



The ROSIE Study

Drug Treatment Outcomes in Ireland

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The ROSIE Study

Drug Treatment Outcomes in Ireland

A Report for the National Advisory Committee on Drugs

2009

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**RESEARCH OUTCOME STUDY IN IRELAND EVALUATING DRUG TREATMENT EFFECTIVENESS (ROSIE),
DEPARTMENT OF MATHEMATICS, NATIONAL UNIVERSITY OF IRELAND, MAYNOOTH (NUIM),
CO. KILDARE, IRELAND**

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FOREWORD

The ROSIE study played an important role in developing and informing drugs policy in Ireland. The study was commissioned to establish the current impact of methadone treatment on the health of individuals and on offending behaviour. The fact that over 8,700 people are now included in the methadone programme represents a significant achievement and illustrates the focus that the Government is putting on tackling the problem of drugs misuse.

The outcome of this research shows that treatment does work. There were significant reductions in drug use after one year in treatment and those in treatment also reported that their involvement in crime had reduced very significantly. A number of those in treatment have also undergone training and some have gained employment.

I wish to thank the people involved in the study for their co-operation and for giving the time to facilitate the work of the Research Team. I want to congratulate the Research Team, NUI Maynooth, and in particular Dr Catherine Comiskey and her co-authors, on their achievement in maintaining contacts and completing interviews with so many of the participants. I also thank the National Advisory Committee on Drugs who commissioned the work and, in particular, its Chairperson, Dr. Des Corrigan.

John Curran T.D.

Minister of State with Responsibility for the National Drugs Strategy

PREFACE

It is one of the core tasks of the NACD to advise Government about the treatment of problem drug-taking in Ireland. In addition, Action 99 of the 2001-2008 National Drug strategy required the NACD to commission outcome studies within the Irish setting to establish the current impact of methadone treatment on both individual health and on offending behaviour. As a result the NACD, in 2002, commissioned Professor Catherine Comiskey and her team at NUI Maynooth to conduct what has become known as the ROSIE Study. Most of the 404 opiate users recruited into the study between September 2003 and July 2004 were in receipt of methadone while some were in detoxification, others in abstinence-based treatment and a small number were attending needle exchange. They were followed up for 3 years.

The outcomes from the ROSIE study show drug treatment works and that investment in drug treatment is paying dividends. Significant reductions are shown in the key outcome areas of drug use, involvement in crime and injecting drug use. In addition improvements were seen in employment and training. We were thus able to advise the Minister that investment in opiate treatment services leads to benefits to the individual drug user, to their family and to the rest of the community and that this investment must be continued.

In the area of physical and mental health some improvements were made over the 3 years. However, results were mixed. This may be to do with the measures used or the poor health condition of the study cohort from the outset or poly substance use or indeed lack of treatment for dual diagnosis. In 2004 the NACD published a report entitled "*Mental Health and Addiction Services and the Management of Dual Diagnosis in Ireland*" in which we highlighted the difficulties faced by individuals dependent on drugs who had a co-existing mental health problem. The NACD recommended then that the Addiction and Mental Health Services need to develop guidelines based on best international practice for the management of dual diagnosis in Ireland. Despite our disappointment with the lack of change envisaged for those with dual diagnosis as set out in *A Vision for Change*, the NACD stands by its recommendation on the need for dialogue and an agreed set of guidelines. We also reiterate our recommendation that patients in receipt of methadone prior to admission to a psychiatric facility should be continued on that prescription while in psychiatric care.

Arising from the results of the ROSIE Study the NACD has advised the Government through the Minister of State that:

- Whilst there are still areas for further study it is clear that continued investment in drug treatment is required. It is anticipated that implementation of the rehabilitation strategy will give more good outcomes in the years to come.
- The development of an exit form for those completing treatment as part of the NDTRS would greatly enhance the quality of the data available in the future and reduce the need for longitudinal studies over time. In particular having a unique identifier would also enhance the quality of data analysis and our understanding of the interplay between factors affecting the lives of problematic drug users. Having a unique identifier in use would also enable a greater understanding of the impact of problematic drug use on services and on communities thus facilitating better planning.

The success of this study is due to the expertise and commitment of Professor Comiskey and her team. Much credit is also due to Dr Eamon Keenan, Chair of the NACD's Treatment subcommittee and his colleagues on the Research Advisory Group for the project including Liam O'Brien, Dr Derval Howley, Dr Ide Delargy, Dr Aileen O'Gorman, Professor Shane Allwright and our two External Advisors, Professor John Strang and Dr Michael Farrell both of the National Addiction Centre, Institute of Psychiatry, London. A special thanks is due to the former Director of the NACD, Ms Mairead Lyons for her tireless inputs into this work from its inception onwards. The NACD's Research Officer, Dr Gemma Cox was originally the Project Manager of ROSIE before she joined the NACD and has been heavily involved in both the actual research and in bringing the various Bulletins and this final report to publication. As ever my colleagues and I are enormously grateful to the staff of the NACD who have contributed in no small way to the completion of this report. They may be small in number but they work incredibly hard to bring all of the NACD's work to finality.

Dr Des Corrigan FPSI

Chairperson, NACD

EXECUTIVE SUMMARY

Background

Recognition of the harms associated with opiate dependency and the chronic nature of this condition has led to an increased availability of, and access to, treatment and/or rehabilitative services under the National Drugs Strategy (2001-2008). At an international level, a number of outcome studies, for example the Drug Abuse Treatment Outcome Study (DATOS) in the United States, the National Treatment Outcome Research Study (NTORS) in England and Wales and the Drug Outcome Research in Scotland (DORIS) have supported the overall effectiveness of established treatment options available for heroin users. To date, no national longitudinal data have been available to determine the overall effectiveness of such treatment options in the Irish context. This lack of information, coupled with the increased recognition of the need for treatment and care services to be informed by evidence-based research, contributed to the National Advisory Committee on Drugs (NACD) commissioning a national drug treatment outcome study in Ireland. The tender was awarded to Dr Catherine Comiskey at the National University of Ireland, Maynooth in 2002.

Objective

The Research Outcome Study in Ireland Evaluating Drug Treatment Effectiveness (ROSIE) was the first national, prospective, longitudinal drug treatment outcome study in Ireland. The primary objective of the study was to evaluate the effectiveness of treatment and other intervention strategies for opiate use in Ireland. This was to be realised by the achievement of the following five goals:

1. To develop a research model, instrument and study based on the NTORS (<http://www.dtors.org.uk/NTORS.aspx>) and the Maudsley Addiction Profile questionnaire (Marsden *et al*, 1998).
2. To define, derive and measure a set of demographic and drug-using life history measures at national level for opiate users in Ireland.
3. To define, derive and measure a set of treatment outcome measures for opiate users in Ireland.
4. To present findings that highlight current opiate treatment outcomes in Ireland.
5. To compare the Irish national findings at international level.

Methods

The study design was based on the established tradition of longitudinal drug treatment outcomes research and thus employed a “before and after” research methodology, whereby individuals are used as their own reflexive control. To this end, study participants were interviewed at treatment-intake or as soon as possible thereafter and then at six months, one year and three years after treatment-intake.

Drug services were selected from both inpatient and outpatient settings and from three modalities; methadone maintenance, structured detoxification, and abstinence-based treatment programmes. In addition, a sub-sample of individuals was recruited from needle exchange interventions. These modalities were selected as they were considered to be the principal interventions available to opiate drug users in Ireland.

Using a structured questionnaire, 404 individuals were recruited from 54 services provided by 44 separate agencies and/or organisations between September 2003 and July 2004. Participant eligibility criteria were to (a) be over 18 years of age, (b) be an opiate user, (c) be commencing a ‘new treatment episode’, (d) be prepared to consent to the tracking/follow-up procedures and (e) be prepared to provide a range of locator information.

The main outcome measures included in the study were drug-using behaviour (including drug type, frequency and quantity of use), health (physical and mental), social functioning (employment, accommodation and family relations), harm (injecting-related risk and overdose), mortality and crime.

Key Outcomes

The location and interview rates of participants obtained by ROSIE at the 3-year follow-up time point exceeded levels seen in comparable international studies and were in direct contrast to the usual trend of decreasing follow-up rates as time progresses. At the 3-year time point, 97% of all original participants were located and 88% of participants successfully completed interviews, with just 4% choosing not to be interviewed. This is an improvement on the 1-year follow-up; some respondents who had refused to participate at that stage decided that they would like to take part in the study at the subsequent time point. At 3-years, 1.5% of participants were deceased and one participant was in a coma. Of those participants who were located but not interviewed, four were living in another country and eight were part of a methadone programme. No member of this sub-group of respondents was in prison.

The ROSIE 1-year mortality rate was 0.5%; two participants died in the first year. This was low when compared with the NTORS equivalent rate of 1.2% or Smyth *et al's* (2005) mortality rate of 1.8% in their follow-up study of opiate users seeking inpatient treatment in Dublin. However, this is not unexpected since mortality rates following inpatient detoxification treatment are known to be higher than those associated with outpatient treatments. In all, six of the 404 participants died between the start of recruitment in September 2003 and the end of the 3-year follow-up interview period in July 2007, leading to a 3-year mortality rate of 1.5%.

Treatment Status

It was observed that 38% of the participants recruited in methadone were still in their intake treatment setting at 3-years. Research suggests that retention in methadone treatment is associated with more positive outcomes (Lawless and Cox 2001) and the findings presented here are very encouraging for methadone treatment services, particularly given that, at 3-years, it was observed that 59% of those interviewed were currently receiving methadone treatment.

Of those participants recruited in the detoxification and abstinence modalities, approximately 70% completed their intake treatment. This compares with studies conducted in the UK that show completion rates varying from 25% to 50% (Gossop *et al*, 1999; Keen *et al*, 2001) and is particularly noteworthy in the light of work by Ravndal *et al* (2005), in which it is stated that the completion of treatment is an important indicator for improved outcomes.

Drug Use

It was observed that there were significant differences reported in the use of all drugs from intake to 3-years with heroin use reducing from 77% to 46%, cannabis use reducing from 64% to 49%, cocaine use reducing from 44% to 20%, benzodiazepine use reducing from 44% to 32%, non-prescribed methadone reducing from 41% to 14% and crack cocaine usage reducing from 15% to 7%. However, while use of benzodiazepines was lower at 3-years than at intake, it was found that the proportion using this drug increased significantly from 1-year to 3-years. The percentage drug-free from all illegal drugs in the last 90 days increased significantly from 9% at intake to 28% at 1-year and 29% at 3-years. It was observed that the proportion consuming alcohol both at 1-year and at 3-years decreased significantly from intake. Overall, the main conclusion was that reductions observed in the proportions using a range of drugs, and in the mean number of days on which drugs were used, between intake and 1-year were sustained at 3-years.

Crime

Significant improvements in crime outcomes observed between intake and 1-year were still evident at the 3-year time point. The number of those selling/supplying drugs fell from 30% to 13% and the number handling stolen goods fell from 25% to 10%. Once initial improvements were achieved between intake and 1-year, it seems that participants experienced a period of stabilisation with respect to criminal activity and this outcome did not change significantly between 1- and 3-years. For those who were experiencing legal problems other than being arrested, significant improvements were evident for three of the eight legal problem categories. Most notably, those experiencing no legal problems increased at 1-year follow-up and increased slightly again at 3-year follow-up.

Health and Risk Behaviour

Although the reported physical health outcomes improved slightly at 3-years, little change was observed in symptoms of mental health reported for the same period. For physical health outcomes, only poor appetite showed a significant decline at 3-years. However, non-significant increases were observed in six of the ten symptoms with stomach pains in particular showing a significant increase at 3-years. With regard to mental health outcomes, the frequencies of anxiety-related and depression-related symptoms were considerably different at 3-years. Significant improvements were observed at 3-years for depressive symptoms such as feeling hopeless about the future, feelings of worthlessness, feeling no interest in things and feeling lonely. However, of those who experienced anxiety symptoms, only “feeling tense” showed a significant reduction at 3-years.

Improvements were evident in injecting-related risk behaviour of participants throughout the study period. Reductions in both the proportion of participants injecting any drug and in the frequency of injecting in the last 90 days (particularly for those injecting between 25 and 79 days) occurred at 3-years. Of the participants who reported injecting drugs, the percentage of respondents who never shared or borrowed needles was close to 90% at treatment-intake and remained stable at 3-years. Likewise, the proportion of participants who never shared other injecting paraphernalia remained consistently high throughout. There was a non-significant reduction in the reported number of times on which respondents injected daily, declining from four times a day to three times a day. Incidents of non-fatal overdose also remained fairly constant with figures for overdose between treatment-intake and 3-years remaining stable.

Social Functioning

Under the National Drugs Strategy (2001-2008), the importance of rehabilitation, employment and social functioning of drug users has been recognised. A significant increase in the numbers of participants undertaking training courses at 1-year and 3-years in comparison to intake was observed with the percentage increasing from 16% at intake to 29% at 1-year and 33% at 3-years. In addition, improvements in participants' recent employment status were found with a significant increase ($p < 0.001$) between intake and 3-years for those currently employed and the percentage working rising from 16% at intake to 29% at 3-years. It was also observed that the number of participants deemed 'usually not working in the last 90 days' decreased from 42% at intake to 31% at 3-years.

In terms of social functioning, accommodation and family, a significant increase was observed in the number of participants reporting living in their own or rented accommodation in the last 90 days when comparing intake and 1-year, and intake and 3-years, with figures rising from 34% at intake, to 45% at 1-year, and 49% at 3-years.

Per-protocol Group

The *per-protocol* group was defined as those participants who completed all three interviews at intake, 1-year and 3-years. This group consisted of 289 individuals or 72% of all those who were recruited to the study. The *per-protocol* group is particularly useful when tracking changes over the 3-year follow-up period as data for these individuals are available at each of the three time points. As follow-up rates at 1-year and 3-years were very high, findings within the *per-protocol* population reflected the results presented on specific outcomes for the full population.

Conclusions and Recommendations

The results presented on outcomes are positive and encouraging from the perspective of not only the individual opiate user but the community, the treatment provider and society. Improvements observed at 1-year were generally sustained. However, some measures did deteriorate. For this reason, more research is required on the long-term mental and physical health outcomes of opiate users in treatment. In addition, while the majority of the participants demonstrated improvements in outcomes, there remained a group of participants who did not respond to treatment. Further research using data from ROSIE may assist in determining the factors that influence positive treatment responses. The results presented here are a first look at the wealth of data that were collected by the ROSIE study. It is hoped that treatment users, treatment providers and policy makers will see this study as *their* resource and that this resource will continue to be used for the benefit of all those who contributed to the success of the ROSIE study.

CHAPTER ONE: INTRODUCTION

1.1 Aims

The primary objective of the study was to evaluate the effectiveness of different kinds of treatments and interventions currently available to opiate users in Ireland. To this end the aims were:

- To undertake the first national, prospective longitudinal drug treatment outcome study;
- To describe the characteristics of people seeking treatment for their problem drug use;
- To examine treatment outcomes at six months, one year and three years after participants commenced their index treatment and;
- To provide an economic cost-estimate for the problems associated with drug use among the cohort.

This chapter describes the rationale for this evaluation and key contents of the forthcoming chapters are highlighted.

1.2 Background and Rationale

In the recent past a growing number of drug prevention activities have been carried out across the globe, throughout Europe and in Ireland. Many of these projects however have not been effectively evaluated. There is an urgent need to increase current knowledge about the process of evaluation and to pool experience and results. This has been well recognised internationally; the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has published its Guidelines for the Evaluation of Drug Prevention, a manual for programme planners and evaluators (EMCDDA 1997a, 1997b, 1997c, 2001), while the National Institute on Drug Abuse of the United States Department of Health and Human Services has published research-based guidelines on the principles of drug addiction treatment (NIDA 1999) and has initiated a series of related projects in various states. The need for evaluation of drug treatment programmes at global and European level has also been well documented by the World Health Organisation (WHO) and the United Nations Drug Control Programme (UNDCP) (Marsden *et al*, 2000). With ever increasing drug-using population in Ireland (Comiskey, 2001; Kelly *et al*, 2004) and subsequent increases in the demand for treatment services, there is a growing need to evaluate treatment for opiate use in Ireland in a national context.

In response to the acknowledged gaps in the literature, the United States, Australia and many European countries undertook drug treatment evaluation programmes. In the United States, the Drug Abuse Treatment Outcome Study (DATOS) reported national patterns of treatment effectiveness during the 1990s (Simpson, 2003). The Australian Treatment Outcome Study (ATOS) was the first large scale prospective treatment outcome study on heroin dependence in that country (Darke *et al*, 2005) and in England and Wales, the importance of research on the outcome of treatment for substance use problems was also recognised. Marsden *et al* (1998) highlighted that priority must be given to developing valid and reliable instruments to assess treatment outcomes and consequently conceived the Maudsley Addiction Profile (MAP) instrument. This instrument contains measures of physical and mental health symptoms and three aspects of personal and social functioning. Gossop *et al* (1998) provided an overview of five years' of treatment outcome research in the UK and stressed the importance of deciding how best to allocate scarce national resources to tackle drug use treatment problems. In Scotland, the Drug Outcome Research in Scotland (DORIS) study followed a cohort of 1,007 opiate users over a period of 33 months (McKeganey *et al*, 2006).

In Ireland, the Alcohol and Drug Research Unit (ADRU) of the Health Research Board (HRB) maintains the National Drug Treatment Reporting System (NDTRS) and holds a valuable collection of data on the nature of the drug problem (<http://www.hrb.ie>). However, in spite of these excellent international and national developments, as of 2002, no large scale treatment evaluation had been undertaken in Ireland. The National Advisory Committee on Drugs (NACD) was established to advise the Government in relation to prevalence, prevention, treatment, rehabilitation and consequences of problem drug use in Ireland and commissioned ROSIE as a response to the evaluation need.

1.3 Best Practice in Evaluation Studies

The WHO (Marsden *et al*, 2000) states that evaluations systematically answer common questions about interventions, including:

- Is this intervention properly targeted?
- Is it working in the way it was designed to?
- To what extent is it effective?
- What does it cost?
- Are there any unexpected problems?

To answer these questions, there are three types of evaluation. Firstly, there is an implementation evaluation, also called a process evaluation or programme monitoring. This type of evaluation assesses how the intervention is being implemented. Secondly, an impact or outcome evaluation is carried out: this assesses the impacts of an intervention on the target population and other people. Outcome evaluation studies report changes that service participants may experience over time. A drug treatment outcome evaluation addresses questions regarding treatment for drug use, including whether respondents are better off after treatment and whether drug use was reduced as a result of treatment (Marsden *et al*, 2000). Finally, an economic evaluation assesses whether an intervention is good value for money. A comprehensive evaluation can comprise of all three types, however, in practice, resource and other constraints mean that some elements will be emphasised more than others. The primary focus and scope of an evaluation will depend on what kind of assessment is required by whom, at what time, and using which available resources. ROSIE is the first national outcome evaluation for the treatment of opiate use in Ireland, commissioned by the NACD in 2002 for what was ultimately a three year study period, for the benefit of treatment clients, service providers and policy makers.

1.4 Study Outline

In **Chapter Two**, methodological details on the study design, implementation and execution are presented. Information in this chapter includes how to estimate sample sizes required for such a study, how to design effective data management and quality control procedures including database construction, follow-up procedures and field operations. Details of the relevant types of data analysis required and presentation are also included.

Chapter Three presents results relating to the study design and execution. Recruitment numbers and geographical coverage are reported. Detailed information is given regarding participant follow-up and numbers and location procedures, including discussion of loss to follow-up and mortality. The results from the data quality assurance audit are presented here also.

Chapters Four, Five, Six, Seven and Eight present the results of key outcome measures in ROSIE. These are under the headings of treatment pathways, drugs, crime, health and social functioning. **Chapter Nine** introduces and provides results for the *per-protocol* population.

Finally, **Chapter Ten** discusses the key results observed in ROSIE. It places these results in an international context and makes recommendations for treatment service policy makers and future researchers.

In general, throughout this document, percentages greater than five are rounded to the nearest integer in the text, while percentages in tables are given to one decimal place.

CHAPTER TWO: STUDY DESIGN, RESEARCH METHODOLOGY AND MANAGEMENT

2.1 Introduction

Prior to any data collection, the design, research methodology and management of the study must be clearly laid out for the study to be successful. Failure to perform in-depth research into these three branches of the early part of the study may result in situations where the data are effectively useless. For example, insufficient consideration into the design of the study may result in collection of, for example, the wrong data, insufficient data or biased data. Poor research may lead to an inappropriate design being applied to the study. Poor management can result in the divulgence of private information which may lead to legal considerations. Mismanagement of data can result in incorrect conclusions being drawn from data analysis.

The aim of this chapter is to describe the design, research methodology and management of ROSIE and thus to provide a set of methodological guidelines for future similar longitudinal evaluations. Each aspect of the methodology, from ethics, study design, interdisciplinary collaboration and networking, data analysis, database construction and management, fieldwork, security, quality control, tracking procedures and successful project completion is discussed in detail.

Each of the three branches of the early study development process is considered in turn. The chapter begins by presenting the rationale for the study in terms of how to evaluate treatment effectiveness and describing the various treatment modalities and settings to be evaluated. The subjects, population definition and the analysis sub-group as well as selection of recruitment sites are next considered with a description of the research instrument used in the study also given.

An in-depth discussion of designing the study is then presented. The type of experimental design is considered and described, as are the formulae for the statistical power and sample size calculations. The Statistical Analysis Plan follows with a detailed discussion on the analytical techniques used in this research.

The data management process is considered in **Section 2.4** and begins with a brief discussion of the Data Protection Act and its relevance to ROSIE. Next, the set-up of the database containing the respondent information and the Data Management Plan are presented. The quality control and auditing process is also described. Following this, the fieldwork and follow-up procedures are considered. The ROSIE databases used for follow-up purposes are discussed, as well as the sources for respondent follow-up and difficulties encountered while tracking respondents. Difficulties encountered while conducting interviews are described next, with the fieldwork and follow-up section ending with a discussion on ethical concerns and safety of interviewers. The chapter concludes by emphasising the necessity for an evaluation to be an evolving process which needs to be flexible and open to the changes in circumstances it will encounter during the longitudinal study period.

2.2 Objectives and Evaluating Treatment Effectiveness

The primary objective of the study was to evaluate the effectiveness of different kinds of treatments and interventions currently available to opiate users in Ireland. To this end the aims were:

- To undertake the first national, prospective longitudinal drug treatment outcome study;
 - To describe the characteristics of people seeking treatment for their problem drug use;
 - To examine treatment outcomes at six months, one year and three years after participants commenced their index treatment and;
 - To provide an economic cost-estimate for the problems associated with drug use among the cohort.

Accordingly, the study was designed to describe the nature of treated opiate use in Ireland across modalities that reflect the delivery of care in Ireland. The following five goals were identified and their achievement would realise the ROSIE aims:

1. To develop a research model, instrument and study based on the National Treatment Outcome Research Study (NTORS) (<http://www.dtors.org.uk/NTORS.aspx>) and the Maudsley Addiction Profile questionnaire (Marsden *et al.*, 1998).
2. To define, derive and measure a set of demographic and drug-using life history measures at national level for opiate users in Ireland.
3. To define, derive and measure a set of treatment outcome measures for opiate users in Ireland.
4. To present findings that highlight current opiate treatment outcomes in Ireland.
5. To compare the Irish national findings at international level.

Evaluation of opiate treatment effectiveness involves measuring outcomes for individuals who enter treatment. There are several levels at which these outcomes can be defined, i.e. individual, family, community and society. These levels are examined in this document in the contexts of health, social and economic (time rather than units of currency) impacts. The key strands within the survey instrument measure and assess changes under these three headings. At each level, one key outcome variable was prioritised. In summary, a threefold definition of target outcomes was defined and is shown below (Table 2.2(a)).

Table 2.2(a) Summary of Targeted Outcomes and Key Variables at the Individual, Community and Societal Levels

Outcome Level	Health	Social	Economic
INDIVIDUAL	Key: Risk of death due to overdose or suicide. Improvements in general health, risk of harm and mental health.	Reduced aggression, anxiety, group conflict, criminal activity.	Unemployment.
FAMILY & COMMUNITY	Key: Risk of harm to closest dependant. Decreased risk of transmission of harm to others (drug use and infectious disease).	Improved social relations with family and community, reduced aggression with others.	Reduced community debt.
SOCIETY	Change in health service utilisation.	Reduced public nuisance, police force involvement.	Key: Reduction in cost to society. Crime, health costs, loss of revenue.

By answering key questions regarding treatment episodes, evaluation of treatment effectiveness at these levels is possible. The particular questions that ROSIE wished to address were:

- (i) Has opiate users' drug use reduced following treatment?
- (ii) Has opiate users' physical and mental health improved following treatment?
- (iii) Has opiate users' opiate related harm reduced following treatment?
- (iv) Have opiate users' living, social and family circumstances improved following treatment?
- (v) Have opiate users' crime levels reduced following treatment?

In answering these questions, the impact of treatment not only on the individual, but on their immediate community, in terms of their family and friends, and on society, including in terms of the impact on victims of crime and usage of medical and legal resources available has been assessed.

A range of outcome criteria was defined and measured by asking questions on the following outcomes:

- a) Substance use
 - 1) Use of opiate drugs (including heroin and similar).
 - 2) Frequency of use of opiate drugs (including heroin and similar).
 - 3) Number of days of use in the last 90 days.
 - 4) Amount used on a typical day.
 - 5) Frequency of use and/or consumption of all other drugs (non-opiate and including alcohol).
 - 6) For each other drug (non-opiate and including alcohol):
 - I. Number of days of use in the last 90 days.
 - II. Amount used on a typical day.
- b) Risk behaviour
 - 1) Frequency of needle sharing.
 - 2) Number of days injected in the last 90 days.
 - 3) Typical number of times injected in one day.
 - 4) Number of times used or passed a used needle in the last 30 days.
 - 5) Number of days used someone else's filter, spoon or flush water in the last 30 days.
 - 6) Frequency of unprotected sex in the last 90 days.
 - 7) Number of accidental overdoses in the past 90 days.
- c) Physical and mental health
 - 1) Frequency of physical and mental health symptoms (including anxiety, depression and suicidal ideation).
 - 2) Number of times attempted suicide in the past 90 days.
 - 3) Number of times attempted suicide in the last six months.
 - 4) Number of days in contact with medical services (including hospital, accident and emergency, GP and community treatment) in the last 90 days.
- d) Personal/social functioning
 - 1) Frequency of criminal behaviour (including selling drugs, shoplifting and others).
 - 2) Number of weeks of non-criminal employment in the past 90 days.
 - 3) Contact with dependant, partner, family/relatives and friends.
 - 4) Type of relationship with children, if any.
 - 5) Number of days conflict with partner (if any) in the last 90 days.
 - 6) Number of days conflict with relatives in the last 90 days.
 - 7) Number of days conflict with friends in the last 90 days.

As the study evolved, minor changes were made in plan implementation but the core strategy and overall objectives remained unchanged. For the purposes of data analysis and interpretation, in some circumstances it was necessary to recode new variables from those collected during the study, for example, the reported amount of alcohol intake was recoded into units of alcohol. As further data analysis was conducted, limitations in some questions and their responses became apparent in terms of their tractability for analysis.

2.2.1 Treatment Settings and Modalities

ROSIE participants were to be recruited within residential (or inpatient) and outpatient community settings. Four modalities of treatment intervention were included; methadone (maintenance and reduction were not distinguished), structured detoxification, abstinence programmes and needle exchange. These were selected as they reflected the treatment interventions available at a national level at the time of the study implementation.¹

Methadone

The provision of methadone, a long-acting opiate agonist, under medical supervision is the main pharmacological substitution intervention for opiate users in Ireland. Initially, a low commencing dose (usually between 10mls and 40mls) is prescribed, aimed at achieving a level of comfort while reducing the likelihood of overdose. By the end of six weeks of treatment, the individual is usually stabilised on an appropriate therapeutic dose. Methadone maintenance is a long-term treatment option of no fixed duration, usually forming part of a wider process of assisting an individual to reduce various forms of drug-related harm and to address social, legal and financial problems until the person is ready and willing to withdraw from the drug substitution therapy. There are different models of maintenance prescribing, ranging from low-threshold programmes to highly structured regimes (Cox *et al*, 2007c).

The ROSIE methadone modality includes both maintenance and reduction approaches. At the start of the study, when treatment centres were contacted, it was observed that many of the clinics, while aspiring to methadone reduction programmes, were mostly providing methadone maintenance. Thus, the Research Advisory Group (RAG) included methadone maintenance and methadone reduction as one modality to capture this dichotomy from the client and provider perspective.

Structured Detoxification

Structured detoxification is a process whereby individuals are systematically and safely withdrawn from opiates, under medical supervision. The most common method of opiate detoxification in Ireland is to use methadone and slowly taper the individual down from the usual dose to zero over a period of time. Structured detoxification programmes are provided in both inpatient and outpatient facilities and can vary in duration from approximately four to 12 weeks. ROSIE recruitment for this modality was carried out in centres where detoxification was part of a treatment programme over a specific period of time up to a maximum of 12 weeks (Cox *et al*, 2007a). This differentiates from the ten to 15 day detoxification that occurs, for example, in the prison context, which is not aimed at delivering treatment but instead at managing acute withdrawal from opiates on arrival in prison.

Abstinence

ROSIE defined the abstinence modality as being any structured programme which required individuals to be drug-free (including free from any pharmacological intervention) in order to participate in, and remain on, the programme. Such programmes provide intensive psychological support and a structured schedule of daily activities that clients are obliged to attend. Treatment can occur in an inpatient (often referred to as residential rehabilitation) or an outpatient (i.e. structured drug-free day programmes) setting. Inpatient abstinence-based treatment programmes can differ markedly in their underlying philosophy, structure, intensity and duration.

Programmes may be either short-term (usually between four and 12 weeks) or long-term (usually between three and 12 months). ROSIE study participants were recruited from the three main types of residential rehabilitation programmes identified in the international literature: 12-step/Minnesota model programmes, Christian houses and a therapeutic community (Cox *et al*, 2007b).

Needle Exchange

While needle exchange is not a treatment modality in itself, it was felt that capturing the journey of those accessing needle exchange interventions and their progress through the services was important for completeness. Hence, some interviewees were recruited from needle exchange services.

¹ Initially, counselling was to be included as a modality. Upon commencing recruitment, however, it was found that very few opiate users were receiving **only** counselling as a form of treatment. Consequently, the RAG took the decision to omit counselling as a treatment modality.

2.2.2 Subjects' Inclusion Criteria

In terms of participant eligibility, only those opiate users defined as presenting for a new treatment episode were recruited to ROSIE, where 'new treatment episode' is defined as incorporating those who had never presented for treatment before, those who had presented for this type of treatment previously but were not in receipt of this type of treatment in the last six months and those who had presented for other types of treatment previously. Following talks with the NACD Treatment sub-committee and the RAG, it was decided that a new treatment episode participant was a pragmatic choice of definition given the possible lack of availability of participants presenting for their first ever treatment. In addition, if opiate users who were currently in treatment were selected, the comparability of intake data between participants would have been compromised as intake would refer only to the beginning of the recruitment process, not to the beginning of the treatment episode. It should be noted, however, that this choice of participant definition imposed the limitation that, in some circumstances, such participants could be difficult to identify and recruit due to a possible lack of availability of treatment places.

Inclusion criteria for participants were to (a) be over 18 years of age, (b) be starting a new treatment episode as defined above, (c) have used opiates, (d) be prepared to consent to the tracking/follow-up procedures and (e) be prepared to provide a range of locator information. Involvement in ROSIE was voluntary and it was made clear to potential respondents that refusal to participate would not affect the treatment received. Participants were informed that they could, at any time, withdraw from the study. Confidentiality was assured and individuals were informed that all answers and comments provided would remain anonymous. The intake interview took approximately one hour, interviews took place in a variety of settings (treatment services, prisons, cafés, participants' homes) and participants were not financially reimbursed for completing an intake interview. Participants did, however, receive a gift voucher to the value of €20 at the follow-up interviews in recognition of their time, contribution and commitment to the study. Trained ROSIE fieldworkers carried out all interviews.

2.2.3 Site Selection and Coverage

ROSIE was designed, not as a randomised control trial with specific numbers of respondents allocated to a treated or control group within certain geographical locations, but as a study that reflects the availability and distribution of treatment service provision in Ireland. Ideally, all health regions would have been included in some capacity, however not all treatment modalities were available within all regions. Consequently, only regions with available opiate services were included. ROSIE, therefore, reflects the availability and distribution of existing national treatment service provision in 2003, the time of recruitment.

All agencies providing treatment to opiate users in Ireland were contacted and informed about the ROSIE study. Information was sought from services regarding the nature of the organisation and the range of services provided. Thereafter, all methadone clinics within the greater Dublin area that had the capacity to facilitate treatment-intake during the recruitment period were included in the site selection process. Many clinics outside Dublin were known to be full to capacity but these were still contacted for recruitment purposes. In addition, all General Practitioners (GPs) prescribing under the Methadone Protocol were informed of the research and their assistance in study recruitment was requested. GPs were contacted via the Central Treatment List and followed-up with telephone calls and letters (see **Section 2.5.2**). All residential drug treatment facilities in the country that provide services for opiate users were included in the selection process. The co-operation of both the methadone central treatment list holders and the GP co-ordinator was critical to the project. Finally, study recruitment was also to be carried out in the main inpatient facilities in the country and in an outpatient detoxification facility.

2.2.4 Research Instruments and Pilot Phase

The ROSIE intake research instrument was adapted from the Maudsley Addiction Profile (MAP) and the DORIS instrument. The MAP is a brief, interviewer-administered questionnaire for treatment outcome research applications that measures problems in the four domains of substance use: health risk behaviour, physical and mental health and personal/social functioning (Marsden *et al*, 1998). The DORIS instrument is an extension of the MAP and includes extra quantitative and qualitative components (private communication, Neil McKeganey and Gordon Hay, Centre for Drug Misuse Research, Glasgow, 2002).

Every question on the DORIS intake instrument was scrutinised and edited where necessary by the senior project management team to confirm its suitability for use in the ROSIE project. The phrasing and time frame of each question was checked to ensure the question captured the required data within the correct time reference. Prior to the roll-out of ROSIE recruitment, the newly developed instrument was approved by the RAG and was piloted in a range of settings. Results are presented below.

Pilot Study

The ROSIE pilot interview instrument and pack were devised in the spring of 2003. This followed a comprehensive consultation and research phase in the winter of 2002, during which a detailed study design protocol and data protection, management and quality assurance plans were agreed. The questionnaire relied on self-reporting, which is accepted as being valid and reliable for the collection of data on drug use, criminality and HIV risk behaviour (Darke, 1998; Del Boca & Noll, 2002). The instrument was pre-piloted within the research team and was formally tested by a researcher in the field for eight weeks from early March to early May 2003. The instrument was tested in a range of non-residential settings including a large statutory health clinic, two smaller community treatment centres and with a GP. A total of 18 respondents were interviewed during the period. The mean time taken per interview was 47 minutes with a range of 28 to 87 minutes.

