



UNIVERSITY
of
GLASGOW

Scottish Centre for Infection
and Environmental Health



Estimating the National and Local Prevalence of Problem Drug Misuse in Scotland

Executive Report

November 2004
Issued January 2005

**Gordon Hay, Maria Gannon, Neil McKeganey, Sharon
Hutchinson & David Goldberg**

Centre for Drug Misuse Research, University of Glasgow
Scottish Centre for Infection and Environmental Health

Summary

In this report we outline the results of the second national study funded by the Scottish Executive to provide estimates of the prevalence of problem drug misuse in Scotland. The estimates refer to the calendar year 2003. The study used the capture-recapture method and focussed on those aged 15-54 years old. Estimates of the prevalence of opiate and / or benzodiazepine misuse have been provided for every Council area, Drug and Alcohol Action Team (DAAT) area, NHS Board area and Police Force area within Scotland. Estimates of the prevalence of drug injecting are also given at the Council and NHS Board area level. These estimates are compared with the results of a previous study relating to 2000.

In addition, this study has also provided estimates of the prevalence of opiate and / or benzodiazepine misuse at the Local Health Care Co-operative (LHCC) level. This study has also provided an estimate of the number of crack cocaine users in the Aberdeen City Council area; however there were too few data to provide estimates in any other Council area for crack cocaine use. Moreover, it was not possible to provide estimates of psychostimulant use more generally.

In terms of the national prevalence of problem drug misuse we estimate that there were 51,582 individuals misusing opiates and / or benzodiazepines in the year 2003. This corresponds to 1.84% of the population aged between 15 and 54. The 95% confidence interval (CI) attached to the national estimate ranges from 51,456 to 56,379 (1.84-2.01%). The proportion estimated to be female is 31% and male 69%. The age breakdown among males was 30% aged between 15 and 24, 45% between 25 and 34 and 25% aged between 35-54.

In terms of the local estimates we have identified problem drug misuse in every Council area in Scotland. Aside from the comparatively low prevalence rates found in island Council areas, the prevalence of problem drug misuse by Council area has ranged from 0.66% (95% CI 0.39-3.48%) in Moray and 0.69% (95% CI 0.51-1.50%) in East Dunbartonshire through to 3.31% (95% CI 3.16-3.49) in Glasgow City. The highest prevalence of problem drug misuse within a DAAT area is to be found in the Dundee City DAAT area, with a prevalence rate of 2.80% of those aged 15 to 54 (95% CI 2.51-3.22%), followed by Greater Glasgow with a prevalence of 2.64% of the 15 to 54 age range (95% CI 2.55-2.87%). With that prevalence rate, Greater Glasgow is also the NHS Board with the highest prevalence. Finally, the highest prevalence rates in terms of Police Force areas were found in Tayside and Dumfries & Galloway, although over half of the problem drug users in Scotland reside in the Strathclyde Police Force area.

In terms of drug injecting we estimate that 18,737 people were injecting opiates and/or benzodiazepines in 2003 (95% CI 17,731 to 20,289). The highest drug injecting prevalence rates were identified in the Argyll & Clyde, Greater Glasgow and Grampian NHS Board areas; in each of these areas it is estimated that just under 1% of the population inject drugs.

The LHCC analyses found that there were variations in the levels of opiate / benzodiazepine use within DAAT areas, with comparatively high levels of problem drug use being found in LHCC areas within the Greater Glasgow, Ayrshire & Arran and Argyll & Clyde DAAT areas. There were only sufficient data to provide an estimate of the prevalence of crack cocaine use in Aberdeen City where there are an estimated 1,070 people using that drug (95% CI 736 to 1,672). That estimate corresponds to 0.72% of the population aged 15 to 54 (95% CI 0.53-1.20%) or alternatively 38% of those estimated to use opiates and / or benzodiazepines in the city.

Overall the prevalence of problem drug use has decreased in Scotland from 55,800 (95% CI 1.92 to 2.09) in 2000 to 51,582 (95% CI 1.84 to 2.01) in 2003. This decrease is statistically significant at the 90% level and is thus indicative of a true decline in problem drug use prevalence. Significant decreases at the 95% level in prevalence were found in the Aberdeen, Glasgow City and North Lanarkshire areas. In contrast, significant increases were seen in Dumfries and Galloway and South Ayrshire.

There was also a decrease in injecting prevalence nationally. As an injecting estimate for Ayrshire and Arran was not obtained in 2000, in order to compare 2000 and 2003, the estimates for Ayrshire and Arran for 2003 were deducted from the overall figure of 18,737. Thus, for mainland Scotland, the prevalence decreased from 22,805 in 2000 to 17,022 in 2003 (not including Ayrshire & Arran), although such a decrease is not statistically significant. There was, however, a statistically significant decrease in the Greater Glasgow NHS Board area. There have been increases (though not statistically significant) in some other areas, particularly Dumfries & Galloway.

This study has demonstrated that it is possible to undertake a repeated comparable analysis to provide successive prevalence estimates over time.

Contents

	Page No
Summary	
1 Introduction.....	1
2 Aims and Objectives	2
3 Methods.....	3
4 Data.....	10
4.1 Scottish Drug Misuse Database	10
4.2 Hospital Admissions	11
4.3 Social Enquiry Reports	11
4.4 Police.....	12
4.5 Hepatitis C Virus.....	12
4.6 Summary	12
5 Results	15
5.1 Opiates and Benzodiazepine Use	15
5.1.1 National Prevalence	15
5.1.2 Council Areas	15
5.1.3 DAAT Areas	26
5.1.4 NHS Board Areas	29
5.1.5 Police Force Areas	32
5.1.6 LHCC Areas	35
5.2 Drug Injecting	36
5.3 Psychostimulants.....	41
6 Comparison between 2000 and 2003.....	43
7 Discussion and Conclusions.....	46
References	50
Acknowledgements.....	51

Index of Tables

- 1 Summary of data on problem drug use by Council area (age 15 to 54)
- 2 Summary of data on drug injecting by NHS Board area (age 15 to 54)
- 3 Estimates of the number of problem drug users by Council area (age 15 to 54)
- 4 Estimates of the prevalence of female problem drug use (age 15 to 54)
- 5 Estimates of the prevalence of male problem drug use (age 15 to 54)
- 6 Estimates of the percentage of problem drug users who are female (age 15 to 54)
- 7 Estimates of the prevalence of male problem drug use by age group
- 8 Prevalence rates of male problem drug use by age group
- 9 Estimates of the number of problem drug users by DAAT area (age 15 to 54)
- 10 Estimates of the number of problem drug users by NHS Board area (age 15 to 54)
- 11 Estimates of the number of problem drug users by Police Force area (age 15 to 54)
- 12 Estimates of the number of drug injectors by NHS Board area (mainland Scotland, age 15 to 54)
- 13 Estimates of the number of drug injectors by Council area (mainland Scotland, age 15 to 54)
- 14 Crack cocaine users identified from Scottish Drug Misuse Database (SDMD) and Social Enquiry Report (SER) data sources (age 15 to 54)
- 15 Comparison between 2000 and 2003 problem drug use prevalence estimates by Council area (mainland Scotland, age 15 to 54).

Index of Figures

- 1 Estimated prevalence of problem drug use by Council area (age 15 to 54)
- 2 Estimated prevalence of problem drug use by Council area (non rural areas, age 15 to 54)
- 3 Estimated prevalence of problem drug use by Council area (rural areas, age 15 to 54)
- 4 Estimated prevalence of problem drug use by DAAT area (age 15 to 54)
- 5 Estimated prevalence of problem drug use by DAAT area (age 15 to 54)
- 6 Estimated prevalence of problem drug use by NHS Board area (age 15 to 54)
- 7 Estimated prevalence of problem drug use by NHS Board area (age 15 to 54)

- 8 Estimated prevalence of problem drug use by Police Force area (age 15 to 54)
- 9 Estimated prevalence of problem drug use by Police Force area (age 15 to 54)
- 10 Estimated prevalence of problem drug use by LHCC area (age 15 to 54)
- 11 Estimated prevalence of drug injecting by NHS Board area (age 15 to 54)
- 12 Estimated prevalence of drug injecting by NHS Board area (age 15 to 54)

1 Introduction

In this report we outline the results of research funded by the Substance Misuse Division of the Scottish Executive and carried out jointly by the Centre for Drug Misuse Research at the University of Glasgow and the Scottish Centre for Infection and Environmental Health to provide national and local estimates of the prevalence of problem drug misuse within Scotland for the year 2003. Previously estimates of the prevalence of problem drug use and drug injecting were obtained for 2000 (Hay, McKeganey and Hutchinson, 2001). This study sought to replicate those analyses to provide comparable estimates, and in addition has endeavoured to respond to the needs of Drug and Alcohol Action Teams (DAATs) by providing prevalence estimates at a smaller geographical area than in 2000. This study also attempts to provide information on the extent of psychostimulant use in Scotland. Change in the extent of drug use in Scotland is examined by comparing the prevalence estimates for 2003 with the prevalence estimates from 2000.

Providing comparable estimates of the prevalence of problem drug use at both the national and local level across Scotland is far from a straightforward exercise. Although the methods used to estimate prevalence within this study are becoming more established with their increasing use in different settings, this study appears to be the first that sets out to obtain prevalence estimates that can be directly compared with a previous study. Thus the study has to combine comparability and consistency across the different geographical areas and across time.

This Executive Report outlines the main results of the study, in particular the prevalence estimates at the Council, DAAT, NHS Board and Police Force area levels for both problem drug misuse and drug injecting. The LHCC results are contained within an appendix to this report. Information on the extent of crack cocaine use is also provided. Local area reports for each DAAT area within Scotland are also available and the relevant LHCC estimates are provided within these DAAT reports.

2 Aims and Objectives

The aims of the study were to:

- Estimate the national prevalence of problem drug use in 2003
- Estimate the prevalence of problem drug use at the LHCC area level in 2003
- Estimate the prevalence of problem drug use at the Council area level in 2003
- Estimate the prevalence of problem drug use at the DAAT area level in 2003
- Estimate the prevalence of problem drug use at the NHS Board area level in 2003
- Estimate the prevalence of problem drug use at the Police Force area level in 2003
- Estimate the prevalence of drug injecting at the Council area level in 2003
- Estimate the prevalence of drug injecting at the NHS Board area level in 2003
- Provide information on the extent of psychostimulant use
- Compare the prevalence estimates with the results of a 2000 study.

The objectives of the study were therefore to:

- Derive and state a definition of problem drug use
- Stratify the available data on drug use in Scotland by LHCC, Council, DAAT, NHS Board and Police Force area levels using postcode district data
- Use the capture-recapture method to provide comparable prevalence estimates to those provided in the 2000 study
- Adapt the capture-recapture method to provide problem drug use prevalence estimates at the LHCC level that are consistent with NHS Board estimates
- Adapt the capture-recapture method to provide drug injecting prevalence estimates at the Council area level that are consistent with NHS Board estimates
- Use the capture-recapture method to provide estimates of the prevalence of psychostimulant use at the Council area level.

3 Methods

In this section we provide a brief description of the more pertinent aspects of the methods used to generate estimates of the prevalence of drug misuse in Scotland. The capture-recapture method has been described in previous reports and in the scientific literature particularly in the context of providing a national or regional estimate by combining stratified estimates (Gemmell, Millar and Hay, 2004; Hay and Gannon, forthcoming; Hickman et al, 2004).

