changes over time are between DORIS2 and DORIS4 (25 months). Of the 859, 353 had no children, 175 had at least one child and at least one child living with them, and 331 had at least one child but none living with them. The mean no. of children living with them was 1.5 (median 1, standard deviation 0.65). The mean age of children living with them was 6.4 years (median 5.1, standard deviation 4.78, inter-quartile range 3- 9.1). Of the 175 respondents with at least one child living with them, 97 (55.4%) had at least one child under 5 living with them; 43 of the 175 were lone parents. The maximum number of children living with a DORIS respondent was four (two respondents).

Table 25 – Variables associated retention of children

Characteristic	No children living with them (n=331)	Children, with at least one living with them (n=175)	P-value*
Male	259 (78.2%)	81 (46.3%)	<0.0001
Paid legal employment since last interview	17 (5.1%)	24 (13.7%)	0.0008
Used heroin in last 90 days	228 (68.9%)	113 (64.6%)	0.3252
SDS score of 7 or more	188 (57.8%)	102 (59.3%)	0.7541
Regular routine for getting up each day	250 (75.5%)	144 (82.3%)	0.0816
Relationship with mother good or very good (mother still living)	185 (65.1%)	96 (62.7%)	0.6180
Relationship with father good or very good (father still living)	104 (44.8%)	55 (43.3%)	0.7815
Partner has problem with drugs or drugs and alcohol (where in relationship)	66 (41.0%)	48 (36.4%)	0.4186
Relationship with partner good or very good (where in relationship)	123 (76.4%)	98 (74.2%)	0.6699
Arrested since last interview	153 (46.2%)	63 (36.0%)	0.0270
Age – mean (standard deviation)	29.9 (6.3)	29.1 (5.9)	0.1318
SF-36 mental health score – mean (standard deviation)	56.6 (21.0)	52.5 (22.7)	0.0444
Since last interview, lived in own house or flat	126 (38.8%)	116 (69.0%)	<0.0001
Since last interview had any contact with social services	121 (36.6%)	67 (38.3%)	0.7017
Length of time since started injecting greater than 1 std above the mean	55 (20.6%)	19 (17.3%)	0.4598

* P-value from Chi-square test or two-sample t-test

Table 25 above shows the results of tests for association between living with one's children and 15 different variables at DORIS2, for those respondents who had children. The variables that are most strongly associated with retention of children are: gender (men less likely to be living with children), stable housing (living in one's own house or flat), and having had a period of paid employment since the baseline interview. Other variables with an association, albeit weaker, were: having recently been arrested and having a poorer self-reported mental health score. However, what is most notable about the data in Table 25 is the absence of any association with the two major DORIS drug use variables (whether or not the respondent had used heroin in the last three months, and level of drug dependency). This absence is all the more surprising because these variables are so strongly associated with other patterns of behaviour in our sample, including criminality, employment status and housing status.

Table 26 –Variables associated with retention of children (women only)

Characteristic	No children living with them (n=72)	Children, with at least one living with them (n=94)	P-value*
Paid legal employment since last interview	1 (1.4%)	6 (6.4%)	0.1402
Currently in paid legal employment	0	3 (3.2%)	0.2587
Used heroin in last 90 days	58 (80.6%)	62 (66.0%)	0.0373
SDS score of 7 or more	52 (73.2%)	56 (60.2%)	0.0814
Regular routine for getting up each day	50 (69.4%)	81 (86.2%)	0.0088
Currently buy own food	47 (65.3%)	79 (84.0%)	0.0051
Relationship with mother good or very good (mother still living)	31 (51.7%)	53 (61.6%)	0.2309
Relationship with father good or very good (father still living)	20 (39.2%)	31 (42.5%)	0.7174
Partner has problem with drugs or drugs and alcohol (where in relationship)	28 (63.6%)	29 (50.9%)	0.1997
Relationship with partner good or very good (where in relationship)	33 (75.0%)	40 (70.2%)	0.5912
Index treatment was methadone maintenance or both maintenance and detox	6 (8.3%)	31 (33.0%)	0.0002
Arrested since last interview	36 (50.0%)	25 (26.6%)	0.0019
Since last interview, lived in own house or flat	44 (62.0%)	74 (79.6%)	0.0129
Since last interview had any contact with social services	46 (63.9%)	46 (48.9%)	0.0547
Length of time since started injecting greater than 1 std above the mean	2 (3.3%)	4 (7.4%)	0.4201
Age at birth of first child – mean (standard deviation)	20.0 (2.96)	19.9 (2.68)	0.7538