The 87-minute interview was an extreme case as it involved a respondent who was continually falling asleep. Without this interview the average time to complete the interview was 39 minutes.

Of the 18 respondents interviewed during the pilot phase, 13 were male and five were female. The ages of this group ranged from 20 to 35 years with a mean age of 27.5 years. Of the 18 respondents, 17 were in receipt of methadone treatment and one was using a needle exchange. Respondents had sought treatment for a range of drugs used. Of the 18 respondents 14 had previously had treatment for drug use. Ten respondents had used some opiate the day prior to the interview. When asked about overdoses 13 of the 18 respondents had a drug overdose at some time in their life. The average number of overdoses per respondent was three with a range of three to ten. Eight respondents had also attempted suicide. Three respondents had attempted suicide at least once in the last six months. With respect to questions regarding sexual behaviour, 12 of 17 respondents reported that they had had sex in the past 90 days, of whom eight said they had never used condoms. No respondent had bought or sold sex within the last six months, while eight of 17 respondents said they were single and not in a relationship. Regarding children, 11 of 17 said that they were parents and three said they or their partner were expecting a baby. Respondents' number of children ranged from one to four. Seven of 17 respondents said that they were not currently in trouble with the law, however respondents had committed a range of crimes in the last 90 days. The most frequent crime committed was drug possession, followed by handling stolen goods.

The aims of the pilot study were to test the suitability, validity and timing of the instrument delivery; the efficacy of the structures and procedures in place to collaborate with external sources in a timely manner; and the quality and reliability of the data management process. A substantial amount of time was invested in the planning and design phase of the ROSIE project. Evidence of the benefits of this investment was found in the successful completion of the pilot instrument in a range of varied external settings, and the smooth execution of the data input and analysis. However obstacles and limitations must also be considered and acted upon. Given interview length and the slow speed of respondent enrolment during the pilot phase a revised plan on the timing and enrolment of participants was devised. In addition, the training of additional interviewers was set as a priority. With regard to the data collected, amendments to the demographic questions were made to enable a more accurate demographic data analysis.

Following the pilot phase the intake survey instrument was refined. The instrument contained several sections including locator information, demographic characteristics, index treatment, drug treatment history, drug use, injecting-related risk behaviour, physical and mental health, and contact with family, social care and other services. A brief description of these sections is provided.

Locator Information

To facilitate follow-up, the following information was sought from participants at intake interview; full name/nickname, street name, current address and participants' telephone numbers (mobile and landline), the name, address and telephone number of a parent (or other family member), the name and address of the treatment referrer, the name and address of the respondent's GP, the name and address of their social worker (if any) and the name and address of a key worker/drug worker who would be able to contact the participant.

Demographic Characteristics

Demographic variables included age, gender, country of birth, nationality, ethnic origins, age at which the participant left school, the highest level of educational qualifications, current employment status, respondents' usual occupation over the previous six months, their employment status in the last 90 days, the ways in which participants financially supported themselves over the preceding 90 days, current accommodation, accommodation during the previous 90 days, any housing problems, who they lived with, any problems in the area where they resided, marital status, contact/conflict with family/friends, whether they had children under 18 years and the number of children in their care.

Index Treatment

Participants were asked a number of questions in relation to their index treatment including the type of index treatment they were receiving, the type of treatment that they wanted, their reasons for coming to index treatment, the duration of the index treatment, the length of time they had attended the index treatment at the time of the intake interview, the time they expected to be in index treatment, if they had been on a waiting list prior to commencing the index treatment and how long they had spent waiting.

Drug Treatment History

Participants were asked whether they had ever had previous treatment for their drug use and/or alcohol consumption, what this treatment was and at what age they had the treatment. In addition, participants were asked whether they had ever been on a methadone programme (age of first time on methadone, number of episodes, treatment setting and longest period on methadone), had ever had a supervised detoxification (age of first time, inpatient/outpatient setting, how many detoxification episodes, was programme completed), had ever been in residential drug treatment (age of first time, how many times, was treatment completed, how long was the programme) had ever had one-to-one counselling (age of first time, how many counsellors had participants seen, the setting, the longest period of regular attendance), had ever been to Narcotics Anonymous (age of first time) and had ever been to Alcoholics Anonymous (age of first time). Participants were also asked whether they had commenced any form of treatment, excluding their index treatment, in the six months prior to interview.

Drug Use

Participants were asked to provide a detailed drug-using history. To this end, they were asked whether they had ever used or consumed a list of 12 substances (heroin, 'street' methadone, other opiates, benzodiazepines, cocaine, crack, amphetamines, ecstasy, LSD, cannabis, tobacco and alcohol), age of first use or consumption, whether they had ever considered their drug use to be a problem, and the age at which they first thought use was a problem. In addition, for all 12 substances, participants were asked to report on their frequency of use over the preceding 90 days, the amount used on a typical using day and the usual route of administration. Respondents were asked to identify what drug they considered to be their 'main' drug over the previous 90 days, and what drug had caused them the most problems in that time period. Participants were also asked about their drug use in the previous three days and about their prescribed medication over the previous four weeks (including frequency and dose). This section also contained questions regarding lifetime history of non-fatal overdose and frequency of overdose in the previous 90 days.

Injecting-related Risk Behaviour

Participants were asked about their drug injecting history (ever injected, age at which first injected, frequency of injecting over the previous 90 days, and frequency of injecting on an average injecting day). Participants were also asked to identify all of the drugs (if any) that they had injected over the preceding 90 days.

This section examined the injecting-related risk behaviour of the participants by asking if participants had ever engaged in a range of activities associated with injecting (used a needle/syringe that had been used by somebody else, passed on used injecting equipment to others, re-used own injecting equipment, used filter, spoon or flush water used by somebody else) and about the frequency of such behaviour over the preceding 90 days. Finally, participants were asked about needle-exchange attendance (age at which first attended and frequency of attendance over the last six months).

Physical and Mental Health

Participants were asked to rate their general health. In addition, individuals were presented with a ten-item physical health and a ten-item mental health assessment, and asked to report the frequency with which they suffered each symptom over the preceding 90 days. While these questions captured important data regarding participants' perception of their physical and mental health, this approach meant that no aggregate health score could be assigned to each individual and used as an objective comparative measure.

Additional questions in the health section were concerned with suicidal ideation, suicide attempts and sleeping and eating patterns. Participants were also asked an open-ended question about any specific health problems they might have had during the preceding 30 days.

Contact with Family, Social Care and Other Services

Participants were asked about the frequency of contact and conflict with family members and attendance at a range of social care services (stayed overnight in hospital, hospital accident and emergency departments, GP, social services, employment/training services, housing services and church/religious groups) over two time periods, in the 12 months prior to the intake interview and in the preceding 90 days. Participants were also asked if they had ever had HIV, hepatitis B and hepatitis C tests, when their last test was taken and the results of the tests.

Criminal Activity

Participants were asked if they had ever committed a list of offences (including drug dealing, acquisitive crime, assault, fraud/forgery/deception, soliciting and criminal damage) and how frequently they had committed these crimes in the preceding 90 days. Participants were asked if they had ever been arrested for any of the aforementioned crimes and the frequency of arrest over the preceding 90 days. Participants were asked if they had a prison history, the total length of time they had spent in custody, if they had any legal issues at the time of intake interview, if they had had any contact with the criminal justice system in the preceding 90 days, and if they had been the victim of a crime in the same time period.

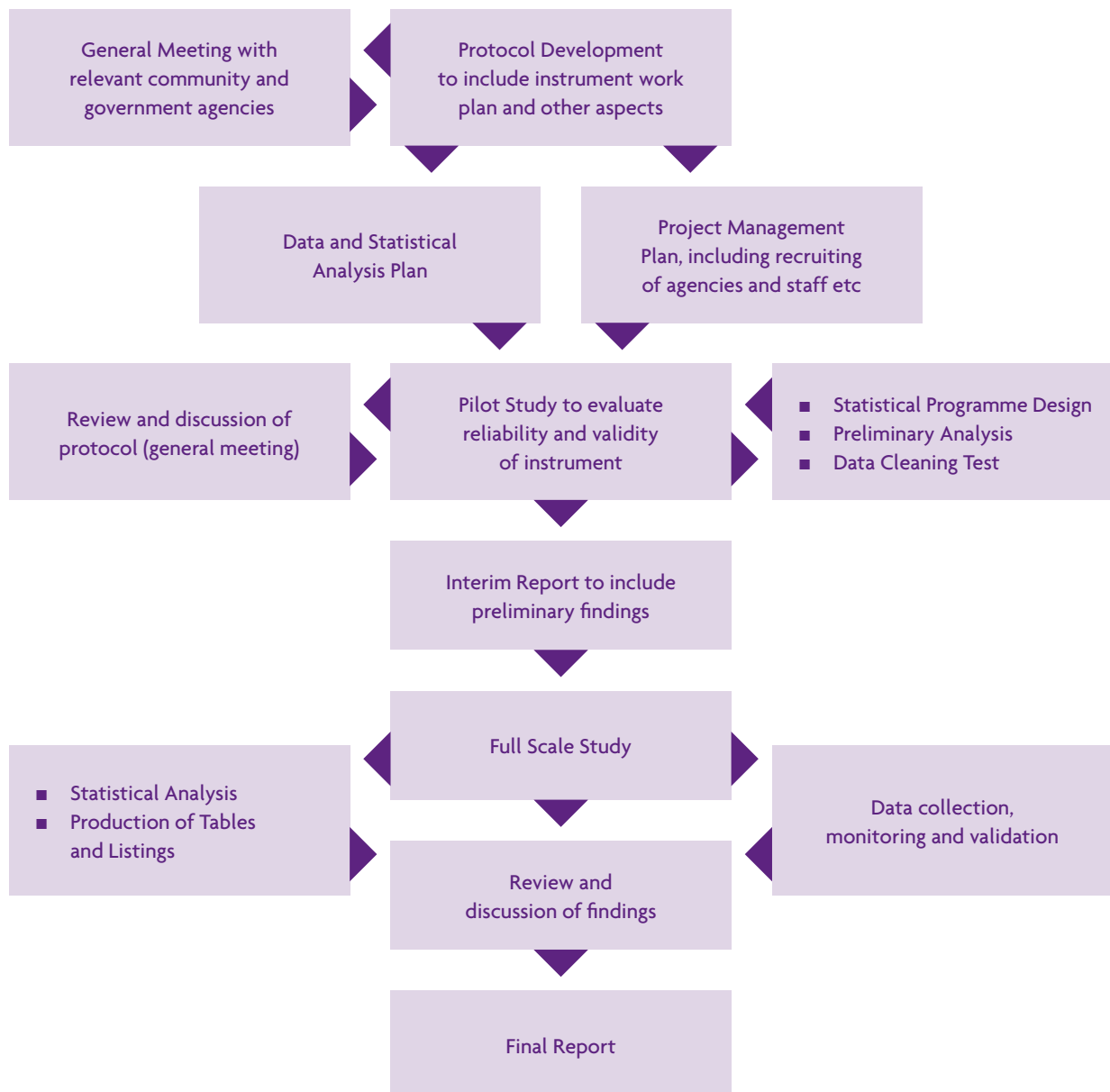
2.3 Designing the Study

The design of the ROSIE study is longitudinal and prospective in nature. It is a cohort study comparing within-treatment effectiveness in different treatment modalities and a range of treatment settings. Pre- and post-treatment comparisons were made without a control group, since it was considered unethical to have a control group who were opiate users but were excluded from treatment.

2.3.1 Experimental Design and Study Extension

In order to measure changes in the treated group, differences between intake responses and between each set of interviews were analysed. ROSIE recruited opiate users within 30 days of commencing a new treatment episode.

It was originally planned that participants would then be interviewed on two subsequent occasions at six months and at one year following recruitment. In **Chapter Three** it will be seen that following the 1-year interviews, the study was extended and participants were interviewed again three years after treatment-intake. An overview of the study execution process is given in **Figure 2.1**.

Figure 2.1 Overview of the Study Execution Process

2.3.2 Statistical Power and Sample Size Calculations and Plans

Following discussions on best practice at the RAG meeting in June 2003, it was decided that ROSIE would focus on retaining participants at the follow-up time points, rather than concentrating on maximising numbers recruited to the study, once sufficient respondents were available to permit valid statistical analysis. This approach may be unique in the drug treatment evaluation arena. Given that NTORS had recruited approximately 1,100 participants from a population of 50 million individuals (0.0022% of overall population), the RAG decided that a recruitment sample of 500 participants was more than sufficient for a population of four million (0.0125% of overall population). Resources would then be concentrated on securing a high percentage of follow-up. ROSIE allocated a full calendar year to recruitment. If 500 participants were recruited before the end of this period then the project would halt further recruitment. However, if at the end of the first calendar year of recruitment, recruited numbers were less than 500, focus would be switched to follow-up rather than additional recruitment.

Tables 2.3(a) and **2.3(b)** summarise the optimal sample size planned for the study, that is, the initial sample size aimed for by ROSIE. The sample sizes are accompanied in each table by the percentage that the sample size represents of the overall population. It is important to note that the planned allocation of sample sizes to modalities and treatment settings were chosen to broadly reflect the known distributions of the available services, while providing adequate numbers and sufficient sample size to allow comparisons. Sample sizes in **Tables 2.3(a)** and **2.3(b)** broadly reflect the data published by the Alcohol and Drug Research Unit (ADRU)² of the Health Research Board (HRB), demonstrating that the majority of participants' treatment settings are non-residential and the treatment modality of the majority of participants is drug substitution therapy within the former Eastern Regional Health Authority (ERHA) and counselling outside this region. However, as discussed earlier (see **Section 2.2.1**), counselling was omitted as a treatment modality.

Table 2.3(a) Planned Sample Sizes within Settings at Recruitment

	Setting						Total
	Inpatient			Outpatient			
	Hospital	Prison	Community	GPs	Community	Health Board	
Optimal sample size	50 (11.1%)	25 (5.6%)	75 (16.7%)	50 (5.6%)	75 (16.7%)	225 (50%)	500

Table 2.3(b) Planned Sample Sizes within Modalities at Recruitment

	Modality*				Total
	Methadone	Structured detoxification	Abstinence	Needle exchange	
Optimal sample size	325 (72.2%)	50 (11.1%)	50 (11.1%)	25 (5.6%)	450*

* The counselling modality was not included in ROSIE. Thus, the optimal sample size total is the sample size total including counselling, minus the counselling sample size: 500-50 = 450.

In order to ensure that sample sizes were sufficient to register significant changes within treatment settings, statistical calculations were performed to estimate the required sample sizes. Taking any key variable at an individual level, say risk of death from accidental overdose, the following assumptions were made:

1. Treatment lowers the risk of death, that is, the average number of episodes per group after treatment (\bar{x}_2) is lower than before treatment (\bar{x}_1).
2. A reduction of one or two in the mean numbers of episodes is significant, ($\bar{x}_1 - \bar{x}_2 = 1$ or $\bar{x}_1 - \bar{x}_2 = 2$).
3. Pre- and post-treatment groups are independent.
4. Numbers within groups pre- and post-treatment do not change.
5. The standard deviation of the mean number of episodes pre- and post-treatment is less than four. While this assumption was the most likely of all the assumptions to be violated, the ROSIE pilot study provided extra validation that it was true.

Given these assumptions, estimates of the required sample sizes are provided in **Table 2.3(c)**. For ethical reasons, this particular parameter was used to perform the sample size calculations since risk of death to a participant through overdose or suicide is the most important outcome variable. Furthermore, a reduction of one or two in the mean number of episodes within a group is clinically significant.

Table 2.3(c) Required Sample Sizes within Modality

Size of the reduction in mean number of episodes	Standard deviation estimate	Required minimum sample size within a modality
$\bar{x}_1 - \bar{x}_2 = 1$	s=1	6
$\bar{x}_1 - \bar{x}_2 = 1$	s=2	22
$\bar{x}_1 - \bar{x}_2 = 1$	s=3	49
$\bar{x}_1 - \bar{x}_2 = 1$	s=4	87
$\bar{x}_1 - \bar{x}_2 = 2$	s=1	2
$\bar{x}_1 - \bar{x}_2 = 2$	s=2	6
$\bar{x}_1 - \bar{x}_2 = 2$	s=3	13
$\bar{x}_1 - \bar{x}_2 = 2$	s=4	22

2.3.3 Statistical Analysis Plan (SAP)

The SAP provides a full description of the data analysis procedure for the ROSIE study. Although analysis procedures can change throughout a study, the general overall procedure and the analytical techniques applied to the collected data were as described in the SAP. The contents of the SAP included an overview of the analysis process, a statistical analysis schedule, a description of population subsets of analytical interest, criteria to decide if subjects would be evaluated, statistical methodology, methods for testing statistical assumptions and a description of the appropriate statistical evaluation software.

The SAP summarises the statistical analysis in two parts. Firstly, the establishment of intake figures determined the severity and nature of addiction. This allowed collection of appropriate data in follow-up for the purposes of comparison within treatment modalities and settings. Secondly, comparison analysis evaluates treatment effectiveness within either treatment modality or setting. No analysis has to date been made across settings. This comparative analysis was extended at 3-year follow-up to include comparison between 1-year follow-up and 3-year follow-up.

For the purpose of identifying sub-populations of interest, participants were defined according to their eligibility (see **Section 2.2.2** for description of study eligibility criteria). The two main types of sample populations considered for analysis were the *per-protocol* population (participants who completed all interviews and are deemed to have no major protocol violations), intent-to-follow population (participants who completed any part of the study and provided data for at least one time-point). Other sub-populations were defined on an *ad hoc* basis throughout the study.

The eligibility and compliance of participants was considered when examining criteria to decide whether data were suitable for evaluation. These criteria were:

- The inclusion criteria and exclusion criteria based on the interviewer's impression of the nature of the interview and its validity.
- Acceptable timing for visit dates: Intake interview must be conducted within four weeks from the start of the new treatment episode. Follow-up visits were scheduled to take place as close as possible to the six month or 1-year due visit date. For flexibility, an interval of time of +/- four weeks was accepted during which the follow-up interview could take place.
- Concomitant treatments: Section C17 of the questionnaire requests details of concomitant drug treatment undergone by the participants during the study.
- Participants entering the study on multiple occasions.

Listings of deviations from the protocol (violation of eligibility criteria and other deviations) were provided by the Project Manager in monthly reports and a decision on whether these protocol deviations were minor or major were made by the Project Manager following consultation with the Principal Investigators. Inferential statistics were then performed on sets of key variables. These are summarised in the coming chapters of this report. The inferential statistical analysis was generally performed on the intent-to-follow (ITF) population sub-sample. Details of the methods of analysis are given in the next section. Specific details on the *per-protocol* population are also provided in later chapters.

2.3.4 Statistical Methodologies

A number of statistical methodologies were used for the purpose of data analysis. The ROSIE data required statistical techniques that were suitable for the repeated aspect of the study. For example, the proportion that used heroin at intake and the proportion that used heroin at 1-year cannot be considered independent as there was an overlap in the subjects at these time points: the overlap being that all those investigated at 1-year are a sub-sample of those at intake. Thus, statistical techniques which considered this aspect of the data were the most suitable. Statistical significance refers to a p-value of less than 0.05. Each of the tests used in the remainder of the report are now detailed.

Consider the tabular form of the data displayed in **Table 2.3(d)**. Only differences in the number using at time point one and not using at time point two, and the number not using at time point one and using at time point two, will give an indication of a time effect in the data. In other words, a significant difference in n_{12} and n_{21} will indicate that there is something other than random variation contributing to a change in the using habits of those in this sub-sample. In this situation, McNemar's test is the appropriate analytical tool. Necessarily, only those participants appearing at both time point one and two were considered for the ROSIE analysis. This had implications in that, in some circumstances, the proportion of participants who displayed a particular characteristic at time point one, whilst differing largely from the proportion of participants who displayed the same characteristic at time point two, were not *significantly* different. This was often a consequence of the fact that the proportions do not correspond to the participants who completed interviews at both time points and it is that set of participants' responses on which analysis was carried out.

Table 2.3(d) McNemar's Test

		Using heroin at time point one	
		No	Yes
Using heroin at time point two	No	n_{11}	n_{12}
	Yes	n_{21}	n_{22}

When comparing data of the same nature but across three time points in the *per-protocol* group (**Chapter Nine**), Cochran's Q test statistic was applied. This is simply an extension of McNemar's testing procedure. In the event of a significant or close to significant Cochran's Q test, further analysis of all pair-wise comparisons between time points was performed.

When comparing sample means at two time points, a paired sample t-test was performed. This procedure, again, considered only those participants with recorded measurements at the two corresponding time points under analysis. For some of the comparisons considered, there were insufficient numbers of participants with recorded measurements at each of the considered time points for an analysis to be undertaken.

In circumstances where the data were ordinal and comparisons were to be performed between time points, the Friedman's Test was used.

This procedure considers the score given by a participant to a particular question at each time point under consideration. These scores are then ranked across time points. This is performed for each participant contributing a score to each time point and the ranks summed over each time points for all of the participants. If the time points have summed ranks that do not differ largely, then there will not be a significant time effect. On the other hand, if the summed ranks differ largely across time points this will result in a significant test statistic.

It should be noted that the results when comparing 1-year and 3-year follow-up for the *per-protocol* group are identical to the same comparisons between 1-year and 3-year follow-up for the full population. The *per-protocol* group encompasses those participants for whom data were collected at intake, 1-year and 3-year follow-up and thus coincides with the members of the full population who completed interviews at each time point and on whom comparative analysis was conducted.

It should also be noted that the data presented refer to the full cohort who completed each interview and that statistical comparisons were made on matched data or dependent pairs. In terms of presenting statistical comparisons, time points with a common letter subscript are statistically significant while those with no common letter subscript are not statistically significant. As an example, consider **Table 2.3(e)**, which is an excerpt from an analysis presented later in the report. For wage/salary, there is a statistically significant difference between intake and 3-years as they both have subscript 'b'. Similarly, there is a statistically significant difference between 1-year and 3-years for the wage/salary category as both time points contain the common subscript 'c'. However, there is not a significant difference between intake and 1-year for wage/salary as they do not have a common letter subscript (if there was, it would have subscript 'a'). For social welfare, intake does not significantly differ from either 1-year or 3-years as they do not have common subscripts, however, 1-year and 3-years do significantly differ from each other as they both have the common letter subscript 'c'.

Table 2.3(e) Analysis Example

	Intake		1-year		3-years	
	n %		n %		n %	
Main sources of income in the last 90 days						
Wage/salary	83	20.9 _b	59	19.3 _c	95	26.7 _{bc}
Social welfare	309	77.4	236	77.4 _c	260	72.8 _c

Note: matching subscript letters denote statistical significance.

2.4 Data and Project Management

In this section, the data management required for the study is considered. The compliance of the study with the Data Protection Act is discussed in detail. Next, the set-up of the participant information database and the associated security issues surrounding this are described. The Data Management Plan is introduced and the section concludes with a discussion on data quality control and the auditing process used when performing quality control checks on the data.

2.4.1 Data Protection Act

The Data Protection Act was established in 1988 to ensure individuals' privacy. Part of the Act states that organisations that maintain information on an individual must comply with data protection principles (for further information see <http://www.dataprotection.ie>). This Act clearly applied to ROSIE and as such, it was necessary to ensure compliance in terms of data protection.

The Data Protection Act as it pertains to the ROSIE study can be summarised in eight guidelines. These state that the data controller must:

1. Obtain and process the information fairly.
 - a. At the time when information about individuals is collected, are they made aware of the uses for that information?
 - b. Are people made aware of any disclosures of their data to third parties?
 - c. Has people's consent for any secondary uses of their personal data, which might not be obvious to them, been obtained?
 - d. Can the data collection practices be described as open, transparent and up-front?
2. Keep it only for one or more specified and lawful purposes.
 - a. Is the purpose (or purposes) for which personal information is kept made clear?
 - b. Are the individuals on the database also clear about this purpose?
 - c. If it is a requirement to register with the Data Protection Commissioner, does the register entry include a proper, comprehensive statement of the purpose?
 - d. Has responsibility been assigned for maintaining a list of all datasets and the purpose associated with each?

3. Process it only in ways compatible with the purposes for which it was given initially.
 - a. Are there defined rules about the use and disclosure of information?
 - b. Are all staff aware of these rules?
 - c. Are the individuals aware of the uses and disclosures of their personal data? Would they be surprised if they learned about them? Consider whether the consent of the individuals should be obtained for these uses and disclosures.
 - d. If it is a requirement to register with the Data Protection Commissioner, does the register entry include a full list of persons to whom personal data may need to be disclosed?
4. Keep it safe and secure.
 - a. Is there a list of security provisions in place for each dataset?
 - b. Is someone responsible for the development and review of these provisions?
 - c. Are these provisions appropriate to the sensitivity of the personal data kept?
 - d. Are computers and databases password-protected, and encrypted if appropriate?
 - e. Are computers and our servers securely locked away from unauthorised people?
5. Keep it accurate and up-to-date.
 - a. Is all the information needed to serve the purpose collected effectively, and are individuals dealt with in a fair and comprehensive manner?
 - b. Has a check been made to ensure that all the information collected is relevant, and not excessive, for the specified purpose?
 - c. If an individual asked for the justification of every piece of information held about him or her on computer, can this be done?
 - d. Does a policy exist in this regard?
6. Ensure that it is adequate, relevant and not excessive.
 - a. Is the computerised data checked for accuracy?
 - b. Is it known how much of the personal data are time-sensitive, i.e. likely to become inaccurate over time unless updated?
 - c. Are steps taken to ensure that the databases are kept up-to-date?
7. Retain it no longer than is necessary for the specified purpose or purposes.
 - a. Is there a clear statement on how long items of information are to be retained?
 - b. Is there clear awareness about any legal requirements to retain data for a certain period?
 - c. Are the databases of data that are no longer needed, such as data relating to former customers or staff members, regularly purged?
 - d. Is there a policy in place on deleting personal data as soon as the purpose for which the data were obtained has been completed?
8. Give a copy of his/her personal data to any individual, on request.
 - a. Is a named individual responsible for handling access requests?
 - b. Are there clear procedures in place for dealing with such requests?
 - c. Do these procedures guarantee compliance with the Act's requirements?

To ensure the ROSIE study complied with each of these rules, a Data Management Plan (DMP) (see **Section 2.4.3**), approved protocol, information sheet and informed consent form were prepared. The DMP included a full description of all procedures for the management of the information collected during the project. The SAP included a full description of all procedures for the analysis of the data collected during this project. The protocol and study proposal sought and gained approval from the Ethics Committee of the National University of Ireland, Maynooth.

The information sheet and consent form were approved by the Freedom of Information Office at the National University of Ireland, Maynooth. The consent of the individual participating in the study was obtained at the start of the study by the on-site ROSIE researcher, who had been trained in this process. A copy of the actual consent form, details on the assurance of confidentiality and an information sheet formed part of the ROSIE interview package given to each participant. Further, the consent of the participating treatment centres was obtained by the ROSIE team following a series of consultation and information exchange meetings.

To ensure that staff were aware of the rules pertaining to the study, a staff training scheme was established. To ensure the data were kept safe and secure, appropriate provisions were put in place. These provisions were based on the European Medicines Agency (EMA) Guidelines for Good Clinical Practice. All computers and databases were password-protected and the computer network was isolated and not connected to the main National University of Ireland, Maynooth computer network. The computers and servers were secured in the project office which was only accessible by authorised personnel and was monitored by 24 hour security.

Finally, as the National University of Ireland, Maynooth was already registered with the Data Protection Commissioner, approval of ROSIE procedures was obtained through the Freedom of Information Office.

2.4.2 Database Set-up and Data Security

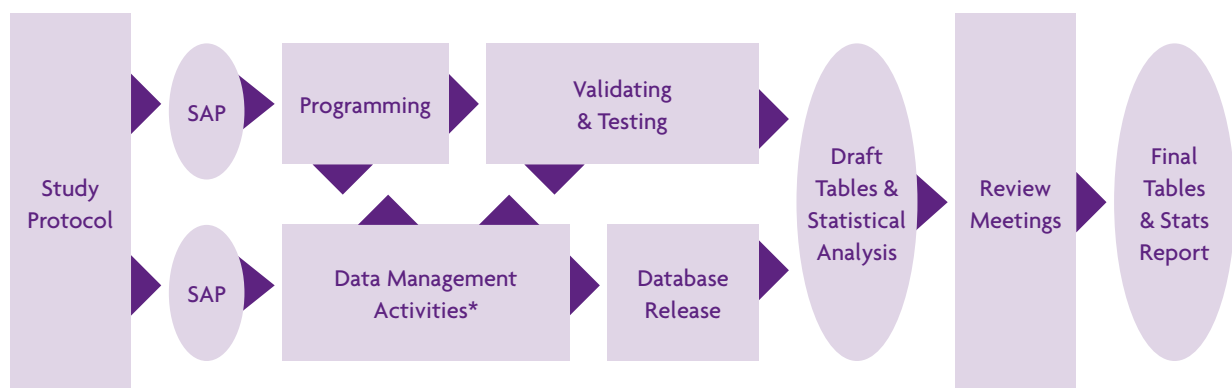
Each participant was assigned a unique ID number corresponding to their name, address and contact details. The contact information corresponding to a participant ID number was kept on a Microsoft Excel database for tracking and follow-up. This file was only accessible on the Project Administrator's password-protected personal computer. At the end of the study this file will be destroyed.

The remaining information gathered from the questionnaires was stored in SPSS databases. These three databases (intake, 1-year follow-up and 3-year follow-up) were kept separately on a secure server accessible only by password-protected personal computers. The unique participant ID number was used in all databases and was used for the purpose of merging datasets when necessary. No other variables corresponding to an individual, that is, which could be used to identify a participant, were used in SPSS. Personal information was removed from the original questionnaires and stored separately in a locked safe by the Project Administrator. This process was undertaken prior to questionnaires being transferred to the Data Administrator for the purposes of data entry.

2.4.3 Data Management Plan (DMP)

The DMP was established to provide a detailed description of all procedures for the management of the information collected during ROSIE. These procedures included data collection, database management, data protection and data cleaning. The data management flowchart is displayed in **Figure 2.2**.

Figure 2.2 Data Management Flowchart for ROSIE Study



* Data entry, data quality control, data security and dataset mapping.

The operation procedures for database management not only cover data entry but data quality control, data mapping, derived datasets and database lock. An annotated ROSIE interview instrument, known as the coding book, was produced to show SPSS dataset names, variable names, variable length and associated information including measure and values. The databases were then set up to conform to the coding book specifications. Data were entered onto the database on a regular basis, where possible, within five working days of receipt of the completed interview. When the database was declared complete, database lock was applied. This meant that the data were available for analysis but could not be accidentally modified.

2.4.4 Quality Control and Data Auditing

It was the Data Administrator's responsibility to ensure information was entered in a timely and accurate fashion. If a particular situation arose where there was confusion over an answer (data point) in the questionnaire, the interviewer was asked for clarification. To check the accuracy of the compiled data, an auditing procedure was established. These data audits were performed on the intake data (at least two audits), the 1-year data (one audit) and the 3-year data (five audits). Each audit involved a complete check of every question on 12 questionnaires selected using a stratified random sampling technique. Stratification was by interviewer, to ensure that checks were conducted on questionnaires from each. At the 3-year follow-up time point, each questionnaire comprised of 665 questions. Every question, in each of 12 randomly selected questionnaires, was audited. This comprised a total of 7,980 data points. In addition, for every questionnaire in the 3-year database, 87 of the most important and 36 of the less important questions were audited. As the 3-year database was audited five times, this means that the total number of data points audited was 76,431. The percentage of errors found during the auditing process was very low: 0.14% or 107 errors/incorrect data entries of all of the audited data points. Given this very low error rate, the ROSIE team are confident in the accuracy and quality of the data that were used to perform the statistical analyses.

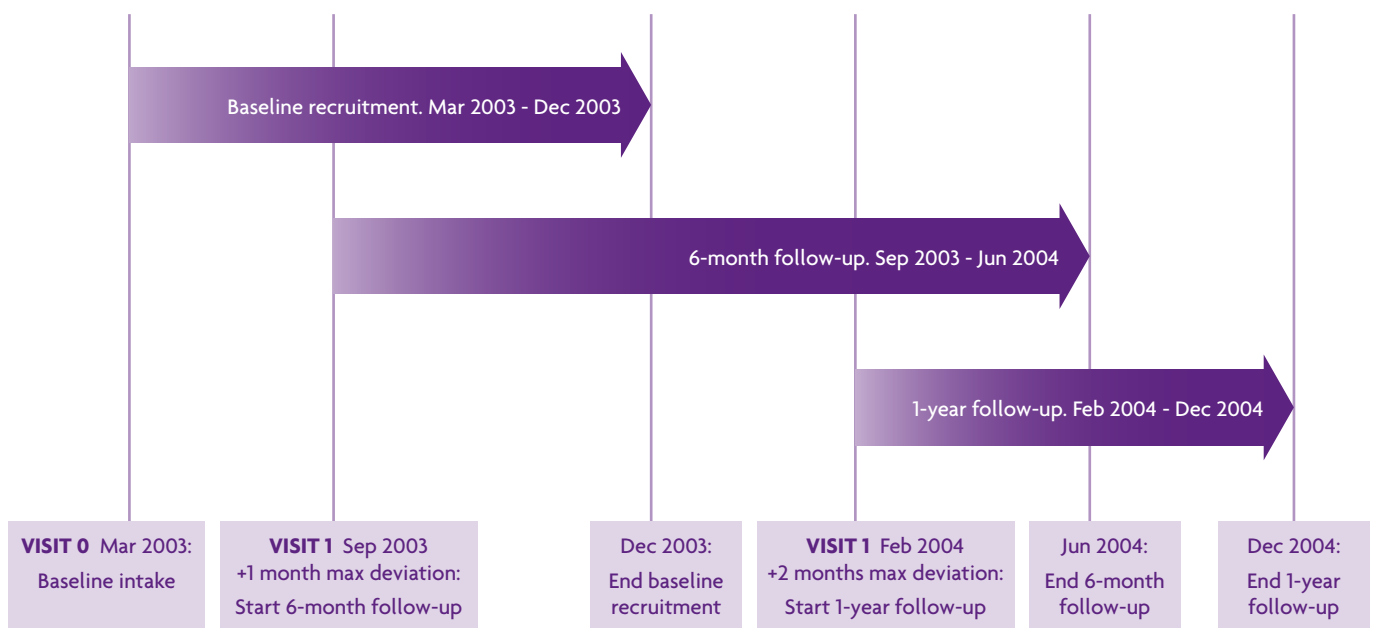
2.4.5 Project Management and Planning

The original time frame of the study is summarised graphically on the following timeline.