The capture-recapture method fits statistical models to describe the pattern of overlap between different sources of data on the identifiable drug misusing population and then applies this knowledge to assess the likely size of the hidden problem drug misusing population. The estimate of the total drug misusing population is arrived at by combining the minimum enumeration of identifiable drug misusers and the statistically estimated hidden population. Within this study, it was necessary to undertake separate analyses of the available data for each Council area to analyse the overlaps between these data sources to produce a series of estimates of the hidden drug misusing population. The process of arriving at a national estimate involved summing all of those local estimates. The main unit of analysis in this research has therefore been the Council area. On the basis of these Council area estimates, it has been possible to produce estimates for the differently configured NHS Board areas, DAAT areas and Police Force areas in Scotland. In addition, separate analyses have also needed to be undertaken within three Council areas that straddle NHS Board boundaries (East Renfrewshire, South Lanarkshire and West Dunbartonshire).

Further developmental work, undertaken since the 2000 study, demonstrated that it is possible to produce local level prevalence estimates using postcode district level (e.g. EH5) information only¹. In contrast with the previous study, therefore, geographical data were collated at the postcode district rather than sector level. LHCC, Council and NHS Board area of residence were assigned according to an individual's postcode district of residence. As a consequence of this, the Council and NHS Board areas referred to in this study, and in particular the baseline populations aged 15 to 54, may differ from the actual Council or NHS Board areas. For example, there are 6,076 persons aged 15 to 54 resident in the AB23 postcode district². As 3,718 of those persons, or 61%, are resident in the City of Aberdeen the whole of that postcode district has been assigned to the City of Aberdeen thus artificially inflating the population of the city and deflating the population of the neighbouring Aberdeenshire. The development work completed since the 2000 study has demonstrated

¹ <http://www.drugmisuse.isdscotland.org/publications/abstracts/prevalence2.htm>

² Source: General Register Office for Scotland, Scotland Census Online

that the impact on the prevalence estimates in these areas is minimal, particularly when considering prevalence rates. Care should however be taken in interpreting any changes in the number of problem drug users between 2000 and 2003. An appendix to this report details the Council and NHS Board population sizes used in this study, and their composition in terms of postcode districts. Although in the 2000 study it was possible to differentiate between the small part of North Lanarkshire Council covered by Greater Glasgow, as that area is comprised of postcode districts that are mainly in the City of Glasgow the 2003 study has assigned that area to the city.

For most of the Council areas, the estimates were derived using four separate sources of data (treatment, hospital admissions, police and social work). For all of the mainland Council areas the available data were stratified by gender and the males were further stratified into three age groups. In the Eilean Siar and Orkney Isles Council areas, there were insufficient data to perform capture-recapture analyses. Therefore the prevalence estimates in those areas were obtained by applying the known (from the Scottish Drug Misuse Database data) to unknown ratio of problem drug users found elsewhere in the Northern Constabulary area to both of those Council areas.

Data have been collected only on problem drug users aged between 15 and 54. The prevalence estimates contained in this report relate to the calendar year 2003.

The population figures used in the report are the 2001 census day population counts (© Crown copyright, data supplied by General Register Office for Scotland). Population figures for age group / gender strata have also been derived from the 2001 census data. As the 2000 study employed mid-year population size estimates for 2000 care must be taken in interpreting any changes in estimated prevalence rates.

Confidence Intervals

Confidence intervals were derived for each stratified estimate using the approach proposed by Cormack (1992). The confidence intervals for estimates obtained by combining stratified estimates (e.g. all mainland Council and NHS Board estimates, along with the national estimate) were derived following the approach outlined in Millar, Gemmell and Hay (2004) where the distribution of each confidence interval is approximated by a log-normal distribution and 5,000 samples from those distributions are summed to provide confidence intervals for the totals. The confidence intervals are recalculated at each geographical level, i.e. the confidence interval for Lothian and Borders Police Force areas was derived in the manner described above by summing the distributions for the Lothian NHS Board and the Borders NHS Board areas. This will, however, have the effect of skewing the resultant

confidence interval reflecting the fact that the individual estimates are not symmetric and often have higher upper limits.

Confidence intervals have not been derived for the Eilean Siar and Orkney Isles Council areas. The confidence interval for the Northern Constabulary Police Force area is calculated from the confidence intervals attached to the Highland Council and Shetland Isles Council estimates and takes the upper and lower bounds of the Eilean Siar and Orkney Isles estimates to be the same as the point estimates. This has a minimal impact on the Northern Constabulary estimate due to the relatively small number of drug users found in those two areas.

The confidence intervals in Table 6 for the percentage of the population we estimate to be female were also derived by combining approximated distributions.

Drug Injecting

Four data sources were used in the capture-recapture analyses to estimate the prevalence of drug injecting. Those sources were treatment, Social Enquiry Reports, drug-related acute hospital admissions and positive hepatitis C virus tests. Data on HIV testing were also available but not used within the final analyses due to potential difficulties in identifying current injectors. Further details on the definitions used for identifying injecting drug users are provided in Chapter 4.

Although both the treatment source and Social Enquiry Reports record the current injecting status of patients / clients, there is the potential for both the hepatitis C data source and the hospital admissions source to include non-injectors. In the case of the hepatitis C virus data, the tests carried out in 2003 could include people who had injected drugs in the past and either now do not inject drugs or indeed use drugs. In the case of the hospital admissions source each individual within that source has received a diagnosis of mental and behavioural disorders either due to use of opioid or multiple psychoactive drugs (ICD10 Codes F11 and F19) and a diagnosis of one of four conditions indicative of drug injecting such as endocarditis or abscesses. It is however possible that this data source could include opiate users who have those conditions but do not inject.

As the Scottish Drug Misuse Database data refers primarily to individuals starting agency contact, it may be appropriate to consider that those individuals in the database in 2002 may still be injecting in 2003 and indeed that assumption was made in the 2000 study that employed data from 1999 and 2000 to provide injecting estimates for 2000. Sensitivity analyses using different combinations of the above data sources were carried out. Those analyses suggested that it was

appropriate to employ the hospital admissions data source along with the treatment and Social Enquiry Report sources.

For the Council area injecting estimates the general approach outlined above was adapted slightly to ensure that the area-stratified estimates summed to give the relevant NHS Board area level estimate. Thus each stratified estimate was rescaled by a factor corresponding to the ratio of the summed estimates to the NHS Board area estimate. The reasons for this are twofold, first to ensure consistency between the different area estimates and second to aid comparability across NHS Board areas in relation to the number of Council areas they cover.

In the Borders NHS Board area, there were too few data that could be used within a capture-recapture analysis, in particular there was no hospital admissions data and only three individuals identified through the Social Enquiry Report source. To derive an estimate for the Borders we used the mortality multiplier method which had previously been used to provide an estimate for the Ayrshire & Arran NHS Board area in the absence of a capture-recapture estimate (Bird, Hutchinson and Goldberg, 2003).

The available data sources identified very few drug injectors in the Orkney Isles or the Western Isles NHS Board areas. It was therefore not possible to provide estimates of the prevalence of drug injecting in those two areas. Aside from the treatment data, there were very few individuals identified as drug injectors in Shetland, perhaps reflecting the perceived different nature of drug use / drug injecting in that area where drug-related crime is less common than in mainland Scotland. Thus again there were insufficient data to obtain an injecting prevalence estimate using the capture-recapture method. The mortality multiplier approach used to derive an injecting prevalence estimate for the Borders NHS Board area was not feasible as there were no drug-related deaths in Shetland in 2003. An estimate for the Shetland Isles NHS Board area could however be derived by applying the proportion of drug users in the treatment data source identified as injecting drugs to the number of problem drug users found in that NHS Board area.

Estimates of the prevalence of drug injecting were also be derived at the Council area level. In that analysis, only three sources of data had sufficient data to warrant inclusion in a capture-recapture analysis. Those three sources were the hospital admissions, treatment and Social Enquiry Report sources. Due to insufficient numbers of drug users identified from the hospital admission source two-sample capture-recapture estimates were derived for each Council area (or part Council area for those straddling NHS Board boundaries) where the hospital admissions data were combined with the treatment data source to give a 'medical' data source. The estimates for each Council area were then rescaled to ensure that the summed estimate for each NHS Board area remained the same, i.e. the Council estimates were

multiplied by a factor corresponding to the NHS Board estimate divided by the sum of the relevant Council area estimates. This approach was slightly adapted for the Councils within the Greater Glasgow NHS Board area to account for the very small number of injectors identified in East Dunbartonshire and East Renfrewshire. In Greater Glasgow the estimates of injecting by Council were apportioned according to the known numbers of injectors found in each Council area. This provided similar estimates for the remaining Councils within Greater Glasgow and offered estimates for the two small areas. Confidence intervals for the Council area injecting estimates are not provided due to the approach taken to derive them, i.e. rescaling a three-sample capture-recapture estimate by the sum of two-sample capture-recapture estimates. The most appropriate approach to deriving confidence intervals for those estimates would also need to include approximations to statistical distributions.

LHCC Estimates

LHCCs are groups of GPs and other health care providers delivering services at a local level. There are 83 LHCCs in Scotland, two of which in Greater Glasgow have a high degree of overlap in the areas they cover. Those two LHCC areas have therefore been combined into a single area. Not all GPs in Scotland have signed up to LHCCs and in particular there is not an LHCC in the Western Isles (although the Western Isles NHS Board area can be considered as being similar in size and nature to a LHCC area). Thus in total there are effectively 83 LHCC areas in Scotland. Each LHCC area was constructed as one or more postcode districts and each postcode district in Scotland was assigned to an LHCC area on the basis of where most of the residents are registered with a GP (from the Community Health Index). Some of those areas are however quite small and it was impractical to perform a capture-recapture analysis at such a small level, for example the Arran LHCC area or some of the LHCCs covering the more sparsely populated areas of the Highlands. We have therefore combined the Arran LHCC with the LHCC that Ardrossan is part of. We also combined the Nairn / Ardesier LHCC with neighbouring Badenoch LHCC and combined the East Sutherland, Lochaber, West Sutherland and Wester Ross & Lochalsh LHCCs into a single area. Thus in total estimates have been provided for 78 areas; 75 on mainland Scotland with the remaining three following the NHS Board boundaries with the estimates for Orkney and the Western Isles derived using the multiplier method described above. For the 75 LHCC mainland areas the three-sample capture-recapture analysis using the combined treatment, Social Enquiry Report and police treatment sources was used. The LHCC estimates within each NHS Board area have been rescaled in a similar fashion to that described above for Council level injecting estimates to ensure that that combined local estimates added up to the relevant NHS Board total estimate. Again confidence intervals for the LHCC estimates have not been produced as those estimates were derived after scaling to fit the higher level NHS Board estimates.

Comparisons between 2000 and 2003

Although the capture-recapture method was used in the both the 2000 and the 2003 studies, there were some differences in how the method was applied. Some of those differences have been described above, such as the use of postcode district data instead of postcode sector data and the use of hospital admissions data. Two further differences are now outlined.

Firstly, all of the data used in the 2003 study relate to the calendar year 2003 whereas in the previous study some smaller or more rural areas required data from 1999 and 2000 to provide sufficient overlaps between data sources to include within the analyses. Having sufficient data from one calendar year appears to be primarily due to increases in the number of drug users identified from treatment services, although the inclusion of hospital admission data may also increase the known populations.

Secondly, the approach taken within the data analysis has changed slightly between 2000 and 2003. Whereas in 2000 a range of different analyses were carried out in different Council areas (for example stratifying by age and gender in some areas and only by age or not at all in other Council areas), in the 2003 study a more systematic approach to stratifying the analyses was taken. As evidenced by Table 4, estimates by gender were provided for all 29 mainland Council areas and the 'males' estimates were further broken down into three age groups providing information on the age and gender distribution across the country. One drawback of this changed approach is that the confidence intervals for 2003 are wider than they could have been if different stratifications had been carried out.