* P-value from Chi-square test or Fisher's Exact Test or two-sample t-test as appropriate

Since the propensity for DORIS respondents to be living with their children was very different for male and female respondents, Table 8.2 shows associations with a similar list of variables for female DORIS respondents only. There were 94 respondents with at least one child living with them (37 of whom were lone parents) and 72 respondents who were mothers but did not have a child living with them. Of those who did have children living with them, the mean number was 1.8 (median: 2) with a standard deviation of 0.86. The mean age of those children was 6.8 (median: 6), with a standard deviation of 4.42. Table 26 shows that, aside from the positive association with being in one's own house or flat and the negative association with arrests, the associations with retaining one's children are different for the female respondents – having a regular routine and currently being one's own food. Two drug-related variables were also significant for the female respondents – being on methadone maintenance treatment at baseline, and not having used heroin in the last three months - although the latter variable only just reaches significance ($p = 0.0373$). Note that for neither mothers living with children (Table 26), nor for the larger sample of male and female parents living with children (Table 25), was there any greater propensity for them to have had recent contact with social services than mothers or parents who did not have children living with them.

Associations, or lack of associations, between variables may be misleading, due to the confounding effects of a third variable. Accordingly, the relationship between retention of children and drug use is explored further in two multivariate logistic regression analyses, one for all DORIS2 respondents with children (Table 27) and one for all female DORIS respondents with children (Table 28). The variables chosen to enter the model were as follows: gender (first model only), lone parentage, any paid employment since last interview, currently living in own house or flat, used heroin in the last three months, Severity of Dependence Scale score of 7 or more, regular routine for getting up each day, currently buying own food, relationship with children good/very good, baseline treatment methadone maintenance, arrested since last interview, and SF-36 mental health score.

Table 27: Multivariate model for retention of children – All DORIS2 respondents with children

Variable	Odds Ratio (95% Confidence Interval)	P-value
Sex (male vs female)	0.26 (0.16 to 0.41)	<0.0001
Lone parent	0.28 (0.17 to 0.45)	<0.0001
Paid legal employment since last interview	2.90 (1.37 to 6.12)	0.0053
Currently living in own house or flat	2.51 (1.59 to 3.96)	<0.0001
Relationship with children good/very good	4.70 (2.57 to 8.57)	<0.0001

$r^2 = 36.2\%$

Table 28: Multivariate model for retention of children - All DORIS2 female respondents with children

Multivariate Logistic Regression – R-squared 30.0% (not allowing ‘length of time since started injecting’ to enter):

Variable	Odds Ratio (95% Confidence Interval)	P-value
Currently living in own house or flat	2.74 (1.32 to 5.71)	0.0070
Regular routine for getting up each day	2.70 (1.12 to 6.54)	0.0273
Relationship with children good/very good	3.15 (1.23 to 8.10)	0.0171
Index treatment methadone maintenance or both	4.49 (1.63 to 12.34)	0.0036
Arrested since last interview	0.46 (0.22 to 0.97)	0.0415

$r^2 = 30.0\%$

It can be seen that, both models are well-fitted (see r^2 values) for data of this type. The previous (Table 26) association for mothers retaining their children with level of drug dependency now disappears. However, drug treatment remains important: women whose baseline treatment was methadone maintenance are four and a half times more likely to retain their children. Other noteworthy associations for women are, positively, with living in one’s own house, and having a regular routine, and negatively, with a recent arrest. For all parents, we can note the positive association with living in one’s own house or flat and the negative association with being a lone parent.