Figure 2.3 Overview of the Original Project Timeline

Interview Schedule Timeline

Illustration of the visit schedule for an individual client enrolling in March 2003 and timelines for the full cohort.



Milestones and outcomes were also planned, as follows:

September 2002 - December 2002

1. **Milestones:** To prepare and submit detailed project proposal for ethical review.
Outcome: Project proposal receives ethical approval from the NUIM Ethics Committee.
2. **Milestones:** To organise a preliminary meeting with relevant bodies, including the Centre for Drug Misuse Research (Glasgow, Scotland), National Institute for Regional and Spatial Analysis (NIRSA), NUIM, Merchant's Quay Project, Baggot Street Clinic and the relevant local task forces and community agencies.
Outcomes: Compilation of an overview of current client base and treatment modalities within Ireland, confirmation of collaborative parties, dissemination of information to treatment providers with regard to the project.
3. **Milestones:** To draw up a protocol detailing the Data and Project Management Plan to be applied at all the sites, including precise information on objectives to be reached, research questions to be answered, methods to be applied, staff to be dedicated and other related information.
Outcomes: A Maudsley-based instrument for the analysis of a set of primary outcomes, a detailed work plan for the collection of data at relevant sites, a time schedule for interim reports and general meetings.

January 2003 - December 2003

4. **Milestones:** To train research associates and supervise the application of the common protocol by two relevant bodies (Pilot Study of 60 participants) in order to ensure data compatibility, comparability, reliability and attrition rates. To adapt the data protocol according to experience and information gained from the pilot in the first six months.
Outcomes: Report and analysis of pilot study, refinement and production of the final project instrument and the setting up of a central database for collating and analysing information prior to the extension of the protocol to all relevant sites.
5. **Milestones:** To extend the protocol to all relevant additional sites, by supervising recruitment of approximately 500 participants and the application of the common protocol in order to again ensure data compatibility, comparability and reliability. It was envisaged that the 500 participants would be recruited between March and December 2003, following a period of quality assurance, liaison and training within all treatment centres involved.
Outcomes: The recruitment of 500 participants and the submission to the National Advisory Committee of the 1-year interim report containing synthesis and analysis of the pilot data, information on the implementation of the data protocol and on the gathering of primary data from the recruitment stage.

January 2004 - December 2004

6. **Milestones:** To supervise the gathering of the additional information on six months and 1-year follow-ups at all sites. To analyse on a common basis the material from the sites, comparing pre-treatment outcomes with 1-year follow-up outcomes.
Outcomes: To submit to the National Advisory Committee the two year (after the starting date) progress report, containing:
 - Recruitment and early follow-ups.
 - Synthesis and analysis of the data collected at all sites.
 - Preliminary identification of key qualitative and quantitative indicators.
 - Preliminary recommendation on how these might be further utilised and developed.

To complete the 1-year follow-up collection of data at all sites and supervise data cleaning and quality control.

January 2005 - June 2005

7. **Milestones:** To analyse the complete set of data and derive the final findings, following the Statistical Analysis Plan described earlier.

Outcomes: A complete final report will be submitted to the National Advisory Committee containing:

- Measurement of the nature of opiate use and related problems in Ireland.
- Outcome measures on the effectiveness of treatment/prevention strategies, including: indicators of successful cessation/reduction of drug use, changes in physical and mental health symptoms, changes in criminal behaviour and changes in personal/social functioning.

By establishing both a timeline and a plan of milestones and outcomes the progress of the evaluation could be easily tracked and measured. Delays could be quickly identified and procedures relating to the delay either adjusted, or in some instances goals redefined. An example of how changes in follow-up procedures improved the overall follow-up rates is provided in the next section.

2.5 Databases and Field Methodology

This section considers the databases that were established to yield high follow-up rates in the study. Approaches to fieldwork are also described. As the study evolved, the follow-up strategies and databases developed to assist with the follow-up process were refined.

2.5.1 ROSIE Databases

The Contact Database

Information on the individuals who participated in the study was held on two databases: the Contact Log and the Follow-up database (both in MS Excel), which were maintained by the Project Administrator. No other personnel had access to these databases and the Project Administrator was responsible for the input, security and filing of all participants' details. At intake, participants were requested to provide locator information to ensure regular contact was maintained throughout the research period.

This information was entered onto the Contact Log and each participant was assigned a unique ID number. This ID number was logged on the first page of each questionnaire and the respondent's personal details were entered on the following page. This page was removed after interview and filed in a secure lock-in safe. Thereafter the questionnaire was analysed by participant ID number only to safeguard the participant's privacy. Aside from locator information, the Contact Log contained other relevant information such as participant date of birth, treatment setting, the original interview date and the final interview due date.

The Follow-up Database

The Follow-up database was used to track participants' whereabouts through the entire project from intake interview to final interview. Each participant's treatment setting was also noted, including date of intake interview and due date for the following interview stage. Used on a daily basis, all attempts at making contact with respondents through either post or telephone were logged and the data, including who had been spoken to, time and date, were entered into the spreadsheet. This file was used as the central database to track all individuals over the 3-year period. The file was colour-coded to monitor the status of each participant at that particular time, where status referred to interview completion, tracking information and interview arrangement and completion. For example, yellow indicated 'interview completed', orange indicated 'interview arranged', green indicated 'participants to be pursued' and so on. This colour-coding strategy was extremely useful given the large number of participants in the study.

Database Usage

When the project commenced in 2003, the follow-up database was split between researchers. Each researcher tracked participants on their own list and provided feedback progress to the central database held by the Project Administrator. From 2006, the Project Administrator maintained full control of the database for the final 3-year follow-up to monitor all participants centrally. This was conducted in order to prevent duplication of information and to ensure that participants were followed-up. Importantly, it was felt that one person making contact with various centres/services would encourage familiarity with the study and foster further co-operation. However, towards the end of the final 3-year follow-up, another researcher assumed responsibility for any participants whose interviews had not taken place and who were thought to be homeless, and attempted to contact them through the various homeless services in Dublin. Any information subsequently obtained was noted on the central follow-up database.

The Follow-up database was divided according to the date when participants were due to be interviewed. At the onset of each new follow-up interview, participants were contacted in monthly batches by post at least one month prior to their due interview date. If a reply was not received within one week, attempts were made to contact the participant by telephone. Tracking was undertaken through a number of different avenues when the respondent could not be contacted directly. These methods are outlined in the next section.

2.5.2 Sources for Participant Follow-up

Prior to any follow-up information being sought, participants' permission to be contacted directly and through nominated third parties was obtained at the intake interview.

Central Treatment List at the Drug Treatment Centre Board

The Central Treatment List provides treatment details for individuals currently receiving methadone treatment in Ireland, including through the prison services. Each month a list was compiled of individuals (who could not be contacted through the traditional methods of telephone or correspondence) and this was submitted to the Drug Treatment Centre Board (DTCB) along with respective dates of birth. Any individuals who remained outstanding from the previous month were also submitted in the event that they had recently commenced methadone treatment. The DTCB would then check the list against those in treatment and provide details of treatment providers, including GPs, where study participants were currently attending for methadone. Contact could then be made with the participant through the treatment provider *only* if previous attempts by post and telephone had proved unsuccessful and *only* when prior permission had been received from the treatment provider.

Once permission had been obtained, a researcher went to meet the participant at the treatment site when his/her next appointment was due, in anticipation of undertaking the interview either on site or elsewhere. The participant was under no obligation to participate in the interview.

Prison List

An additional list of outstanding participants was submitted to the Co-ordinator for Drug Treatment Services for Prisons who could identify any participants being held in custody around the country. At the end of each month a list of untracked participants was submitted which also included outstanding participants from previous months in the event that they had recently entered custody. In addition, current court lists were checked (<http://www.courts.ie>) and should a participant's name appear for mention/sentence, they were also included on the above list. It should be noted that without a date of birth to cross-check against it was not known whether this was a ROSIE participant or simply a ROSIE participant's namesake. However, the Co-ordinator for Drug Treatment Services would confirm any participants (along with date of birth) currently in custody and where they were being held. Information such as the release date of participants and last address given by the participant was also provided. Should this address differ from our original and last address, it offered another means of contacting the participant and correspondence was then forwarded.

Treatment Providers

Treatment providers were invaluable in assisting with tracking participants. At regular intervals throughout the research period, treatment services were contacted to identify any ROSIE participants who were currently accessing their services, whether the participant had accessed services in the past or received onward referrals. In some instances, if the individual was initially recruited at that particular treatment service, the service providers still had some contact with the participant either through after-care services or drop-in services, thus re-establishing contact for follow-up.

Homeless Organisations

With permission obtained from ROSIE participants at the intake interview, assistance could be sought from homeless organisations such as the Homeless Network, Focus Ireland, the Homeless Persons Unit and various hostels. These organisations were able to confirm if an individual was homeless and contact could subsequently be made with hostels in the area or areas where participants had previously stayed.

Community Organisations

Agencies such as the Community Drug Teams (CDTs) and Community Centres provided information on participants' whereabouts. They also advised if participants were in contact with any community services.

Health Board Services

According to the last known address of a participant, a social/outreach worker responsible for the area concerned was contacted to determine if the participant was known to them.

Welfare Services

With the co-operation of the Probation and Welfare Services, ROSIE was able to make contact with participants released from prison and assigned to a Probation Officer, or undertaking any training courses or workshops. The Department of Social and Family Affairs assisted the study in forwarding ROSIE letters to participants who were in receipt of social welfare since the study commenced.

2.5.3 Difficulties Encountered

A lack of knowledge and awareness of the ROSIE study was an obstacle to acquiring information and accessing services for interview purposes. Unfamiliarity with the study along with turnover of staff in services meant that service providers could be reluctant to divulge personal participant information and/or to facilitate arrangements to meet participants on site. In such circumstances, information and reports on ROSIE were forwarded to the provider and a follow-up telephone call was made a few days later.

As the research process spanned over five years, change of address and mobile telephone numbers were a frequent occurrence among participants. Maintaining regular contact proved to be quite challenging especially with a small sub-group of participants who were homeless at the recruitment stage. If someone was not contactable through telephone numbers or addresses, the process of tracking often proved to be protracted and complicated. It was not uncommon to make dozens of telephone calls over a period of three to six months to try to contact hard-to-reach participants through family, friends, treatment providers and other services.

Some participants were considered to be 'chaotic' users, that is, they were particularly difficult to contact as they were homeless, did not access services on a regular basis or did not remember the study and consequently did not respond to any contact. Further, other participants who had successfully undergone treatment, had been drug-free for some time or who were in regular employment, also proved difficult to contact and did not respond to contact efforts. Of these participants, many expressed the need to move on from that period of their lives or believed that their continued input to the study was no longer relevant. Furthermore, other participants were reluctant to interview if they were still using or felt embarrassed at their continuing use and/or lack of progress in terms of treatment. In these instances, the value of their contribution to the study was emphasised. A gift voucher of €20 was offered to all participants at the 1- and 3-year follow-up stages in recognition of their contribution to the project. The final follow-up rate of 90% was particularly high when compared with similar international studies.

2.5.4 Conducting Interviews

Once contact had been established with the participant and they had agreed to be interviewed, the interview was arranged in a place and time of the participant's choosing, usually in the participant's home or in a café. On those occasions where contact was not directly made with the participant but they were known to be in treatment, contact and interview were conducted on site only with the permission of the treatment provider.

Questionnaires were administered through face-to-face interviews with respondents. At intake, the interviews took approximately one and a half hours to complete, due mainly to the lengthy background and demographic information required from the participant. Subsequent ROSIE interviews were considerably shorter and took approximately 30 minutes to complete. However, the time required to conduct the interviews could vary enormously if the participant was using drugs at the time (information could be difficult to obtain and the interviewer was required to repeat or clarify the questions) or if the participant was simply talkative and willing to discuss their treatment or current situation in more detail. In these situations, interviews could again take between one and one and a half hours to complete.

2.5.5 Ethical Concerns and Interviewer Safety

Full and informed consent was obtained from all those participating in the ROSIE study.

At the recruitment stage, all participants were informed about the study and given an information sheet and a consent form to sign. If at any stage of the follow-up a participant decided to withdraw from the study, their decision was respected and a note made on the follow-up database.

The participants in ROSIE had the right to remain anonymous and this was respected in that no identifying information about participants was revealed. Appropriate precautions were taken to protect the confidentiality of both participants and data. All data were stored in a locked room and obligations to participants under the Data Protection Act were followed.

Several measures were taken to ensure the safety of all interviewers at all times during the study. Firstly, a diary was kept with interview locations, interview times and the mobile telephone number or contact details of the participants involved. Secondly, interviewers were required to check-in by telephone after each interview both to inform the office that the interview had been successfully completed and to ensure the safety of the interviewer.

Participants were asked many personal questions about their drug use, homelessness and assault, including sexual assault, as well as sexual relationships. Personal issues surrounding these topics could be a source of emotion and distress and it was necessary that interviewers handle such situations with due sensitivity and care. This was ensured in a number of ways: more experienced fieldworkers met with participants known to have had emotional responses previously, or who were deemed chaotic. All researchers carried a list of suggested referral services for participants who felt in need of advice or assistance. Throughout all interviews, participants were reassured that should they feel uncomfortable about particular sections of the questionnaire they were under no obligation to respond.

It was important to ensure interviewers were completely comfortable with the format of the questionnaire, with all questions posed in the same manner to maintain consistency. New interviewers were required to spend a week familiarising themselves with the questionnaire and conducting role-play interviews with experienced fieldworkers. Meetings were held with new interviewers after their initial interviews to assess how the interview went and to address any questions or difficulties. A brief assessment of their completed questionnaires was also conducted.

Some interviews could be very long and demanding, for example, if a participant was showing signs of being under the influence of drugs or alcohol or if a particularly sensitive issue, such as sexual abuse, was raised. On such occasions, the interviewer could approach the senior fieldworker regarding any concerns or difficulties they encountered. Steps were also taken to ensure that interviewers were not over-stretched. Accordingly a usual limit of three interviews was set for any particular day. Fieldworkers also had daily contact with the Project Manager and were encouraged to debrief on a regular basis.

2.5.6 Limitations of the Study

No control group was used in ROSIE and participants were not randomly allocated to particular treatment conditions. In addition it should be borne in mind that drug users may avail of numerous forms of treatment over a 3-year time period. Therefore a participant recruited from a detoxification facility at intake may be receiving methadone from a GP at 3-year follow-up. The design of the study does not allow for changes in areas such as crime, drug use and health symptoms to be attributed to the influence of a particular treatment factor.

The data in the ROSIE interviews are gained through self-reporting from the participants. There is some debate about the reliability of self-report. However, Darke (1998) found through extensive reviews of the international literature, that self-report relating to information about drug use, criminality and HIV risk behaviours was valid and reliable when compared to information obtained through urine testing and independent collaboration. In addition, Bell (1998) argues that self-report provides us with more in-depth information about frequency, amount and pattern of drug use and other variables than would be gleaned from the testing of biochemical markers or urine testing.

Another issue to consider is information bias and in particular recall bias. Recall can be affected by factors such as time delay, wording of questions and possibly qualities of the researcher (Ashworth, 2005), while Del Boca and Noll (2002) state that respondent recall can also be influenced by opiate withdrawal, fatigue and mood. However, they also suggest that recall bias can be limited by relating questions to specific time periods. Accordingly, participants in the ROSIE study were asked questions in relation to specific periods of time such as 90 days and six months.

2.6 Closing Remarks

In this chapter, the design, research and management of the ROSIE study have been considered in detail. Throughout any study, there is a learning curve, and ROSIE was no different in that respect. At an early stage in the process, the importance of the study design, research instrument, analytical techniques and implementation became abundantly clear. Through appropriate management and training, the study evolved and surpassed all expectations in terms of follow-up and data richness and quality. This is illustrated in both the quality control results and increases in follow-up rates from 1-year to 3-years which are presented in **Chapter Three**. Future researchers should be cognisant of the fact that failure to perform in-depth research into the design, execution and management of the study may result in situations where the data are, in effect, useless.

CHAPTER THREE: RECRUITMENT, FOLLOW-UP AND MORTALITY

3.1 Introduction

This chapter provides information on the numbers recruited at intake within each of the modalities and settings. Some data on the level of coverage achieved and the geographical distribution of the services that collaborated with the research at the recruitment stage are also provided. The follow-up rates achieved at each time point of the original study protocol are also discussed. This chapter highlights how evaluation is a dynamic process that must evolve with the circumstances encountered during the longitudinal research process. This is illustrated by describing changes made to the original study design and discussing how these changes enhanced the research and the subsequent follow-up rates. Detailed results on follow-up rates at each time point are included, with information on those followed-up but not interviewed and data on the numbers and causes of death observed within the study. Finally, the reliability of results from a body of research should always be questioned in terms of the accuracy and quality of the data collected. **Chapter Two** details the quality assurance procedures and quality control measures that were developed for this study. The current chapter presents the results of these rigorous quality control checks. The data quality was of a very high standard and the results on treatment outcomes in **Chapters Four** through to **Nine** are based on clean and accurate data.

3.2 Recruitment Rates

Chapter Two established that ROSIE had initially intended to recruit 500 participants to the study within a nine month period. As discussed, this optimal sample size was revised to 450 due to exclusion of the counselling modality. Recruitment was conducted from late September 2003 to early July 2004. Originally it was planned that recruitment would commence in March 2003 following a brief pilot study period. However, during the pilot study it became apparent that many new treatment places had been filled in the recent past. Accordingly fewer eligible individuals were available for recruitment than had been anticipated and the Research Advisory Group (RAG) discussed the possibility of widening the inclusion criteria to include clients not new to treatment. This proposal, while increasing the sample size, would have substantially changed the study design and was rejected. As a result a total of 404 people, who met the original inclusion criteria, were recruited to ROSIE. The breakdown of participants recruited across treatment modality and setting is given in **Table 3.2(a)**.

Table 3.2(a) Intake Study Recruitment by Modality and Treatment Setting

	Setting	Modality				Total
		Methadone programmes	Structured detoxification	Abstinence programmes	Needle exchange	
Inpatient	Hospital		33			33
	Prison	5	14			19
	Community		12	70		82
Outpatient	GPs	54				54
	Community	48		12	17	77
	Health Board*	108	22		9	139
Total		215	81	82	26	404

* A new agency, the Health Service Executive (HSE) assumed responsibility for the health service in the Republic of Ireland on January 1, 2005.

Comparisons of these results with the planned sample sizes described in **Chapter Two** are provided in **Table 3.2(b)** and **Table 3.2(c)** below. The tables summarise the optimal sample size and that achieved in ROSIE. The sample sizes are accompanied in each of the tables by the percentage that the sample size represents of the full population. While there are some clear differences in both the sample size and the percentages in many of the numbers in the tables, these differences are not large enough to affect the overall conclusions and effectiveness of model-fitting and other statistical and analytical procedures.

Table 3.2(b) Planned and Achieved Sample Sizes by Setting at Recruitment

	Setting						Total
	Inpatient			Outpatient			
	Hospital	Prison	Community	GPs	Community	Health Board	
Optimal sample size	50 (11.1%)	25 (5.6%)	75 (16.7%)	50 (5.6%)	75 (16.7%)	225 (50%)	500
Overall achieved	33 (8.2%)	19 (4.7%)	82 (18.2%)	54 (13.4%)	77 (19.1%)	139 (34.4%)	404

Table 3.2(c) Planned and Achieved Sample Sizes by Modality at Recruitment

	Modality*				Total
	Methadone programmes	Structured detoxification	Abstinence programmes	Needle exchange	
Optimal sample size	325 (72.2%)	50 (11.1%)	50 (11.1%)	25 (5.6%)	450*
Overall achieved	215 (53.2%)	81 (20.0%)	82 (20.3%)	26 (6.4%)	404

* The counselling modality was not considered in ROSIE. Thus, the optimal sample size total is the sample size total including counselling, minus the counselling sample size: 500-50 = 450.

The sample sizes achieved broadly reflect the data published by the Alcohol and Drug Research Unit (ADRU) of the Health Research Board (HRB).

3.3 Site Selection and Geographical Coverage

As described in **Chapter Two**, ROSIE was designed not as a randomised control trial with specific numbers of participants allocated to a treated or control group within certain geographical locations, but as a study that reflects the availability and distribution of treatment service provision nationally. Recruitment began in early 2003 with enrolment of participants to the pilot study, as discussed in **Chapter Two**. The majority of the 404 participants in ROSIE were recruited between September 2003 and July 2004. All participants recruited were entering a new treatment episode (see **Section 2.2.2**).

Study recruitment was carried out in 19 methadone clinics within the Greater Dublin area. These clinics had the capacity to facilitate new treatment-intakes over the recruitment period. Many clinics outside Dublin were full to capacity and unable to facilitate new clients over the study period. Nevertheless, study recruitment was undertaken in seven clinics outside the capital city. In addition GPs contacted via the Central Treatment List and followed-up with telephone calls and letters resulted in 30 GPs participating in the study and assisting the study with access to clients for study recruitment. All residential drug treatment facilities in the country that worked with an opiate using clientele were included in the selection process. Interviews were undertaken in nine such facilities.

Finally, intake study recruitment was carried out in the three main inpatient facilities in the country and in one outpatient facility.

An estimated 54 different services provided by approximately 44 separate agencies and/or organisations participated in the ROSIE study intake recruitment. These agencies provide treatment/rehabilitation services to opiate users in both inpatient and outpatient settings. Agencies across all former health board areas (Eastern Regional Health Authority, the South-Eastern, Mid-Western, Western, Midlands and North-Eastern Health Boards) were included with the exception of the Southern and North-Western Health Board areas, however clients residing in these areas were recruited to the study.

In order to provide information on the coverage of the treated population achieved by ROSIE, the ROSIE recruitment figures were compared, where possible, with those of the National Drug Treatment Reporting System (NDTRS) for 2003. The NDTRS reports that there were 4,900 cases³ of commenced or re-commenced treatment for problem drug use in 2003, giving ROSIE a national coverage rate of approximately 8% of all new treatments. In addition, NDTRS reports that there were 1,265 cases of commenced or re-commenced methadone-based treatment and 682 cases of detoxification programme commencement. ROSIE recruited 215 participants within the methadone modality and 82 participants within the detoxification programme representing national coverage of approximately 17% and 12% respectively. The NDTRS figures are based on a calendar year, which does not match the time frame of ROSIE recruitment, but the data nonetheless provide some information on the scale of the ROSIE study in that the coverage rates achieved by ROSIE are well in excess of other national treatment outcome studies, where coverage rates are seldom published but are estimated to be in single figures and below 5% (private communication, N. McKeganey, DORIS, Scotland).

3.4 Follow-up Rates

In the previous section it was outlined that it was originally planned to recruit 500 participants, all of whom were new to treatment. This target of 500 individuals was not possible, primarily due to the non-availability of new treatment places. Furthermore, although it was originally planned to recruit participants from March 2003, this was delayed until September 2003, since it was agreed that meticulous study design and implementation in the early stages would be of benefit to the ultimate success of the project and additional time was taken to ensure that this was done to the highest standard. Delay was also encountered as recruitment of services and participants was slow in the early stages of the project. The combined effect of these changes was that while recruitment was achieved within the intended nine month period, the time period had shifted and scheduled six month follow-up interviews were due to be completed at the same time as the research team was still recruiting to the study. Thus the six month follow-up rate was affected, since priority at that time was given to recruitment.

Extensive efforts were made to contact and interview all 404 individuals who had participated in study recruitment at six months. **Table 3.4(a)** shows that while a total of 82% (n=332) of participants were located at six months, 59% (n=237) of the study population successfully completed the interview. The follow-up rate was lowest in the abstinence-based modality at 49% (n=40). Across all other modalities, over half of each group completed the six month follow-up interview. In total 8% (n=34) of the study population was not tracked.

Table 3.4(a) Follow-up Rates at 6-Months

	6-Months	
	n	%
Follow-up rates at six months		
Successfully completed six month interview	237	58.7
Declined to be interviewed	15	3.7
Located but not interviewed	80	19.8
Not located	38	9.4
Not tracked	34	8.4

³ Number of cases includes individuals who commence more than one treatment episode in the period being measured.

Follow-up rates improved considerably and were comparable with similar international studies at the 1-year follow-up time point. By this stage, respondents and services were familiar with ROSIE and it had an identity.

At 1-year the location rate rose to 92% (n=373). Full interviews were carried out with 75% (n=305) of participants, 0.5% (n=2) were deceased, 4% (n=16) declined to be interviewed and 12% (n=50) were located but not interviewed. Of those participants who were located but not interviewed, five participants had left the country, ten participants were on a methadone programme, one participant was in residential treatment and one was in a detoxification programme (Cox *et al*, 2006). Details of these results are in **Table 3.4(b)** below.

Table 3.4(b) Follow-up Rates at 1-year

	1-year	
	n	%
Follow-up rates at 1-year		
Successfully completed 1-year interview	305	75.5
Declined to be interviewed	16	3.9
Located but not interviewed	50	12.4
Not located	31	7.7
Deceased	2	0.5

The low interview rate at six months suggested that data on outcomes at this time point could have biased results as they might not have reflected the results of the full cohort. However, higher follow-up rates were achieved at 1-year. Therefore the six month analysis was set aside, particularly as the international literature showed very little change from six months to 1-year, and 1-year was targeted for a higher follow-up rate. This gave the added benefit of an additional time point at which participants could be measured and also provided a time point at which to measure the sustainability of changes observed in the 1-year outcome measures. This, as shall be seen from the follow-up rates at 3-years, contributed significantly to the study and clearly demonstrates the necessity for a flexible study design and protocol that can react rapidly to both internal and external forces.

The follow-up rate and location rate obtained by ROSIE at the 3-year follow-up time point exceeded that of comparable international studies and was in direct contrast to the usual trend of decreasing follow-up rates as time progresses. At the 3-year time point 97% of all the original participants were located, of whom 4% (n=14) withdrew from the study and 88% (n=357) successfully completed interviews. This was an improvement on the 1-year follow-up as some participants who had declined to be interviewed at that stage, decided that they would like to take part in the study at the 3-year time point. At 3-years, 1.5% (n=6) of participants were deceased and one participant was in a coma. Of the participants who were located but not interviewed, four participants were living in another country and eight participants were on a methadone programme, while none of those participants were in prison. The details of the results are provided in **Table 3.4(c)** below.

Table 3.4(c) Follow-up Rates at 3-years

	3-years	
	<i>n</i>	%
Follow-up rates at 3-years		
Successfully completed 3-year interview	357	88.3
Declined to be interviewed	14	3.5
Located but not interviewed, of whom <i>Living abroad n=4</i> <i>Methadone programme n= 8</i> <i>No data available n= 2</i>	14	3.5
Not located	12	3.0
Deceased	6	1.5
Ineligible: Hospitalised/incapacitated	1	0.2
Total	404	100

3.5 Mortality Rates

Drug use increases the risk of premature death. Drug-related deaths can occur from direct causes, for example overdose, and indirect causes, for example infections such as hepatitis and HIV, spread from sharing injecting equipment, as well as from accidents, violence and suicides while under the influence of drugs (EMCDDA, 2004). According to the EMCDDA, drug-related deaths and deaths among drug users is one of the five key indicators of drug misuse in Europe. It is difficult to establish the number of deaths among drug users in Ireland per annum but it is estimated to be from 60 to 90 per annum (Long *et al*, 2005b).

From **Table 3.5(a)**, it can be seen that the ROSIE study 3-year mortality rate was 1.5% (95% CI⁴: 0.5%, 3.2%). Six of the 404 participants died between the start of recruitment in September 2003 and the end of 3-year follow-up interview period in July 2007. Two of these deaths occurred within the 1-year follow-up period. The mortality rate for the population at 1-year was very low at 0.5% (n=2) (95% CI: 0.06%, 1.8%) when compared with the NTORS rate of 1.2% or the rate of 1.8% in Smyth *et al*'s (2005) follow-up study of opiate users seeking inpatient treatment in Dublin. Over a four year period, the NTORS reported annual mortality rate of 1.2% was six times higher than the mortality in an age-matched population (Gossop *et al*, 2002). However, the ROSIE confidence interval for the mortality rate at 1-year includes the two point estimates. In an attempt to ensure accuracy, the names of all participants for whom follow-up interviews were not achieved were checked against the General Death Register both at the 1-year and the 3-year follow-up time point.

All of the deceased were male and ranged in age between 26 and 52 years of age. There was no single common cause of death amongst these participants. Two participants died from a drug overdose, a further two died as a result of a brain haemorrhage, one died in a road traffic crash and one participant was murdered. In terms of treatment modality, three of the deceased were recruited from the methadone modality, two were recruited from the detoxification modality and one was recruited from the needle exchange modality.

⁴ Confidence Interval.

Table 3.5(a) Details of Causes of Death

Age at death	Gender	Cause of death (per death certificate)	Intake modality
52	Male	Overdose	Methadone
26	Male	Methadone overdose	Detoxification
28	Male	Brain haemorrhage during operation	Detoxification
33	Male	Beaten and stabbed (murdered)	Methadone
33	Male	Brain haemorrhage	Needle exchange
30	Male	Motorbike accident	Methadone

Information concerning the deaths of these individuals was obtained from a number of sources. Family members reported four of the deaths. A member of staff at a drug treatment facility reported another of the deaths while information concerning the death of one individual was obtained from newspaper reports. The Death Registrar in Dublin confirmed all of the deaths with the exception of one individual who died in the United Kingdom and who was thus not recorded on the Irish Death Register.

Overdose is the main cause of death among heroin users in the EU (EMCDDA, 2004) and this is reflected in the results from ROSIE. It was established that two of the participants died directly from overdose while another two participants developed brain haemorrhages. It was not possible to ascertain whether the other two deaths were caused indirectly because of their drug use. However drug users, and in particular those who are injecting, are ten to 20 times more likely to die from AIDS, other infectious diseases, violence, accidents and suicide than the general population (EMCDDA, 2004).

Each of the six deceased participants from the ROSIE study was male. This reflects the trend that male opiate users have a higher risk of death than female opiate users (Gossop *et al*, 2002). This could be explained by more risky behaviour among males as they are more likely to have started using drugs younger, to be engaging in polydrug use and consumption of alcohol and to be injecting alone (EMCDDA, 2004). Furthermore, two of the deceased participants were recruited in the detoxification modality. Drug users are particularly vulnerable to overdose after detoxification treatment or a period of time in prison. This is because drug users' tolerance drops while they are abstinent from drugs and they are therefore more likely to overdose if they use after this period of time (EMCDDA, 2004).

CHAPTER FOUR: TREATMENT STATUS

4.1 Introduction

Drug use is a complex problem and it is being increasingly recognised that there is no single treatment modality that works for all individuals undergoing treatment. A range of services is provided in Ireland to accommodate this understanding (Long *et al.*, 2005). These services fall into two main philosophies: medication-free therapy and medically-assisted therapy (Drug Misuse Research Division, 2005). Medication-free therapy uses models such as the Therapeutic Community or Minnesota Model. In contrast, medically-assisted treatment includes detoxification and substitution therapies such as methadone. Currently, the drug treatments provided in Ireland include counselling and group-work, detoxification, abstinence, methadone maintenance and needle exchange. Since the early 1990s, Methadone Maintenance Treatment (MMT) has been considered to be an effective method of opioid dependence treatment in Ireland. However, rehabilitation is now recognised as a crucial component of all drug treatment (Report of the Working Group on Drugs Rehabilitation, 2007).

In this chapter, participants' treatment status is discussed and the types of treatments that participants engaged in at the three time points are described. In addition treatment retention and completion rates are presented. Firstly, treatment status and completion rates for participants who were recruited in the methadone, detoxification and abstinence modalities is presented. Any treatments that participants may have started within the six months prior to the 1-year and 3-year interview are also presented. Finally, participants' drug-free status is assessed with respect to their current treatment status.

4.2 Results

Treatment Status and Completion Rates

In **Table 4.2(a)**, the *current treatment status* of participants is shown. At 3-years, there were 66% (n=217) of participants *in methadone, detoxification or abstinence-based treatment*. There were 65% (n=212) of the population *in methadone treatment*, 1% (n=3) *in detoxification treatment* and 0.3% (n=1) *in abstinence-based treatment*. Of those in *methadone treatment* at 3-years, 38% (n=70) were still *in their intake methadone treatment setting*. These participants attended this setting continuously and had therefore been in the same episode of methadone treatment for approximately three years. It is also shown that 34% (n=111) of participants were *not attending methadone, detoxification or abstinence-based treatment* at the 3-year interview.

With regards to participants' treatment status and recent drug use, it is shown that of the participants who were currently in treatment, 11% (n=24) were *drug-free of all illicit drugs and alcohol*, 18% (n=38) were *drug-free from all illicit drugs* and 34% (n=73) were *drug-free from all illicit drugs except cannabis*. In relation to the participants who were not attending treatment, 32% (n=35) were *drug-free from all illicit drugs including alcohol*, 46% (n=51) were *drug-free from all illicit drugs* and 57% (n=63) were *drug-free from all illicit drugs except cannabis*.

Table 4.2(a) Treatment Status at 3-years

	<i>n</i>	%
¹Current treatment		
Participants currently in treatment	217	66.2
In methadone treatment	212	64.6
Still in intake methadone treatment setting	70	37.8
In detoxification programme	3	0.9
In abstinence-based programme	1	0.3
Participants not currently in treatment	111	33.8
¹In treatment and recent drug use		
Drug-free (all illicit drugs)	38	17.5
Drug-free (all illicit drugs excluding cannabis)	73	33.6
Drug-free (all illicit drugs and alcohol)	24	11.1
¹Not in treatment and recent drug use		
Drug-free (all illicit drugs)	51	45.9
Drug-free (all illicit drugs excluding cannabis)	63	56.8
Drug-free (all illicit drugs and alcohol)	35	31.5

¹ Treatment refers to methadone, detoxification and abstinence-based treatment. Other forms of treatment such as counselling and group-work were not included due to inconsistencies in the way they were reported.

Table 4.2(b) displays the completion rates for participants in relation to their index intake treatment. Completion rates were almost identical for *detoxification* and *abstinence-based* modalities. There were 70% (n=46) of *detoxification* participants who had completed their treatment and 69% (n=47) who had completed their abstinence treatment. There were also 3% (n=5) of participants who had completed their *methadone* treatment in their recruitment site and 38% (n=70) who were still attending their *methadone* treatment in their recruitment site. However, there were 21% (n=36) of participants who did not complete their intake *methadone* treatment. There was no increase in the number of participants who completed their *methadone* treatment from 1-year to 3-year follow-up.

Table 4.2(b) Completion Rates for Intake Treatment

	Outcome	
	<i>n</i>	%
¹Detox modality from intake		
Completed intake detox treatment	46	69.7
Didn't complete intake detox treatment	20	30.3
¹Abstinence modality from intake		
Completed intake abstinence treatment	47	69.1
Didn't complete intake abstinence treatment	21	30.9
Methadone modality from intake		
Completed intake methadone treatment	5	2.9
Did not complete intake methadone treatment	36	20.6
Still attending intake methadone treatment	70	37.8

¹ These figures differ from the figures published in ROSIE Findings 2 as more information was gathered from participants at the 3-year follow-up with regards to completion of index treatment.