Despite these minor changes in applying the capture-recapture method to the available data on drug misuse in Scotland in the more recent study, it is appropriate to directly compare the problem drug use prevalence rates found in each Council or NHS Board area with the corresponding estimates for 2000, or indeed the drug injecting prevalence rates at the NHS Board area level.

To identify whether there has been a significant change in prevalence between 2000 and 2003 at the Council area level the 95% confidence intervals have been compared. If those intervals overlap then it was taken that any difference is not statistically significant. However, for the national prevalence estimate, an approach similar to that described above for calculating confidence intervals for estimates that were derived as the sum of stratified estimates was taken. To be more specific, instead of examining whether the 95% confidence interval for the 2000 estimate overlaps with the 2003 estimate, the estimated difference in prevalence between 2000 and 2003 was considered. A 95% confidence interval for this estimated difference could be

constructed using a computer intensive method that derives 5,000 simulated values from the distribution of the estimated difference. If that 95% confidence interval does not include zero then there would have been a significant difference. Moreover, this approach can be used to tell at what level of significance any difference would be. Within this report we have used the 90% level of significance when comparing the 2000 national estimate with the 2003 national estimate.

4 Data

In this section we provide a more detailed description of the data sources employed in this study. In general the approach taken was to collect all available data on the use of illicit substances across all data sources in 2003. The illicit use of any opiate or benzodiazepine, or additionally the prescribed use of methadone, is described within the study as **opiate and / or benzodiazepine use**. The illicit use of either amphetamines, cocaine (including crack cocaine) or ecstasy is described as **psychostimulant use**. Where a data source notes that an individual has injected any illicit drug at any point within 2003 then that person is noted as a drug injector and those data on drug injectors are used to provide an estimate of **drug injecting**. As will be seen below, none of the contributing data sources provided information on the severity of an individual's drug use or their level of addiction. For the purposes of the study we define **problem drug use** as opiate and / or benzodiazepine use (thus assuming that all illicit use of those drugs or the use of methadone is considered problematic). However, the nature of the contributing data sources suggests that this assumption cannot be made for psychostimulants within this study.

4.1 Scottish Drug Misuse Database

The most substantial data source we have drawn upon in this research is the Scottish Drug Misuse Database. This database obtains anonymised demographic data on individuals at the point of first contact with a range of drug services, including non-statutory agencies and general practitioners. As the database currently collates only information on new contacts at agencies, it cannot on its own be used to provide information on the total number of individuals attending drug services in Scotland. The data on drug users held on the Scottish Drug Misuse Database was therefore augmented by data held by specialist agencies on the total numbers in treatment.

In contrast with the 2000 study, it was not possible to use data from general practitioners as a separate source within the capture-recapture analyses as, in some Council areas, there was an insufficient number of returns to the Scottish Drug Misuse Database from general practitioners in 2003. More generally there are some Council areas where joint working between general practitioners and treatment services made it inappropriate to treat general practice data as a separate source.

The data from all contributing treatment agencies were combined with the agency and GP returns to the Scottish Drug Misuse Database to obtain a single data source at the Council area level, which was then reviewed to remove erroneous or incomplete data records, those which did not meet the case definition of the study, and to eliminate multiple

occurrences of a unique individual. As the Scottish Drug Misuse Database provided the most comprehensive and consistent source of information on drug users in contact with services across Scotland, any additional data found within the Scottish Drug Misuse Database relating to an individual was included within the analyses, such as the LHCC area of residence, injecting status or the use of psychostimulants. Where Council area or LHCC area of residence was missing, this was also substituted from the Scottish Drug Misuse Database.

Although many needle exchanges collate sufficient information on their clients to enable their inclusion within a capture-recapture analysis, the provision of needle exchanges across Scotland is inconsistent; therefore needle exchange data have not been used within these analyses. The data from needle exchanges which contribute to the Scottish Drug Misuse Database have not been included in the Scottish Drug Misuse Database source.

4.2 Hospital Admissions

The Information Services Division (ISD) of National Services Scotland collates information on all hospital admissions in Scotland. The data were derived from inpatient and day case discharge summaries from non-obstetric, non-psychiatric specialties in general acute NHS hospitals in Scotland. The system records diseases using the World Health Organization's International Classification of Diseases 10th Revision (ICD10) and up to six diagnoses can be given. An individual was included in this hospital admission source if they had a diagnosis that related to their opioid use (ICD10 F11) or their use of multiple psychoactive drugs (ICD10 F19). Opioid use did not have to be the individual's primary diagnosis, it could be any of the six diagnoses listed, therefore this source includes discharges where the primary diagnosis was for another condition such as abscesses or for injuries or for conditions not directly related to drug misuse such as diabetes. Where there was a diagnosis of a condition related to drug injecting (acute and subacute infective endocarditis, phlebitis / thrombophlebitis, cutaneous abscess, furuncle and carbuncle or cellulitis; ICD10 I35, I80 and L02) then it was also assumed that the individual was a drug injector.

4.3 Social Enquiry Reports

Social Enquiry Reports are compiled by Social Work or corresponding departments to help in assessing the most suitable form of sentencing where an individual is being dealt with by the criminal justice system. As the report is written in relation to the individual's offending behaviour and a particular crime, any drugs that an individual is using may not be noted if the Social Worker does not feel that this is related to the case. This data source is, however, particularly relevant in identifying drug users who have committed acquisitive crime and who may be less

likely to be contacting drug treatment agencies. All 32 Councils granted the research project access to Social Enquiry Reports and all reports pertaining to 2003 were screened by trained data collectors. Thus for each Council area, a Social Enquiry Report data source was compiled which contained information on those who had the use of opiates or benzodiazepines noted within a report. The injecting status, as far as could be ascertained, was also noted. Data on psychostimulant use were also collated.

4.4 Police

Data on individuals who had been detained under the Misuse of Drugs Act were made available by all of Scotland's Police Forces. Data pertaining to individuals detained for opiate or benzodiazepine offences were collated within a Police source for each Council area. Data on psychostimulant use were also collated; however for some areas there were difficulties in differentiating between powder cocaine and crack cocaine offences. As the Police data only relates to the possession of a drug, no information was available on the individuals' injecting status.

4.5 Hepatitis C Virus

The Scottish Centre for Infection and Environmental Health (SCIEH) collates information on those receiving a positive test result for infection with the hepatitis C virus. As drug injecting or needle sharing could be noted as a risk factor a list of drug injectors could be constructed.

4.6 Summary

The data from each of the above data sources were encrypted and cleaned to remove multiple counting within source. Where a drug user appeared in more than one LHCC or Council area within an NHS Board area the record with the latest date was used to indicate the area of residence. To compare across data sources a 'soft matching' approach was taken, where two (or more) records were classed as a match if the surname initial, gender and date of birth were the same (as opposed to 'hard matching' that would insist that all identifiers including forename initial should be the same across both records). Table 1 summarises the data on known opiate / benzodiazepine misuse from the various sources by Council area. For reasons of confidentiality Table 1 does not include the three island Council areas. Table 2 presents the corresponding data on drug injecting by NHS Board area, again excluding the three island NHS Board areas.

Table 1 Summary of data on known problem drug users by Council area (age 15 to 54)

Council Area	Treatment	Hospital Admissions	Social Enquiry Reports	Police	Total¹
Aberdeen City	1,059	223	577	176	1,460
Aberdeenshire	374	49	170	98	575
Angus	201	10	95	29	303
Argyll & Bute	218	24	72	28	285
Clackmannanshire	92	16	119	20	174
Dumfries & Galloway	704	58	217	79	904
Dundee City	724	33	399	130	1,109
East Ayrshire	520	124	198	96	752
East Dunbartonshire	122	14	41	31	176
East Lothian	261	7	69	50	339
East Renfrewshire	220	0	56	38	286
Edinburgh, City of	2,083	207	476	311	2,647
Falkirk	250	37	178	67	426
Fife	1,254	77	527	113	1,673
Glasgow City	5,015	780	1,158	651	6,247
Highland	220	35	128	73	370
Inverclyde	568	129	146	138	743
Midlothian	265	14	80	57	341
Moray	80	0	32	23	117
North Ayrshire	638	135	185	123	829
North Lanarkshire	507	118	344	141	906
Perth & Kinross	262	38	137	56	422
Renfrewshire	509	72	251	103	828
Scottish Borders	220	21	55	14	274
South Ayrshire	243	59	157	56	408
South Lanarkshire	395	78	327	123	798
Stirling	153	24	156	49	292
West Dunbartonshire	495	70	139	93	654
West Lothian	385	41	190	81	556
MAINLAND SCOTLAND	18,037	2,493	6,679	3,047	24,894

1 As an individual can be present in more than one source, the columns cannot be added to provide the total (which accounts for multiple occurrences).

Table 2 Summary of data on known drug injectors by NHS Board area (age 15 to 54)

NHS Board Area	Treatment	Hospital Admissions	Social Enquiry Reports	Hepatitis C	Total¹
Argyll & Clyde	630	84	103	56	787
Ayrshire & Arran	333	67	96	46	491
Borders	49	0	3	0	52
Dumfries & Galloway	181	15	176	34	347
Fife	489	20	135	8	581
Forth Valley	181	25	112	25	305
Grampian	805	93	213	133	1,091
Greater Glasgow	1,412	294	315	358	2,102
Highland	97	3	31	19	134
Lanarkshire	159	33	94	29	293
Lothian	665	43	81	63	799
Tayside	150	16	72	50	263
MAINLAND SCOTLAND	5,151	693	1,431	821	7,245

1 As an individual can be present in more than one source, the columns cannot be added to provide the total (which accounts for multiple occurrences).

As noted above the treatment, Social Enquiry Report and Police data sources were all screened to identify psychostimulant use. In total 1,768 individuals were identified as using psychostimulants from the Social Enquiry Report data and 1,279 individuals were similarly identified from the Police data source. Further information on individuals reporting psychostimulant use at treatment services reporting to the Scottish Drug Misuse Database can be found elsewhere³. In terms of crack cocaine use there was only one Council area in Scotland where a sufficient number of crack cocaine users were identified from the Police and Social Enquiry Report data to enable a capture-recapture analysis. This either suggests that there are very low levels of crack use in all but that one Council area or that crack cocaine offences are only being recorded as cocaine offences.

³ <http://www.drugmisuse.isdscotland.org/publications/04dmss/04sdmd.htm>

5 Results

In this section we present the information on both the national and local estimated prevalence of problem drug misuse within Scotland. We provide a national estimate first, followed by separate estimates for each Council, DAAT, NHS Board and Police Force area. At each point where we present the local prevalence information, we provide a graphical representation of the data on a map of Scotland, followed by a bar chart and a table summarising the prevalence estimates. We also include estimates of the prevalence of opiate and / or benzodiazepine use at the LHCC level. We then provide estimates of the prevalence of drug injecting at the NHS Board and Council area levels, followed by information on psychostimulant use.

5.1 Opiates and Benzodiazepine Use

5.1.1 National Prevalence

To obtain a national estimate of the prevalence of problem drug misuse in the year 2003, we have summed the local estimates for each of the 32 Council areas in Scotland. On this basis, we estimate that there are 51,582 individuals who are misusing opiates or benzodiazepines within Scotland. The 95% confidence interval attached to this estimate is 51,456 to 56,379. This corresponds to a prevalence rate of 1.84% of the Scottish population aged between 15 and 54 (95% CI 1.84-2.01%). As noted in the methods section the 95% confidence is skewed as it is derived from combining the distributions of the stratified estimates, which are themselves skewed.

5.1.2 Council Areas

Table 3 summarises the estimates of the prevalence of problem drug misuse for each of the 32 Council areas in Scotland. This information is presented as a map in Figure 1. In Figures 2 and 3 we have summarised the information on the prevalence of problem drug misuse by differentiating between the rural and non-rural Council areas. Within this research a Council area has been classified as rural if it has a population density of less than one person per hectare (Scottish Executive, 2000).