Table 29 below shows that, although drug use variables were not associated with retention of children at DORIS2, there *was* an association between a reduction in drug dependence over time (between DORIS2 and DORIS4) and retention of children. Those retaining their children showed a significant fall in severity of dependence ($p = 0.0243$), while parents not living with their children showed no change.

Table 29 – change in SDS score DORIS2 – DORIS4

Children retained - SDS drug score 7 or more, n (%):

		DORIS 4	
		No	Yes
DORIS 2	No	40 (24.7)	20 (12.3)
	Yes	37 (22.8)	65 (40.1)

McNemar's Test: p-value=0.0243
 Difference in proportions (confidence interval): -10.5% (-19.5%, -1.5%)

Children not retained - SDS drug score 7 or more, n (%):

		DORIS 4	
		No	Yes
DORIS 2	No	49 (21.2)	54 (23.4)
	Yes	55 (23.8)	73 (31.6)

McNemar's Test: p-value=0.9237
 Difference in proportions (confidence interval): -0.4% (-9.3%, 8.4%)

Thus, although drug consumption variables are strongly associated with a range of non-drug outcomes in the DORIS study, no independent association between various measures of drug use (used heroin in last 3 months, severity of dependence score) and whether or not those DORIS interviewees with children have their children living with them at DORIS2. It might be considered surprising that those drug users who are current heroin users, and who report greatest dependence, are not significantly more likely to be no longer living with their children. However, for those who do retain their children, retention is positively associated with decreasing drug dependence over time. For women drug users, methadone maintenance treatment is positively associated with retaining their children.

SECTION 10: Conclusions and Policy Considerations

It is probably fair to say that most social science researchers undertaking work within the health field do so with only modest expectations that their research will have a significant impact on the world they are examining. The reasons for this are likely to be complex and varied. On occasion the lack of impact may simply be a result of the fact that there were no clear and easily delineated findings arising from the research that could have been implemented. On other occasions the researchers may have failed to identify key implications arising from their research because they did not regard this as a priority in their work. Equally, there will be occasions where the nature of the recommendations themselves reduce their chances of being implemented because they are too costly or too out of step with current thinking. On still other occasions the findings from any particular study may fail to be implemented because they conflict with findings from other research. In this final chapter it is worth considering how successful DORIS has been in influencing drug policy and drug provision within Scotland?

As has been evident in the preceding chapters the DORIS study encompassed a wide range of areas relating to drug policy and drug services. Over the period in which the study was carried out there has been a near continuous debate within Scotland as to the balance between services and the direction of drug policy. There has been extensive discussion in the media and elsewhere as to the role of the methadone programme within Scotland for example, whether drug users are remaining on methadone for much longer than meets their needs and whether in this sense the methadone programme may be generating a further form of iatrogenic dependency on the part of clients. There has been extensive discussion as to the balance between services, for example, whether drug abuse treatment in Scotland has relied too heavily on methadone and provided too few places within residential rehabilitation programmes. The DORIS findings have contributed centrally to these discussions with the finding, for example, that only around 3% of drug users on methadone were drug free nearly three years following the onset of treatment. This particular research finding received extensive coverage within both the Scottish and international press.

Towards the latter stages of the DORIS research discussions over drug policy were further stimulated by the election of a new government in Scotland and the development of a new drug policy. Whereas the previous Scottish drug policy had placed considerable emphasis on stabilising individuals in the face of their continued drug use, the new drug strategy represented a major shift in focus by placing recovery at the heart of the strategy. The “Road to Recovery” strategy (Scottish Government 2008) defined recovery as:

(A) process through which an individual is enabled to move on from their problem drug use towards a drug free life as an active contributing member of society. Furthermore, it incorporates the principle that recovery is most effective when service users needs and aspirations are placed at the centre of their care and treatment (Scottish Government,2008:23):

For the first time within Scotland there is now a drug strategy which explicitly identifies abstinence as the goal of treatment. Whilst it would be wrong to suggest that the DORIS research findings have had a critical role in shaping this new strategy nevertheless the research has contributed to the policy discussions out of which this change in strategy was developed. It is perhaps in this area more than any other that the DORIS research has contributed to drug policy debate and development.