Table 4.2(c) below illustrates other types of treatments that participants started attending in the six months prior to the intake, 1-year and 3-year interviews. These may be a new treatment episode or participants may have been starting this type of treatment for the first time. The number of participants who started attending *one-to-one counselling* increased significantly from 13% (n=44) at intake to 33% (n=99) at 1-year ($p<0.001$) and 30% (n=107) at 3-years ($p<0.001$). There was also a significant increase in the numbers who began attending *group work* from 9% (n=30) at intake to 27% (n=81) at 1-year ($p<0.001$) and 23% (n=82) at 3-years ($p<0.001$).

Table 4.2(c) New Treatment Types in the Last Six Months

	Intake		1-year		3-years	
	n	%	n	%	n	%
^{1,2}Started the following treatments in last six months						
Structured/supervised detoxification	45	13.3 _b	27	8.9	20	5.6 _b
One-to-one counselling	44	13.2 _{ab}	99	32.5 _a	107	30.0 _b
Group work	30	9.0 _{ab}	81	26.6 _a	82	23.0 _b
Residential drug treatment	20	5.9	16	5.2	10	2.8
Prescribed methadone	18	5.6	32	10.5	40	11.2

Note: Matching subscript letters denote statistical significance.

¹ Does not include intake treatment.

² Categories are not mutually exclusive.

4.3 Discussion and Conclusion

The aim of Dole and Nyswander's model of methadone treatment was to provide people with a high enough dose of methadone to allow them to function in regular society and participate in therapeutic and rehabilitative services (Ward *et al*, 1992). However, many methadone treatment programmes have shifted away from this ideology of long-term maintenance towards achieving abstinence from all drugs including methadone within a few years (Farrell *et al*, 1994). From the ROSIE results, it is evident that just under 40% of the participants recruited in methadone were still in their intake treatment at 3-years. Research suggests that retention in methadone treatment is associated with more positive outcomes (Teesson *et al*, 2007). Other research has shown that two to three years is the suggested optimal time frame for methadone treatment to be beneficial. Caplehorn *et al* (1993) state that longer time frames in treatment have more benefits than shorter periods. Furthermore, Ward *et al* (1992) found that participants who left their methadone treatment early had an increased likelihood of engaging in regular heroin use.

In this chapter it can be seen that approximately 70% of participants recruited within the detoxification and abstinence modalities completed their intake treatment. Ravndal *et al* (2005) state the completion of treatment is an important indicator for improved outcomes. They found that most facilities agree that 'treatment completion is a good indicator of treatment success'. In their study, 40% was the average completion rate in all programmes. Thus, for those ROSIE participants who completed their detoxification or abstinence-based intake treatment, this is a very positive outcome. In addition, studies conducted in the UK show completion rates varying from 25-50% (Gossop *et al*, 1999; Keen *et al*, 2001). ROSIE compares favourably to this range.

There were significant increases in the number of participants who started counselling and group work in the six months prior to interview at 1-year and 3-years. Those who participate in counselling services while undergoing methadone treatment are shown to have more effective treatment outcomes (McLellan *et al*, 1999). Participants in residential treatment also showed positive outcomes when partaking in counselling services. Meier and Best (2006) found that clients who had individual counselling while undertaking treatment were likely to have higher completion rates. Group counselling was also found to be important with regards to completion rates. An increase in participation in one-to-one and group counselling among the ROSIE cohort is a very positive outcome.

With just over one-third of the participants recruited in methadone still in their methadone index treatment, a very positive outcome is indicated since retention in treatment is associated with better results. Furthermore, ROSIE completion rates for abstinence and detoxification facilities are particularly high in comparison to other studies. There is also a significant improvement in the numbers engaged in counselling, which is also recognised as a key determinant for positive treatment outcome.

Overall, the results in this chapter indicate that many of the participants in ROSIE displayed signs of positive treatment outcomes. While this is encouraging, the need for further research into those participants with less positive outcomes is recognised.

CHAPTER FIVE: DRUG USE

5.1 Introduction

During the 1970s an opiate use problem began to appear in Ireland and by the late 1980s, the drug problem had reached epidemic proportions in Dublin's inner city areas. In the general population, it is estimated that 19% of adults have used an illegal drug in their lifetime (Drug Misuse Research Division, 2005), while for young adults (aged 15-34 years) this rises to 26%.

The most recent published estimate of the number of opiate users in Ireland is 14,452, based on 2000-2001 data (Kelly *et al*, 2004). According to the Health Research Board (HRB), between 1998 and 2002 opiates were the most frequently reported main problem drug for all cases treated for problem drug use, while cannabis was the second most frequently reported main problem drug (Long *et al*, 2005a). However, a different pattern emerges with the number of new cases treated who reported problem drug use. Between 1998 and 2002 opiate use decreased by 21% whereas cannabis use saw an increase of 144% for the same period. Although the numbers of new cases treated who reported cocaine increased consistently at this time the numbers remained small.

In terms of use of multiple drugs, known as polydrug use, the WHO defines it as 'the use of more than one drug or type of drug by an individual, often at the same time or sequentially, and usually with the intention of enhancing, potentiating or counteracting the effects of another drug'. There is evidence to suggest that polydrug use is on the increase among individuals seeking treatment and the HRB estimates that the percentage of cases treated who reported problems with more than one drug increased from 71% in 1998 to 76% in 2002. For the same time period, 28% reported problem use of one drug, 32% reported problem use of two drugs, 26% reported problems with three drugs and 15% reported problems with four or more drugs (Long *et al*, 2005a). However, the pattern of additional drug use differs among all new cases, with alcohol accounting for 41% of all new cases, followed by ecstasy at 37% and cannabis at 34% for the same time period (Long *et al*, 2005a).

The following chapter presents outcomes from intake, 1-year and 3-year follow-up with regard to current drug use (including consumption of alcohol and tobacco), polydrug use and those free of drugs. The data provide a snapshot of participants' drug use at the three time periods and consequently whether their behaviour has altered across the time points. In the final section, a summary of the results is presented.

5.2 Results

Current Drug Use

In **Table 5.2(a)**, results for the usage of a range of drugs are presented. Participants' *heroin* use significantly declined ($p < 0.001$) from 77% ($n=306$) at intake to 48% ($n=145$) at 1-year, while *non-prescribed methadone* use also reduced ($p < 0.001$) from 41% ($n=162$) to 13% ($n=41$). In the same time period similar significant reductions ($p < 0.001$) were also evident for *cannabis*, with its use decreasing from 64% ($n=243$) at intake to 54% ($n=161$) at 1-year and *benzodiazepine* use reducing ($p < 0.001$) from 44% ($n=174$) to 23% ($n=69$). Reported use for *cocaine* also significantly decreased ($p < 0.001$) from 44% ($n=179$) to 21% ($n=64$) with *crack cocaine* also decreasing ($p < 0.001$) from 15% ($n=59$) to 6% ($n=19$).

Table 5.2(a) Drug Use

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Drug use in the last 90 days						
Heroin	306	76.9 _{ab}	145	47.5 _a	165	46.2 _b
Cannabis	243	64.1 _{ab}	161	53.5 _a	174	48.9 _b
Cocaine	179	44.3 _{ab}	64	21.0 _a	71	20.0 _b
Benzodiazepines	174	44.3 _{ab}	69	22.6 _{ac}	113	31.7 _{bc}
Non-prescribed methadone	162	40.6 _{ab}	41	13.4 _a	49	13.8 _b
Crack cocaine	59	14.6 _{ab}	19	6.3 _a	23	6.5 _b

Note: Matching subscript letters denote statistical significance.

At 3-years significant results were maintained for all drugs. There were significant differences ($p < 0.001$) reported for all drugs from intake to 3-year follow-up with *heroin* use reducing from 77% ($n=306$) to 46% ($n=165$), *cannabis* use reducing from 64% ($n=243$) to 49% ($n=174$), *cocaine* use reducing from 44% ($n=179$) to 20% ($n=71$), *benzodiazepine* use reducing from 44% ($n=174$) to 32% ($n=113$), *non-prescribed methadone* reducing from 41% ($n=162$) to 14% ($n=49$) and *crack cocaine* reducing from 15% ($n=59$) to 7% ($n=23$).

Clearly the data highlight the improvement in participants' drug use across all categories indicating that treatment is having a positive impact on participants' drug-using behaviour both at the 1- and 3-year time points. Only one significant difference was noted between 1- and 3-year follow-up, with *benzodiazepines* use increasing significantly ($p=0.020$) and respondents reporting using the drug more frequently, nevertheless the percentage at 3-year follow-up had not returned to the original level.

Positive outcomes were evident for mean number of days on which drugs were used for both the population as a whole and for participants who used each drug for the same period (see **Tables 5.2(b)** and **5.2(c)**, respectively). There was a significant reduction in the reported daily use of all drugs between intake and 1-year follow-up. *Heroin* use decreased from a intake average of 40.1 days to 15.5 days ($p < 0.001$) at 1-year follow-up. Use of *non-prescribed methadone* also dropped from 11.6 days to 3.8 days ($p < 0.001$). Individuals also reported using *cannabis* less frequently, with use of the drug declining from 39.0 days to 32.0 days ($p < 0.001$). Substantially lower rates of *benzodiazepines* were also observed with mean days decreasing from 15.5 days at intake to 5.3 days at 1-year follow-up ($p < 0.001$). Both *cocaine* and *crack cocaine* also showed significant declines with *cocaine* use decreasing from 7.6 days at intake to 3.4 days at 1-year follow-up ($p < 0.001$) and *crack cocaine* reducing from 2.1 days at intake to 0.9 days at 1-year follow-up ($p=0.011$). This improvement continued at 3-year follow-up with significant reductions for all drugs except *crack cocaine*. In fact, all drugs except *crack cocaine* show a significant difference between intake and 3-year follow-up. However, *non-prescribed methadone*, *crack cocaine* and *cocaine* show no statistically significant difference between 1-year and 3-year follow-up, indicating that the improvement made between intake and 1-year follow-up was maintained but not improved upon. For *heroin* and *benzodiazepine* use, there was an increase in the mean number of days on which drugs were used but the result was still significantly lower at 3-year follow-up than at intake. *Cannabis* use, on the other hand, continued to decline. Overall, respondents' drug use remained low at 3-year follow-up indicating that drug use did not return to original intake levels.

Table 5.2(b) Mean Days Used: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days used in the last 90 days			
Heroin	40.1 (35.8) _{ab}	15.5 (28.0) _{ac}	20.7 (32.8) _{bc}
Cannabis	39.0 (40.1) _{ab}	32.0 (39.5) _{ac}	25.1 (36.1) _{bc}
Benzodiazepines	15.5 (29.1) _{ab}	5.3 (15.9) _{ac}	9.4 (22.8) _{bc}
Non-prescribed methadone	11.6 (23.2) _{ab}	3.8 (15.7) _a	2.6 (10.8) _b
Cocaine	7.6 (17.3) _{ab}	3.4 (13.1) _a	2.9 (11.6) _b
Crack cocaine	2.1 (9.9) _a	0.9 (6.3) _a	1.1 (6.6)

Note: Matching subscript letters denote statistical significance.

Table 5.2(c) Mean Days Used: Of Those Who Used

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days used in the last 90 days			
Heroin	52.3 (32.2) _a	32.7 (33.1) _{ab}	44.7 (35.4) _b
Cannabis	60.8 (34.3) _{ab}	59.8 (35.3) _{ac}	51.5 (36.2) _{bc}
Benzodiazepines	35.0 (35.0) _a	23.6 (26.4) _a	29.9 (32.3)
Non-prescribed methadone	28.6 (29.0) _b	28.5 (33.8)	19.5 (23.3) _b
Cocaine	17.2 (22.7)	16.1 (24.9)	14.6 (22.5)
Crack cocaine	14.5 (22.5)	14.5 (21.3)	17.1 (21.0)

Note: Matching subscript letters denote statistical significance.

However, the improvements in population drug use are not necessarily mirrored for the sub-sample population representing only those participants who used a particular drug at both time points. For this sub-sample population, the figures differ slightly with significant differences evident in *heroin* use, declining from 52.3 days at intake to 32.7 days at 1-year follow-up ($p < 0.001$), *cannabis* use, declining from 60.8 days at intake to 59.8 days at 1-year follow-up ($p = 0.041$), and *benzodiazepines* use, declining from 35 days at intake to 23.6 at 1-year follow-up ($p < 0.005$). At 3-year follow-up, significant differences were only observed for respondents' use of *cannabis* and *non-prescription methadone*. Of those using *cannabis*, individuals used this drug less frequently at 3-year follow-up than at intake ($p < 0.001$), reducing from 60.8 days to 51.5 days, while the mean number of days on which *non-prescription methadone* was used decreased from 28.6 days at intake to 19.5 days at 3-year follow-up ($p = 0.012$). Comparisons between 1-year and 3-year follow-up indicate that the mean number of days on which *heroin* was used, for those using at both time points, increased between 1-year and 3-years, although not to the same levels as at intake. The mean number of days on which using *cannabis* was used reduced further between 1-year and 3-years ($p < 0.001$), from 59.8 days to 51.5 days, respectively.

The significant differences observed in the sub-sample are more of a reflection of change for those participants who used all drugs at both time periods. Although significant reductions continued to be maintained at 3-year follow-up for most drugs, there is a noticeable levelling out of drug use between 1-year and 3-year follow-up indicating that greatest improvement occurred one year into treatment. However, it should be noted that *benzodiazepines* showed a significant increase between 1- and 3-year follow-up (**Table 5.2(b)**).

Tables 5.2(d) and **5.2(e)** present the average amount of each substance consumed on a typical using day for both the population as a whole and the sub-sample in the 90 days prior to interview. For the population figures, comparisons between intake and 1-year follow-up showed participants' consumption of all drugs, with the exception of *cannabis*, declined significantly.

Respondents' reported use of *heroin* at 1-year follow-up reduced from 0.6g to 0.2g ($p < 0.001$), *cocaine* use reduced from 0.9g to 0.4g ($p < 0.001$), use of *non-prescribed methadone* reduced from 23.3ml to 7.1ml ($p < 0.001$) and *benzodiazepine* use reduced from 42mg to 23mg ($p = 0.012$).

Quantities of drugs consumed continued to improve between intake and 3-year follow-up with use of *heroin* ($p < 0.001$), *cannabis* ($p < 0.001$), *cocaine* ($p < 0.001$) and *non-prescribed methadone* ($p < 0.001$) all declining at 3-year follow-up. It should be noted however that increased consumption was observed between 1-year and 3-year follow-up for respondents' use of *benzodiazepines* ($p = 0.036$).

Table 5.2(d) Mean Amounts Used: Population

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
¹Mean amounts used per day in the last 90 days			
Heroin (g)	0.6 (0.8) _{ab}	0.2 (0.6) _a	0.2 (0.4) _b
Cannabis (joints)	7.7 (16.5) _b	5.5 (20.8)	3.7 (11.1) _b
Cocaine (g)	0.9 (2.4) _{ab}	0.4 (1.2) _a	0.3 (0.8) _b
Non-prescribed methadone (ml)	23.3 (37.7) _{ab}	7.1 (27.1) _a	9.1 (29.6) _b
Benzodiazepines (mg)	41.9 (105.5) _a	22.6 (121) _{ac}	39.9 (136.8) _c

Note 1: Matching subscript letters denote statistical significance.

Note 2: Crack cocaine was excluded due to inconsistency in data reporting.

¹ These figures were based on:

- Heroin: one bag costing €20 and containing on average 0.113g at intake and 1-year, with one bag costing €20 and containing on average 0.1g at 3-years.
- Cocaine: one gram costing €110 at intake, €66 at 1-year and €70 at 3-years.
- Cannabis: one ounce costing €110 at intake, €100 at 1-year and €198.45 at 3-years (or a joint costing approximately 39c at intake, approx 35c at 1-year and approx 70c at 3-years).

Table 5.2(e) Mean Amounts Used: Of Those Who Used

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
¹Mean amounts used per day in the last 90 days			
Heroin (g)	0.7 (0.8) _{ab}	0.4 (0.9) _a	0.4 (0.5) _b
Cannabis (joints)	12.0 (19.1) _b	10.4 (27.8)	7.7 (15.1) _b
Cocaine (g)	2.3 (3.3)	1.8 (2.0)	1.6 (1.3)
Non-prescribed methadone (ml)	58.9 (38.6)	56.6 (55.6)	68.5 (50.5)
Benzodiazepines (mg)	116.7 (149.6)	141 (276)	151.2 (233.6)

Note 1: Matching subscript letters denote statistical significance.

Note 2: Crack cocaine was excluded due to inconsistency in data reporting.

¹ These figures were based on:

- Heroin: one bag costing €20 and containing on average 0.113g at intake and 1-year, with one bag costing €20 and containing on average 0.1g at 3-years.
- Cocaine: one gram costing €110 at intake, €66 at 1-year and €70 at 3-years.
- Cannabis: one ounce costing €110 at intake, €100 at 1-year and €198.45 at 3-years (or a joint costing approximately 39c at intake, approx 35c at 1-year and approx 70c at 3-years).

For those participants who used each substance in the previous 90 days (sub-sample), only the amount of *heroin* consumption improved at the 1-year follow-up stage, decreasing from 0.7g to 0.4g ($p < 0.001$). However, at 3-year follow-up significant reductions in use were reported for both *heroin* use ($p < 0.001$) and *cannabis* use ($p = 0.021$) with a non-significant increase observed for the quantity of *non-prescribed methadone* consumed. Nevertheless, the quantities of *cocaine*, *non-prescribed methadone* and *benzodiazepines* used by participants did not significantly reduce over all time points demonstrating that participants who used these drugs at the corresponding time points did not change their using habits in terms of quantities consumed.

Drug-free Status

The percentage of participants who were drug-free, including those who were not using any illicit drugs, those who were not using any illicit drugs excluding cannabis and those not using any illicit drugs or prescribed methadone are presented in **Table 5.2(f)**. Significant improvements were observed in all three categories at 1-year follow-up with percentages *drug-free (not using any illicit drug)* increasing from 9% ($n = 37$) at intake to 28% ($n = 84$) at 1-year follow-up ($p < 0.001$), *drug-free (not using any illicit drug excluding cannabis)* increasing from 13% ($n = 53$) at intake to 41% ($n = 126$) at 1-year follow-up ($p < 0.001$) and *drug-free (not using any illicit drugs or prescribed methadone)* increasing from 6% ($n = 24$) at intake to 19% ($n = 59$) at 1-year follow-up ($p < 0.001$).

Improvement was maintained at the 3-year period with all drug-free figures showing significant increases from intake. Individuals who were *drug-free (not using any illicit drug)* rose from 9% ($n = 37$) at intake to 29% ($n = 105$) at 3-year follow-up ($p < 0.001$) with *drug-free (not using any illicit drug excluding cannabis)* also rising from 13% ($n = 53$) at intake to 43% ($n = 153$) at 3-year follow-up ($p < 0.001$) and *drug-free (not using any illicit drugs or prescribed methadone)* rising from 6% ($n = 24$) at intake to 19% ($n = 68$) at 3-year follow-up ($p < 0.001$). The most marked improvements were made at the 1-year follow-up stage with levels remaining constant for participants who were *drug-free (not using any illicit drug)* between 1-year and 3-year follow-up. However, the significant increases in *drug-free (not using any illicit drug excluding cannabis)* could be attributed to the widespread use of *cannabis* among users undergoing treatment. Current research indicates that *cannabis* use is highly prevalent among opiate users in treatment (Best *et al*, 1999).

Table 5.2(f) Drug-free

	Intake		1-year		3-years	
	<i>n</i>	%	<i>N</i>	%	<i>n</i>	%
Drug-free in the last 90 days						
Drug-free (not using any illicit drug)	37	9.3 _{ab}	84	27.6 _a	105	29.4 _b
Drug-free (not using any illicit drug excluding cannabis)	53	13.3 _{ab}	126	41.3 _a	153	42.9 _b
Drug-free (not using any illicit drugs or prescribed methadone)	24	6.0 _{ab}	59	19.4 _a	68	19.0 _b

Note: Matching subscript letters denote statistical significance.

Alcohol and Tobacco

The percentage of participants who had smoked *tobacco* or consumed *alcohol* in the 90 days prior to intake interview is shown in **Table 5.2(g)**. At treatment-intake, 93% (n=359) of participants smoked *tobacco* and just over half of the respondents, 54% (n=204), consumed *alcohol*. At 1-year follow-up only *alcohol* consumption showed a significant decline with the number of participants consuming *alcohol* decreasing (p=0.008) from 54% (n=204) at intake to 46% (n=139) at 1-year follow-up. Improvements across both categories were found at 3-year follow-up where *tobacco* consumption reduced (p=0.014) from 93% (n=359) at intake to 89% (n=316) at 3-year follow-up and *alcohol* consumption reduced (p=0.002) from 54% (n=204) to 44% (n=157) for the same time period.

Table 5.2(g) Alcohol and Tobacco Consumption

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Consumption in the last 90 days						
Tobacco	359	93.0 _b	272	89.5	316	89.0 _b
Alcohol	204	53.8 _{ab}	139	46.0 _a	157	44.2 _b

Note: Matching subscript letters denote statistical significance.

The frequency of consumption over the previous 90 days for those who used *tobacco* or *alcohol* is displayed in **Tables 5.2(h)** and **5.2(i)**. The population figures reveal significant reductions in the mean number of days of *alcohol* consumption at 1-year follow-up, decreasing from 13.3 days at intake to 9.9 days at 1-year follow-up (p=0.008). Daily consumption of *tobacco* also reduced but this was not significant. Participants' consumption of both substances further declined at 3-year follow-up, however only *alcohol* showed a significant reduction to 10.9 days at 3-year follow-up (p=0.049).

An analysis of the sub-sample who consumed *tobacco* or *alcohol* indicates that there were no significant differences in the mean number of days on which both substances were consumed when comparing intake with both 1-year and 3-year follow-up. Therefore for those consuming *alcohol* or *tobacco*, daily consumption remained constant throughout the study period.

Table 5.2(h) Mean Days Consumed Tobacco and Alcohol: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days used in the last 90 days			
Tobacco	81.4 (25.1)	79.4 (28.4)	78.8 (28.9)
Alcohol	13.3 (23.7) _{ab}	9.9 (20.8) _a	10.9 (22.5) _b

Note: Matching subscript letters denote statistical significance.

Table 5.2(i) Mean Days Consumed Tobacco and Alcohol: Of Those Who Consumed

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days used in the last 90 days			
Tobacco	87.5 (11.9)	88.8 (8.2)	88.6 (8.6)
Alcohol	24.8 (27.5)	21.5 (26.4)	24.6 (28.4)

Tables 5.2(j) and **5.2(k)** illustrate the average amount of *tobacco* and *alcohol* consumed on a typical day in the last 90 days for both the population and the sub-sample, respectively. Participants reported reductions in the amounts of both *tobacco* ($p=0.021$) and *alcohol* consumption ($p=0.032$) between intake and 1-year follow-up. At intake, population figures show that *tobacco* consumption was on average 18.3 cigarettes a day with *alcohol* consumption at 9.1 units of alcohol. In comparison, at 1-year follow-up, participants had reduced their intake of *tobacco* to 15.9 cigarettes per day and *alcohol* to 6.1 units per day. Comparison between intake and 3-year follow-up show similar reductions in the reported consumption of both substances with *tobacco* ($p=0.010$) and *alcohol* ($p<0.001$) decreasing significantly.

No significant differences were found between intake and 1-year follow-up, intake and 3-year follow-up or 1-year and 3-year follow-up among those participants using at both time points under investigation. This indicates that, overall, among the using population, consumption remained consistent across the three interview periods.

Table 5.2(j) Mean Amounts of Tobacco and Alcohol Consumed Per Day: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean amounts consumed per day in the last 90 days			
Tobacco	18.3 (13) _{ab}	15.9 (10.9) _a	16.1 (11.7) _b
Alcohol	9.1 (15.2) _{ab}	6.1 (13.9) _a	5.8 (9.9) _b

Note: Matching subscript letters denote statistical significance.

Table 5.2(k) Mean Amounts of Tobacco and Alcohol Consumed Per Day: Of Those Who Consumed

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean amounts consumed per day in the last 90 days			
Tobacco	19.6 (12.5)	17.8 (9.9)	18.1 (10.8)
Alcohol	16.9 (17.0)	13.3 (18.1)	13.1 (11.3)

Polydrug Use

The WHO defines polydrug use as ‘the use of more than one drug or type of drug by an individual, often at the same time or sequentially, and usually with the intention of enhancing or counteracting the effects of another drug’. **Table 5.2(I)** presents percentages of participants engaging in polydrug use across all time periods. Significant reductions were observed at both 1-year and 3-year follow-up in comparison with intake figures. The percentage engaged in polydrug use decreased between intake and 1-year ($p<0.001$) and between intake and 3-years ($p<0.001$), with 76% ($n=308$) engaging in polydrug use at intake decreasing to 50% ($n=151$) at 1-year follow-up, with a further small decrease to 47% ($n=166$) at 3-year follow-up.

Table 5.2(I) Polydrug Use

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Engaging in polydrug use	308	76.2 _{ab}	151	49.5 _a	166	46.5 _b

Note: Matching subscript letters denote statistical significance.

5.3 Discussion and Conclusion

The major finding, in terms of drug use outcomes, was a considerable reduction in all drug use across both 1- and 3-year follow-up compared to intake. At treatment-intake, just over three-quarters of ROSIE study participants had used opiates in the last 90 days. In addition, high proportions of respondents reported current use of cannabis, cocaine, benzodiazepines and non-prescribed methadone. Between treatment-intake and 3-year follow-up, the proportion of participants who reported using heroin, cannabis, cocaine, benzodiazepines, non-prescribed methadone and crack cocaine all significantly decreased.

Reductions were also found in the frequency of drug use at 3-year follow-up. For the population as a whole, there were significant decreases in the number of mean days on which drugs were used for all drugs except crack cocaine. However, for the sub-sample population, only heroin and non-prescribed methadone showed significant reductions at 3-year follow-up. Participants were also using smaller amounts with reductions evident for all drugs except benzodiazepines for the population as a whole. Once again, sub-sample figures differ with only heroin and cannabis declining significantly.

Of particular note in this chapter are the significant improvements observed for the percentages reporting drug-free status. Polydrug use improved markedly across the study, since over three-quarters of the study population reported the use of two or more substances at treatment-intake and this figure reduced significantly at 3-year follow-up.

In terms of alcohol and tobacco, there were few differences reported in consumption of either substance across the three time periods. At intake, a high proportion of the cohort smoked tobacco on a daily basis. By 3-year follow-up, the average number of cigarettes smoked per day had reduced but not significantly. Regarding alcohol consumption, just over half of all participants reported recent drinking of alcohol at treatment-intake. However by 3-year follow-up there was a decline, although not significant, in the amount of alcohol units consumed.

CHAPTER SIX: CRIME

6.1 Introduction

The connection between crime and drugs has long been established. This connection can be seen both in terms of the illegality of drugs themselves and in the criminal acts that drug users often commit to fund their drug habit. It is therefore not surprising that a reduction in various types of criminal offences is seen as one of the main benefits of treatment for problem drug use. This reduction can have both social and economic benefits. On a social level, a reduction in crime means fewer individuals are the direct victims of crimes such as muggings, burglaries or thefts. On an economic level, a reduction in drug-related crime means that there are fewer costs incurred due to shoplifting, burglary and theft, and consequently substantial costs can be avoided by the criminal justice system.

Figures for drug-related offences have until very recently been produced by An Garda Síochána; however this role has now been assigned to the Central Statistics Office. **Table 6.1(a)** shows the number of proceedings initiated under the Misuse of Drugs Act (MDA), categorised by non-headline crime (Irish Prison Service, 2005). Non-headline crime refers to less serious offences that are tried by a judge only, whereas the more serious headline crimes are heard by a jury. Generally most drug users are involved in non-headline crime.

Table 6.1(a) Proceedings Initiated Under the Misuse of Drugs Act (Non-headline)

	Year					
	2000	2001	2002	2003	2004	2005
Offence						
Possession	6,485	7,009	6,038	4,805	5,065	7,432
Supplying or dealing drugs	1,706	1,520	1,530	1,758	1,608	1,928
Obstruction	68	138	193	392	368	479
Other MDA offences	136	101	215	195	261	235

While it is relatively straightforward to estimate the volume of crime that is directly related to illegal drugs, such as possession or dealing, estimating the level of crime that is committed by drug users in general is more difficult. To date only two studies have been conducted on this topic. The first was conducted by Keogh (1997) and sought to explore the link between crime and drug use in Dublin. The second such study was conducted by the Garda Research Unit (Furey and Browne, 2004) and sought to examine the link between opiate use and crime in Ireland. In terms of the amount of crime committed by drug users in general Keogh estimated that drug users were responsible for 66% of crime in the Dublin Metropolitan Area (DMA), while Furey and Browne estimate that drug users were responsible for 28% of the crime in the DMA.

Treatment options for drug users have been put in place by the Irish prison system.

These include the increased availability of methadone services, vaccinations against hepatitis B (although this has met with limited success), the employment of registered nurses and the employment of a consultant psychiatrist in addiction at Mountjoy Prison in Dublin.

6.2 Results

Criminal Activity

Given the information above it is easy to see the importance of crime outcomes in the context of delivery of treatment services for problem drug users.

Table 6.2(a) shows that an analysis of crimes committed revealed significant improvements at 1-year follow-up compared to intake in terms of *selling/supplying drugs* ($p<0.001$), *theft from a person* ($p<0.001$), *theft from a shop or commercial property* ($p<0.001$), *theft from a vehicle* ($p=0.043$), *theft of a vehicle* ($p=0.003$), *handling stolen goods* ($p<0.001$), *fraud/forgery/deception* ($p<0.001$), *assault* ($p=0.029$), *criminal damage* ($p=0.001$), *soliciting* ($p=0.004$) and *breach of the peace* ($p=0.003$). *Theft from a house or home* ($p=0.052$) was found to be borderline significant. The most notable reduction between intake and 1-year follow-up was for those *selling/supplying drugs* which reduced from 30% ($n=109$) to 12% ($n=35$). Similarly, the number of participants *handling stolen goods* also decreased significantly from 25% ($n=91$) to 8% ($n=25$).

A comparison between intake and 3-year follow-up showed that significant improvements were still evident three years after first entering treatment. Improvements were found for *selling/supplying drugs* ($p<0.001$), *theft from a person* ($p<0.001$), *theft from a house or home* ($p=0.023$), *theft from a shop or commercial property* ($p<0.001$), *theft of a vehicle* ($p=0.043$), *handling stolen goods* ($p<0.001$), *fraud/forgery/deception* ($p<0.001$), *assault* ($p=0.005$), *soliciting* ($p=0.003$) and *breach of the peace* ($p=0.006$). *Criminal damage* ($p=0.052$) was borderline significant. As was the case with the initial follow-up, substantial reductions were still evident between intake and 3-year follow-up for the number of those *selling/supplying drugs* which fell from 30% ($n=109$) to 13% ($n=45$) and for the number *handling stolen goods* which fell from 25% ($n=91$) to 10% ($n=37$) (see **Table 6.2(a)**).

A comparison between 1-year and 3-year follow-up resulted in no significant differences for any crime category between these two time periods. This indicates that most of the observed improvements took place between intake and 1-year follow-up. After these initial improvements were achieved there was a period of stabilisation with participants sustaining these improvements three years after entering treatment.

Table 6.2(a) Crimes Committed

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Crime committed in the last 90 days						
Selling/supplying drugs	109	30.0 _{ab}	35	11.6 _a	45	12.6 _b
Theft from a person	39	10.8 _{ab}	9	3.0 _a	6	1.7 _b
Theft from house/home	23	6.3 _b	9	3.0	11	3.1 _b
Theft from shop/commercial property	63	17.5 _{ab}	25	8.4 _a	27	7.6 _b
Theft from a vehicle	22	6.1 _a	11	3.7 _a	13	3.7
Theft of a vehicle	22	6.0 _{ab}	7	2.3 _a	6	1.7 _b
Handling stolen goods	91	25.3 _{ab}	25	8.3 _a	37	10.4 _b
Fraud/forgery/deception	40	11.2 _{ab}	6	2.0 _a	10	2.8 _b
Assault	29	8.1 _{ab}	11	3.7 _a	10	2.8 _b
Criminal damage	26	7.2 _a	7	2.3 _a	11	3.1
Soliciting	14	3.9 _{ab}	3	1.0 _a	2	0.6 _b
Breach of the peace	24	6.7 _{ab}	6	2.0 _a	9	2.5 _b

Note: Matching subscript letters denote statistical significance.

In order to provide a clearer and more accurate picture of the frequency of criminal activity, outcomes are displayed separately for the population as a whole and the sub-sample who committed crime (see **Tables 6.2(b)** and **6.2(c)**, respectively). In terms of comparison between two time points for this sub-sample, since only those who committed a particular crime at both time points under consideration were included, it was not expected that major differences would be apparent over time. When these differences did occur, that is, when there are statistically significant differences between the mean number of days on which a particular crime was committed for the sub-sample, this reflected the habits of those engaged in criminal activity rather than the habits of the opiate using population as a whole.

For the population, significant improvements were apparent between intake and 1-year follow-up for the mean number of days on which *selling/supplying drugs* ($p<0.001$), *theft from a person* ($p=0.039$), *theft from a commercial property* ($p=0.001$), *theft of a vehicle* ($p=0.041$), *handling stolen goods* ($p<0.001$), *fraud/forgery/deception* ($p=0.003$), *assault* ($p=0.013$), *criminal damage* ($p=0.044$) and *soliciting* ($p=0.006$) were committed. As before, the most noticeable reduction between intake and 1-year follow-up was for the frequency of *selling/supplying drugs* which fell from 12.4 to 4.2 days and in the frequency of *handling stolen goods* which also dropped substantially from 5.3 to 0.8 days (see **Table 6.2(b)**).

Significant differences were still evident three years after entering treatment for *selling/supplying drugs* ($p<0.001$), *theft from a commercial property* ($p=0.001$), *handling stolen goods* ($p<0.001$), *fraud etc* ($p=0.029$) and *soliciting* ($p=0.003$) compared to intake. Similar to the initial follow-up, the most notable differences were again for *selling/supplying drugs* which fell from 12.4 to 5.9 days and for *handling stolen goods* which fell from 5.3 to 1.8 days.

No significant differences were found between 1-year and 3-year follow-up again indicating that while there were improvements between intake and 1-year and 3-year follow-up, most of these improvements took place between intake and 1-year follow-up with a period of stabilisation occurring between 1- and 3-years.