As one might have expected, the highest prevalence rates amongst the non-rural Council areas are found in the major urban centres. The highest prevalence rate is Glasgow at 3.31% of the population aged 15 to 54 (95% CI 3.16-3.49%). The next highest is Dundee City at 2.80% (95% CI 2.51-3.22%). The third highest is Inverclyde at 2.57% (95% CI 2.35-2.91%). It can also be clearly seen that whilst the prevalence of problem drug misuse is lower in the rural as opposed to the non-rural areas, problem drug misuse is occurring in both rural and non-rural

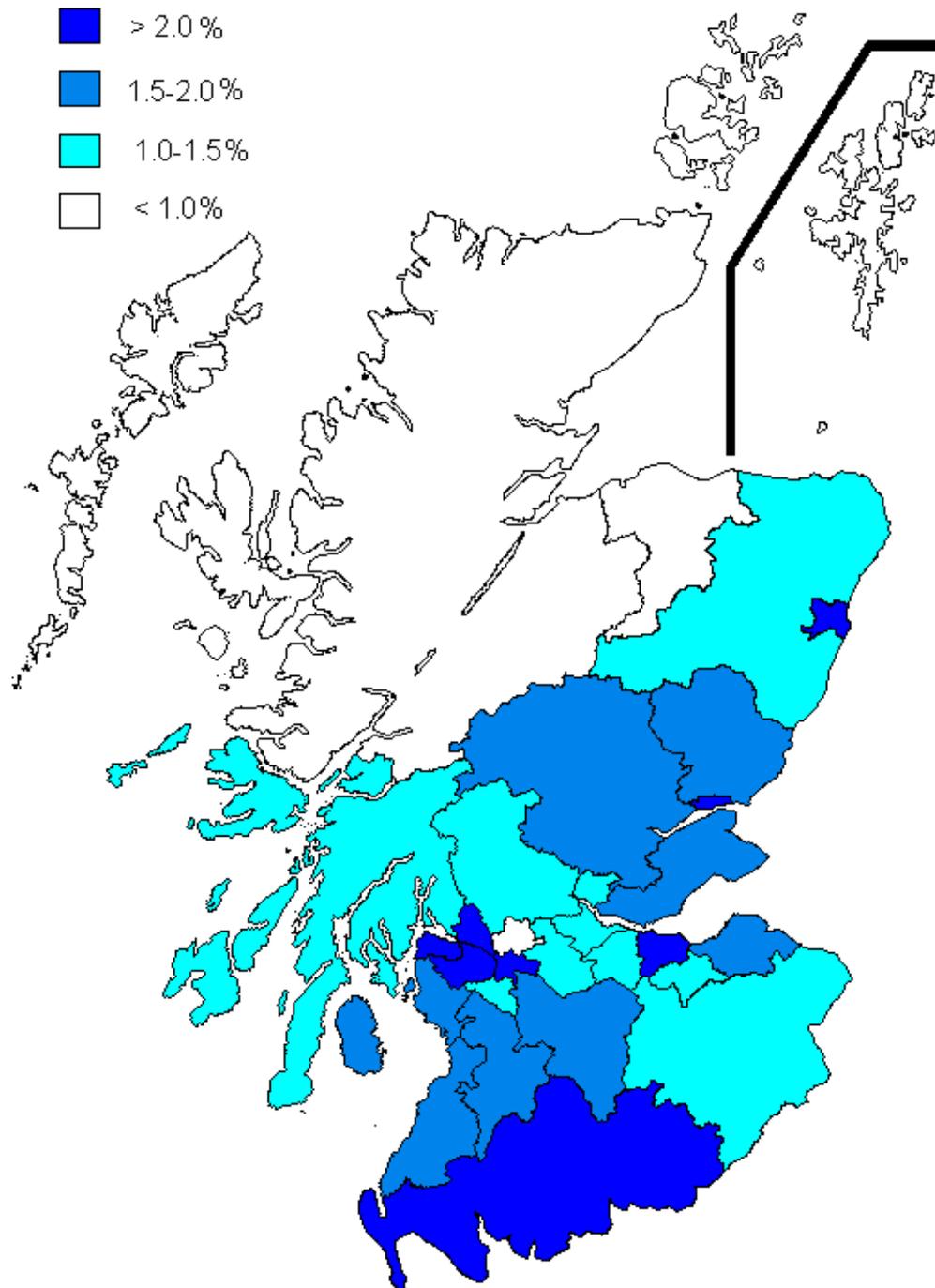
areas. Indeed, comparatively high levels of problem drug use are found in Dumfries and Galloway.

Table 3 Estimates of the number of problem drug users by Council area (age 15 to 54)

Area	Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	2,810	2,587-3,147	2.03	1.87-2.27
Aberdeenshire	1,220	1,056-1,581	1.10	0.95-1.42
Angus	1,038	779-1,837	1.99	1.50-3.53
Argyll & Bute	609	490-974	1.35	1.09-2.16
Clackmannanshire	297	251-436	1.05	0.88-1.53
Dumfries & Galloway	1,806	1,597-2,184	2.43	2.15-2.94
Dundee City	2,522	2,255-2,899	2.80	2.51-3.22
East Ayrshire	1,387	1,255-1,606	1.92	1.73-2.22
East Dunbartonshire	401	301-879	0.69	0.51-1.50
East Lothian	814	658-1,343	1.74	1.40-2.86
East Renfrewshire	723	561-1,896	1.40	1.09-3.67
Edinburgh, City of	5,667	5,176-6,374	2.10	1.92-2.37
Eilean Siar ¹	21		0.16	
Falkirk	856	746-1,066	1.08	0.94-1.34
Fife	3,022	2,690-3,707	1.60	1.43-1.97
Glasgow City	11,235	10,719-11,830	3.31	3.16-3.49
Highland	898	695-1,611	0.81	0.63-1.46
Inverclyde	1,178	1,081-1,335	2.57	2.35-2.91
Midlothian	640	549-975	1.46	1.25-2.22
Moray	310	182-1,627	0.66	0.39-3.48
North Ayrshire	1,342	1,229-1,530	1.85	1.69-2.11
North Lanarkshire	1,894	1,711-2,172	1.06	0.96-1.22
Orkney Isles ¹	16		0.16	
Perth & Kinross	1,187	968-1,645	1.76	1.44-2.44
Renfrewshire	2,295	1,953-2,867	2.41	2.05-3.01
Scottish Borders	680	516-1,295	1.25	0.95-2.38
Shetland Isles	85	45-607	0.71	0.38-5.07
South Ayrshire	951	781-1,318	1.88	1.55-2.61
South Lanarkshire	2,755	2,245-4,453	1.72	1.40-2.77
Stirling	713	504-1,739	1.49	1.05-3.62
West Dunbartonshire	1,185	968-1,312	2.22	1.81-2.46
West Lothian	1,025	918-1,236	1.11	1.00-1.34
SCOTLAND	51,582	51,456-56,379	1.84	1.84-2.01

1 Estimates for Eilean Siar and Orkney Isles Council areas produced using multiplier method (see Chapter 3)

Figure 1 Estimated prevalence of problem drug use by Council area (age 15 to 54)



Note: Estimates for Eilean Siar and Orkney Isles Council areas produced using multiplier method (see Chapter 3)

Figure 2 Estimated prevalence of problem drug use by Council area (non rural areas, age 15 to 54)

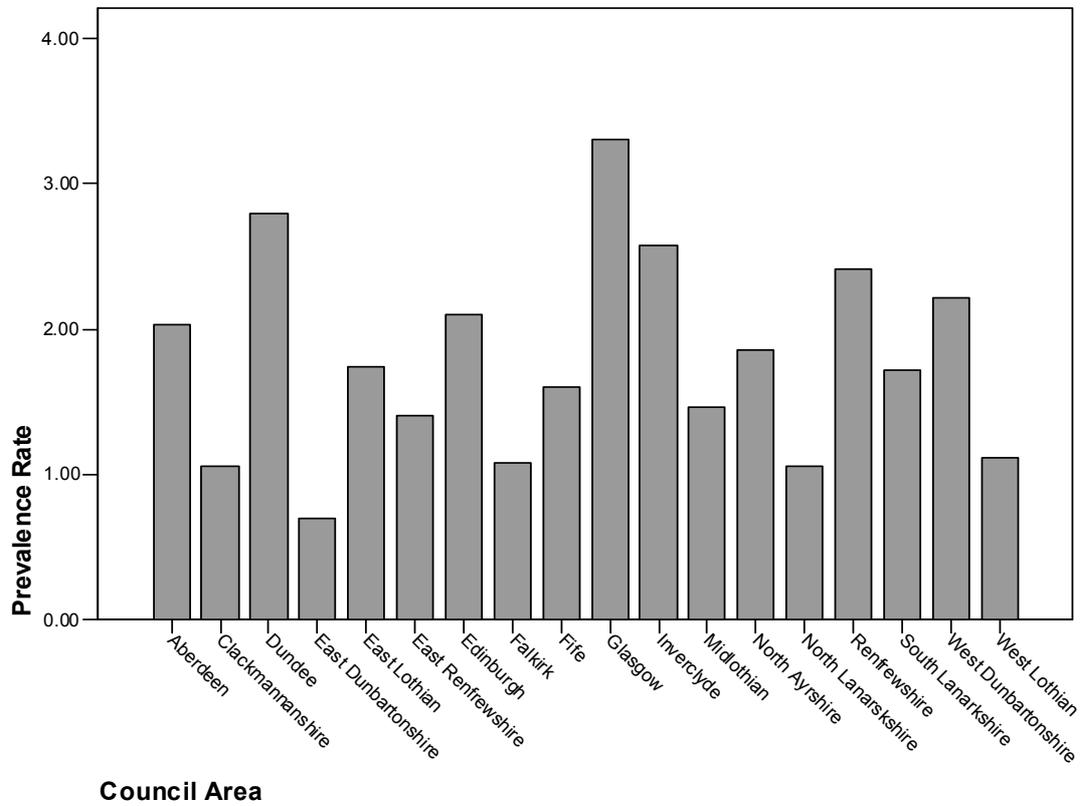
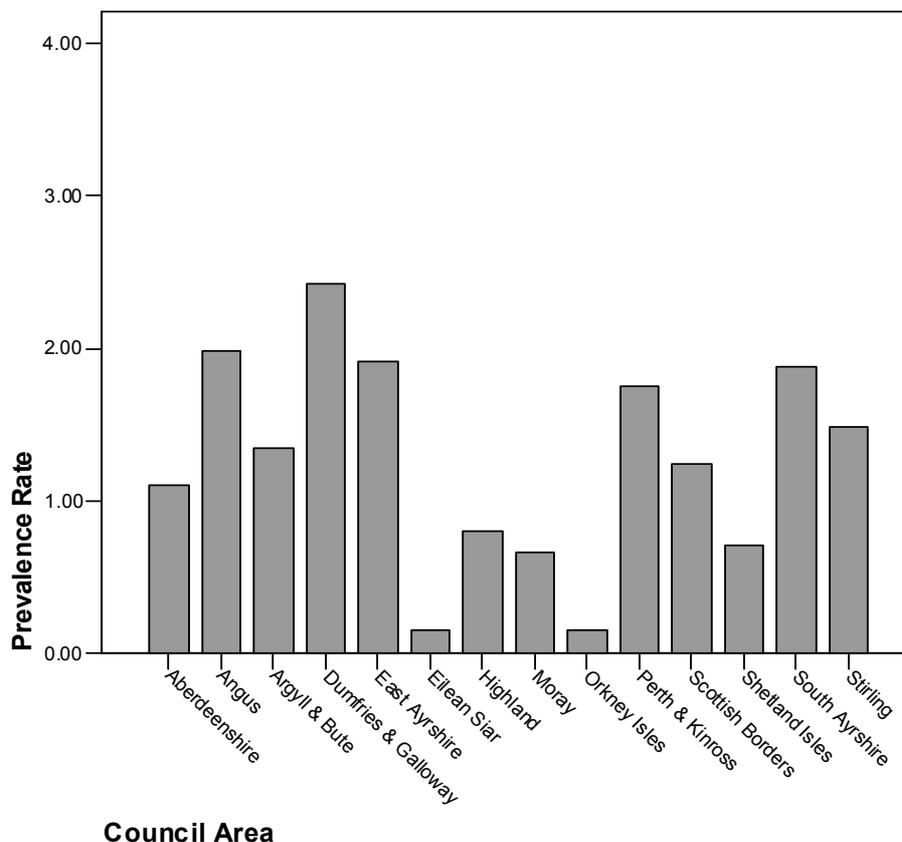