There have, however, been other areas where the DORIS findings have been influential in facilitating change in drug policy and provision in Scotland. In relation to treatment provided within prisons the DORIS research showed that there were marked differences in the types of treatment on offer between the community and the prison settings (methadone was widely available within the community but only rarely provided within the prison environment). In addition the research also showed marked differences in outcomes between community based and prison based drug treatment. In the period since the DORIS study was initiated there has been a significant expansion in the range of drug treatments on offer to prisoners (including an expansion in the use of methadone) as well as in the better integration between prison and community based drug treatment. In addition, there has also been a clearer recognition that the prison environment itself is very different to the community in ways that can have a direct bearing upon treatment. For example, it is essential to ensure that drug treatment within the prison does not in anyway conflict with the maintenance of a secure environment.

It has been increasingly recognized within Scotland, and elsewhere, that securing stable employment is crucial to effective rehabilitation. The DORIS research has proved helpful in highlighting the current failure (despite the investment of substantial funding on the part of government) to succeed in getting anything more than a small proportion of drug users into employment. It is sobering to recognize, for example, that the proportion of the DORIS sample in employment at the outset of the study was actually higher than the proportion in employment at the 33 month follow up point. The research findings have highlighted the size of the challenge to be faced in increasing the numbers of recovering drug users in employment. It is understandable, for example, if most drug users leave treatment with a continuing drug problem, that many prospective employers will be reluctant to offer employment opportunities to those who they see as continuingly vulnerable. Increasing the proportion of recovering drug users in employment may in this sense hinge in part on the capacity of services to increase the proportion of drug users leaving treatment drug free.

Over the last five years there has been growing concern at the circumstances of young children growing up in homes where they are being cared for by one or both parents with a significant drug problem. That concern has arisen in part as a result of a number of high profile cases of child neglect involving addict parents. Where the DORIS study has made a significant contribution to policy in this area has been in enabling an estimate to be produced of the possible scale of the problem of children with drug addicted parents within Scotland.

Finally, and most recently, the DORIS research has contributed to our growing understanding of drug related deaths in Scotland. In this instance the research has identified the possibility that the oft noted finding of poorer health and higher age standardized mortality levels in Scotland compared to England may be due in part to the higher prevalence of problematic drug use in Scotland compared to England and the greater proportion of drug related deaths in Scotland.

Whilst these are by no means the only areas where the DORIS research has had an impact on policy they do give an indication of the degree to which the research findings and the research process in this instance have been closely aligned with the worlds of drug policy and practice within Scotland. One of the reasons why the DORIS research has enjoyed greater success in influencing policy and practice in Scotland is the length of funding of the study itself. The DORIS research was funded by the Robertson Trust, with a contribution from the Scottish Executive, over a five year period. By contrast most other research in this area is funded for little more than eighteen months. As a result of the longer term funding for DORIS it was easier for the researchers to engage in the longer term process of influencing policy and practice than would have been the case had the researchers had to move on to work in other, possibly unrelated, areas. Secondly the study benefited from the fact that whilst the research was largely

funded by an independent charity (and so remained at arms length from government) nevertheless the stipulation from the charity in their agreement to fund the research was that the Scottish government officials would give the study due consideration once it started to produce research findings. It would be inaccurate to suggest that this process was not without some element of pain (on the part of officials as well as on the part of the research team) as research findings entered the heated arena of media debate and on occasion proposed interpretations that were quite at odds with current policy positions on the part of the Scottish Executive officials. In retrospect, however, it is easy to see how the impact of the study was enhanced not diminished by the creative dynamic of a study approved by government but funded by an independent charity.

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forthcoming

- Bloor, M., Robertson, M., McKeganey, N., Neale, J. (forthcoming) Theorising equipment-sharing in a cohort of Scottish drug users, *Health, Risk & Society*.

2008

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