Table 6.2(b) Mean Days Crime Committed: Population

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mean days crime committed in the last 90 days			
Selling/supplying drugs	12.4 (26.3) _{ab}	4.2 (15.7) _a	5.9 (19.9) _b
Theft from a person	0.9 (6.2) _a	0.1 (0.7) _a	0.4 (5.5)
Theft from house/home	0.5 (4.4)	0.3 (3.5)	0.3 (2.2)
Theft from commercial property	4.4 (16.3) _{ab}	1.5 (9.7) _a	1.3 (7.4) _b
Theft from a vehicle	0.4 (4.0)	0.3 (3.6)	0.5 (4.1)
Theft of a vehicle	0.1 (0.7) _a	0.1 (0.6) _a	0.1 (1.7)
Handling stolen goods	5.3 (17.0) _{ab}	0.8 (6.7) _a	1.8 (9.6) _b
Fraud/forgery/deception	1.8 (9.6) _{ab}	0.1 (1.7) _a	0.3 (4.8) _b
Assault	0.1 (0.7) _a	0.0 (0.2) _a	0.1 (1.1)
Criminal damage	0.3 (1.9) _a	0.0 (0.3) _a	0.3 (4.1)
Soliciting	1.9 (12.0) _{ab}	0.0 (0.6) _a	0.1 (2.5) _b
Breach of the peace	0.3 (2.9)	0.0 (0.1)	0.0 (0.4)

Note: Matching subscript letters denote statistical significance.

A rather different set of results can be seen for the sub-sample, with no significant differences found for any crime category at any time point. This result is mainly due to low numbers committing a particular crime at 1-year and 3-year follow-up. Accordingly, there was an insufficient sample size to detect a statistically significant change (see **Table 6.2(c)**). However, the direction of some changes was of concern, namely *theft from a person, criminal damage and soliciting*.

Table 6.2(c) Mean Days Crime Committed: Of Those Who Committed Crime

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days crime committed in the last 90 days			
Selling/supplying drugs	45.7 (32.3)	41.0 (31.0)	49.3 (34.6)
Theft from a person	9.7 (18.7)	5.3 (3.7)	26.7 (36.5)
Theft from house/home	10.7 (17.2)	15.4 (25.2)	8.9 (9.0)
Theft from commercial property	28.6 (32.1)	25.6 (32.7)	18.2 (21.4)
Theft from a vehicle	8.2 (16.1)	13.5 (23.0)	14.1 (17.3)
Theft of a vehicle	2.5 (1.7)	3.4 (3.9)	8.6 (12.6)
Handling stolen goods	23.9 (29.5)	18.4 (28.3)	17.3 (25.6)
Fraud/forgery/deception	17.7 (25.7)	15.5 (20.5)	11.8 (27.7)
Assault	1.9 (1.9)	1.1 (0.4)	4.3 (7.0)
Criminal damage	4.0 (6.8)	3.0 (2.8)	14.0 (24.7)
Soliciting	50.1 (37.7)	5.5 (6.4)	48.0 (0.0)
Breach of the peace	7.3 (13.4)	1.0 (0.0)	2.1 (1.4)

Arrests for Criminal Offences

A comparison between intake and 1-year follow-up for arrests showed there was a significant reduction in the number of those arrested for *criminal damage* ($p=0.002$). At intake, 4% ($n=11$) of participants were arrested for *criminal damage*. By 1-year follow-up this had fallen to 0% ($n=0$) (see **Table 6.2(d)**). No other categories of arrest showed a significant difference between intake and 1-year follow-up although all categories showed some reduction. However, it should be noted that significance may not have been detected due to the small numbers of participants reporting arrests for particular criminal activities at both intake and 1-year. **Table 6.2(d)** provides a descriptive breakdown of the results for arrests by crime. It can be seen from these results that there was a reduction, although not statistically significant, in the number of arrests between intake and 1-year follow-up for *theft from a person*, which fell from 2% ($n=7$) to 0.3% ($n=1$) and *theft from a commercial property*, which fell from 6% ($n=20$) to 3% ($n=9$).

A comparison between intake and 3-year follow-up showed that there was a significant reduction for arrests for *theft from a person* ($p=0.015$). At intake, 2% ($n=7$) of participants were arrested for *theft from a person* falling to 0% ($n=0$) at 3-year follow-up. Other arrest categories showed a significant reduction in the number of arrests made at 3-year follow-up, although all categories, excluding *theft from a house or home*, showed some reduction at 3-year follow-up compared to intake.

Once again, a comparison between 1-year and 3-year follow-up showed that no major changes had taken place, with most of the improvements made at 1-year follow-up sustained at 3-year follow-up and only slight changes evident.

Table 6.2(d) Crimes Arrested For in the Last 90 days

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Arrests by crime in the last 90 days						
Selling/supplying drugs	14	4.1	11	3.7	9	2.5
Theft from a person	7	2.3 _b	1	0.3	0	0.0 _b
Theft from house/home	4	1.3	3	1.0	5	1.4
Theft from commercial property	20	6.2	9	3.0	13	3.6
Theft from a vehicle	2	0.6	1	0.3	1	0.3
Theft of a vehicle	4	1.3	3	1.0	1	0.3
Handling stolen goods	9	2.7	1	0.3	3	0.8
Fraud/forgery/deception	4	1.3	1	0.3	4	1.1
Assault	8	2.6	6	2.0	3	0.8
Criminal damage	11	3.6 _a	0	0.0 _a	3	0.8
Soliciting	3	1.1	0	0.0	0	0.0
Breach of the peace	11	3.6	3	1.0	5	1.4

Note: Matching subscript letters denote statistical significance.

Current Legal Problems

Significant improvements were found between intake and 1-year follow-up for *no legal problems* ($p=0.026$), *on bail – awaiting a trial or hearing* ($p=0.043$) and *outstanding warrants* ($p=0.019$). The number of those experiencing *no legal problems* increased from 52% ($n=199$) to 62% ($n=186$). Those *on bail – awaiting a trial or hearing* dropped from 16% ($n=60$) to 10% ($n=30$). The number of those with *outstanding warrants* decreased from 12% ($n=46$) to 7% ($n=21$) (see **Table 6.2(e)**).

A comparison of intake and 3-year follow-up showed that significant differences were still evident for *no legal problems* ($p<0.001$), *on bail – awaiting a trial or hearing* ($p<0.001$) and *outstanding warrants* ($p=0.049$). Those experiencing *no legal problems* increased from 52% ($n=199$) to 64% ($n=227$), while those *on bail – awaiting trial or hearing* decreased from 16% ($n=60$) to 5% ($n=17$). However, those with *outstanding fines* increased from 6% ($n=22$) to 11% ($n=39$).

Table 6.2(e) Current Legal Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
¹Current legal problem						
None	199	51.6 _{ab}	186	62.2 _a	227	63.6 _b
On probation/community service	37	9.8	28	9.4	30	8.4
On bail – awaiting trial/hearing	60	16.0 _{ab}	30	10.0 _{ac}	17	4.8 _{bc}
On bail – awaiting sentencing	24	6.4	14	4.7	12	3.4
On temporary release	10	2.7	2	0.7	7	2.0
Outstanding warrants	46	12.2 _{ab}	21	7.1 _a	23	6.5 _b
Outstanding fines	22	5.9 _b	23	7.7	39	11.0 _b

Note: Matching subscript letters denote statistical significance.

¹ These categories are not mutually exclusive.

Between 1-year and 3-year follow-up, further significant improvements were found for the number of those *on bail – awaiting a trial or hearing* ($p=0.011$). It was found that 10% ($n=30$) of participants were on bail or awaiting a trial or hearing at 1-year follow-up compared with 5% ($n=17$) at 3-year follow-up.

6.3 Discussion and Conclusion

It can be seen from the preceding results that improvements were made between intake and 1- and 3-year follow-up for the majority of crime outcome measures, with significant reductions in criminal activity evident. Most noticeably, a substantial reduction was found for the number of participants *selling/supplying drugs*. In terms of the frequency of criminal activity, significant improvements could be seen for the population as a whole. Once again the most noticeable reduction was for the frequency of *selling/supplying drugs*. Unfortunately no significant differences were evident for the sub-sample who committed crime between intake and either 1- or 3-year follow-up. The reason for this result was mainly due to the small sample size of those who had committed crime at both time points.

Similarly, no significant improvements were found for arrests for criminal offences between intake and either 1- or 3-year follow-up. This result was primarily due to the small sample size of those arrested. For those who were experiencing legal problems other than being arrested, significant improvements were evident for three of the eight legal problem categories. Most notably, those experiencing *no legal problems* increased at 1-year follow-up and increased slightly again at 3-year follow-up.

When these significant improvements for crime and legal status are examined in more detail, it can be seen that most of the improvements for crime took place between the initial intake interview and 1-year follow-up. This indicates that while there were significant differences between intake and 3-year follow-up, most of the reductions in crime and legal problems took place during the first year after entering treatment. After these initial improvements were achieved, there was a period of stabilisation with no significant differences evident between 1-year and 3-year follow-up.

CHAPTER SEVEN: HEALTH AND RISK BEHAVIOUR

7.1 Introduction

Illicit drugs carry many serious health risks and their use can cause numerous physical and mental health problems. Substance use is related to respiratory problems, cancer of the mouth, stomach and lungs, cardiovascular disease, stroke, HIV/AIDS and hepatitis. Although the use of drugs produces euphoric effects on the brain, constant drug use can affect memory, attention and decision-making abilities. The effect of any drug varies according to the pattern of drug taking, the amount of the drug taken, how it is administered, the physical and mental condition of the drug user, the age of the user, the environment or context in which the drug is being used and the concurrent use of other drugs.

Withdrawal from regular use of drugs can lead to a variety of health complaints including restlessness, headaches, tremors, mood swings, weight loss, fatigue, changes in appetite, muscle and bone pain, insomnia, diarrhoea, and vomiting. Aside from the physical effects of drug use, chronic use of drugs can cause long-term mental health symptoms such as anxiety, memory problems and disrupted sleep patterns, as well as more serious symptoms such as paranoia, aggression and depression. Mental problems such as depression and anxiety are prevalent among participants in substance abuse treatment programmes (Darke *et al*, 1994; Farrell *et al*, 1998).

This link between drug use and psychiatric illness is reflected in the numbers of those with drug dependency issues accessing psychiatric services in Ireland. The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) notes that rates of first admissions to inpatient psychiatric services with a diagnosis of drug dependence between 1990 and 2003 increased steadily and were almost four times higher in 2001 than in 1990 (EMCDDA, 2004).

Injecting drug users (IDUs) are at further risk of serious medical problems since impurities and adulterants can cause abscesses and, in more serious cases, clots in the lungs. One of the more serious health risks of drug use is the consequences of drug injection and the transmission of HIV and other infectious diseases, notably hepatitis B and C. Hepatitis C and HIV occur in high proportions among injecting drug users as a result of unsafe injecting practices and needle sharing. The social context of injecting is an important predictor of hepatitis C virus status as close relationships with other IDUs increase the possibility of engaging in risk behaviour (Smyth *et al*, 2005).

7.2 Results

General Health Self-assessment

All participants were self-assessed in terms of their general health at intake, 1-year and 3-year follow-up (see **Table 7.2(a)**). There was evidence of an improvement in general health at both 1-year ($p=0.003$) and 3-year follow-up ($p=0.038$) compared with intake. For example, at intake 16% ($n=64$) rated their own health as *poor* in comparison to 11% ($n=32$) at 1-year and 14% ($n=49$) at 3-year follow-up. There was an increase also in the percentages reporting *good* or *excellent* health at 1-year and 3-year follow-up compared to intake with *good* increasing from 45.6% ($n=180$) at intake to 50% ($n=150$) at 1-year and 49% ($n=176$) at 3-year follow-up and those reporting *excellent* health increasing from 5% ($n=19$) at intake to 8% ($n=23$) at 1-year and 6% ($n=21$) at 3-year follow-up.

Table 7.2(a) Self-assessment of Health

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Participants' self-assessment of health						
Excellent	19	4.8	23	7.6	21	5.9
Good	180	45.6	150	49.7	176	49.4
Fair	132	33.4	97	32.1	110	30.9
Poor	64	16.2	32	10.6	49	13.8

Physical Health Outcomes

From **Table 7.2(b)**, it is evident that there was a marked decrease between intake and 1-year follow-up in the reporting of all physical health symptoms, with statistically significant differences noted for *poor appetite* ($p=0.002$), *tiredness/fatigue* ($p=0.027$), *joint/bone pains* ($p=0.008$), *muscle pains* ($p=0.004$) and *tremors/shakes* ($p<0.001$). Comparing intake and 3-year follow-up, there was a significant reduction in *poor appetite* ($p<0.001$), *nausea* ($p=0.018$), *joint/bone pains* ($p=0.017$), *muscle pains* ($p=0.001$) and *tremors/shakes* ($p=0.047$). These reductions, with the exception of *nausea* and *tremors/shakes*, were also significant between intake and 1-year follow-up although were not significant between 1- and 3-year follow-up, indicating that the initial improvement between intake and 1-year follow-up was maintained between 1-year and 3-years. However, it should be noted that there was a significant increase in the proportion of participants reporting *tiredness/fatigue* ($p=0.038$), *numbness/tingling* ($p<0.001$) and *tremors/shakes* ($p=0.007$) when comparing 1- and 3-years, although neither *tremors/shakes* nor *tiredness/fatigue* reached the levels reported at intake. Although not significant, there was a larger proportion of participants reporting *numbness/tingling* at 3-years.

Table 7.2(b) Number and Percentage Experienced Physical Health Symptoms

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Physical health symptoms experienced in the last 90 days						
Poor appetite	269	71.7 _{ab}	175	59.5 _a	194	55.6 _b
Tiredness/fatigue	268	71.5 _a	185	63.4 _{ac}	239	68.5 _c
Nausea	148	39.8 _b	97	32.9	114	32.6 _b
Stomach pains	148	39.8	101	34.2	127	36.5
Difficulty breathing	105	28.2	74	25.1	105	30.2
Chest pains	85	22.7	57	19.3	74	21.3
Joint/bone pains	135	36.0 _{ab}	78	26.4 _a	95	27.3 _b
Muscle pains	122	32.7 _{ab}	71	24.1 _a	77	22.0 _b
Numbness/tingling	84	22.6	53	18.0 _c	95	27.4 _c
Tremors/shakes	105	28.7 _{ab}	48	16.3 _{ac}	80	22.9 _{bc}

Note: Matching subscript letters denote statistical significance.

Table 7.2(c) Mean Days Physical Health Symptoms Experienced: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Physical health symptoms experienced in the last 90 days			
Poor appetite	47.3 (38.6) _{ab}	37.2 (39.0) _{ac}	31.9 (37.7) _{bc}
Tiredness/fatigue	43.0 (38.5) _a	38.3 (39.1) _a	39.6 (38.1)
Nausea	14.2 (27.2)	15.2 (29.5)	12.6 (27.3)
Stomach pains	14.5 (26.6)	15.1 (29.1)	15.9 (29.5)
Difficulty breathing	13.4 (28.6)	13.8 (29.6) _c	17.5 (32.6) _c
Chest pains	8.2 (21.4)	8.2 (22.9)	6.8 (19.8)
Joint/bone pains	13.4 (27.7)	11.4 (26.0)	14.3 (29.9)
Muscle pains	9.8 (22.1)	10.4 (25.5)	10.1 (25.0)
Numbness/tingling	8.5 (22.6)	7.7 (21.8) _c	11.5 (26.3) _c
Tremors/shakes	10.2 (23.5)	7.3 (21.2) _c	11.2 (26.8) _c

Note: Matching subscript letters denote statistical significance.

Table 7.2(d) Mean Days Physical Health Symptoms Experienced: Of Those Who Experienced

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Physical health symptoms experienced in the last 90 days			
Poor appetite	66.0 (29.0) _{ab}	62.4 (31.2) _a	57.4 (33.1) _b
Tiredness/fatigue	60.1 (32.2)	60.4 (32.8)	57.8 (32.7)
Nausea	35.6 (33.2)	46.1 (35.1)	38.6 (35.9)
Stomach pains	36.4 (31.4) _b	44.2 (34.4)	43.6 (34.5) _b
Difficulty breathing	47.4 (35.9)	55.2 (34.7)	58.0 (34.1)
Chest pains	36.3 (31.6)	42.4 (35.6)	32.1 (32.1)
Joint/bone pains	37.3 (35.2)	43.0 (34.7)	52.2 (36.0)
Muscle pains	30.0 (29.8)	43.3 (35.8)	45.7 (34.7)
Numbness/tingling	37.7 (34.1)	43.1 (33.5)	42.0 (35.3)
Tremors/shakes	35.4 (32.2)	44.4 (33.5)	49.2 (36.0)

Note: Matching subscript letters denote statistical significance.

For physical health outcomes, participants were scored across ten categories (see **Tables 7.2(c)** and **7.2(d)**). For the population, a comparison between intake and 1-year revealed a statistically significant reduction in the mean number of days on which participants experienced *poor appetite* over the previous 90 days ($p < 0.001$), decreasing from just over 47 days at intake to just over 37 days at 1-year, as well as a significant decrease in those reporting *tiredness/fatigue* ($p = 0.023$). The reporting of the mean number of days on which *tremors/shakes* were experienced had a borderline significant reduction ($p = 0.051$). Similarly, the mean number of days of *poor appetite* significantly reduced between 1- and 3-years ($p = 0.01$) and also between intake and 3-years ($p < 0.001$). Further comparisons of note between 1- and 3-years are the significant increases for *difficulty breathing* ($p = 0.025$), *numbness/tingling* ($p = 0.005$) and *tremors/shakes* ($p = 0.007$). The mean days reported of experiencing *nausea*, *stomach pains*, *chest pains*, *joint/bone pains* and *muscle pains* remained relatively constant across the three interview time points.

An analysis of the sub-sample who experienced physical health symptoms (see **Table 7.2(d)**) revealed improvements in the numbers of days on which particular health complaints were experienced, given that the participant suffered from them at both time points under comparison, for example, the mean number of days of *poor appetite* improved between intake and 1-year ($p = 0.032$) and between intake and 3-years ($p = 0.01$).

There was also a significant increase in the mean days on which stomach pains were experienced, from 36.4 days at intake to 43.6 days at 3-years ($p = 0.038$).

Mental Health Outcomes

From **Table 7.2(e)**, it can be seen that most mental health symptoms improved at 1-year with significant reductions in the numbers reporting *feeling tense* ($p < 0.001$), *suddenly scared for no reason* ($p = 0.002$), *nervousness or shakiness inside* ($p = 0.014$), *feelings of worthlessness* ($p = 0.003$), *feeling lonely* ($p = 0.017$) and *thoughts of ending your life* ($p = 0.010$), with *feeling fearful* showing a borderline significant reduction ($p = 0.05$). Between intake and 3-years, there was a significant reduction in some depression symptoms with *feeling hopeless about the future* reducing from 56% to 49% ($p = 0.022$), *feeling lonely* reducing from 57% to 48% ($p < 0.001$) and *thoughts of ending your life* reducing from 25% to 19% ($p = 0.016$). The latter two reductions were significant between intake and 1-year but were not significant between 1- and 3-years, indicating that the significant results between intake and 3-years were a reflection of improvements sustained from 1-year follow-up.

Table 7.2(e) Number and Percentage Experienced Mental Health Symptoms

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Mental health symptoms experienced in the last 90 days						
Feeling tense	234	65.2 _a	144	51.4 _{ac}	231	67.3 _c
Suddenly scared for no reason	129	35.6 _a	70	24.7 _{ac}	122	35.3 _c
Feeling fearful	149	42.3 _a	98	35.1 _{ca}	163	47.4 _c
Nervousness or shakiness inside	153	42.6 _a	91	32.6 _{ac}	143	41.6 _c
Spells of terror/panic	90	24.5	69	24.6	80	23.3
Feeling hopeless about the future	196	55.8 _b	138	49.1	169	49.0 _b
Feeling of worthlessness	188	52.8 _a	120	42.6 _a	165	48.0
Feeling no interest in things	206	57.4	152	54.1	192	55.8
Feeling lonely	202	57.4 _{ab}	137	49.3 _a	165	48.1 _b
Thoughts of ending your life	88	25.4 _{ab}	52	18.1 _a	65	18.8 _b

Note: Matching subscript letters denote statistical significance.

Between 1- and 3-years there was a significant increase in four mental health symptoms, with each of these related to feelings of anxiety. Those reporting *feeling tense* significantly increased between 1- and 3-years ($p < 0.001$) with levels at 3-years returning to around those reported at intake. Similar results were observed for those reporting *suddenly scared for no reason* ($p = 0.008$), *feeling fearful* ($p = 0.002$) and *nervousness or shakiness inside* ($p = 0.02$).

Analysis of **Table 7.2(f)**, reveals statistically significant reductions in the mean number of days of reporting *feeling tense* ($p < 0.001$), *suddenly scared for no reason* ($p = 0.001$), *feeling fearful* ($p = 0.024$), *nervous/shakiness inside* ($p < 0.001$), *feeling hopeless about the future* ($p = 0.006$), *feelings of worthlessness* ($p < 0.001$), *feeling no interest in things* ($p = 0.044$), *feeling lonely* ($p < 0.001$) and *thoughts of ending your life* ($p = 0.002$), with the only non-significant reduction observed being for reported *spells of terror/panic*. For the depression-related symptoms, these improvements remained significant when comparing intake and 3-years but were not significant when comparing 1- and 3-year follow-up, with the exception of *thoughts of ending your life*. This, while showing improvement, was not statistically significant. These results indicated that the majority of improvement was over the one year period after intake to treatment and this improvement was sustained at 3-years for depression-related symptoms.

Table 7.2(f) Mean Days Mental Health Symptoms Experienced: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mental health symptoms over previous 90 days			
Feeling tense	36.8 (38.0) _{ab}	21.9 (31.0) _{ac}	31.5 (35.4) _{bc}
Suddenly scared for no reason	15.5 (29.7) _a	9.2 (22.8) _{ac}	13.1 (27.1) _c
Feeling fearful	19.6 (31.7) _a	13.7 (26.7) _{ac}	18.6 (31.0) _c
Nervous/shakiness inside	19.8 (32.3) _{ab}	11.4 (24.9) _{ac}	16.3 (29.7) _{bc}
Spells of terror/panic	9.0 (23.0) _b	7.9 (20.6)	6.3 (19.3) _b
Feeling hopeless about future	29.6 (37.0) _{ab}	20.8 (32.2) _a	22.2 (33.4) _b
Feelings of worthlessness	28.6 (37.1) _{ab}	18.6 (31.4) _a	21.4 (32.3) _b
Feeling no interest in things	31.1 (36.7) _{ab}	26.1 (35.1) _a	25.7 (34.3) _b
Feeling lonely	32.7 (37.8) _{ab}	23.4 (33.6) _a	23.4 (34.1) _b
Thoughts of ending your life	8.1 (22.3) _a	3.2 (13.9) _a	5.7 (18.4)

Note: Matching subscript letters denote statistical significance.

For anxiety related symptoms, there was a significant decrease in the mean number of days of reported symptoms of *feeling tense* ($p=0.018$), *nervousness/shakiness inside* ($p=0.035$) and *panic attacks* ($p=0.023$), when intake and 3-year follow-up were compared. It should be noted, however, that both the mean number of days of *feeling tense* ($p<0.001$) and the mean number of days of *nervousness or shakiness inside* ($p=0.008$) increased significantly between 1-year and 3-year follow-up, although they were both significantly smaller than the levels reported at intake.

On a less positive note, the mean days reporting *suddenly scared for no reason* ($p=0.029$) and *feeling fearful* ($p=0.016$) each increased significantly between 1-year and 3-year, returning to levels similar to that at baseline. Of the proportions reporting depressive-type symptoms (*feelings of worthlessness* and *thoughts of ending your life*), there was a similar decline after 1-year with a slight increase at the 3-year stage.

Table 7.2(g) Mean Days Mental Health Symptoms Experienced: Of Those Who Experienced

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mental health symptoms over previous 90 days			
Feeling tense	56.4 (33.2) _{ab}	42.6 (31.5) _a	46.8 (33.9) _b
Suddenly scared for no reason	43.6 (35.5)	37.2 (32.6)	37.1 (34.6)
Feeling fearful	46.2 (33.8)	39.1 (32.3)	39.3 (34.9)
Nervous/shakiness inside	46.6 (34.7) _a	34.9 (32.8) _a	39.2 (35.0)
Spells of terror/panic	36.8 (33.9)	32.2 (30.8)	27.3 (32.2)
Feeling hopeless about future	53.1 (34.8) _{ab}	42.3 (34.7) _a	45.3 (35.1) _b
Feelings of worthlessness	54.1 (35.0) _{ab}	43.7 (35.0) _a	44.5 (33.8) _b
Feeling no interest in things	54.2 (33.0) _{ab}	48.2 (34.8) _a	46.0 (34.3) _b
Feeling lonely	57.0 (33.2) _b	47.6 (33.8)	48.7 (34.4) _b
Thoughts of ending your life	31.9 (34.6)	17.6 (28.9)	30.3 (32.7)

Note: Matching subscript letters denote statistical significance.

Comparisons were next performed for the sub-samples experiencing each symptom (**Table 7.2(g)**). Comparing intake and 1-year, there were significant reductions in the mean number of days reporting *feeling tense* ($p=0.025$), *nervousness/shakiness inside* ($p=0.002$), *feeling hopeless about the future* ($p=0.014$), *feelings of worthlessness* ($p<0.001$) and *no interest in things* ($p=0.039$), given that the particular symptom was experienced at both time points.

When comparing intake and 3-year follow-up, significant improvements were again observed for *feeling tense* ($p=0.003$), *feeling hopeless about the future* ($p=0.003$), *feelings of worthlessness* ($p=0.001$) and *no interest in things* ($p=0.001$), with significant improvements also evident for *feeling lonely* ($p=0.025$). No significant improvements were observed when comparing 1-year and 3-year follow-up. This indicated that improvements made between intake and 1-year follow-up were sustained at 3-years.

Table 7.2(h) HIV, Hepatitis B and Hepatitis C Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
HIV status						
Positive	7	1.7	10	3.3	16	4.5
Negative	310	76.7	122	40.0	91	25.5
Awaiting results	10	2.5	5	1.6	9	2.5
Never tested at intake/not tested in last six months at 1-year and 3-years	43	10.6	162	53.1	234	65.5
Do not know if tested	13	3.2	2	0.7	1	0.3
Tested but missing value answered	21	5.2	4	1.3	6	1.7
Hepatitis B status						
Positive	9	2.2	3	1.0	4	1.1
Negative	239	59.2	79	25.9	97	27.2
Awaiting results	23	5.7	8	2.6	9	2.5
Never tested at intake/not tested in last six months at 1-year and 3-years	72	17.8	208	68.2	240	67.2
Do not know if tested	30	7.4	3	1.0	5	1.4
Tested but missing value answered	31	7.7	4	1.3	2	0.6
Hepatitis C status						
Positive	144	35.6	114	37.4	129	36.1
Negative	122	30.2	42	13.8	50	14.0
Awaiting results	20	5.0	3	1.0	7	2.0
Never tested at intake/not tested in last six months at 1-year and 3-years	69	17.1	141	46.2	165	46.2
Do not know if tested	26	6.4	2	0.7	2	0.6
Tested but missing value answered	23	5.7	3	1.0	4	1.1

Note: Some of these results are implicit from other responses. For example, if it was reported on a questionnaire that a respondent 'has HIV problems', then that participant is deemed to be HIV-positive. If HIV-negative at 3-years, then HIV-negative at 1-year and at intake.

Risk Behaviour

At intake participants were asked in relation to HIV, hepatitis B and hepatitis C whether they had ever been tested for these infections, if they had ever received a positive or negative response to a blood test and if they were awaiting the results of such a test(s). At 1- and 3-year follow-up, participants were asked slightly different questions in that they were asked whether, in the last six months, they had been tested for HIV, hepatitis B or hepatitis C. If they responded that they had, they were asked if they had received the results of those tests and what the test outcome had been.

From **Table 7.2(h)**, it can be seen that respondents who tested *positive* for HIV increased from 2% (n=7/404) of the cohort at intake to 3% (n=10/305) of those interviewed at 1-year and again increased to 5% (n=16/357) of those interviewed at 3-years. Of those *positive* at 1-year, four had not indicated a positive status at intake (one was HIV-negative, one did not know their status and two had never been tested). Of those *positive* at 3-years, ten had not indicated a positive status at intake (six were negative, two were awaiting test results, one did not know their status and one had never been tested).

Also of the group who were *positive* at 3-years, three had not indicated a positive result at 1-year follow-up (one was negative, and two had not been tested).

Individuals who had a *negative* status for HIV showed a noticeable reduction from 77% (n=310) at intake to 40% (n=112) at 1-year and again reduced to 26% (n=91) at 3-years. This reduction in *negative* test results for HIV is explained by 11% (n=43) reporting *never tested* at intake, 53% (n=162) reporting they were *not tested* in the last six months at 1-year, and 66% (n=234) reporting they were *not tested* in the last six months at 3-year follow-up.

The percentage that tested *positive* for hepatitis B was 2% (n=9) at intake, 1% (n=3) at 1-year and 1% (n=4) at 3-year follow-up, while the figures for those who tested *negative* were 59% (n=239) at intake, 26% (n=79) at 1-year and 27% (n=97) at 3-year follow-up. These reductions from intake to 1- and 3-year follow-up for *positive* and *negative* outcomes are explained by 18% (n=72) *never tested* at intake, 68% (n=208) were *not tested* in the last six months at 1-year and 67% (n=240) were *not tested* in the last six months at 3-year follow-up.

Hepatitis C results highlight the larger percentage of respondents infected with hepatitis C in comparison to hepatitis B or HIV, with those testing *positive* remaining relatively constant at about 36% over the duration of the study. At intake 17% (n=69) were *never tested*, at 1-year 46% (n=141) were *not tested* in the previous six months, and at 3-years 46% (n=165) were *not tested* in the previous six months.

With so many reporting they were *not tested* at 1-year and 3-years, the proportion of participants *positive* for HIV, hepatitis B, and hepatitis C could be higher than just those who recently tested positive.

Injecting-related Risk Behaviour

An improvement in injecting-related risk behaviour is evident in **Table 7.2(i)**. There was a decline in the number of participants reporting *injecting any drug* over time. In the 90 days leading up to intake, 44% (n=177) of the cohort were *injecting* with 27% (n=46) injecting on a *daily* basis and 38% (n=65) injecting on a *very frequent* basis. At 1-year, 29% (n=88) of participants were injecting, representing a significant reduction ($p<0.001$), with 19% (n=16) injecting *daily* and 27% (n=23) injecting *very frequently*. A significant reduction ($p<0.001$) can also be seen between intake and 3-years with 28% (n=98) injecting at the 3-year time point, of whom 28% (n=27) were injecting *infrequently*, 22% (n=21) were injecting *frequently*, 21% (n=20) were injecting between 25 and 79 days and 30% (n=29) were injecting on a *daily* basis.

The figures reported for borrowing and lending of needles vary in terms of frequency, with participants reporting using needles after someone else on *one occasion* rising from 7% (n=11) at intake to 8% (n=7) at 1-year follow-up and decreasing to 5% (n=5) at 3-year follow-up. Respondents using needles after someone else *more than once* showed a reduction from 5% (n=9) at intake to 1% (n=1) at 1-year follow-up and rose to 7% (n=7) at 3-year follow-up.

In terms of the reporting of shared needles among those respondents who reported injecting in the last 90 days prior to interview, 88% (n=150) reported *never using a needle after someone in the last 30 days* at intake and 10% (n=17) reporting that *needles they used had been used by someone after them*. These percentages remained fairly constant across the three interview time points. Among those respondents who reported injecting in the last 90 days, the number of participants who reported *re-using their own needles* showed an increase across time. At intake, 37% (n=49) *re-used their own needles more than once* compared to 41% (n=32) at 1-year follow-up and 58% (n=50) at 3-year follow-up.

Table 7.2(i) Injecting-related Risk Behaviour

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Injected in the last 90 days	177	44.0 _{ab}	88	28.9 _a	98	27.5 _b
¹Frequency of injecting in the last 90 days						
Infrequent (1-9 days)	40	23.5	32	37.2	27	27.8
Frequent (10-24 days)	19	11.2	15	17.4	21	21.6
Very frequent (25-79 days)	65	38.2	23	26.7	20	20.6
Daily (80-90 days)	46	27.1 _a	16	18.6 _a	29	29.9
¹Used needle after someone in last 30 days						
No times	150	88.2	75	90.4	82	87.2
One time	11	6.5	7	8.4	5	5.3
More than once	9	5.3	1	1.2	7	7.4
¹Someone used needle after you in last 30 days						
No times	150	89.8	72	86.7	82	87.2
One time	9	5.4	5	6.0	4	4.3
More than once	8	4.8	6	7.2	8	8.5
¹Re-used own needles in last 30 days						
No times	81	61.4 _b	43	54.4	31	36.0 _b
One time	2	1.5	4	5.1	5	5.8
More than once	49	37.1	32	40.5	50	58.1
¹Used filter, spoon or flush water after someone						
No times	137	89.0	74	91.4	77	81.9
One time	6	3.9	1	1.2	6	6.4
More than once	11	7.1	6	7.4	11	11.7

Note: Matching subscript letters denote statistical significance.

¹ Of those who injected in the last 90 days.

There was a decrease in the proportions who reported re-using their own needles from intake to 1-year ($p=0.025$) among the sub-population of respondents who reported injecting in the last 90 days prior to interview. This appears to be attributable to a reduction in the number of times individuals reported *never re-using own needles* from 61% ($n=81$) to 36% ($n=31$) at 3-year follow-up and an increase in those *re-using needles more than once*. In contrast, for those who shared injecting paraphernalia a different pattern emerges. While the figure for participants who reported *never sharing filter/spoon/flush water* after someone else is relatively high at intake – 89% ($n=137$) – the figure falls, although not significantly, to just under 82% ($n=77$) at 3-year follow-up. Frequency figures for those who *shared both at one time and more than once* show an increase, although insignificant, between intake and 3-year follow-up.

Table 7.2(j) Mean Number of Days Injecting

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
¹Days injected in the last 90 days	47.3 (33.8) _a	31.9 (32.6) _a	39.6 (36.3)
¹Times injected on typical day in the last 90 days	4.0 (4.8)	2.9 (4.3)	3.0 (2.4)

Note: Matching subscript letters denote statistical significance.

¹ Of those who have injected in the last 90 days.

Among respondents who *injected in the last 90 days* analysis of the mean number of injecting days revealed a significant reduction from 47.3 days at intake to 31.9 days at 1-year follow-up.

A reduction is also evident for the number of times *injecting on a daily basis*, although not significant, with the *mean number of times injecting on a day* reducing from approximately four times a day at intake to three times a day at both 1-year and 3-year follow-up (see **Table 7.2(j)**).