Figure 3 Estimated prevalence of problem drug use by Council area (rural areas, age 15 to 54)



Note: Estimates for Eilean Siar and Orkney Isles Council areas produced using multiplier method (see Chapter 3)

Gender and Age Group

In this section we present estimates of the prevalence of problem drug use by age and gender. Table 4 provides estimates and confidence intervals for the estimated numbers of female drug users along with the associated prevalence rates whereas Table 5 provides similar information for males. Care must be taken in interpreting the results described in Tables 4 and 5 as in some instances the estimates are derived from small numbers of identifiable drug users and the gender-specific rates in those areas have relatively wide confidence intervals. The percentages of problem drug users estimated to be female are presented in Table 6, along with the associated confidence intervals. From this table, it can be seen that overall 31% of Scotland's problem drug users are estimated to be female (95% CI 27-35%), with the proportion varying from 18% in East Renfrewshire up to 36% in Highland.

In terms of age groups, it was only possible to stratify the available data on male drug users into age groups. Thus estimates were provided for the 15 to 24 year old, 25 to 34 year old and 35 to 54 year old males.

In terms of the age group breakdown among males, although the younger 15 to 24 age group accounts for 30% of the problem drug users across Scotland as a whole, this proportion varies across Council area. This may, in part, be due to the numbers of younger problem drug users beginning to use drugs and will also be influenced by the numbers of drug users in the older age groups, particularly in areas such as Glasgow with comparatively high levels of problem drug use in the older age group.

Again care must be taken in interpreting the results described in Tables 7 and 8 as in some instances the estimates are derived from small numbers of identifiable drug users. However, it is clear that there are areas with high prevalence rates in this lower age group, in particular Dumfries and Galloway with 6.59% of males aged 15 to 24 estimated to be using opiates or benzodiazepines.

Table 4 Estimates of the prevalence of female problem drug use (age 15 to 54)

Council Area	Total Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	941	791-1,147	1.33	1.12-1.62
Aberdeenshire	335	273-425	0.60	0.49-0.76
Angus	343	198-892	1.28	0.74-3.32
Argyll & Bute	131	95-202	0.57	0.41-0.88
Clackmannanshire	81	60-120	0.55	0.41-0.82
Dumfries & Galloway	593	485-750	1.54	1.26-1.95
Dundee City	634	515-810	1.34	1.09-1.71
East Ayrshire	466	388-573	1.24	1.03-1.53
East Dunbartonshire	107	52-341	0.35	0.17-1.12
East Lothian	227	148-403	0.93	0.60-1.64
East Renfrewshire	131	89-378	0.48	0.33-1.40
Edinburgh, City of	1,903	1,669-2,197	1.35	1.19-1.56
Falkirk	212	170-278	0.52	0.41-0.68
Fife	1,044	742-1,657	1.07	0.76-1.69
Glasgow City	3,552	3,236-3,929	1.98	1.80-2.19
Highland	319	151-1,069	0.57	0.27-1.90
Inverclyde	365	306-449	1.52	1.27-1.87
Midlothian	200	145-300	0.87	0.63-1.31
Moray	104	64-211	0.45	0.27-0.90
North Ayrshire	463	387-572	1.21	1.01-1.49
North Lanarkshire	427	357-523	0.46	0.38-0.56
Perth & Kinross	372	221-739	1.07	0.63-2.12
Renfrewshire	790	567-1,181	1.58	1.14-2.37
Scottish Borders	156	101-283	0.55	0.36-1.00
South Ayrshire	212	178-262	0.80	0.67-0.99
South Lanarkshire	942	445-3,031	1.12	0.53-3.61
Stirling	170	134-226	0.68	0.53-0.90
West Dunbartonshire	341	274-454	1.21	0.97-1.61
West Lothian	232	231-306	0.49	0.49-0.64
MAINLAND SCOTLAND	15,793	12,472-23,708	1.10	0.87-1.65

Table 5 Estimates of the prevalence of male problem drug use (age 15 to 54)

Council Area	Total Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	1,869	1,587-2,292	2.76	2.34-3.38
Aberdeenshire	885	647-1,404	1.61	1.17-2.55
Angus	695	401-1,810	2.76	1.59-7.18
Argyll & Bute	478	305-948	2.16	1.38-4.28
Clackmannanshire	216	149-364	1.57	1.09-2.65
Dumfries & Galloway	1,213	917-1,750	3.38	2.55-4.88
Dundee City	1,888	1,506-2,467	4.42	3.53-5.77
East Ayrshire	921	734-1,209	2.65	2.11-3.47
East Dunbartonshire	294	183-756	1.05	0.65-2.69
East Lothian	587	381-1,271	2.63	1.70-5.68
East Renfrewshire	592	290-2,436	2.40	1.18-9.89
Edinburgh, City of	3,764	3,091-4,806	2.92	2.40-3.73
Falkirk	644	469-961	1.68	1.23-2.51
Fife	1,978	1,726-2,314	2.19	1.91-2.56
Glasgow City	7,683	7,013-8,484	4.80	4.39-5.31
Highland	579	431-830	1.07	0.80-1.54
Inverclyde	813	680-1,010	3.72	3.11-4.62
Midlothian	440	318-754	2.10	1.52-3.60
Moray	206	86-2,214	0.88	0.37-9.48
North Ayrshire	879	737-1093	2.56	2.15-3.18
North Lanarkshire	1,467	1,181-1,897	1.71	1.38-2.22
Perth & Kinross	815	570-1,285	2.50	1.75-3.94
Renfrewshire	1,505	1,100-2,219	3.30	2.42-4.87
Scottish Borders	524	299-1,484	2.01	1.14-5.68
South Ayrshire	739	489-1,274	3.07	2.03-5.29
South Lanarkshire	1,813	1,170-3,356	2.37	1.53-4.38
Stirling	543	276-2,210	2.37	1.20-9.63
West Dunbartonshire	844	602-1,320	3.34	2.38-5.22
West Lothian	793	617-1,105	1.78	1.39-2.49
MAINLAND SCOTLAND	35,667	27,955-55,323	2.69	2.11-4.17

Table 6 Estimates of the percentage of problem drug users who are female (age 15 to 54)

Council Area	Estimate	% Female	95% CI
Aberdeen City	2,810	33	26-45
Aberdeenshire	1,220	27	13-36
Angus	1,038	33	12-62
Argyll & Bute	609	22	6-37
Clackmannanshire	297	27	7-50
Dumfries & Galloway	1,806	33	20-45
Dundee City	2,522	25	14-32
East Ayrshire	1,387	34	23-47
East Dunbartonshire	401	27	5-69
East Lothian	814	28	10-49
East Renfrewshire	723	18	2-46
Edinburgh, City of	5,667	34	25-41
Falkirk	856	25	11-34
Fife	3,022	35	24-61
Glasgow City	11,235	32	26-37
Highland	898	36	15-76
Inverclyde	1,178	31	20-46
Midlothian	640	31	12-53
Moray	310	34	3-75
North Ayrshire	1,342	35	23-49
North Lanarkshire	1,894	23	13-28
Perth & Kinross	1,187	31	18-57
Renfrewshire	2,295	34	22-51
Scottish Borders	680	23	5-45
South Ayrshire	951	22	6-24
South Lanarkshire	2,755	34	18-64
Stirling	713	24	4-36
West Dunbartonshire	1,185	29	12-35
West Lothian	1,025	23	13-29
MAINLAND SCOTLAND	51,460	31	27-35

Table 7 Estimates of the prevalence of male problem drug use by age group

	15-24		25-34		35-54	
	n	95% CI	n	95% CI	n	95% CI
Aberdeen City	610	535-707	882	786-999	377	266-586
Aberdeenshire	280	232-349	401	310-541	204	105-514
Angus	300	191-537	233	151-409	162	59-864
Argyll & Bute	127	92-189	176	127-268	175	86-491
Clackmannanshire	80	50-152	107	82-147	29	17-65
Dumfries & Galloway	459	367-592	469	370-636	285	180-522
Dundee City	567	464-711	927	761-1,160	394	281-596
East Ayrshire	270	219-344	484	390-624	167	125-241
East Dunbartonshire	67	46-113	138	103-198	89	34-445
East Lothian	219	155-340	260	183-405	108	43-526
East Renfrewshire	144	79-363	351	166-1,124	97	45-949
Edinburgh, City of	1,163	849-1,729	1,507	1,353-1,695	1,094	889-1,382
Falkirk	250	182-366	253	197-342	141	90-253
Fife	663	586-761	866	774-981	449	366-572
Glasgow City	1,540	1,354-1,770	3,481	3,281-3,705	2,662	2,378-3,009
Highland	175	132-248	300	225-421	104	74-161
Inverclyde	248	198-324	372	333-422	193	149-264
Midlothian	222	166-325	178	135-250	40	17-179
Moray	143	39-2,117	52	38-80	11	9-17
North Ayrshire	233	200-279	433	381-500	213	156-314
North Lanarkshire	444	362-559	725	608-881	298	211-457
Perth & Kinross	295	197-497	361	269-513	159	104-275
Renfrewshire	525	381-772	771	577-1,083	209	142-364
Scottish Borders	198	106-482	175	133-248	151	60-754
South Ayrshire	150	113-215	439	291-732	150	85-327
South Lanarkshire	582	366-1,103	911	634-1,434	320	170-819
Stirling	204	84-995	139	116-173	200	76-1,042
West Dunbartonshire	268	175-469	367	284-506	209	143-345
West Lothian	339	275-433	258	218-315	196	124-357
MAINLAND SCOTLAND	10,765	8,195-17,841	16,016	13,276-20,792	8,886	6,484-16,690