Sexual Health

Table 7.2(k) provides information on the sexual behaviour of participants across a number of categories. While the percentage of participants engaging in *sexual activity with a regular partner* is similar across all time periods, the percentage of those having *sex with someone other than a regular partner* reduced significantly from 33% (n=76) at intake to just over 19% (n=45) at 3-year follow-up. Sexual history in the last 90 days, observed frequencies of *condom usage with a regular partner* and observed frequencies of *condom usage with someone other than a regular partner* remained relatively consistent over the three interview time points.

Table 7.2(k) Sexual Health

	Intake		1-year		3-years	
	n	%	n	%	n	%
Sexual history in the last 90 days						
Participants having sex	261	68.1	185	64.0	235	68.3
Participants not having sex	122	31.9	104	36.0	109	31.7
^{1,2}Sexual partners in the last 90 days						
Having sex with a regular partner	203	82.5	152	84.0	202	86.0
Having sex with someone other than a regular partner	76	33.2 _b	39	12.8	45	19.2 _b
²Condom use with regular partner						
Always used condom	47	24.4	37	28.0	44	22.4
Sometimes used condom	19	9.8	13	9.8	17	8.7
Never used condom	127	65.8	82	62.1	135	68.9
²Condom use with someone other than regular partner						
Always used condom	29	46.0	13	46.4	25	58.1
Sometimes used condom	11	17.5	6	21.4	9	20.9
Never used condom	23	36.5	9	32.1	9	20.9

Note: Matching subscript letters denote statistical significance.

¹ These categories are not mutually exclusive.

² Refers only to those who reported having sex in the last 90 days.

Overdose

Table 7.2(l) displays the incidence of non-fatal overdose at intake, 1-year and 3-year follow-up. At intake, 93% (n=366) of respondents had *not overdosed in the last 90 days* with 7% (n=26) recording an *overdose one or more times*. These percentages remained fairly constant throughout the study with 4% (n=13) and 6% (n=22) reporting *overdose one or more times* at 1-year and 3-year follow-up, respectively. However, there was no evidence of a significant difference between these percentages across any of the time points.

Table 7.2(I) Non-fatal Overdose

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Non-fatal overdose in the last 90 days						
Zero	366	93.4	287	95.7	334	93.8
One or more times	26	6.6	13	4.3	22	6.2

At 1-year, 18% ($n=6/33$) of those not in treatment had experienced an overdose in the last 90 days. This compares with 4% ($n=7/182$) of those in treatment and using drugs experiencing an overdose in the same time frame and the result is significant ($p=0.007$). The same analysis carried out at 3-years shows that 7% ($n=4/60$) of those not in treatment had experienced an overdose in the last 90 days, while 9% ($n=17/191$) of those in treatment and using drugs had had such an experience, however, this result was not significant.

Overdose is often associated with recent detoxification programmes or leaving prison. Individuals may return to use at the levels to which they were accustomed before stopping for a period of time, and thus accidentally overdose. ROSIE asked participants if they had started a detoxification in the last six months. At 1-year 8% ($n=1/12$) of those who had recently completed a detoxification had experienced an overdose in the last 90 days, while at 3-years 0% ($n=0/9$) of those who reported finishing a detoxification programme in the last six months had overdosed.

7.3 Discussion and Conclusion

Improved health outcomes are a crucial element of the treatment process. Physical or mental health problems can affect the treatment given and are frequently associated with poorer treatment outcomes. For the population as a whole, only poor appetite significantly reduced for the reported mean number of days on which physical symptoms were experienced at 3-year follow-up. Figures for the sub-sample reveal a corresponding significant decline in poor appetite while the mean number of days experienced on which stomach pains were experienced showed a significant rise at 3-year follow-up. Interestingly, all symptoms with the exception of poor appetite showed a non-significant increase at 1-year follow-up, indicating improvements did not occur one year into treatment.

With regard to the mental health outcomes, the frequency of anxiety and depression symptoms showed considerable differences at 3-year follow-up. In terms of anxiety symptoms for the population as a whole, feeling tense, nervous/shakiness inside and panic attacks showed considerable reductions at 3-year follow-up. Similar improvements were observed for depressive symptoms such as feeling hopeless about the future, feelings of worthlessness, feeling no interest in things and feeling lonely, with participants experiencing fewer of these symptoms. Within the sub-sample, only feeling tense showed a significant reduction. On the other hand all depressive symptoms, with the exception of thoughts of ending your life, reduced significantly at 3-year follow-up. Thus, the improvements observed in depressive symptoms were not mirrored in anxiety symptoms at 3-year follow-up.

With regard to infections such as HIV, hepatitis B and hepatitis C and sexual health, there were no notable results. Improvements in injecting-related risk behaviour of participants were evident throughout the study. For example, the proportion of participants injecting decreased at 3-year follow-up and reductions were also found for those injecting on a very frequent basis. In terms of sharing needles, the number of respondents who never shared or borrowed needles was high at treatment-intake and remained stable at 3-year follow-up. Furthermore, the proportion of participants who never shared other injecting paraphernalia remained consistently high throughout. Respondents' injecting behaviour revealed a non-significant reduction in the number of times injecting on a daily basis, dropping from four to three times a day. Incidents of overdose remained fairly constant across time with figures showing a minor reduction at 1-year follow-up but increasing back to intake level at 3-years.

CHAPTER EIGHT: SOCIAL FUNCTIONING

8.1 Introduction

With the emergence of the National Drugs Strategy (2001-2008), the importance of rehabilitation, employment and social functioning of drug users has become increasingly acknowledged. This chapter provides information on outcomes of particular relevance to the National Drugs Strategy.

In order for drug users to enter recovery they must believe that being abstinent from drugs is more desirable than using drugs and they must 'find a purpose in their drug-free lives' (Keane, 2007). In a recent study conducted in Scotland, it was found that working was integral to recovery as it provided a distraction and structure to the day (Neale, 2002). It also gave participants self-esteem and pride and enabled them to avoid being stigmatised. Furthermore, the National Drugs Strategy (2001-2008) highlights that access to accommodation is central to the drug treatment process. In other words, lack of accommodation for drug users can undermine their treatment process.

Social support from the family and wider social networks is also increasingly seen as an important factor in the overall rehabilitation process. Research shows that those suffering from addiction problems but who have strong social support are more likely to be retained in treatment (McLellan *et al*, 1998) and are less likely to relapse (Havassy & Hall, 1991). The report of the Working Group on Drug Rehabilitation (2007) emphasises that drug use may deteriorate if a person has difficulties such as unemployment, access to housing and poor relationships with family and friends.

In this chapter the key outcomes that impact on social functioning are considered. These are participation in training and employment, accommodation status and relationship with family, friends and children. These findings will be presented for intake, 1-year and 3-years, describing any differences across the time points. Finally, there is a brief discussion relating the ROSIE findings to the current international literature.

8.2 Results

Training and Employment

Table 8.2(a) shows that there is a significant increase in the number of participants *undertaking training courses* at 1-year ($p<0.001$) and 3-years ($p<0.001$) in comparison to intake. At 3-years, 11% ($n=40$) of participants were attending some sort of *vocational training*, 8% ($n=30$) were attending *community employment (CE) schemes*, 8% ($n=29$) a *personal development and life skills course* and 4% ($n=15$) *further education*. In many cases, these figures were more than double those reported at intake.

Table 8.2(a) Training and Education Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Been on training courses over the last six months						
Yes	63	15.6 _{ab}	88	29.0 _a	117	32.8 _b
No	340	84.4	215	71.0	240	67.2
Type of training course in last six months						
Community employment scheme	15	3.7	23	7.5	30	8.4
Personal development/life skills	11	2.7	18	5.9	29	8.1
Second/third level course	5	1.2	21	6.9	15	4.2
Vocational: computers	9	2.2	6	2.0	11	3.1
Vocational: building/machinery/driving	10	2.5	7	2.3	16	4.5
Vocational: other	9	2.2	11	3.6	13	3.6

Note: Matching subscript letters denote statistical significance.

Table 8.2(b) Employment and Income Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
¹Usual occupation in the last 90 days						
Working (full-time/part-time)	73	18.3	57	18.7	85	23.8
Casual work (cash-in-hand work)	71	17.8	62	20.3	69	19.3
Community employment scheme	15	3.8	23	7.5	30	8.4
In prison	36	9.0	20	6.6	27	7.6
In residential treatment	5	1.3	5	1.6	2	0.6
Home duties	4	1.0	8	2.6	8	2.2
Student	0	0.0	3	1.0	1	0.3
Disability	24	6.0	22	7.2	26	7.3
Not working	171	42.9	105	34.4	109	30.5
Recent employment						
Employed at some point in the last 90 days	84	21.3 _b	70	23.0 _c	107	30.1 _{bc}
Currently employed	64	16.0 _b	65	21.3 _c	102	28.7 _{bc}
²Main sources of income in the last 90 days						
Wage/salary	83	20.9 _b	59	19.3 _c	95	26.7 _{bc}
Family/partner	113	28.3 _{ab}	57	18.7 _{ac}	42	11.8 _{bc}
Social welfare	309	77.4	236	77.4 _c	260	72.8 _c
Drug dealing	101	25.3 _{ab}	31	10.2 _a	28	7.9 _b
Other crime	142	35.7 _{ab}	32	10.5 _a	45	12.6 _b

Note: Matching subscript letters denote statistical significance.

¹ This refers to participants' usual occupations in the last 90 days i.e., what their employment status was for most of the time.

² These categories are not mutually exclusive.

From **Table 8.2(b)**, improvements in participants' *recent employment status* can be seen and there is a significant increase ($p < 0.001$) between intake and 3-years for those currently employed, with figures rising from 16% ($n=64$) to 29% ($n=102$). It is also evident that the number of participants deemed 'not working' decreased from 43% ($n=171$) at intake to 31% ($n=109$) at 3-years. In this case, participants were regarded as 'not working' if they had not engaged in any type of employment, for example, casual work or a community employment scheme, in the last 90 days and there was no specific reason why they could not work, for example, that they were in prison or in treatment.

Regarding main sources of income, the proportion reporting *drug dealing* and *other crime* as a main source of income reduced significantly ($p < 0.001$) at 1-year and 3-years in comparison to intake.

Income from *family/partner* also dropped significantly when comparing intake and 1-year ($p=0.001$), intake and 3-years ($p < 0.001$) and 1-year and 3-years ($p=0.030$). Furthermore, a significantly smaller proportion of participants reported *social welfare* as a main source of income when comparing 1-year and 3-years ($p=0.023$). It is interesting to note that the proportion of participants reporting a *wage/salary* as a main source of income was significantly higher at 3-years when compared to the figures reported for intake ($p=0.018$) and 1-year ($p < 0.001$). These figures indicate that participants are becoming more self-sufficient.

Table 8.2(c) Accommodation Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Current accommodation						
Family home	118	29.7	85	28.1	95	26.6
Drug treatment residence	115	29.0	9	3.0	4	1.1
Own house/flat or rental	101	25.4	131	43.4	168	47.1
Prison	19	4.8	22	7.3	28	7.8
³ Insecure tenure	11	2.8	21	7.0	25	7.0
⁴ Homeless	33	8.3	34	11.3	37	10.4
¹Accommodation in the last 90 days						
Family home	182	46.8 _{ab}	105	34.5 _a	113	31.7 _b
Drug treatment residence	120	30.2 _{ab}	24	7.9 _{ac}	7	2.0 _{bc}
Own house/flat or rental	134	33.8 _{ab}	137	45.1 _a	175	49.0 _b
Prison	49	12.4	27	8.9	34	9.5
³ Insecure tenure	40	10.2	29	9.5	30	8.4
⁴ Homeless	58	14.7 _b	36	11.8	40	11.2 _b
Usually lives with						
Partner/spouse	30	7.6	27	9.0	45	12.7
Parents	148	37.7	85	28.4	83	23.4
Alone	47	12.0	49	16.4	53	14.9
² Children	32	8.1	24	8.0	26	7.3
² Parents and children	17	4.3	6	2.0	12	3.4
² Partner/spouse and children	44	11.2	52	17.4	62	17.5
Other	75	19.1	56	18.7	74	20.9

Note: Matching subscript letters denote statistical significance.

¹ These categories are not mutually exclusive.

² Includes children over the age of 18 years.

³ Insecure tenure refers to participants who were living with friends.

⁴ Homeless refers to participants who were living in hostels, shelters, bed and breakfast accommodation or who had no fixed abode.

Table 8.2(c) shows that there is a significant increase in the number of participants who reported living in their *own or rented accommodation* in the last 90 days when comparing intake and 1-year ($p=0.005$), and intake and 3-years ($p<0.001$), with figures rising from 34% ($n=134$) at intake to 45% ($n=137$) at 1-year and 49% ($n=175$) at 3-years. The number of homeless participants decreased significantly from intake to 3-years from 15% ($n=58$) at intake to 11% ($n=40$) at 3-years ($p=0.040$).

Social Support

Table 8.2(d) displays the participants' contact with family and friends. There is a significant decrease in *contact with father* when comparing intake and 1-year ($p=0.002$), and intake and 3-years ($p=0.015$), with participants having contact with their father on a mean of 43.4 days at intake, 35.2 days at 1-year and 37.4 days at 3-years. There was also a significant decrease in *contact with siblings* from 44.9 days at baseline to 41.3 days at 3-years ($p=0.007$). These differences may be explained by the number of participants who have moved out of the family home.

Table 8.2(d) Contact with Family and Friends

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Number of days contact in the last 90 days			
Partner	75.5 (26.4) _b	81.6 (20.9)	82.0 (19.2) _b
Mother	54.1 (37.5)	52.9 (37.7)	52.4 (36.4)
Father	43.4 (39.6) _{ab}	35.2 (38.2) _a	37.4 (37.3) _b
Siblings	44.9 (39.1) _b	42.0 (37.1)	41.3 (36.1) _b
Friends	41.6 (39.1)	40.9 (39.9)	45.2 (38.6)

Note: Matching subscript letters denote statistical significance.

Table 8.2(e) Conflict with Family and Friends

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Number of days conflict in the last 90 days			
Partner	10.1 (21.6)	6.7 (17.6)	5.5 (13.3)
Mother	8.2 (19.9) _{ab}	4.1 (14.6) _a	3.6 (13.9) _b
Father	8.2 (20.8) _b	5.4 (17.1)	3.9 (15.7) _b
Siblings	5.2 (18.1) _b	3.2 (12.4)	2.0 (11.1) _b
Friends	2.0 (9.4) _b	1.4 (9.2)	0.5 (3.4) _b

Note: Matching subscript letters denote statistical significance.

Table 8.2(e) presents the reduction in conflict across time with family and friends. Mean days *conflict with mother* has reduced significantly from 8.2 days at intake to 4.1 days at 1-year ($p=0.032$) and 3.6 days at 3-years ($p=0.010$). Mean days *conflict with father* ($p=0.003$), *siblings* ($p=0.005$) and *friends* ($p=0.028$) also decreased significantly from intake to 3-years, with the largest decrease occurring in the number of days conflict with mother. These differences may be explained through the decreased contact participants had with family members.

Table 8.2(f) displays participants' self-assessment of relationships with their children. When analysing the data, a significant difference in the quality of the *relationships with children* reported for participants at intake and at 3-years ($p=0.004$) was found. This difference appears to be due to a difference in the percentage of participants reporting a *very good* relationship at intake and those reporting a *very good* relationship at 3-years (57% at intake versus 68% at 3-years). This indicates an overall improvement in relationships between participants and their children.

Table 8.2(f) Relationship with Children

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Type of relationship with children						
Very good	119	56.9	111	63.1	148	67.6
Good	41	19.6	36	20.5	36	16.4
Okay/alright	19	9.1	11	6.3	9	4.1
Poor	7	3.3	8	4.5	5	2.3
Very poor	23	11.0	10	5.7	21	9.6

Table 8.2(g) describes the type of contact participants had with their children. Participants who had *contact with all their children daily* increased from 47% ($n=96$) at intake to 57% ($n=95$) at 1-year and 53% ($n=116$) at 3-years.

It is also evident that the number of participants who *did not see any of their children* in the last 90 days improved from 14% ($n=29$) at intake to 10% ($n=17$) at 1-year. However, this figure reduced back to 14% ($n=31$) at 3-years.

Table 8.2(g) Contact with Children

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Contact with children in the last 90 days						
Contact with all children daily	96	46.8	95	56.9	116	53.0
Contact with all children at least one day	166	82.2	143	85.6	176	80.4
No contact with at least one child	36	17.8	24	14.4	41	18.7
Did not see any of children	29	14.1	17	10.1	31	14.1

Contact with Services

Table 8.2(h) presents the services attended by participants for a medical condition in the last 90 days. It is shown that the number of participants *attending hospital and staying overnight* increased significantly from 9% ($n=34$) at intake to 16% ($n=56$) at 3-years ($p=0.004$). The amount of participants *attending a GP other than their methadone GP* also increased significantly from 34% ($n=124$) at intake to 46% ($n=140$) at 1-year ($p=0.012$). Finally, the number of participants *visiting an outpatient department/receiving community treatment* also increased significantly from 13% ($n=49$) at intake to 20% ($n=73$) at 3-years ($p=0.006$). However, the reasons for these increases are unclear and may be due to a number of differing reasons. For example, this could indicate an improvement in care for conditions such as HIV or hepatitis rather than an increase in health problems.

Table 8.2(h) Treatment for a Medical Condition

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Treatment received in the last 90 days						
Attended hospital and stayed overnight	34	8.7 _b	34	11.1	56	15.7 _b
Attended Accident and Emergency unit	67	17.4	53	17.4	82	23.0
Visited a GP (not methadone GP)	124	33.6 _a	140	45.9 _a	140	39.2
Visited an outpatient department/ received community treatment	49	12.7 _b	59	19.4	73	20.4 _b

Note: Matching subscript letters denote statistical significance.

Table 8.2(i) Number of Times Attended a Medical Service

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
¹Number of times attended service in the last 90 days			
Number of days overnight stay in hospital	6.3 (8.7)	6.9 (10.8)	11.2 (19.0)
Number of visits to Accident and Emergency unit	1.3 (0.8)	1.4 (1.2)	1.4 (1.0)
Number of visits to a GP (not methadone GP)	3.7 (4.1)	4.2 (4.8)	4.2 (11.1)
Numbers of visits for outpatient appointment/ community treatment	4.2 (7.4)	5.0 (14.0)	3.5 (5.5)

¹ Of those who attended these services in the last 90 days.

Table 8.2(i) displays the number of times participants attended a medical service in the last 90 days. There was an increase in the *number of days participants spent overnight in a hospital* from 6.3 days at intake to 11.2 days at 3-years. However, this difference was not statistically significant.

Table 8.2(j) Social Support Contacts

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Social support contacts in the last 90 days						
Had contact with social services	25	6.4	33	10.9	35	9.8
Had contact about employment, training or education	37	10.4 _{ab}	131	43.2 _{ac}	115	32.2 _{bc}
Had contact about social welfare	115	31.1	85	28.1	98	27.5
Had contact about housing issues	55	14.7 _{ab}	93	30.7 _a	96	26.9 _b

Note: Matching subscript letters denote statistical significance.

Table 8.2(j) shows a significant increase in the number of participants who had *contact with someone about employment, training or education issues* between intake and 1-year ($p < 0.001$) and intake and 3-years ($p < 0.001$), with a significant decrease between 1- and 3-years ($p = 0.002$). However, it should be noted that this decrease was minimal in comparison to the increase between intake and 1-year, and the proportion in *contact with someone regarding employment, training or education* at 3-years was significantly larger than the proportion at intake.

In terms of figures, 10% ($n=37$) reported *contact with someone regarding employment, training or education* at intake compared to 43% ($n=131$) at 1-year and 32% ($n=115$) at 3-years. Further, it was to be expected that this figure would reduce at 3-years since more people were in stable employment by this time. There was also an increase in the *numbers seeking advice about housing issues* when comparing intake and 1-year ($p < 0.001$) and intake and 3-years ($p < 0.001$).

Table 8.2(k) Number of Times Attended a Social Service

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
¹Number of times attended service			
From social services	3.3 (3.8)	5.1 (5.4)	8.7 (16.2)
About employment, training or education	9.2 (14.3)	7.7 (15.0) _c	21.4 (31.3) _c
About social welfare	3.6 (8.6)	3.1 (3.2)	2.6 (3.1)
About housing issues	10.3 (19.3)	6.6 (13.7)	6.8 (13.8)

Note: Matching subscript letters denote statistical significance.

¹ Of those who attended these services in the last 90 days.

Table 8.2(k) shows the mean number of times on which participants attended particular services. The *mean number of times participants saw someone about employment, training or education* in the last 90 days increased significantly ($p=0.018$) from 7.7 times at 1-year to 21.4 times at 3-years. This may show an increased desire to participate in employment, training or education by respondents. There is also a decrease in the number of times participants saw *someone about housing issues*. This decreased from 10.3 times at intake to 6.8 times at 3-years. However, this reduction was not statistically significant.

8.3 Discussion and Conclusion

The various aspects of social functioning which include training, education, employment, accommodation status and social support from family and friends, are all regarded as important in the overall treatment process. Outcomes at 1- and 3-years showed considerable improvements were made in all these areas. Results indicated that drug users who had participated in treatment were both willing and able to take up training, education and employment opportunities.

This is evident from the increases in the numbers of those participating in training courses and engaging in employment. Since access to employment is an important aspect of a successful recovery process (Cox & Lawless, 2000), there is clearly an encouraging picture emerging with respect to the prospects of drug users following treatment.

Positive results were also evident for the acquirement of secure accommodation and the move towards a more independent lifestyle. Findings from ROSIE show that the number of those with insecure accommodation in the last 90 days decreased significantly between intake and 3-years. Significant increases were apparent for those living in their own house or in rented accommodation between intake and 1-year and 1-year and 3-years. Obtaining secure accommodation is important if improved treatment outcomes are to be achieved, as according to Keane (2007), 'insecure accommodation is closely associated with problematic drug use', insecure accommodation is defined as being in an institution such as prison or residential treatment, being in homeless accommodation or having unstable accommodation. ROSIE showed improvements for all of these categories, with the exception of being in prison, which remained relatively unchanged over the 3-year period.

Finally, levels of social support, defined as 'resources provided by other persons' (Cohen and Syme, 1985), also increased over the 3-year period. Levels of contact with family members and friends were generally found to have increased while levels of conflict with family and friends had decreased. This result was also very positive as higher levels of social support are linked to better treatment outcomes and to better health outcomes in general (Stansfield, 2006).

Social functioning is an important aspect of the drug treatment process. Significant improvements were seen over time regarding involvement in training and employment. Participants appeared to be more self-sufficient and less dependent on family and social welfare for sources of income and accommodation, with increased numbers of participants currently living in their own house or rented accommodation. Relationships with family, friends and children had also all improved over time. On the whole, participants' social functioning improved significantly over the 3-year follow-up period.

CHAPTER NINE: OUTCOMES FOR THE *PER-PROTOCOL* POPULATION

9.1 Introduction

While the previous chapters present findings for the full population, that is, those who completed an intake interview and who may or may not have completed interviews at 1-year and 3-years, this chapter presents results for only those participants who completed all three interviews, that is, the *per-protocol* group (n=289). This is particularly useful when tracking changes over the 3-year follow-up period, as results for these individuals are present at each of the three time points.

A more comprehensive view of treatment impact is provided by the *per-protocol* population. In order to better illustrate the effects of treatment, findings in this chapter are presented in a manner which focuses on changes as they occurred at different points over time. Knowledge of how and when these changes occur is vital in understanding how drug users respond to treatment over an extended period, as improvements that are evident early on are not always sustained in the long term. Furthering this knowledge is invaluable to those responsible for planning treatment services as provision may be put in place to meet the changing needs of individuals in treatment over time. Other than this emphasis on changes over time, results in this chapter are presented in the order of drug use, crime, health and risk behaviour and finally, social functioning.

9.2 Drug Use

Current Drug Use

A comparison between intake and 1-year follow-up for various types of drug use over the 90 days prior to interview showed that there were significant improvements for *heroin* ($p<0.001$), *cocaine* ($p<0.001$), *crack cocaine* ($p<0.001$), *non-prescribed methadone* ($p<0.001$), *benzodiazepines* ($p<0.001$) and *cannabis* ($p<0.001$). At 1-year the most notable reductions were for *heroin* use which dropped from 81% (n=229) at treatment-intake to 47% (n=135) and *cocaine* which dropped from 44% (n=128) at treatment-intake to 20% (n=58). Substantial reductions were also evident at 1-year follow-up for *non-prescribed methadone* which fell from 44% (n=127) at treatment-intake to 14% (n=41) and also for *benzodiazepines* which fell from 44% (n=124) at treatment-intake to 23% (n=67) (see **Table 9.2(a)**).

A comparison between intake and 3-year follow-up showed that significant improvements were still evident three years after the first treatment episode. Reductions were found for the use of *heroin* ($p<0.001$), *cocaine* ($p<0.001$), *crack cocaine* ($p<0.001$), *non-prescribed methadone* ($p<0.001$), *benzodiazepines* ($p<0.001$) and *cannabis* ($p<0.001$). Similar to 1-year follow-up, the most notable reductions at 3-year follow-up were for *heroin* use which reduced from 81% (n=229) to 47% (n=135), *cocaine* which reduced from 44% (n=128) to 19% (n=54) and *non-prescribed methadone* which fell from 44% (n=127) to 13% (n=36).

A comparison between 1-year and 3-year follow-up revealed that there was a significant difference for the use of *benzodiazepines* ($p=0.020$) which increased from 23% (n=67) at 1-year follow-up to 30% (n=87) at 3-year follow-up. However, despite the increased use of *benzodiazepines* at 3-year follow-up, this still represents a significant improvement compared to intake use. No significant differences were found for any other form of drug use. This indicates that following the initial follow-up, participants experienced a period of stabilisation whereby improvements achieved at 1-year follow-up were retained at 3-year follow-up with no further significant differences found at this point.

Table 9.2(a) Drug Use

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Drug use in the last 90 days						
Heroin	229	80.6 _{ab}	135	46.7 _a	135	46.7 _b
Cannabis	175	65.3 _{ab}	151	52.8 _a	146	50.7 _b
Cocaine	128	44.3 _{ab}	58	20.1 _a	54	18.8 _b
Benzodiazepines	124	43.7 _{ab}	67	23.2 _{ac}	87	30.2 _{bc}
Non-prescribed methadone	127	44.4 _{ab}	41	14.2 _a	36	12.5 _b
Crack cocaine	46	15.9 _{ab}	17	5.9 _a	18	6.3 _b

Note: Matching subscript letters denote statistical significance.

In order to provide a more accurate picture of the findings for the frequency of drug use over the 90 days prior to interview, the results for the population as a whole and the sub-sample who consumed these drugs are presented separately. Regarding the sub-sample, it should be noted that only those who were using at the particular time points under investigation were included. Therefore, it was not expected that major differences would be apparent over time. However when these differences did occur, it reflected the drug users' habits, rather than the habits of the opiate using population in treatment as a whole.

A comparison between intake and 1-year follow-up for the frequency of drug use over the 90 days prior to interview showed significant improvements for the mean number of days drugs were used. *Heroin* ($p < 0.001$), *cocaine* ($p < 0.001$), *crack cocaine* ($p = 0.019$), *non-prescribed methadone* ($p < 0.001$), *benzodiazepines* ($p < 0.001$) and *cannabis* ($p < 0.001$) all showed significant reductions compared to intake levels. The most substantial reduction was for the frequency of *heroin* use which fell from 42.3 to 15.2 days. Substantial reductions at 1-year follow-up were also evident for *cocaine* which reduced from 7.9 to 3.3 days, for *benzodiazepines* which reduced from 15.5 to 5.3 days, and for *non-prescribed methadone* which reduced from 13.2 to 4 days (see **Table 9.2(b)**).

A comparison between intake and 3-year follow-up also showed significant reductions in the mean number of days on which drugs were used. Reductions were apparent for *heroin* ($p < 0.001$), *cocaine* ($p < 0.001$), *non-prescribed methadone* ($p < 0.001$), *benzodiazepines* ($p = 0.001$) and *cannabis* ($p < 0.001$). The only drug which did not have a significant reduction at 3-year follow-up, compared to intake, was *crack cocaine*. The most notable reductions were for the frequency of *heroin* use which reduced from 42.3 to 20.1 days, *cannabis* use which reduced from 40.4 to 25.4 days and *non-prescribed methadone* which fell from 13.2 to 2.0 days.

A comparison of 1- and 3-year follow-up revealed a number of significant differences. There was a significant improvement in the mean number of days on which *cannabis* was used with a reduction from 32.1 to 25.4 days ($p = 0.002$). However, both the frequency of *heroin* use ($p = 0.009$) and *benzodiazepine* use ($p = 0.008$) increased significantly at 3-year follow-up compared to 1-year follow-up, with frequency of *heroin* use increasing from 15.2 to 20.1 days while frequency of *benzodiazepine* use increased from 5.3 to 9.2 days. It should be noted that although there were increases between 1- and 3-year follow-up, the levels did not reach those reported at intake. This perhaps indicates that the greatest improvements are achieved within the first year after treatment entry, after which there may be some disimprovement in outcomes, but not to such an extent that the individual returns to intake levels of drug use.

For the sub-sample who had used drugs in the last 90 days, significant differences were found between intake and 1-year follow-up for frequency of use of *heroin* ($p < 0.001$) with the frequency of *heroin* use decreasing from 52.7 days at intake to 32.5 days at 1-year follow-up and for frequency of use of *benzodiazepines* ($p = 0.005$), decreasing from 35.4 days at intake to 22.8 days at 1-year.

Significant differences were also evident for the sub-sample between intake and 3-year follow-up for *cannabis* ($p < 0.001$) and *non-prescribed methadone* ($p = 0.020$) but not for *heroin* use. Here frequency of *cannabis* use decreased from 61.9 days to 50.3 days and frequency of *non-prescribed methadone* decreased from 29.7 days to 16.2 days (see **Table 9.2(c)**).

A comparison between 1-year and 3-year follow-up showed that there were significant differences for frequency of *heroin* use ($p=0.015$) and *cannabis* use ($p<0.001$). The frequency of *heroin* use increased from 32.5 days at 1-year follow-up to 42.9 days at 3-year follow-up. While this increase still represents a reduction compared to intake, it should be noted that intake and 3-year follow-up were not statistically different in terms of frequency of *heroin* use. However, *cannabis* use decreased from 60.7 days at 1-year follow-up to 50.3 days at 3-year follow-up. No significant differences were found for the frequency of use of other drugs.

Table 9.2(b) Mean Days Used: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days used in the last 90 days			
Heroin	42.3 (35.3) _{ab}	15.2 (27.6) _{ac}	20.1 (32.3) _{bc}
Cannabis	40.4 (40.3) _{ab}	32.1 (39.8) _{ac}	25.4 (36.0) _{bc}
Benzodiazepines	15.5 (29.3) _{ab}	5.3 (15.9) _{ac}	9.2 (23.2) _{bc}
Non-prescribed methadone	13.2 (24.6) _{ab}	4.0 (16.1) _a	2.0 (8.7) _b
Cocaine	7.9 (18.0) _{ab}	3.3 (13.0) _a	2.9 (12.0) _b
Crack cocaine	2.3 (10.8) _a	0.9 (6.4) _a	1.2 (7.3)

Note: Matching subscript letters denote statistical significance.

Table 9.2(c) Mean Days Used: Of Those Who Used

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days used in the last 90 days			
Heroin	52.7 (31.7) _a	32.5 (32.7) _{ac}	42.9 (35.3) _c
Cannabis	61.9 (34) _b	60.7 (35.4) _c	50.3 (36.3) _{bc}
Benzodiazepines	35.4 (35.5) _a	22.8 (26.4) _a	30.8 (33.7)
Non-prescribed methadone	29.7 (29.5) _b	28.5 (33.8)	16.2 (20) _b
Cocaine	17.8 (23.7)	16.4 (25.3)	15.2 (24.3)
Crack cocaine	14.9 (23.8)	15.6 (22.3)	20.4 (22.8)

Note: Matching subscript letters denote statistical significance.

In order to provide a more accurate picture of the findings for the mean amounts of drugs used in the last 90 days prior to interview, the results for the population as a whole and the sub-sample who consumed these drugs are presented separately (see **Tables 9.2(d)** and **9.2(e)**, respectively).

For the population as a whole, a comparison for the amount of drugs used at intake and 1-year follow-up revealed that there were significant differences for *heroin* ($p<0.001$), *cocaine* ($p<0.001$), *non-prescribed methadone* ($p<0.001$) and *benzodiazepines* ($p=0.013$). No significant differences were found for the amount of *cannabis* used. The amount of *heroin* used reduced from 0.7 g to 0.2 g, *cocaine* reduced from 0.9 g to 0.3 g, *non-prescribed methadone* reduced from 25.4ml to 7.5ml and *benzodiazepines* reduced from 38.4mg to 23.8mg (see **Table 9.2(d)**).

A comparison of amounts used at intake and 3-year follow-up revealed somewhat similar results with significant improvements for *heroin* ($p<0.001$), *cocaine* ($p<0.001$), *non-prescribed methadone* ($p<0.001$) and *cannabis* ($p=0.019$).

Unlike 1-year follow-up however, no significant changes were found for the amount of *benzodiazepines* used. It was found that the amount of *heroin* used reduced from 0.7g to 0.2g, *cocaine* use reduced from 0.9g to 0.3g, *non-prescribed methadone* reduced from 25.4ml to 7.6ml and *cannabis* reduced from an average of 7.1 joints per day to an average of 3.8 joints per day.

A comparison between 1- and 3-year follow-up revealed a significant increase in the amount of *benzodiazepines* used ($p=0.036$), with the mean amount increasing from 23.8mg at 1-year follow-up to 40.7mg at 3-year follow-up. No other significant differences were evident between 1- and 3-years, indicating improvements were sustained. The exception to this pattern was *cannabis*, which did not reduce significantly until 3-year follow-up.

Table 9.2(d) Mean Amounts Used: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
¹Mean amount used per typical using day in the last 90 days			
Heroin (g)	0.7 (0.8) _{ab}	0.2 (0.6) _a	0.2 (0.4) _b
Cannabis (joints)	7.1 (15.9) _b	5.6 (21.3)	3.8 (11.4) _a
Cocaine (g)	0.9 (2.3) _{ab}	0.3 (1.1) _a	0.3 (0.8) _b
Non-prescribed methadone (ml)	25.4 (39.2) _{ab}	7.5 (27.8) _a	7.6 (24.8) _b
Benzodiazepines (mg)	38.4 (107.5) _a	23.8 (124.1) _{ac}	40.7 (147.1) _c

Note 1: Matching subscript letters denote statistical significance.

Note 2: Crack cocaine was excluded due to inconsistency in how data were reported.

¹ These figures were based on:

- Heroin: one bag costing €20 and containing on average 0.113g at intake and 1-year, with one bag costing €20 and containing on average 0.1g at 3-years.
- Cocaine: one gram costing €110 at intake, €66 at 1-year and €70 at 3-years.
- Cannabis: one ounce costing €110 at intake, €100 at 1-year and €198.45 at 3-years (or a joint costing approx 39c at intake, approx 35c at 1-year and approx 70c at 3-years).

Table 9.2(e) Mean Amounts Used: Of Those Who Used

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
¹Mean amount used per typical using day in the last 90 days			
Heroin (g)	0.8 (0.9) _{ab}	0.4 (0.9) _a	0.4 (0.5) _b
Cannabis (joints)	11.3 (19.0)	10.8 (28.6)	7.6 (15.3)
Cocaine (g)	2.3 (3.2)	1.8 (2.0)	1.7 (1.3)
Non-prescribed methadone (ml)	58.5 (40.1)	56.6 (55.6)	63.7 (40.2)
Benzodiazepines (mg)	111 (159.8)	141 (276.0)	166.7 (261.3)

Note 1: Matching subscript letters denote statistical significance.

Note 2: Crack cocaine was excluded due to inconsistency in how data were reported.

¹ These figures were based on:

- Heroin: one bag costing €20 and containing on average 0.113g at intake and 1-year, with one bag costing €20 and containing on average 0.1g at 3-years.
- Cocaine: one gram costing €110 at intake, €66 at 1-year and €70 at 3-years.
- Cannabis: one ounce costing €110 at intake, €100 at 1-year and €198.45 at 3-years (or a joint costing approx 39c at intake, approx 35c at 1-year and approx 70c at 3-years).

For the sub-sample who used drugs over the 90 days prior to interview, a comparison of intake and 1-year follow-up indicated a significant reduction in the amount of *heroin* used ($p < 0.001$), with the amount consumed decreasing from 0.8g to 0.4g. This result also held between intake and 3-years, although no significant differences were found between 1- and 3-years.

Drug-free Status

A comparison of intake and 1-year follow-up revealed significant differences for *drug-free (not using any illicit drug)* ($p < 0.001$), *drug-free (not using any illicit drug excluding cannabis)* ($p < 0.001$) and *drug-free (not using any illicit drugs or prescribed methadone)* ($p < 0.001$). Those who were *drug-free (not using any illicit drug)* increased from 7% ($n=19$) to 29% ($n=83$). Those who were *drug-free (not using any illicit drug excluding cannabis)* increased from 10% ($n=29$) to 42% ($n=121$) and those who were *drug-free (not using any illicit drugs or prescribed methadone)* increased from 4% ($n=11$) to 20% ($n=58$) (see **Table 9.2(f)**). This represents a very positive outcome with substantial percentages of participants moving towards a drug-free lifestyle.

Significant differences were also found between intake and 3-years. As was the case at 1-year, *drug-free (not using any illicit drug)* ($p < 0.001$), *drug-free (not using any illicit drug excluding cannabis)* ($p < 0.001$) and *drug-free (not using any illicit drugs or prescribed methadone)* ($p < 0.001$) were all found to have improved significantly compared to intake. Those who were *drug-free (not using any illicit drug)* increased from 7% ($n=19$) to 29% ($n=85$). Those who were *drug-free (not using any illicit drug excluding cannabis)* increased from 10% ($n=29$) to 44% ($n=127$) and those who were *drug-free (not using any illicit drugs or prescribed methadone)* increased from 4% ($n=11$) to 20% ($n=58$).

No significant differences were found between 1-year and 3-year follow-up which shows that improvements gained at 1-year were maintained at 3-years. While there was a minor increase between 1- and 3-years for some categories of drug-free, increases were not significant. Again, this suggests a period of stabilisation following the improvements seen at 1-year.

Table 9.2(f) Drug-free

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Drug-free in the last 90 days						
Drug-free (not using any illicit drug)	19	6.7 _{ab}	83	28.8 _a	85	29.4 _b
Drug-free (not using any illicit drug excluding cannabis)	29	10.2 _{ab}	121	41.9 _a	127	43.9 _b
Drug-free (not using any illicit drugs or prescribed methadone)	11	3.9 _{ab}	58	20.1 _a	58	20.1 _b

Note: Matching subscript letters denote statistical significance.

Alcohol and Tobacco

A comparison of intake and 1-year follow-up for *tobacco* and *alcohol* consumption revealed a significant difference for *alcohol* consumption ($p=0.002$). It was found that the number consuming *alcohol* decreased from 57% ($n=153$) at intake to 44% ($n=126$) at 1-year follow-up. However, there was no significant difference found for those who smoked *tobacco*. A more positive result was found between intake and 3-year follow-up with significant differences found for both *tobacco* ($p=0.024$) and *alcohol* ($p < 0.001$). The numbers of those consuming *alcohol* reduced from 57% ($n=153$) to 44% ($n=126$), while the numbers of those consuming *tobacco* reduced from 93% ($n=254$) to 88% ($n=253$) (see **Table 9.2(g)**).

A comparison between 1- and 3-year follow-up for *tobacco* and *alcohol* revealed no significant changes. The number of those consuming *alcohol* remained exactly the same at both time points. This indicates that improvements evident at 1-year follow-up were sustained at 3-years. With respect to the numbers smoking *tobacco*, while there was a significant difference between intake and 3-year follow-up, the difference between 1-year follow-up and 3-year follow-up was not large enough to be regarded as significant.

Table 9.2(g) Alcohol and Tobacco Consumption

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Consumption in the last 90 days						
Tobacco	254	92.7 _b	257	89.2	253	88.2 _b
Alcohol	153	56.9 _{ab}	126	43.9 _a	126	43.9 _b

Note: Matching subscript letters denote statistical significance.

In order to provide a more accurate picture of the findings for the frequency of *tobacco* and *alcohol* consumption over the 90 days prior to interview, the results for the population as a whole and the sub-sample who consumed *tobacco* and *alcohol* are presented separately. Regarding the sub-sample, in terms of analysis, only those who consumed tobacco or alcohol at the two time points being analysed were considered. Therefore, it was not expected that major differences would be apparent over time. However, when these differences did occur, they reflected the habits of those who smoke tobacco or drink alcohol rather than the habits of the opiate using population in treatment as a whole.

For the *per-protocol* population as a whole, a comparison between intake and 1-year follow-up revealed significant differences for the frequency of *alcohol* consumption ($p=0.006$) but not for the frequency of *tobacco* consumption. It was found that the frequency of *alcohol* consumption reduced from an average of 13.6 days in the last 90 days at intake, to 9.3 days at 1-year follow-up. A comparison between intake and 3-year follow-up showed significant differences for the frequency of consumption of *tobacco* ($p=0.039$) and *alcohol* ($p=0.010$), with the frequency of *tobacco* reduced from 81.5 to 77.8 days and the frequency of *alcohol* consumption fell from 13.6 to 9.7 days for intake and 3-years follow-up, respectively. A comparison between 1- and 3-years revealed no significant differences. In terms of *alcohol* consumption, improvements evident at 1-year were maintained at 3-year follow-up. For the frequency of *tobacco* consumption, while there was a significant difference between intake and 3-year follow-up, the difference between 1-year follow-up and 3-year follow-up was not large enough to be regarded as significant (see **Table 9.2(h)**).

For the sub-sample who consumed *tobacco* and *alcohol*, no significant differences were found between intake and either 1-year or 3-year follow-up, or between 1- and 3-years (see **Table 9.2(i)**). This indicates that those consuming *tobacco* and *alcohol* did so at the same levels over the three years since ROSIE recruitment.

Table 9.2(h) Mean Days Consumed Tobacco and Alcohol: Population

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mean days consumed in the last 90 days			
Tobacco	81.5 (25.3) _b	79.3 (28.5)	77.8 (29.9) _b
Alcohol	13.6 (23.2) _{ab}	9.3 (20) _a	9.7 (20.4) _b

Note: Matching subscript letters denote statistical significance.

Table 9.2(i) Mean Days Consumed Tobacco and Alcohol: Of Those Who Consumed

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mean days consumed in the last 90 days			
Tobacco	87.9 (11.2)	88.9 (7.5)	88.3 (9.5)
Alcohol	23.9 (26.6)	21.1 (25.8)	22.1 (26)

In order to provide a more accurate picture of the findings for the amount of *tobacco* and *alcohol* consumed over the 90 days prior to interview, the results for the population as a whole and the sub-sample who consumed tobacco and alcohol are presented separately (see **Tables 9.2(j)** and **9.2(k)**, respectively).

For the population as a whole, a comparison between intake and 1-year follow-up revealed a significant reduction in the amount of alcohol consumed ($p=0.032$) with a reduction from 8.5 units per day at intake to 6.0 units per day at 1-year. No significant reduction was evident from the amount of *tobacco* consumed ($p=0.052$), however it should be noted that this result was borderline significant. When intake and 3-year follow-up were compared, it was found that significant reductions were evident for both *tobacco* ($p=0.022$) and *alcohol* ($p=0.001$) with *alcohol* consumption reduced from 8.5 units per day to 5.6 units per day while *tobacco* consumption reduced from 17.3 cigarettes per day to 15.7 cigarettes per day. A comparison between 1-year follow-up and 3-year follow-up revealed no significant differences. This indicates that improvements evident at 1-year follow-up stabilised thereafter and were still apparent at 3-years.

For the sub-sample who consumed *tobacco* and *alcohol*, no significant differences were found for the amounts consumed between intake and either 1-year or 3-year follow-up or between 1- and 3-years. This indicates that those consuming *tobacco* and *alcohol* were consuming approximately the same quantities of these substances over the three year study period.

Table 9.2(j) Mean Amounts Consumed Tobacco and Alcohol: Population

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mean amount consumed per typical day in the last 90 days			
Tobacco	17.3 (11.3) _b	15.8 (11)	15.7 (11.7) _b
Alcohol	8.5 (12.4) _{ab}	6 (14.2) _a	5.6 (10) _b

Note: Matching subscript letters denote statistical significance.

Table 9.2(k) Mean Amounts Consumed Tobacco and Alcohol: Of Those Who Consumed

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mean amount consumed per typical day in the last 90 days			
Tobacco	18.6 (10.5)	17.8 (10.0)	17.9 (10.9)
Alcohol	15.0 (12.9)	13.7 (18.9)	12.8 (11.6)

Polydrug Use

A comparison between intake and 1-year follow-up revealed a significant reduction in the number of those engaging in polydrug use ($p<0.001$), with 78% ($n=224$) of participants engaging in polydrug use at intake which reduced to 50% ($n=143$) at 1-year follow-up. A comparison between intake and 3-year follow-up also revealed significant reductions for polydrug use ($p<0.001$), with 78% ($n=224$) of participants engaging in polydrug use at intake compared with 45% ($n=131$) at 3-year follow-up. A comparison between 1-year and 3-year follow-up revealed that while there had been a further small reduction in the percentage of those engaging in polydrug use, this reduction was not significant. However, this shows that improvements with regard to polydrug use one year after intake to treatment were still evident at the 3-year time point.

Table 9.2 (l) Polydrug Use

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Engaging in polydrug use	224	77.5 _{ab}	143	49.5 _a	131	45.3 _b

Note: Matching subscript letters denote statistical significance.

9.3 Crime

Criminal Activity

Comparison of intake and 1-year follow-up for crimes committed over the 90 days prior to interview showed significant improvements for *selling/supplying drugs* ($p<0.001$), *theft from a person* ($p<0.001$), *theft from a house or home* ($p=0.010$), *theft from a shop/commercial property* ($p<0.001$), *theft from a vehicle* ($p=0.024$), *theft of a vehicle* ($p=0.001$), *handling stolen goods* ($p<0.001$), *fraud/forgery/deception* ($p<0.001$), *assault* ($p=0.007$), *criminal damage* ($p=0.001$), *soliciting* ($p=0.004$) and *breach of the peace*. The most notable reduction was for *selling/supplying drugs* which reduced from 31% ($n=81$) at intake to 11% ($n=31$) at 1-year follow-up. Notable reductions were also apparent for all other forms of criminal activity (see **Table 9.3(a)**).

Similar positive results were evident between intake and 3-year follow-up with *selling/supplying drugs* ($p<0.001$), *theft from a person* ($p<0.001$), *theft from a house or home* ($p=0.031$) *theft from a shop/commercial property* ($p<0.001$), *theft of a vehicle* ($p<0.001$), *handling stolen goods* ($p<0.001$), *fraud/forgery/deception* ($p=0.001$), *assault* ($p=0.023$), *soliciting* ($p=0.004$) and *breach of the peace* ($p=0.011$) all showing significant improvements. As at 1-year, the most notable reduction was for *selling/supplying drugs* which reduced from 31% ($n=81$) to 11% ($n=31$). All other types of criminal activity, excluding *theft from a vehicle* and *criminal damage*, showed significant reductions compared to intake levels.

Table 9.3(a) Crimes Committed

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Crimes committed in the last 90 days						
Selling/supplying drugs	81	31.0 _{ab}	31	10.8 _a	31	10.8 _b
Theft from a person	31	11.8 _{ab}	7	2.5 _a	5	1.7 _b
Theft from house/home	18	6.9 _{ab}	7	2.5 _a	9	3.1 _b
Theft from shop/commercial property	50	19.1 _{ab}	24	8.5 _a	22	7.6 _b
Theft from a vehicle	21	8.0 _a	9	3.2 _a	12	4.2
Theft of vehicle	21	7.9 _{ab}	5	1.8 _a	6	2.1 _b
Handling stolen goods	68	26.2 _{ab}	21	7.3 _a	30	10.4 _b
Fraud/forgery/deception	28	10.8 _{ab}	4	1.4 _a	8	2.8 _b
Assault	20	7.7 _{ab}	8	2.8 _a	8	2.8 _b
Criminal damage	18	6.9 _a	5	1.7 _a	11	3.8
Soliciting	12	4.6 _{ab}	3	1.1 _a	2	0.7 _b
Breach of peace	20	7.7 _{ab}	5	1.8 _a	8	2.8 _b

Note: Matching subscript letters denote statistical significance.

A comparison between 1-year and 3-year follow-up for crimes committed revealed that while there were some minor increases and decreases, there were no significant changes between these two time points. Thus any improvements in criminal activity evident at 1-year were maintained at 3-years.

In order to provide an accurate picture of the findings for the frequency of crimes committed in the 90 days prior to interview, the results for the *per-protocol* population as a whole are presented separately from the sub-sample who committed crime (see **Table 9.3(b)**). Regarding the sub-sample, in terms of comparative analysis, only those who committed the same particular crime at the two time points being analysed were considered. Therefore, it was not expected that major differences would be apparent over time. However, when these differences did occur, it reflected a change in the frequency of a particular crime being committed by those respondents who committed that crime at both time points, rather than a change for all participants.

For the *per-protocol* population as a whole, a comparison between intake and 1-year follow-up showed that improvements were apparent for nine of the 12 crime categories with *selling/supplying drugs* ($p<0.001$), *theft from a person* ($p=0.043$), *theft from a commercial property* ($p=0.001$), *theft of a vehicle* ($p=0.035$), *handling stolen goods* ($p<0.001$), *fraud/forgery/deception* ($p=0.007$), *assault* ($p=0.005$), *criminal damage* ($p=0.030$) and *soliciting* ($p=0.006$) all showing improvement. The most notable reduction was for the average number of days *selling/supplying drugs* in the last 90 days, which reduced from 12.7 to 3.9 days (see **Table 9.3(b)**).

A comparison between intake and 3-year follow-up showed that fewer significant reductions were evident than at 1-year, with only *selling/supplying drugs* ($p<0.001$), *theft from a commercial property* ($p=0.001$), *handling stolen goods* ($p=0.002$) and *soliciting* ($p=0.004$) showing significant differences for the frequency at which they were committed. However, it should be noted that *fraud/forgery/deception* ($p=0.056$) was borderline significant. As at 1-year follow-up, the most notable reduction was for *selling/supplying drugs* which reduced from 12.7 to 4.3 days.

No further reductions or increases were evident between 1- and 3-years. This indicates that a period of stabilisation took place after the initial improvements were achieved and that these were still evident at 3-year follow-up.

Table 9.3(b) Mean Days Crimes Committed: Population

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days crime committed in the last 90 days			
Selling/supplying drugs	12.7 (26.5) _{ab}	3.9 (15.6) _a	4.3 (16.5) _b
Theft from a person	1.0 (7.1) _a	0.1 (0.7) _a	0.5 (6.1)
Theft from house/home	0.6 (4.8)	0.3 (3.6)	0.3 (2.3)
Theft from shop/commercial property	4.9 (17.3) _{ab}	1.6 (10.0) _a	1.2 (7.3) _b
Theft from a vehicle	0.6 (4.7)	0.3 (3.6)	0.5 (3.9)
Theft of a vehicle	0.2 (0.8) _a	0.1 (0.6) _a	0.1 (1.9)
Handling stolen goods	5.6 (17.8) _{ab}	0.8 (6.8) _a	2.0 (10.5) _b
Fraud/forgery/deception	1.8 (9.7) _a	0.1 (1.8) _a	0.4 (5.4)
Assault	0.1 (0.4) _a	0.0 (0.2) _a	0.1 (1.2)
Criminal damage	0.3 (2.3) _a	0.0 (0.1) _a	0.4 (4.5)
Soliciting	2.6 (14.0) _{ab}	0.0 (0.6) _a	0.2 (2.8) _b
Breach of the peace	0.4 (3.5)	0.0 (0.1)	0.0 (0.3)

Note: Matching subscript letters denote statistical significance.

No significant results were found for the sub-sample of those who committed crime at any time point (see **Table 9.3(c)**). This was primarily due to the small number of those committing crimes for the particular categories at both time points being analysed, which rendered the statistical tests inconclusive.

Table 9.3(c) Mean Days Crimes Committed: Of Those Who Committed Crime

	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days crime committed in the last 90 days			
Selling/supplying drugs	44.9 (32.2)	42.2 (32.2)	44.1 (32.2)
Theft from a person	9.7 (20.5)	5.3 (4.5)	31.3 (38.8)
Theft from house/home	11.1 (18.5)	18.8 (27.8)	8.9 (9.9)
Theft from shop/commercial property	29.3 (32.9)	25.6 (32.7)	16.7 (22.3)
Theft from a vehicle	8.2 (16.1)	15.2 (25.3)	11.8 (15.9)
Theft of a vehicle	2.5 (1.8)	4.0 (4.2)	8.6 (12.6)
Handling stolen goods	23.9 (30.3)	20.0 (29.2)	19.3 (27.8)
Fraud/forgery/deception	19.2 (26.4)	15.5 (20.5)	14.4 (30.8)
Assault	1.6 (0.8)	1.2 (0.4)	5.4 (8.3)
Criminal damage	5.3 (7.9)	1.0 (0.0)	14.0 (24.7)
Soliciting	56.3 (37.0)	5.5 (6.4)	48.0 (0.0)
Breach of the peace	8.1 (14.4)	1.0 (0.0)	1.7 (1.1)

Arrests for Criminal Offences

Significant results were found for two categories only with respect to arrests by crime in the last 90 days. *Theft from a person* showed a significant decrease ($p=0.031$) from 3% at intake to 0% at 3-years, while *criminal damage* showed a significant decrease ($p=0.004$) from 4% at intake to 0% at 1-year. This increased to 1% at 3-years, but the increase was not significant. Once again, the small number of those who were arrested may have made statistical tests less sensitive at detecting any significant differences over time (see **Table 9.3(d)**).

Table 9.3(d) Crimes Arrested For in the Last 90 days

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Arrests by crime in the last 90 days						
Selling/supplying drugs	8	3.3	10	3.5	5	1.7
Theft from a person	6	2.8 _b	1	0.4	0	0.0 _b
Theft from house/home	2	0.9	2	0.7	3	1.0
Theft from commercial property	14	6.1	9	3.2	9	3.1
Theft from a vehicle	2	0.9	0	0.0	0	0.0
Theft of a vehicle	4	1.8	3	1.1	1	0.3
Handling stolen goods	7	2.9	1	0.3	3	1.0
Fraud/forgery/deception	3	1.3	1	0.3	3	1.0
Assault	7	3.2	6	2.1	3	1.0
Criminal damage	9	4.1 _a	0	0.0 _a	3	1.0
Soliciting	2	1.0	0	0.0	0	0.0
Breach of the peace	7	3.2	3	1.1	4	1.4

Note: Matching subscript letters denote statistical significance.

Current Legal Problems

A comparison of current legal problems between intake and 1-year follow-up showed that there were significant differences for *no legal problems* ($p=0.040$), *serving a sentence in prison* ($p=0.004$), and *outstanding warrants* ($p=0.026$).

Two of these categories showed positive results with those experiencing *no legal problems* increasing from 55% ($n=151$) at intake to 62% ($n=176$) at 1-year follow-up and those with *outstanding warrants* reducing from 13% ($n=36$) at intake to 7% ($n=21$) at 1-year follow-up. However, there was an increase in the number of those *serving a sentence in prison* with 2% ($n=6$) *serving a sentence in prison* at intake compared to 7% ($n=21$) at 1-year follow-up (see **Table 9.3(e)**).

A comparison of *current legal problems* between intake and 3-year follow-up showed that improvements were evident across a wider range of categories than at 1-year follow-up. Significant differences were found for *no legal problems* ($p=0.008$), *serving a sentence in prison* ($p=0.027$), *outstanding warrants* ($p<0.001$) and also *on bail – awaiting trial* ($p<0.001$). Again, reductions were evident for those experiencing *legal problems* and those with *outstanding warrants*, although the most notable positive results were for those *on bail – awaiting trial* reducing from 16% ($n=44$) to 5% ($n=15$). However, there was an increase in the number of those *serving a sentence in prison* with 2% ($n=6$) in prison at intake compared to 7% ($n=20$) at 3-year follow-up.

A comparison between 1-year and 3-year follow-up showed that there was a further reduction of the number *on bail – awaiting trial* from 11% ($n=30$) to 5% ($n=15$). No other significant results were evident for any other legal problems. Again this indicates a period of stabilisation after initial improvements were achieved.

Table 9.3(e) Current Legal Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
¹Current legal problems						
None	151	54.5 _{ab}	176	62.0 _a	186	64.4 _b
On probation/community service	26	9.6	27	9.5	24	8.3
Serving sentence in prison/ in prison on remand	6	2.2 _{ab}	21	7.4 _a	20	6.9 _b
On bail – awaiting trial/hearing	44	16.2 _b	30	10.6 _c	15	5.2 _{bc}
On bail – awaiting sentencing	10	3.7	14	4.9	10	3.5
On temporary release/parole	6	2.2	2	0.7	5	1.7
Outstanding warrants	36	13.2 _{ab}	21	7.4 _a	16	5.6 _b
Outstanding fines	19	7.0	22	7.8	30	10.4

Note: Matching subscript letters denote statistical significance.

¹ Categories are not mutually exclusive.

9.4 Health and Risk Behaviour

Physical Health Outcomes

A comparison of intake and 1-year follow-up for reported physical health symptoms revealed significant differences for *poor appetite* ($p=0.007$), *tiredness/fatigue* ($p=0.031$), *joint/bone pains* ($p=0.003$), *muscle pains* ($p=0.002$) and *tremors/shakes* ($p<0.001$). It should also be noted that *nausea* ($p=0.064$) was borderline significant (see **Table 9.4(a)**).

Improvements were still evident at 3-year follow-up, with significant differences between intake and 3-years for *poor appetite* ($p<0.001$), *nausea* ($p=0.047$), *joint and bone pains* ($p=0.001$), *muscle pains* ($p=0.004$) and *tremors/shakes* ($p=0.045$). However, no reduction was apparent for *tiredness and fatigue*. Again positive results were evident for all significant categories, in particular for *poor appetite* which reduced from 72% ($n=193$) to 56% ($n=158$).

There were also significant differences between 1-year and 3-year follow-up, with *tremor/shakes* ($p=0.006$), *tiredness/fatigue* ($p=0.038$) and *numbness and tingling* ($p<0.001$) all showing deterioration compared to 1-year follow-up. The most notable increase was for *numbness and tingling* which increased from 17% ($n=48$) to 29% ($n=80$). These findings are contradictory to results found for other outcome measures such as crime or drug use. Instead of a period of stabilisation following 1-year results, there seemed to be a marked deterioration in some health categories.

Table 9.4(a) Number and Percentage Experienced Physical Health Symptoms

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Physical health symptoms experienced in the last 90 days						
Poor appetite	193	72.3 _{ab}	167	60.1 _a	158	55.8 _b
Tiredness/fatigue	194	72.4 _a	174	62.8 _{ac}	198	70.0 _c
Nausea	107	40.1 _b	91	32.5	94	33.1 _b
Stomach pains	99	37.2	94	33.6	107	37.9
Difficulty breathing	79	29.9	69	24.6	82	29.0
Chest pains	59	22.2	51	18.2	55	19.4
Joint/bone pains	100	37.5 _{ab}	71	25.4 _a	74	26.2 _b
Muscle pains	91	34.3 _{ab}	66	23.6 _a	67	23.6 _b
Numbness/tingling arms/legs	60	22.5	48	17.1 _c	80	28.5 _c
Tremors/shakes	75	28.8 _{ab}	44	15.8 _{ac}	65	22.9 _{bc}

Note: Matching subscript letters denote statistical significance.

A comparison of intake and 1-year follow-up for the frequency of reported physical health problems revealed significant differences for *poor appetite* ($p=0.001$) and *tiredness and fatigue* ($p=0.042$). It was found that *poor appetite* reduced from 49.2 days to 37.6 days and *tiredness and fatigue* reduced from 45.0 days to 38.0 days. No other significant differences were found between intake and 1-year follow-up (see **Table 9.4(b)**).

A comparison of intake and 3-year follow-up showed that there were significant differences for *poor appetite* ($p<0.001$) and *numbness and tingling* ($p=0.040$), with *poor appetite* reducing from 49.2 days to 30.9 days and *numbness and tingling* increasing from 8.2 days to 12.3 days. No significant results were found for the other variables.

A comparison between 1-year and 3-year follow-up showed significant differences for *poor appetite* ($p=0.010$), *difficulty breathing* ($p=0.025$), *numbness and tingling* ($p=0.005$) and *tremors/shakes* ($p=0.007$). It was found that there was a further reduction for *poor appetite*, however all other significant variables showed an increase in the frequency of symptoms of approximately 4 to 5 days. In terms of the frequency of reported health problems, it would appear that the most positive results are evident at 1-year follow-up, after which deterioration takes place.

Table 9.4(b) Mean Days Physical Health Symptoms Experienced: Population

	Intake	1-year	3-years
	Mean (s.d.)	Mean (s.d.)	Mean (s.d.)
Mean days reported in the last 90 days			
Poor appetite	49.2 (38.8) _{ab}	37.6 (39.2) _{ac}	30.9 (37.2) _{bc}
Tiredness/fatigue	45.0 (38.8) _a	38.0 (39.3) _a	41.3 (38.4)
Nausea	14.2 (27.7)	14.6 (28.9)	12.6 (27.4)
Stomach pains	14.0 (26.6)	14.4 (28.3)	16.5 (30.3)
Difficulty breathing	14.3 (29.5)	13.7 (29.5) _c	17.4 (32.7) _c
Chest pains	7.6 (20.5)	8.0 (22.8)	6.3 (19.4)
Joint/bone pains	13.2 (27.1)	10.8 (25.3)	14.1 (29.9)
Muscle pains	9.6 (21.7)	9.9 (24.7)	11.4 (26.7)
Numbness/tingling arms/legs	8.2 (22.3) _b	7.4 (21.1) _c	12.3 (27.3) _{bc}
Tremors/shakes	10.0 (23.4)	7.2 (21.2) _c	11.3 (27.0) _c

Note: Matching subscript letters denote statistical significance.

Mental Health Outcomes

A comparison between intake and 1-year follow-up for mental health complaints showed that there were significant differences for *feeling tense* ($p=0.001$), *suddenly scared for no reason* ($p=0.004$), *feeling nervous/shakiness inside* ($p=0.016$), *feelings of worthlessness* ($p=0.003$), *feeling lonely* ($p=0.012$) and *thoughts of ending your life* ($p=0.018$). It should also be noted that *feeling fearful* ($p=0.059$) was borderline significant. All of these results showed an improvement on intake scores (see **Table 9.4(c)**).

A comparison between intake and 3-year follow-up showed that a narrower range of improvements were apparent than at 1-year follow-up. However, there were significant differences for *feeling hopeless about the future* ($p=0.003$), *feeling lonely* ($p=0.001$) and *thoughts of ending your life* ($p=0.010$). It should also be noted that *feelings of worthlessness* ($p=0.054$) was borderline significant.

A comparison between 1-year and 3-year follow-up also showed significant differences for *feeling tense* ($p<0.001$), *suddenly scared for no reason* ($p=0.008$), *feeling fearful* ($p=0.002$) and *nervous/shakiness inside* ($p=0.020$). However, all of these results showed deterioration with *feeling tense* and *feeling fearful* increasing beyond intake levels.

This result was in line with similar comparisons of 1-year and 3-year follow-ups for physical health outcome measures. As before, after improvements evident at 1-year, deterioration was apparent at 3-year follow-up.

Table 9.4(c) Number and Percentage Experienced Mental Health Symptoms

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Mental health symptoms experienced in the last 90 days						
Feeling tense	169	65.3 _a	134	50.4 _{ac}	184	66.2 _c
Suddenly scared for no reason	90	34.6 _a	67	24.9 _{ac}	98	34.8 _c
Feeling fearful	107	42.8	93	35.1 _c	131	46.8 _c
Nervous/shakiness inside	110	43.0 _a	87	32.8 _{ac}	117	41.9 _c
Panic attacks	63	24.0	66	24.7	68	24.3
Feeling hopeless about the future	144	57.1 _b	132	49.4	131	46.6 _b
Feelings of worthlessness	136	53.8 _a	113	42.2 _a	131	46.8
No interest in things	152	59.4	142	53.2	151	53.7
Feeling lonely	150	59.8 _{ab}	132	50.0 _a	137	49.1 _b
Thoughts of ending your life	64	25.9 _{ab}	49	17.9 _a	50	17.8 _b

Note: Matching subscript letters denote statistical significance.

A comparison between intake and 1-year follow-up for the frequency of reported mental health symptoms showed that there were significant differences for *feeling tense* ($p < 0.001$), *suddenly scared for no reason* ($p = 0.002$), *feeling fearful* ($p = 0.038$), *nervous/shakiness inside* ($p < 0.001$), *feeling hopeless about the future* ($p = 0.015$), *feelings of worthlessness* ($p < 0.001$), *no interest in things* ($p = 0.029$), *feeling lonely* ($p = 0.001$) and *thoughts of ending your life* ($p = 0.003$). All of these results showed improvement between intake and 1-year follow-up. The frequency of *feeling tense* showed the most notable reduction decreasing from 37.2 to 21.9 days (see **Table 9.4(d)**).

A comparison between intake and 3-year follow-up revealed less significant differences than at 1-year follow-up. However, reductions were still evident for *feeling tense* ($p = 0.021$), *feeling hopeless about the future* ($p < 0.001$), *feelings of worthlessness* ($p = 0.001$), *no interest in things* ($p = 0.001$), *feeling lonely* ($p < 0.001$) and *thoughts of ending your life* ($p = 0.032$). The most notable reductions were for *feeling lonely* which reduced from 34.3 to 23.8 days and for *feelings of worthlessness* which reduced from 29.3 to 19.9 days. Between 1-year and 3-years however, deterioration was apparent for *feeling tense* ($p < 0.001$), *suddenly scared for no reason* ($p = 0.029$), *feeling fearful* ($p = 0.016$) and *nervous/shakiness inside* ($p = 0.008$). Of these significant results, the greatest increases were for *feeling fearful* which increased from 14.0 to 18.5 days, *nervous/shakiness inside* which increased from 11.7 to 16.4 days and *feeling tense* which increased from 21.9 to 30.5 days. This result is in line with other comparisons between 1-year and 3-year follow-up for health outcome measures.

Table 9.4(d) Mean Days Mental Health Symptoms Experienced: Population

	Intake		1-year		3-years	
	Mean (s.d.)		Mean (s.d.)		Mean (s.d.)	
Mean days reported in the last 90 days						
Feeling tense	37.2 (37.9) _{ab}		21.9 (31.4) _{ac}		30.5 (35.5) _{bc}	
Suddenly scared for no reason	15.8 (30.2) _a		9.3 (23.1) _{ac}		13.4 (28.0) _c	
Feeling fearful	20.1 (32.2) _a		14.0 (27.2) _{ac}		18.5 (31.2) _c	
Nervous/shakiness inside	19.8 (31.8) _a		11.7 (25.3) _{ac}		16.4 (29.8) _c	
Panic attacks	9.3 (23.3)		8.0 (20.9)		7.2 (21.0)	
Feeling hopeless about the future	29.2 (36.7) _{ab}		21.4 (32.8) _a		20.5 (32.6) _b	
Feelings of worthlessness	29.3 (37.7) _{ab}		18.9 (31.7) _a		19.9 (31.5) _b	
No interest in things	32.6 (37.4) _{ab}		25.9 (35.2) _a		24.1 (34.1) _b	
Feeling lonely	34.3 (38.4) _{ab}		24.1 (33.9) _a		23.8 (34.4) _b	
Thoughts of ending your life	8.9 (23.8) _{ab}		3.3 (14.3) _a		5.6 (18.8) _b	

Note: Matching subscript letters denote statistical significance.

Injecting-related Risk Behaviour

A comparison of intake and 1-year follow-up for injecting-related risk behaviour over the 90 days prior to interview showed that there was a significant difference for whether or not participants had *injected* ($p < 0.001$). It was found that there was a substantial reduction in the number of those *injecting* drugs with 58% ($n=131$) injecting at intake reducing to 29% ($n=83$) at 1-year follow-up. No significant differences were found for other injecting-related risk behaviour categories (see **Table 9.4(e)**).

Table 9.4(e) Injecting-related Risk Behaviour

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Injecting behaviour in the last 90 days						
Injected	131	58.0 _{ab}	83	28.7 _a	77	26.7 _b
¹Injecting-related risk behaviour the last 30 days						
Borrowed used injecting equipment	11	8.7	8	10.3	10	13.5
Lent used injecting equipment	10	8.1	10	12.8	10	13.5
Re-used own needles/syringes	34	34.4	35	46.1	45	64.3
Used filter, spoon or flush water after someone	11	9.6	7	9.0	14	18.9
Overdosed in the last 90 days	20	7.2	11	3.9	15	5.2

Note: Matching subscript letters denote statistical significance.

¹ Of those who injected in the last 90 days.

A comparison between intake and 3-year follow-up showed that reductions in the number of those *injecting* ($p < 0.001$) were still evident, with 27% ($n=77$) still injecting at 3-years compared to 58% ($n=131$) at intake. However, a comparison between 1-year and 3-year follow-up revealed no significant differences. This indicates that following improvements at 1-year, individuals' behaviour stabilised and results were sustained.