Table 8 Prevalence rates of male problem drug use by age group

	15-24		25-34		35-54	
	%	95% CI	%	95% CI	%	95% CI
Aberdeen City	3.51	3.08-4.07	4.88	4.35-5.53	1.16	0.82-1.81
Aberdeenshire	2.56	2.12-3.19	3.22	2.49-4.34	0.64	0.33-1.62
Angus	5.66	3.61-10.14	3.96	2.56-6.94	1.16	0.42-6.16
Argyll & Bute	2.91	2.11-4.33	3.34	2.41-5.09	1.40	0.69-3.92
Clackmannanshire	2.77	1.73-5.27	3.24	2.48-4.45	0.38	0.23-0.86
Dumfries & Galloway	6.59	5.27-8.50	5.72	4.51-7.75	1.38	0.87-2.52
Dundee City	4.89	4.00-6.13	9.36	7.69-11.72	1.86	1.32-2.81
East Ayrshire	3.71	3.01-4.73	5.57	4.49-7.18	0.89	0.66-1.28
East Dunbartonshire	1.06	0.73-1.78	2.45	1.83-3.52	0.55	0.21-2.76
East Lothian	5.37	3.80-8.33	4.80	3.38-7.47	0.84	0.33-4.09
East Renfrewshire	2.71	1.49-6.84	6.71	3.17-21.50	0.69	0.32-6.74
Edinburgh, City of	3.51	2.56-5.22	4.11	3.69-4.63	1.85	1.50-2.33
Falkirk	3.07	2.24-4.50	2.57	2.00-3.48	0.70	0.44-1.25
Fife	3.23	2.85-3.71	3.99	3.57-4.52	0.93	0.76-1.19
Glasgow City	3.79	3.33-4.36	7.85	7.40-8.36	3.55	3.17-4.01
Highland	1.62	1.22-2.29	2.43	1.82-3.41	0.34	0.24-0.52
Inverclyde	5.02	4.01-6.55	7.37	6.60-8.36	1.63	1.25-2.22
Midlothian	5.26	3.94-7.71	3.54	2.68-4.97	0.34	0.15-1.53
Moray	3.06	0.83-45.23	0.84	0.61-1.29	0.09	0.07-0.14
North Ayrshire	3.11	2.67-3.73	5.29	4.65-6.10	1.14	0.84-1.68
North Lanarkshire	2.29	1.87-2.88	3.26	2.73-3.96	0.68	0.48-1.04
Perth & Kinross	4.49	3.00-7.57	4.86	3.62-6.90	0.86	0.56-1.48
Renfrewshire	5.39	3.91-7.93	6.90	5.16-9.69	0.85	0.58-1.48
Scottish Borders	4.10	2.19-9.98	2.89	2.20-4.09	0.99	0.39-4.95
South Ayrshire	3.00	2.26-4.30	8.10	5.37-13.51	1.10	0.62-2.40
South Lanarkshire	3.47	2.18-6.58	4.89	3.40-7.69	0.78	0.41-1.99
Stirling	3.56	1.47-17.38	2.68	2.24-3.33	1.66	0.63-8.66
West Dunbartonshire	4.69	3.07-8.21	5.95	4.60-8.20	1.56	1.07-2.57
West Lothian	3.77	3.05-4.81	2.16	1.82-2.64	0.83	0.53-1.52
MAINLAND SCOTLAND	3.59	2.73-5.95	4.83	4.00-6.27	1.28	0.93-2.40

5.1.3 DAAT Areas

DAATs are the main local administrative entities for the co-ordinated response to drug misuse in Scotland. While some are mapped along NHS Board boundaries, other DAATs have divided in accordance with Council boundaries. In Figure 4 we present a graphical representation of drug misuse prevalence across the 22 DAATs. Figure 5 presents the prevalence estimates by DAAT area in the form of a bar chart whereas Table 9 summarises those data in a table.

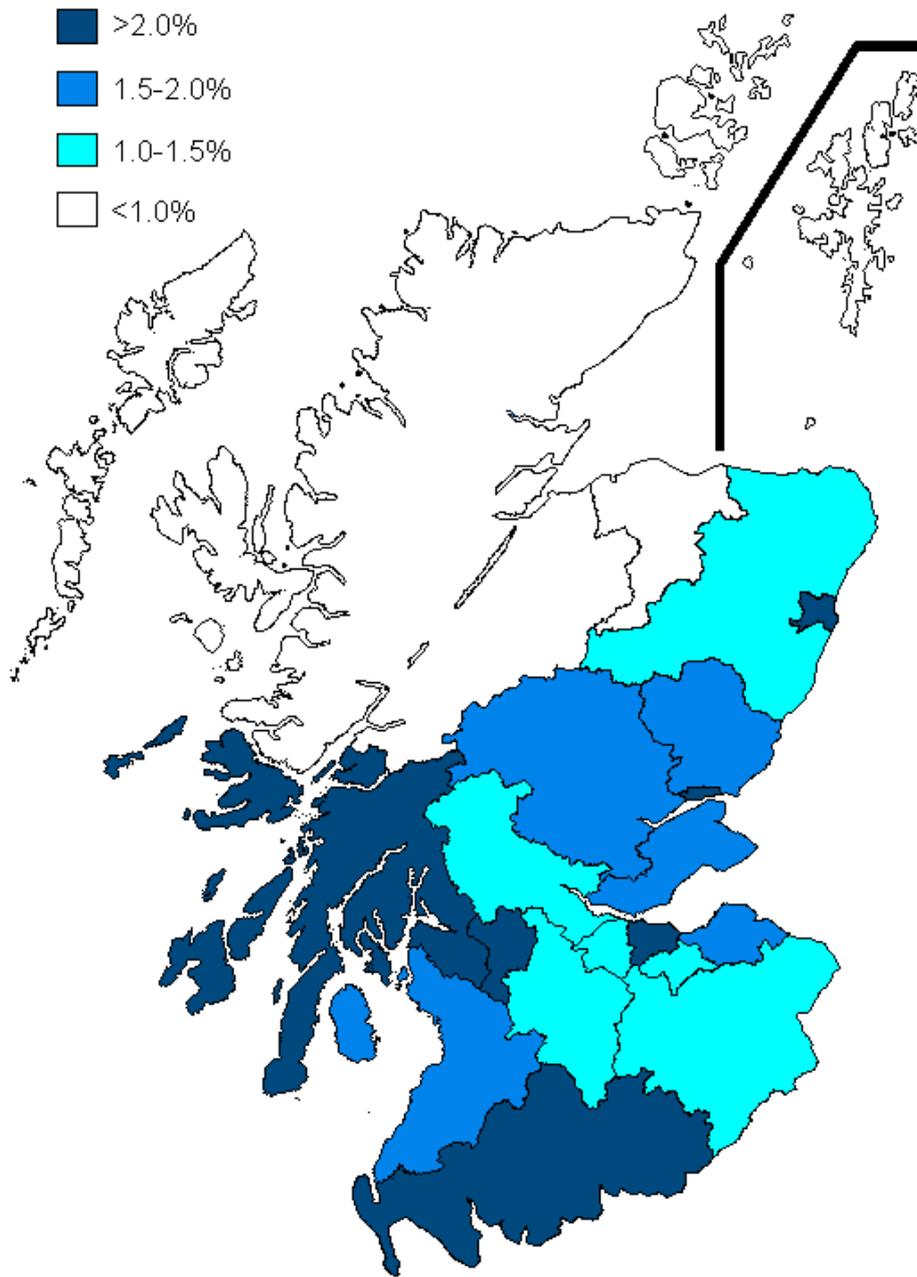
We see here that the Dundee City DAAT area has the highest prevalence rate at 2.80% (95% CI 2.51-3.22%), followed by the Greater Glasgow DAAT area at 2.64% (95% CI 2.55-2.87%). The Dumfries and Galloway DAAT area follows with a prevalence rate of 2.43% (95% CI 2.15-2.94).

Table 9 Estimates of the number of problem drug users by DAAT area (age 15 to 54)

Area	Total Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	2,810	2,587-3,147	2.03	1.87-2.27
Aberdeenshire	1,220	1,056-1,581	1.10	0.95-1.42
Angus	1,038	779-1,837	1.99	1.50-3.53
Argyll & Clyde	5,241	4,929-6,510	2.29	2.16-2.85
Ayrshire & Arran	3,680	3,448-4,175	1.88	1.76-2.14
Borders	680	516-1,295	1.25	0.95-2.38
Dumfries & Galloway	1,806	1,597-2,184	2.43	2.15-2.94
Dundee City	2,522	2,255-2,899	2.80	2.51-3.22
East Lothian	814	658-1343	1.74	1.40-2.86
Edinburgh City	5,667	5,176-6,374	2.10	1.92-2.37
Fife	3,022	2,690-3,707	1.60	1.43-1.97
Forth Valley	1,866	1,645-2,972	1.20	1.06-1.91
Greater Glasgow	13,228	12,771-14,400	2.64	2.55-2.87
Highland	898	695-1,611	0.81	0.63-1.46
Lanarkshire	3,806	3,285-5,443	1.27	1.10-1.82
Midlothian	640	549-975	1.46	1.25-2.22
Moray	310	182-1,627	0.66	0.39-3.48
Orkney Isles ¹	16		0.16	
Perth & Kinross	1,187	968-1,645	1.76	1.44-2.44
Shetland Isles	85	45-607	0.71	0.38-5.07
West Lothian	1,025	918-1,236	1.11	1.00-1.34
Western Isles ¹	21		0.16	
SCOTLAND	51,582	51,456-56,379	1.84	1.84-2.01

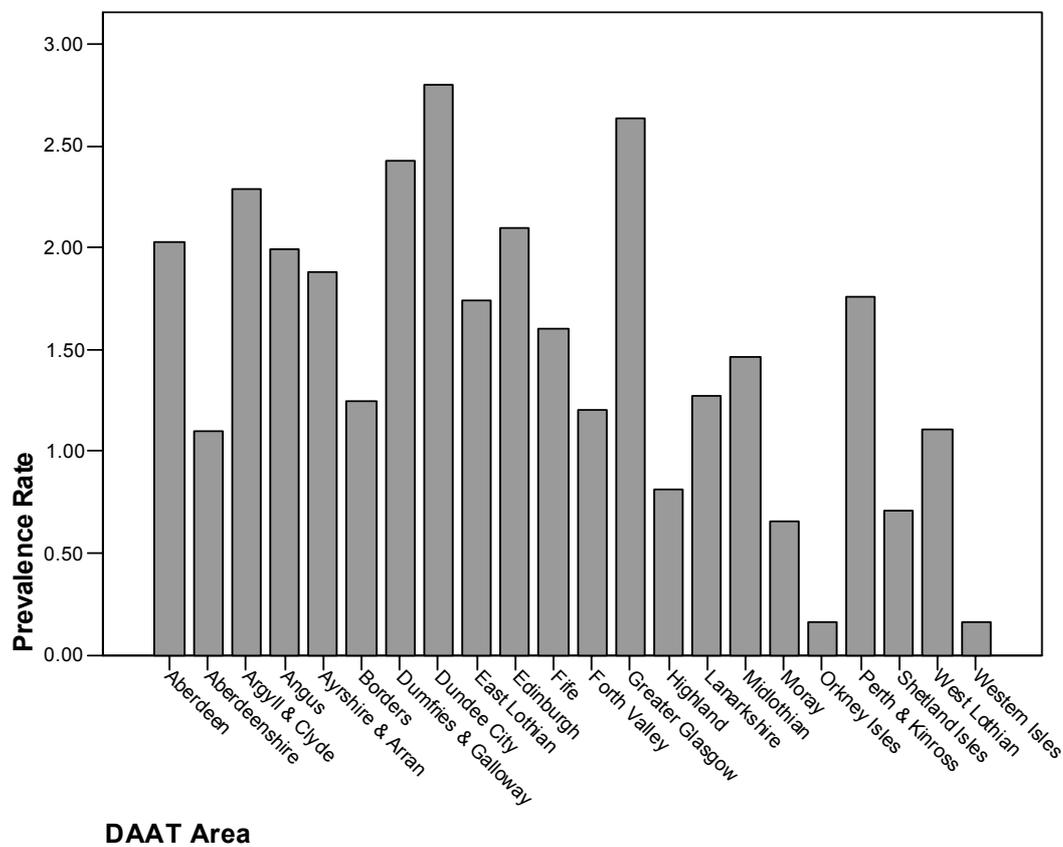
1 Estimates for Orkney Isles and Western Isles DAAT areas produced using multiplier method (see Chapter 3)

Figure 4 Estimated prevalence of problem drug use by DAAT area (age 15 to 54)



Note: Estimates for Orkney Isles and Western Isles DAAT areas produced using multiplier method (see Chapter 3)

Figure 5 Estimated prevalence of problem drug use by DAAT area (age 15 to 54)



Note: Estimates for Orkney Isles and Western Isles DAAT areas produced using multiplier method (see Chapter 3)

5.1.4 NHS Board Areas

In the next section we look at the same prevalence information, but this time divided in accordance with NHS Board areas.