Sexual Health

A comparison of intake and 1-year follow-up for sexual-related health revealed that there were no significant differences for any categories. An examination of the figures in **Table 9.4(f)** shows that there was very little alteration in respondents' sexual behaviour one year after first entering treatment. However, a comparison of intake and 3-year follow-up showed that there was a significant difference for *having sex with someone other than a regular partner* ($p=0.001$). It was found that participants were less likely to have sex with someone other than a regular partner at 3-year follow-up, with 32% ($n=54$) *having sex with someone other than a regular partner* at intake compared to 20% ($n=38$) at 3-year follow-up. As before there were no other significant differences evident at 3-year follow-up. Similarly, no significant differences were evident between 1-year and 3-year follow-up.

Table 9.4(f) Sexual Health

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sexual history in the last 90 days						
Participants having sex	190	68.8	175	63.4	189	68.0
Participants not having sex	86	31.2	101	36.6	89	32.0
^{1,2}Sexual partners in the last 90 days						
Having sex with a regular partner	149	82.8	143	83.6	160	84.7
Having sex with someone other than a regular partner	54	32.3 _b	37	24.2	38	20.1 _b
²Condom use with regular partner						
Always used condom	37	26.1	34	27.6	37	23.7
Sometimes used condom	14	9.9	12	9.8	14	9.0
Never used condom	91	64.1	77	62.6	105	67.3
²Condom use with someone other than a regular partner						
Always used condom	20	45.5	13	50.0	22	61.1
Sometimes used condom	7	15.9	5	19.2	6	16.7
Never used condom	17	38.6	8	30.8	8	22.2

Note: Matching subscript letters denote statistical significance.

¹ These categories are not mutually exclusive.

² Refers only to those who reported having sex in the last 90 days.

9.5 Social Functioning

Training and Education Status

A comparison between intake and 1-year follow-up for training and education status over the last six months showed that there was a significant difference for the number of those that had been on a *training course* ($p<0.001$). This result was quite positive with 15% ($n=43$) of participants attending a *training course* at intake compared to 29% ($n=84$) at 1-year follow-up. No other significant results were found for the remaining training and education status categories (see **Table 9.5(a)**).

A comparison between intake and 3-year follow-up showed that again there was a significant difference for the number of those that had been on a training course ($p<0.001$). As at 1-year, this result was quite positive with 33% ($n=96$) of participants attending a training course at 3-year follow-up compared to 15% ($n=43$) at intake. As at 1-year, no other significant differences were found between intake and 3-years. Similarly, a comparison between 1-year and 3-year follow-up revealed that while there was a general increase in the uptake of training and educational courses: these changes were not significant.

Table 9.5(a) Training and Education Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Been on training courses over the last six months						
Yes	43	14.9 _{ab}	84	29.2 _a	96	33.2 _b
No	245	85.1	204	70.8	193	66.8
Type of training course in the last six months						
Community employment scheme	11	3.8	20	6.9	27	9.3
Personal development/life skills	8	2.8	18	6.2	24	8.3
Second/third level course	3	1.0	20	6.9	13	4.5
Vocational: computers	6	2.1	6	2.1	7	2.4
Vocational: building/machinery/driving	7	2.4	6	2.1	12	4.2
Vocational: other	5	1.7	11	3.8	11	3.8

Note: Matching subscript letters denote statistical significance.

Employment and Income Status

A comparison between intake and 1-year follow-up for employment and income status over the 90 days prior to interview revealed that there were significant differences for participants' main sources of income in terms of *family/partner* ($p<0.001$), *drug dealing* ($p<0.001$) and *other crime* ($p<0.001$). These results were very positive with improvements ranging from approximately 13% to 27% for all significant categories (see **Table 9.5(b)**). This indicates that participants were far more self-reliant one year after entering treatment.

Further improvements were evident at 3-year follow-up with significant differences evident for *paid legal employment* in the last 90 days ($p<0.001$), *currently employed* ($p<0.001$) and main sources of income in terms of *wage/salary* ($p=0.001$), *family/partner* ($p<0.001$), *social welfare* ($p=0.004$), *drug dealing* ($p=0.001$) and *other crime* ($p=0.001$). Again these results were very positive, with improvements ranging from approximately 10% to 25% for all significant categories.

Table 9.5(b) Employment and Income Status

	Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Usual occupation in the last 90 days						
Working (full-time/part-time)	52	18.0	51	17.6	74	25.6
Casual work	50	17.3	58	20.1	51	17.6
Community employment scheme	11	3.8	20	6.9	27	9.3
In prison	15	5.2	19	6.6	23	8.0
In treatment	3	1.0	5	1.7	2	0.7
Home duties	4	1.4	8	2.8	5	1.7
Student	0	0.0	3	1.0	1	0.3
Disability	18	6.2	22	7.6	22	7.6
Not working	133	46.0	103	35.6	84	29.1
Recent employment						
Employed in the last 90 days	58	20.5 _b	64	22.1 _c	95	33.0 _{bc}
Currently employed	43	15.0 _b	58	20.1 _c	90	31.3 _{bc}
¹Main sources of income in the last 90 days						
Wage/salary	56	19.6 _b	54	18.7 _c	85	29.5 _{bc}
Family/partner	89	31.0 _{ab}	53	18.3 _{ac}	34	11.8 _{bc}
Social welfare	236	82.2 _b	229	79.2 _c	209	72.3 _{bc}
Drug dealing	74	25.8 _{ab}	27	9.3 _a	18	6.3 _b
Other crime	108	37.8 _{ab}	30	10.4 _a	35	12.2 _b

Note: Matching subscript letters denote statistical significance.

¹ These categories are not mutually exclusive.

A comparison between 1-year and 3-year follow-up showed significant differences for *paid legal employment* in the last 90 days ($p < 0.001$), *currently employed* ($p < 0.001$) and main sources of income in terms of *wage/salary* ($p < 0.001$), *family/partner* ($p < 0.030$) and *social welfare* ($p = 0.0023$). Unusually, compared to results from other comparisons of 1-year and 3-year follow-ups, further improvements were evident for all significant categories, with improvements ranging from approximately 7% to 11%. It should be noted that a number of participants were in residential treatment at intake and thus were unable to work. As a result, an increase in the number of those working is to be expected.

9.6 Discussion and Conclusion

Overall results for drug use in terms of drugs used, frequency of use and amount used were quite positive. For the *per-protocol* population as a whole, reductions in the use of heroin and cocaine were particularly encouraging. However, while the largest improvements were observed at 1-year follow-up, some deterioration was evident between 1-year and 3-year follow-up for frequency of heroin use and for the use of benzodiazepines, in both frequency and quantity. It should be noted that these increases did not signify a return to intake levels of consumption. For the sub-sample who used drugs over the 90 days prior to interview, reductions were found for both the frequency and amount of heroin used at 1-year follow-up. However, the frequency of heroin use increased at 3-years, although not to the same level as at intake. Positive results were also evident for those who reported being drug-free: improvements at 1-year were sustained at 3-year follow-up. Similar results were observed for polydrug use and the consumption of alcohol and tobacco.

As with drug use, there were clear improvements in criminal behaviour and legal problems. Results for criminal activity were particularly positive, as any improvements found at 1-year were still evident at 3-years. Improvements were also found for legal problems with participants experiencing less legal problems at both 1- and 3-year follow-up. Due to the small numbers committing crime and being arrested, statistical tests were unable to detect any significant differences for these sub-groups.

Unlike the findings for crime and drug use, results for health and risk behaviour indicated that improvements found at 1-year were not always maintained at 3-year follow-up. While both physical and mental health showed improvements in terms of types and frequency of complaints at 1-year follow-up, there was marked deterioration at 3-years for a wide range of health problems. In terms of injecting-related health, fewer individuals were injecting at 1-year and at 3-years. Regarding sexual health, fewer individuals reported having sex with someone other than a regular partner at 1-year and at 3-years compared to intake.

The pattern of the findings for social functioning also differed from drug use and crime. In terms of the uptake of training and education, improvements were evident at 1-year follow-up and were sustained thereafter. Positive results were apparent for employment and income status, with a wide range of categories showing improvements at 1-year follow-up. A comparison of 1-year and 3-year follow-up showed further improvements, which was very encouraging as it indicated that individuals were moving towards a more independent lifestyle.

In conclusion, overall results for the *per-protocol* group were positive. Most improvements were attained at 1-year and were sustained in many categories. Drug use, crime and social functioning on the whole displayed positive outcomes at 3-years, while health and risk behaviour showed less improvement in the long term.

CHAPTER 10: CONCLUSION

10.1 Introduction

The aim of ROSIE was to evaluate the effect of treatment for opiate use not only on the individual presenting for treatment but on the community and the society within which that person resides. The conclusions from this study can be summarised as follows:

- It was found that the mortality rate of participants followed-up at 1- and 3-years was low at 0.5% and 1.5%, respectively.
- Of those interviewed at 3-years, 59% were currently in receipt of methadone treatment.
- Significant reductions were observed from intake to 1-year follow-up in both the proportion using and the mean number of days on which participants used a range of drugs.
- With the exception of the proportion using benzodiazepines, these reductions were generally sustained when participants were interviewed again at 3-years.
- The proportion using benzodiazepines increased significantly from 1- to 3-years but the proportion using at 3-years was still lower than the proportion using at intake.
- The percentage drug-free from all illegal drugs in the last 90 days increased significantly from 9% at intake to 28% at 1-year and 29% at 3-years.
- Contrary to expectation, reductions in participants' opiate and other drug use were not mirrored by an increase in cocaine use, with the proportion using at 1-year and at 3-years significantly lower than at intake.
- The reduction in participants' opiate and other drug use was not accompanied by an increase in alcohol consumption, with the proportion using at 1-year and at 3-years significantly lower than at intake.
- Significant reductions were observed from intake to 1-year follow-up in both the proportion committing and the mean number of days on which participants committed a range of crimes. These reductions were sustained at 3-year follow-up.
- Health outcomes were mixed. The proportion experiencing some physical health symptoms reduced significantly from intake to 1-year. These were poor appetite, tiredness/fatigue, joint/bone pains, and tremors/shakes. There was no significant reduction in feelings of nausea, stomach pains, difficulty breathing, chest pains and numbness/tingling. At 3-years, the proportion experiencing some physical health symptoms increased significantly from 1-year. These were tiredness/fatigue, joint/bone pains, numbness/tingling and tremors/shakes.
- A similarly mixed pattern was observed in the proportion experiencing a range of mental health outcomes, with some symptoms reducing significantly from intake to 1-year (feeling tense, suddenly scared, nervousness, feeling of worthlessness, feeling lonely, thoughts of ending your life) and some increasing from 1-year to 3-years (feeling tense, suddenly scared, feeling fearful and nervousness).
- There were significant reductions from intake to 1-year in the proportion who had injected a drug in the last 90 days. This reduction was sustained at 3-years.
- There was a significant improvement from intake to 3-years and from 1-year to 3-years in the proportion employed in the last 90 days and in the proportion currently employed. The percentage employed in the last 90 days was 30% at 3-years.
 - There was a significant increase in the mean number of times on which participants had attended a service regarding employment, training or education from 1- to 3-years.
 - The proportion living in their own house/flat or rental accommodation increased significantly from intake to 1-year and this increase was sustained at 3-years. The percentage living in their own house/flat or rental accommodation was 49% at 3-years.
 - The proportion of those with no fixed abode or living in hostels, shelters or bed and breakfast accommodation in the last 90 days decreased significantly from intake to 3-years. At 3-years 3% of respondents reported no fixed abode and 9% reported living in a hostel, shelter or bed and breakfast accommodation.

10.2 Conclusions in an International Context

In an international context ROSIE achieved exceptionally high follow-up rates with 75% of all participants interviewed at 1-year and 88% interviewed at 3-years. In England and Wales, NTORS at the 2-year and 4-5 year follow-up points did not attempt to interview all of the original 1,075 participants recruited. The eligible sample for 2-year and 4-5 year follow-up was constructed using a sampling frame of 894 participants (83% of the intake sample) for whom definite locator information was confirmed by contact during the first year after intake. From this, a random stratified sample of 650 participants was selected and 76% of those selected were followed-up and interviewed (Gossop, M., Marsden, J. & Stewart, D. (2000)). The ROSIE 3-year mortality rate was 1.5%. The mortality rate for the study population at 1-year was very low at 0.5% when compared with NTORS (1.2%) or Smyth *et al's* (2005) follow-up study of opiate users seeking inpatient treatment in Dublin (1.8%). However, it should be noted that the confidence interval for the ROSIE mortality rate at 1-year did include these two point estimates.

It was observed that 40% of the participants recruited in the methadone modality were still in their intake treatment setting at 3-years. In addition, it was observed that 59% of those interviewed at 3-years were currently receiving methadone treatment. Approximately 70% of participants recruited within the detoxification and abstinence modalities completed their intake treatment, an encouraging result, since Ravndal *et al* (2005) state that the completion of treatment is an important indicator for improved outcomes. Studies conducted in the UK show completion rates varying from 25-50% (Gossop *et al*, 1999; Keen *et al*, 2001), so the Irish completion rates reported by ROSIE compare favourably at the international level.

Reductions observed in the proportion using a range of drugs and the mean numbers of days on which drugs were used, between intake and 1-year, were sustained at 3-years. However, while the proportion using was lower at 3-years than at intake, it was found that the proportion using benzodiazepines increased significantly from 1-year to 3-years. The percentage drug-free from all illegal drugs in the last 90 days increased significantly from 9% at intake to 28% at 1-year and 29% at 3-years. In terms of alcohol consumption, it was observed that the proportion using at 1- and 3-years decreased significantly from intake. NTORS, in England and Wales, observed that decreases in opiate use were not mirrored by similar decreases in cocaine use and alcohol consumption, and levels at 4-5 years remained the same as at intake (Gossop, M., Stewart, D., Tracey, S. & Marsden, J. (2002)). However, ATOS in Australia reported that cocaine use did decrease significantly during the 3-year study period (Teesson *et al*, 2007).

A comparison between intake and 3-year follow-up showed that significant improvements in crime outcomes were still evident at this time point for a range of crimes, following improvements at 1-year. Similar, sustained reductions in crimes committed were observed by both NTORS (Gossop, M., Stewart, D., Tracey, S. & Marsden, J. (2002)) and ATOS (Teesson *et al*, 2007).

The main conclusion on health and risk is that, again, positive outcomes observed at 1-year were generally sustained at 3-years.

However, there is a need to continue to closely monitor health over perhaps a longer time period as some health measures were observed to deteriorate between the 1- and 3-year interviews. ATOS observed that participants who had borderline personality disorders did not exhibit the same level of improvements across all outcomes including health, as those without such disorders (Darke *et al*, 2005). Given these international findings, there is clearly a need for further refined analysis within the physical and mental health outcomes of the ROSIE study.

With the emergence of the National Drugs Strategy (2001-2008), the role of rehabilitation, employment and social functioning for the improvement of quality of life of drug users has received more emphasis. Significant improvements in the levels of employment and education were observed in ROSIE. In addition, in terms of social functioning, accommodation and family, a significant increase was observed in the number of participants who reported living in their own or in rented accommodation in the last 90 days when intake and 1-year, and intake and 3-years, were compared. The main conclusion was that the various aspects of social functioning, which included training, education, employment, accommodation status and social support from family and friends, are all regarded as important to the success of the overall treatment process. Results at 1- and 3-years showed considerable improvements in these areas. These results are very positive since access to employment and other social supports is believed to be an important aspect of a successful recovery process (Cox & Lawless, 2000; Stansfield, 2006).

Finally, it is clear that overall improvements observed in outcomes at 1-year were generally sustained at 3-years. That said, there remains potential to perform further refined analysis on the ROSIE data in the context of international findings.

10.3 Recommendations for Future Research

The results presented on outcomes for treatment for opiate use are both positive and encouraging from the perspective of not only the individual opiate user but the community, the treatment provider and society. In summary, many improvements observed at the 1-year time point following treatment entry were sustained. This was particularly true of outcomes for drug use, crime and social functioning. Health and risk behaviour initially showed improvement but this was not always sustained in the longer term. More focus and research is required on the long-term mental and physical health outcomes of opiate users in treatment.

While the majority of the participants demonstrated improvements in outcomes, there remained a group of participants who did not respond to treatment. This is evident in the proportion that did not complete or remain in their intake treatment, the proportion that continued to use opiates regularly and those who continued to engage in polydrug use. There is now a pressing need to perform further analysis on the ROSIE dataset to examine the factors that may influence outcomes and produce a positive treatment response.

Finally, the results presented here are a glimpse at the wealth of data collected by ROSIE. It is hoped that treatment users, treatment providers and policy makers will see this study as *their* resource and that this resource will continue to be used for the benefit of all those who contributed to the success of the ROSIE study.

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APPENDIX: KEY OUTCOMES BY GENDER

Drug Use

Table 1: Drug Use at Treatment Intake, 1-year and 3-years by Drug Type and Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Heroin	228	77.0 _{ab}	116	51.8 _a	127	48.8 _b	78	76.5 _{ab}	29	35.8 _a	38	39.2 _b
Methadone	115	38.7 _{ab}	32	14.3 _a	36	13.8 _b	47	46.1 _{ab}	9	11.1 _a	13	13.5 _b
Benzodiazepines	128	43.8 _{ab}	56	25.0 _{ac}	91	35.0 _{bc}	46	45.5 _{ab}	13	16.0 _a	22	22.9 _b
Cocaine	134	44.4 _{ab}	51	22.8 _a	62	23.9 _b	45	44.1 _{ab}	13	16.0 _a	9	9.4 _b
Crack Cocaine	44	14.6 _{ab}	14	6.3 _a	15	5.8 _b	15	14.7 _a	5	6.2 _a	8	8.3
Cannabis	187	66.1 _{ab}	123	55.7 _a	135	51.9 _b	56	58.3 _b	38	47.5	39	40.6 _b
Alcohol	150	53.4 _{ab}	94	42.5 _a	111	42.9 _b	54	55.1	45	55.6	46	47.9
Polydrug use	223	73.8 _{ab}	121	54.0 _a	134	51.5 _b	85	83.3 _{ab}	30	37.0 _a	32	33.0 _b

Note: Matching subscript letters denote statistical significance.

Table 2: Mean Drug Using Days at Treatment Intake, 1-year and 3-years by Drug Type and Gender

	MALE			FEMALE		
	Intake	1-year	3-years	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Heroin	40.0 (36.1) _{ab}	17.3 (28.7) _a	21.0 (32.8) _b	40.5 (35.1) _{ab}	10.7 (25.7) _{ac}	19.8 (32.9) _{bc}
Methadone	10.0 (21.1) _{ab}	3.9 (15.5) _a	2.6 (10.3) _b	16.4 (28.1) _{ab}	3.7 (16.1) _a	2.6 (12.1) _b
Benzodiazepines	16.2 (29.7) _{ab}	5.3 (14.2) _{ac}	10.7 (24.4) _{bc}	13.5 (27) _{ab}	5.5 (20.0) _a	5.8 (17.4) _b
Cocaine	7.2 (16.7) _{ab}	3.6 (12.9) _a	3.4 (12.6) _b	8.6 (19.1) _{ab}	2.8 (13.6) _a	1.5 (8.3) _b
Crack Cocaine	1.8 (8.5)	1.0 (7.0)	0.9 (4.8)	3.0 (13.2)	0.5 (3.4)	1.6 (9.9)
Cannabis	39.4 (40.3) _{ab}	32.7 (39.3) _{ac}	26.0 (35.9) _{bc}	37.6 (39.8) _{ab}	30.1 (40.2) _a	22.8 (36.7) _b
Alcohol	14.1 (23.9) _{ab}	9.9 (21.2) _a	11.1 (23) _b	11.1 (23.0)	9.8 (19.9)	10.4 (21.1)

Note: Matching subscript letters denote statistical significance.

Table 3: Mean Quantity of Drugs Consumed at Treatment Intake, 1-year and 3-years by Drug Type and Gender

	MALE			FEMALE		
	Intake		1-year	Intake		3-years
	Mean (s.d.)		Mean (s.d.)	Mean (s.d.)		Mean (s.d.)
Heroin (grams)	0.6 (0.8) _{ab}		0.2 (0.7) _a	0.2 (0.5) _b		0.1 (0.2) _b
Methadone (mls)	22.6 (37.7) _{ab}		6.6 (21.8) _a	7.9 (24.2) _b		12.2 (40.5) _b
Benzodiazepines (mgs)	47.1 (116.9) _a		26.2 (137.4) _{ac}	49.3 (156.1) _c		13.6 (46.0)
Cocaine (grams)	1.0 (2.7) _{ab}		0.4 (1.2) _a	0.3 (0.9) _b		0.1 (0.5) _b
Cannabis (joints)	8.3 (17.3) _b		6.7 (24.0)	4.6 (12.8) _b		1.2 (1.9) _b
Alcohol (units)	10.0 (16.5) _{ab}		6.0 (14.2) _a	6.1 (9.6) _b		4.9 (10.8)

Note: Matching subscript letters denote statistical significance.

Note 2: Crack cocaine was excluded due to inconsistency in data reporting.

¹ These figures were based on

- Heroin: one bag costing €20 and containing on average 0.113g at intake and 1-year, with one bag costing €20 and containing on average 0.1g at 3- years.
- Cocaine: one gram costing €110 at intake, €66 at 1-year and €70 at 3-years.
- Cannabis: one ounce costing €110 at intake, €100 at 1-year and €198.45 at 3-years (or a joint costing approximately 39c at intake, approx 35c at 1-year and approx 70c at 3-years).

Table 4: Drug Abstinence Rates at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	n	%	n	%	n	%	n	%	n	%	n	%
Drug Abstinence ¹	33	11.1 _{ab}	60	26.9 _a	76	29.2 _b	4	3.9 _{ab}	24	29.6 _a	29	29.9 _b

Note: Matching subscript letters denote statistical significance.

¹ Drug abstinence is defined as not using any illegal drug in the last 90 days.

CRIME

Table 5: Offending Behaviour at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Selling/supplying	86	31.0 _{ab}	34	15.4 _a	36	13.8 _b	23	26.7 _{ab}	1	1.3 _a	9	9.4 _b
Theft from a person	31	11.2 _{ab}	7	3.2 _a	5	1.9 _b	8	9.3 _b	2	2.5	1	1.0 _b
Theft from house/home	18	6.5	8	3.6	9	3.5	5	5.8	1	1.3	2	2.1
Theft from shop etc.	36	13.2 _a	17	7.7 _a	22	8.5	27	31.4 _{ab}	8	10.1 _a	5	5.2 _b
Theft from a vehicle	19	6.9	11	5.0	13	5.0	3	3.5	0	0.0	0	0.0
Theft of a vehicle	20	7.2 _{ab}	7	3.2 _a	6	2.3 _b	2	2.3	0	0.0	0	0.0
Handling stolen goods	69	24.9 _{ab}	20	9.0 _a	32	12.4 _b	22	26.5 _{ab}	5	6.3 _a	5	5.2 _b
Fraud/forgery/deception	32	11.8 _{ab}	5	2.3 _a	8	3.1 _b	8	9.4	1	1.3	2	2.1
Assault	27	9.8 _{ab}	10	4.5 _a	10	3.8 _b	2	2.4	1	1.3	0	0.0
Criminal damage	23	8.4 _a	7	3.2 _a	9	3.5	3	3.5	0	0.0	2	2.1
Soliciting	2	0.7	1	0.5	1	0.4	12	14.0 _{ab}	2	2.5 _a	1	1.0 _b
Breach of the peace	20	7.3 _{ab}	5	2.3 _a	9	3.5 _b	4	4.7	1	1.3	0	0.0

Note: Matching subscript letters denote statistical significance.

HEALTH AND RISK BEHAVIOUR

Table 6: Physical Health Symptoms at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Poor appetite	194	69.3 _{ab}	126	58.9 _a	134	52.8 _b	75	78.9 _{ab}	49	61.3 _a	60	63.2 _b
Tiredness/fatigue	192	69.1	129	60.8	170	66.9	76	78.4	56	70.0	69	72.6
Nausea (feeling sick)	100	36.2	72	33.5	79	31.0	48	50.0	25	31.3	35	36.8
Stomach pains	106	38.4	73	34.0	83	32.7	42	43.8	28	35.0 _c	44	46.8 _c
Difficulty breathing	74	26.9	51	23.7	72	28.3	31	32.0	23	28.8	33	35.1
Chest pains	68	24.4	41	19.1	54	21.3	17	17.9	16	20.0	20	21.3
Joint/bone pains	94	33.7	57	26.5	68	26.8	41	42.7	21	26.3	27	28.7
Muscle pains	86	31.0 _{ab}	48	22.3 _a	56	22.0 _b	36	37.5 _b	23	28.8	21	22.1 _b
Numbness/tingling arms/legs	58	21.0	40	18.6 _c	67	26.4 _c	26	27.1	13	16.3 _c	28	30.1 _c
Tremors/shakes	81	29.8 _a	36	16.8 _{ac}	58	22.7 _c	24	25.5	12	15.0	22	23.2

Note: Matching subscript letters denote statistical significance.

Table 7: Mental Health Symptoms at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Feeling tense	171	64.8 _a	102	50.2 _{ac}	163	65.2 _c	63	66.3	42	54.5 _c	68	73.1 _c
Suddenly scared for no reason	95	35.2 _a	45	22.0 _{ac}	86	34.3 _c	34	37.0	25	32.1	36	37.9
Feeling fearful	114	43.3 _a	66	32.8 _{ac}	121	48.4 _c	35	39.3	32	41.0	42	44.7
Nervous/shaking inside	111	41.3	64	31.8	97	38.6	42	46.7	27	34.6	46	49.5
Panic attacks	67	24.5	45	22.2	54	21.5	23	24.7	24	30.8	26	28.0
Feeling hopeless about future	140	53.4	96	47.3	115	45.8	56	62.9	42	53.8	54	57.4
Feelings of worthlessness	141	52.8 _{ab}	84	41.2 _a	113	45.2 _b	47	52.8	36	46.2	52	55.3
No interest in things	150	55.8	113	55.7	136	54.2	56	62.2	39	50.0	56	60.2
Feeling lonely	147	55.9 _{ab}	95	47.5 _a	116	46.6 _b	55	61.8	42	53.8	49	52.1
Thoughts of ending life	65	25.0 _{ab}	38	17.8 _a	45	17.9 _b	23	26.4	14	18.9	20	21.3

Note: Matching subscript letters denote statistical significance.

Table 8: Injecting Drug Use at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Any drug	130	43.3 _{ab}	70	31.3 _a	74	28.5 _b	47	46.1 _{ab}	18	22.2 _a	24	25.0 _b
Heroin	124	41.1 _{ab}	63	28.1 _a	67	25.8 _b	44	43.1 _{ab}	17	21.0 _a	23	24.0 _b
Cocaine	69	22.8 _{ab}	24	10.7 _a	28	10.8 _b	17	16.7 _{ab}	4	4.9 _a	6	6.3 _b
Benzodiazepines	45	14.9 _{ab}	9	4.0 _a	14	5.4 _b	7	6.9	0	0.0	2	2.1

Note: Matching subscript letters denote statistical significance.

Table 9: Mean Times Injected at Treatment Intake, 1-year and 3-years by Gender

	MALE			FEMALE		
	Intake	1-year	3-years	Intake	1-year	3-years
	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>	<i>Mean (s.d.)</i>
Mean days injected	20.7 (32.9) _{ab}	10.6 (23.8) _a	9.7 (24.2) _b	19.4 (30.5) _a	4.9 (18.0) _{ac}	14.0 (29.9) _c
Mean times injected per day	1.7 (4.0) _{ab}	1.0 (3.0) _a	0.8 (1.9) _b	1.6 (2.6) _{ab}	0.3 (0.7) _{ac}	0.8 (1.6) _{bc}

Note: Matching subscript letters denote statistical significance.

Table 10: Injecting-related Risk Behaviour in the Last 30 Days, at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Borrowed used needle/syringe	16	5.7	6	2.7	10	3.9	5	5.4	2	2.5	2	2.1
Lent used needle/syringe	13	4.7	8	3.6	9	3.5	4	4.2	3	3.8	3	3.2
Reused own needle/syringe	43	17.5	29	13.4	38	15.2	9	10.6	7	8.9	17	18.1
Used filters/spoons after someone	13	4.8	6	2.7	9	3.5	4	4.6	1	1.3	8	8.3

Note: Matching subscript letters denote statistical significance.

Table 11: Overdose at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Overdose	22	7.6	11	5.0	19	7.3	4	3.9	2	2.6	3	3.1

Note: Matching subscript letters denote statistical significance.

CONTACT WITH SERVICES

Table 12: Contact with Health and Social Care Services at Treatment Intake, 1-year and 3-years by Gender

	MALE						FEMALE					
	Intake		1-year		3-years		Intake		1-year		3-years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Stayed overnight in hospital	29	9.9	22	9.8	33	12.7	5	5.1 _b	12	14.8	23	23.7 _b
Treated in A & E	52	18.0	42	18.8	60	23.1	15	15.6	11	13.6	22	22.7
Seen G.P.	77	27.7 _{ab}	97	43.3 _a	97	37.3 _b	47	51.6	43	53.1	43	44.3
Out-patients appointment	36	12.5	33	14.8	47	18.1	13	13.5 _{ab}	26	32.1 _a	26	26.8 _b
Contact with social services	16	5.4	19	8.5	17	6.5	9	9.6	14	17.3	18	18.6
Employment/education services	24	9.0 _{ab}	102	45.9 _{ac}	84	32.3 _{bc}	13	14.8 _b	29	35.8	31	32.0 _b
Social welfare services	89	32.4	67	30.2	73	28.1	26	27.4	18	22.2	25	26.0
Housing/homeless services	34	12.0 _{ab}	60	27.0 _a	67	25.8 _b	21	23.3	33	40.7	29	29.9

Note: Matching subscript letters denote statistical significance.

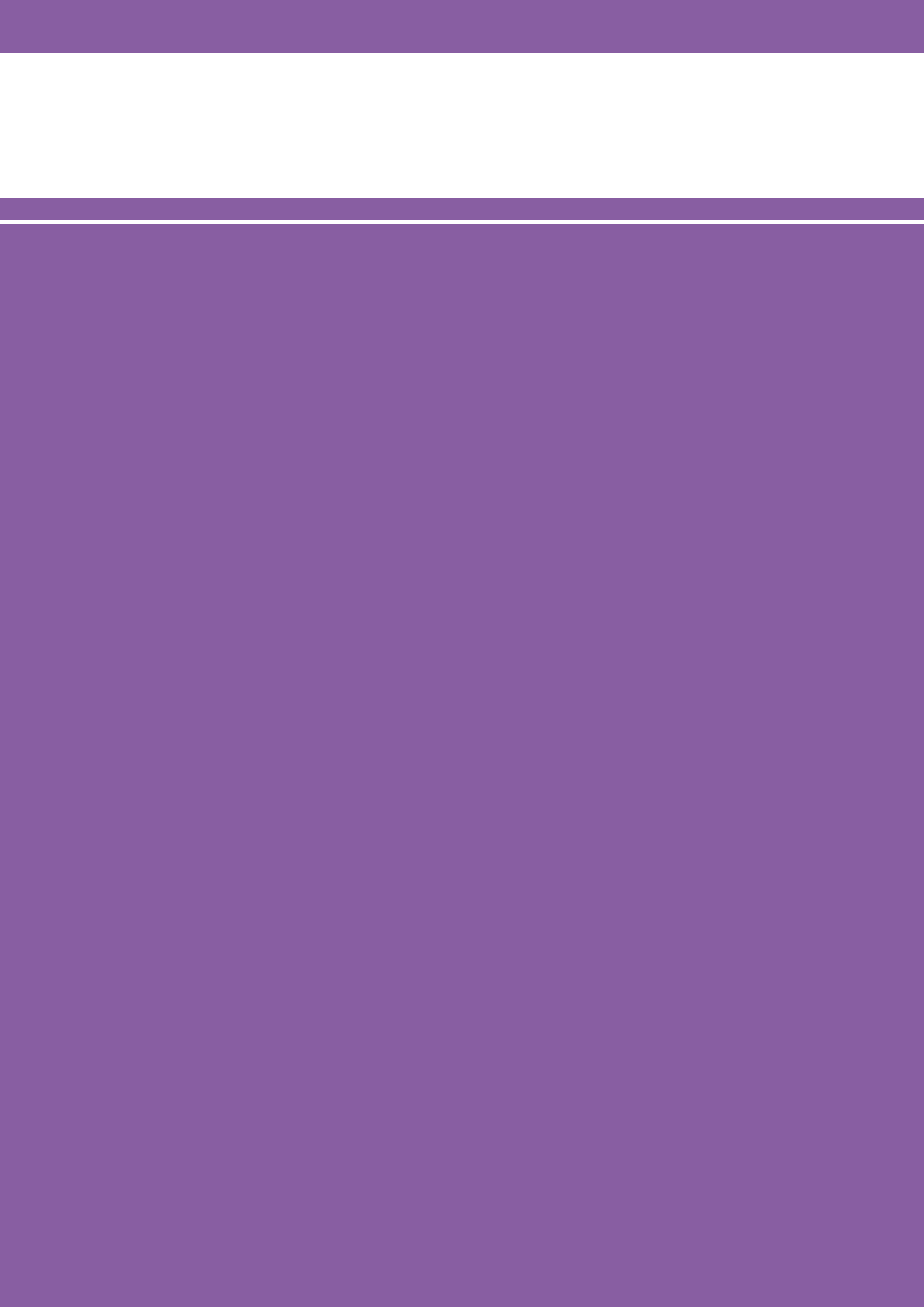
TREATMENT STATUS

Table 13: Treatment Status at 3-years by Gender

	MALE		FEMALE	
	<i>n</i>	%	<i>n</i>	%
Participants currently in treatment	145	61.2	72	79.1
In Methadone treatment	140	59.1	72	79.1
In detoxification programme	3	1.3	0	0.0
In abstinence-based programme	1	0.4	0	0.0
Participants not currently in treatment	92	38.8	19	20.9
¹Drug status in last 90 days of those in treatment at 3-years				
Drug free (all illicit drugs)	18	12.4	20	27.8
Drug free (all illicit drugs excluding cannabis)	41	28.3	32	44.4
Drug free (all illicit drugs and alcohol)	12	8.3	12	16.7
¹Drug status in last 90 days of those not in treatment at 3-years				
Drug free (all illicit drugs)	45	48.9	6	31.6
Drug free (all illicit drugs excluding cannabis)	53	57.6	10	52.6
Drug free (all illicit drugs and alcohol)	32	34.8	3	15.8

¹ Treatment refers to methadone, detoxification and abstinence-based treatment.

Other forms of treatment such as counselling and group work were not included due to inconsistencies in the way they were reported.





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