By expressing the estimated number of drug misusers in each area as a percentage of the population aged 15 to 54, it is possible to make comparisons across NHS Board areas. On that basis, the area with the highest prevalence rates for problem drug misuse is Greater Glasgow at 2.64% (95% CI 2.55-2.87%). The next highest is Dumfries & Galloway at 2.43% (95% CI 2.15-2.94%). The third highest is Argyll & Clyde at 2.29% (95% CI 2.16-2.85%).

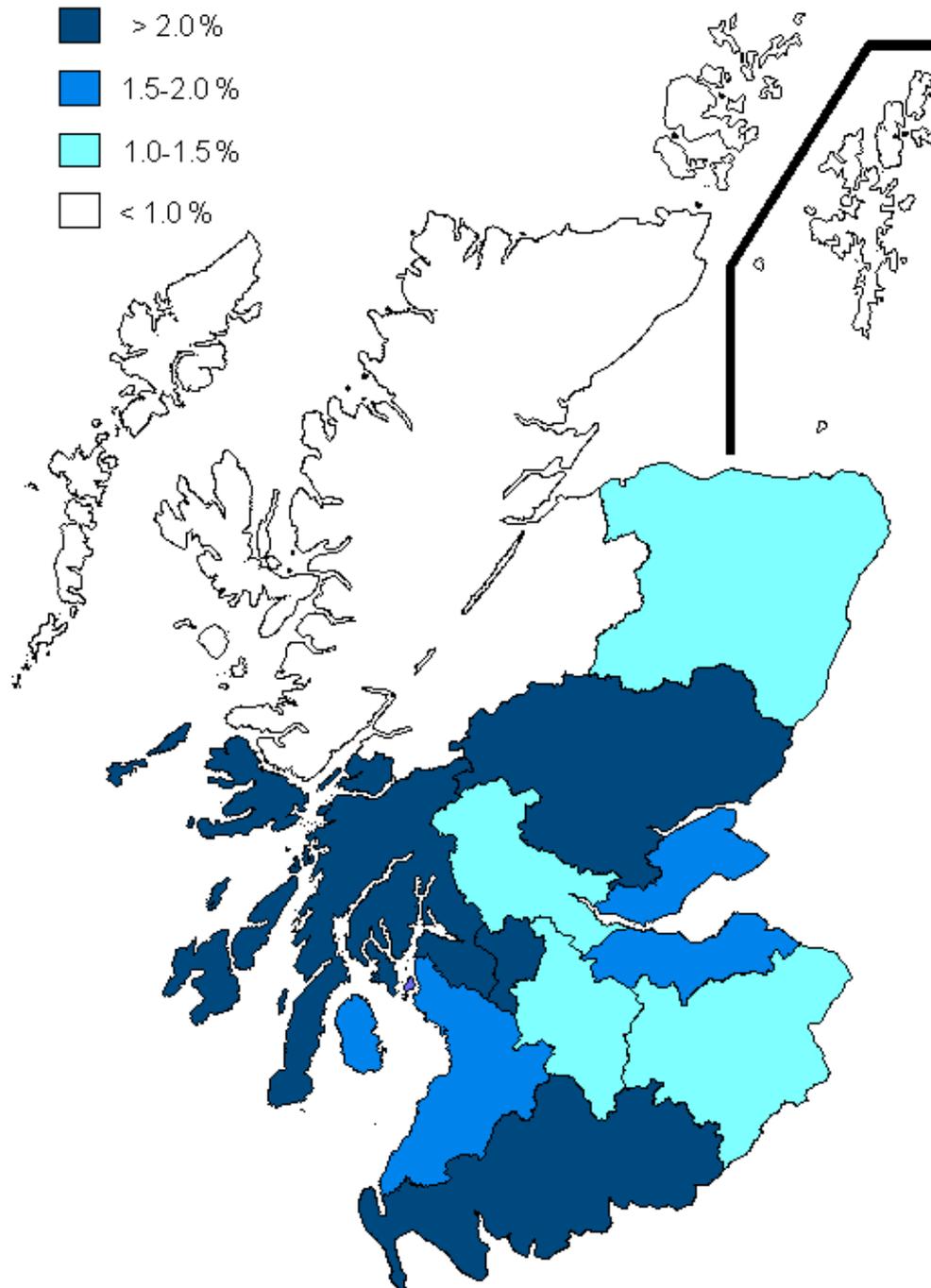
The NHS Board area with the highest number of problem drug users is Greater Glasgow, where the estimated total is 13,228, 95% confidence interval 12,771 to 14,400. The next highest area is Lothian, where the estimated total is 8,146, 95% confidence interval 7,676-9,197.

Table 10 Estimates of the number of problem drug users by NHS Board area (age 15 to 54)

Area	Total Estimate		Prevalence	
	N	95% CI	%	95% CI
Argyll & Clyde	5,241	4,929-6,510	2.29	2.16-2.85
Ayrshire & Arran	3,680	3,448-4,175	1.88	1.76-2.14
Borders	680	516-1,295	1.25	0.95-2.38
Dumfries & Galloway	1,806	1,597-2,184	2.43	2.15-2.94
Fife	3,022	2,690-3,707	1.60	1.43-1.97
Forth Valley	1,866	1,645-2,972	1.20	1.06-1.91
Grampian	4,340	4,051-5,737	1.46	1.37-1.94
Greater Glasgow	13,228	12,771-14,400	2.64	2.55-2.87
Highland	898	695-1,611	0.81	0.63-1.46
Lanarkshire	3,806	3,285-5,443	1.27	1.10-1.82
Lothian	8,146	7,676-9,197	1.80	1.70-2.03
Orkney Isles ¹	16		0.16	
Shetland Isles	85	45-607	0.71	0.38-5.07
Tayside	4,747	4,357-5,826	2.27	2.08-2.78
Western Isles ¹	21		0.16	
SCOTLAND	51,582	51,456-56,379	1.84	1.84-2.01

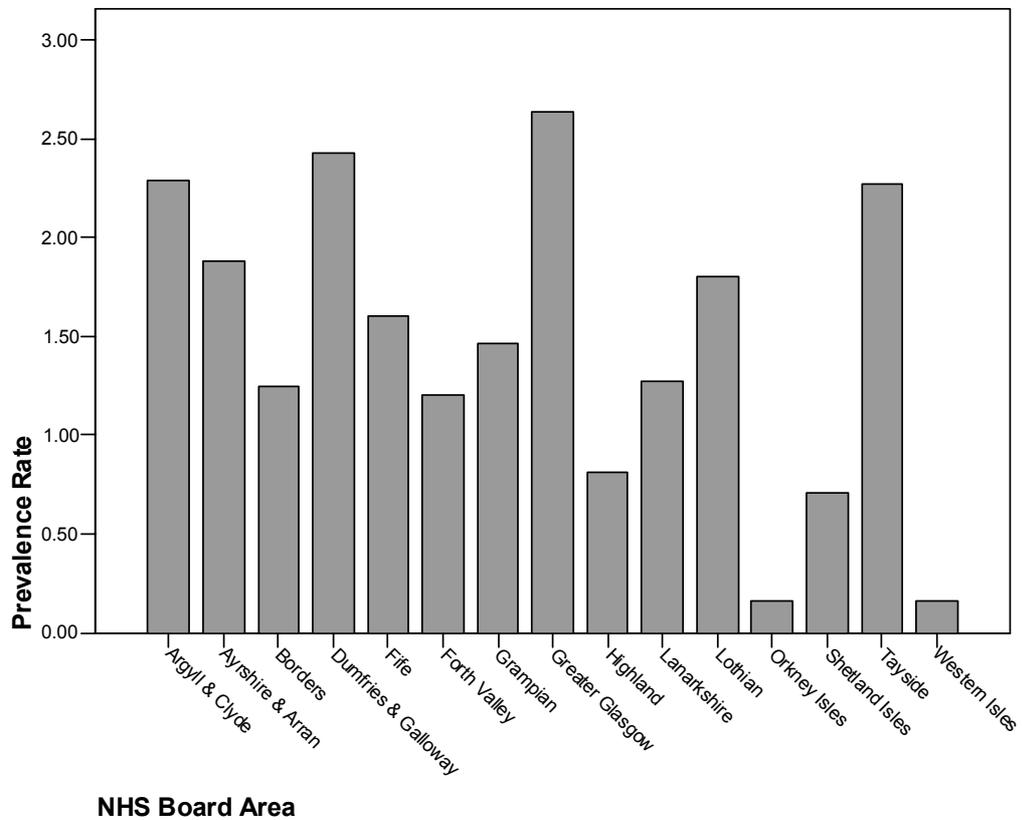
1 Estimates for Orkney Isles and Western Isles NHS Board areas produced using multiplier method (see Chapter 3)

Figure 6 Estimated prevalence of problem drug use by NHS Board area (age 15 to 54)



Note: Estimates for Orkney Isles and Western Isles NHS Board areas produced using multiplier method (see Chapter 3)

Figure 7 Estimated prevalence of problem drug use by NHS Board area (age 15 to 54)



Note: Estimates for Orkney Isles and Western Isles NHS Board areas produced using multiplier method (see Chapter 3)

5.1.5 Police Force Areas

Next we present the information on drug misuse prevalence by Police Force area. Again we present a table summarising the results then a map showing this information followed by a bar chart.

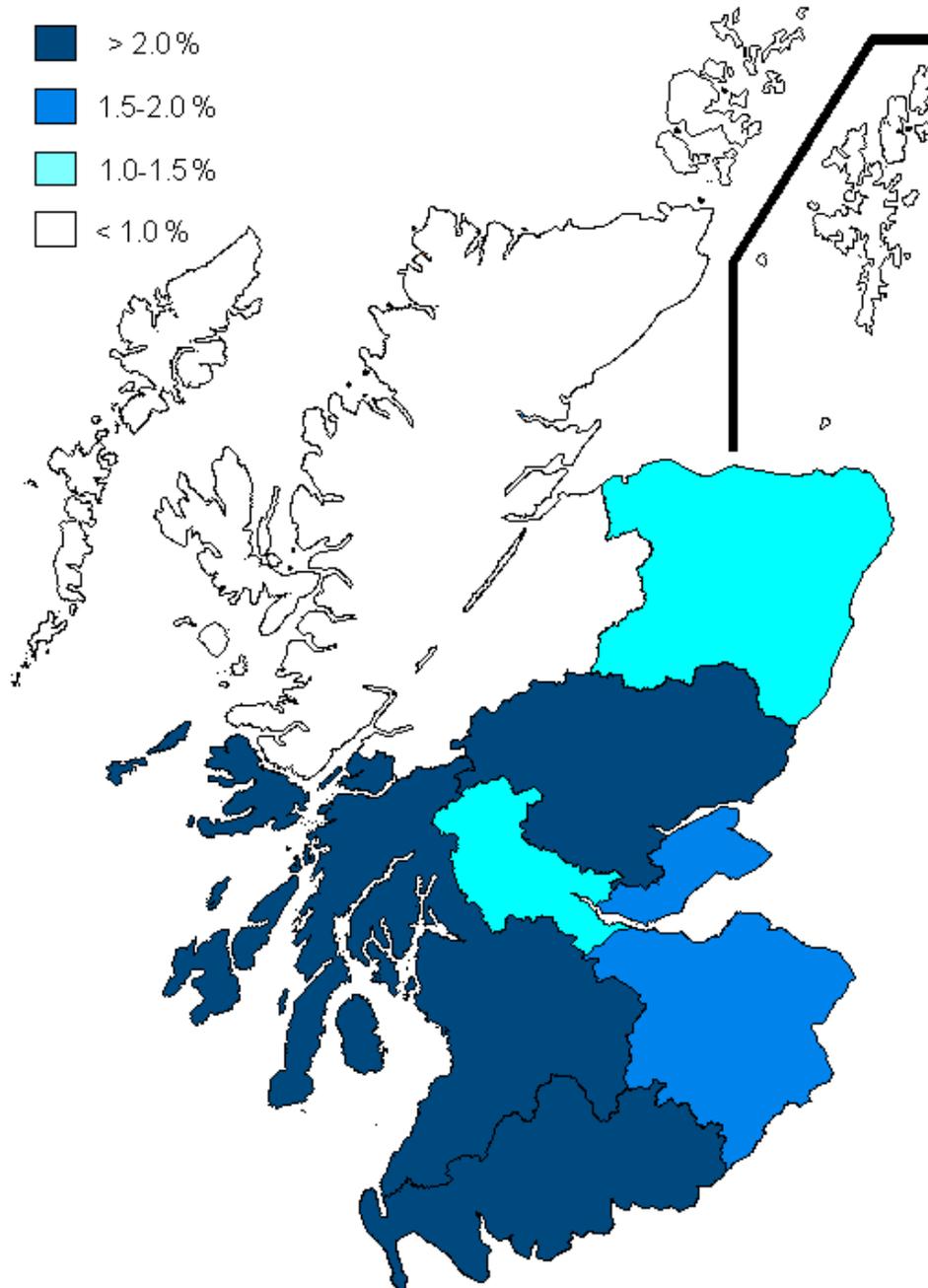
Whilst drug misuse is clearly occurring in all Force areas, the prevalence of drug misuse is highest in the Dumfries & Galloway area at 2.43% of the population within the 15 to 54 age range (95% CI 2.15-2.94%). The area with the second highest prevalence is Tayside at 2.27% (95% CI 2.08-2.78%). The area with the lowest prevalence is the Northern Constabulary area at 0.70% (95% CI 0.51-1.29%).

Table 11 Estimates of the number of problem drug users by Police Force area (age 15 to 54)

Area	Total Estimate		Prevalence	
	N	95% CI	%	95% CI
Central	1,866	1,645-2,972	1.20	1.06-1.91
Dumfries & Galloway	1,806	1,597-2,184	2.43	2.15-2.94
Fife	3,022	2,690-3,707	1.60	1.43-1.97
Grampian	4,340	4,051-5,737	1.46	1.37-1.94
Lothian & Borders	8,826	8,378-10,104	1.74	1.65-1.99
Northern ¹	1,020	736-1,872	0.70	0.51-1.29
Strathclyde	25,955	25,469-28,715	2.12	2.08-2.35
Tayside	4,747	4,357-5,826	2.27	2.08-2.78
SCOTLAND	51,582	51,456-56,379	1.84	1.84-2.01

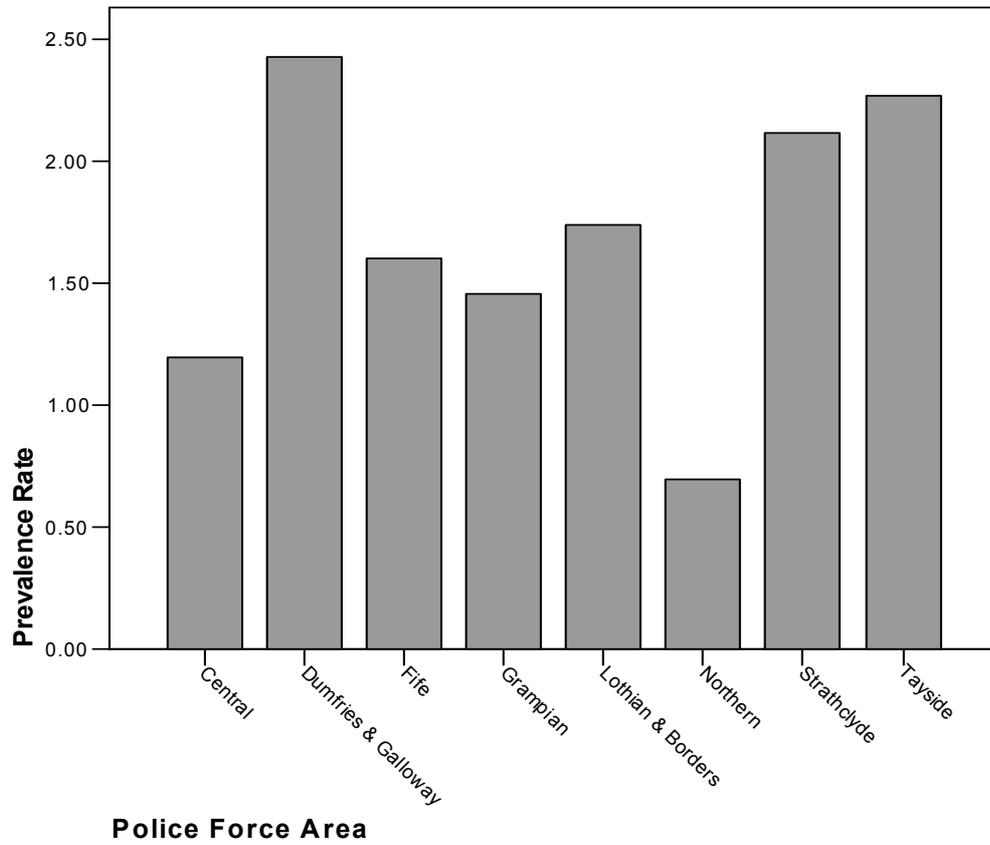
1 Estimates for Eilean Siar and Orkney Isles parts of the Northern Constabulary area are produced using multiplier method (see Chapter 3)

Figure 8 Estimated prevalence of problem drug use by Police Force area (age 15 to 54)



Note: Estimates for Eilean Siar and Orkney Isles parts of the Northern Constabulary area are produced using multiplier method (see Chapter 3)

Figure 9 Estimated prevalence of problem drug use by Police Force area (age 15 to 54)



Note: Estimates for the Eilean Siar and Orkney Isles parts of the Northern Constabulary area are produced using multiplier method (see Chapter 3)

5.1.6 LHCC areas

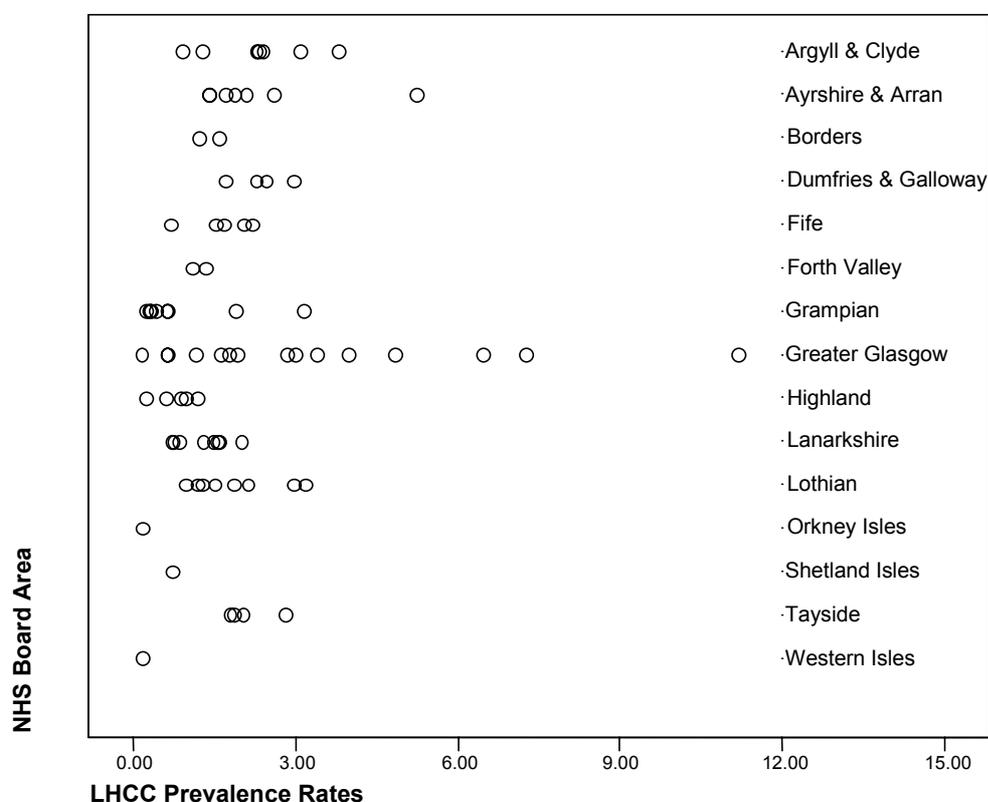
While estimates of the prevalence of problem drug use at the Council, DAAT, NHS Board or Police Force level are useful in showing changes in prevalence across Scotland, there is a need for lower-level estimates highlighting any differences in prevalence within DAAT areas. A previous study⁴ examined the issues involved when deriving prevalence estimates within DAAT areas and focussed on LHCC area level estimates.

Figure 10 summarises the results from the LHCC area analyses, where each row summarises the different estimates (expressed as the rate per population aged 15 to 54) in a single NHS Board area.

Figure 10 also highlights the variation in prevalence rates that were found within each NHS Board area. An appendix to this report presents the prevalence rates for each LHCC. From Figure 10 there appears to be LHCC areas with high levels of problem drug use in the Greater Glasgow, Ayrshire & Arran and Argyll & Clyde NHS Board areas. It should be noted that the LHCC area within the Greater Glasgow NHS Board area with a prevalence rate of 11.19% in the 15 to 54 age range covers a part of Glasgow City where there is a homeless addiction unit therefore the available data for that area would also include temporary residents of that LHCC area. Although the inclusion of data from this agency may breach a key assumption of the capture-recapture method (that the population does not have people moving in or out of it) the comparatively high prevalence rate could reflect the number of problem drug users who have lived in that LHCC area at any point during 2003.

⁴ <http://www.drugmisuse.isdscotland.org/publications/abstracts/prevalence2.htm>

Figure 10 Estimated prevalence of problem drug use by LHCC area (age 15 to 54)



Note: Estimates for Orkney Isles and Western Isles NHS Board areas produced using multiplier method (see Chapter 3)

5.2 Drug Injecting

In this section we present estimates of the prevalence of drug injecting at the NHS Board and Council area level. Drug injecting was defined as the injecting of any drugs, not necessarily opiates or benzodiazepines (but not including the injecting of steroids).

As noted in Chapter 3, a mortality multiplier method was used in the Borders NHS Board area. From the General Register Office for Scotland figures for drug-related deaths in Scotland during 2003, there were 216 deaths with the 'drug abuse' ICD10 codes (F11-F16 or F19) (GROS, 2004). One of those deaths was in the Borders. As we had estimated that there were 18,650 drug injectors in the rest of mainland Scotland, the mortality ratio would be $215/18,650 = 1.15\%$. Applying that mortality ratio to the one death in the Borders suggests that there are 87 drug injectors in that area. A 95% confidence interval (82-94) was derived using a similar approach. As also noted in Chapter 3 there were insufficient data to provide comparable estimates for the three

Island NHS Board areas, however an alternative approach suggested that there were 53 drug injectors in Shetland. The following tables provide the injecting prevalence estimate for mainland Scotland, but given the small number of injectors estimated to reside in Shetland compared to the national confidence interval, there is justification in taking the national prevalence estimate to be as shown in Table 12.

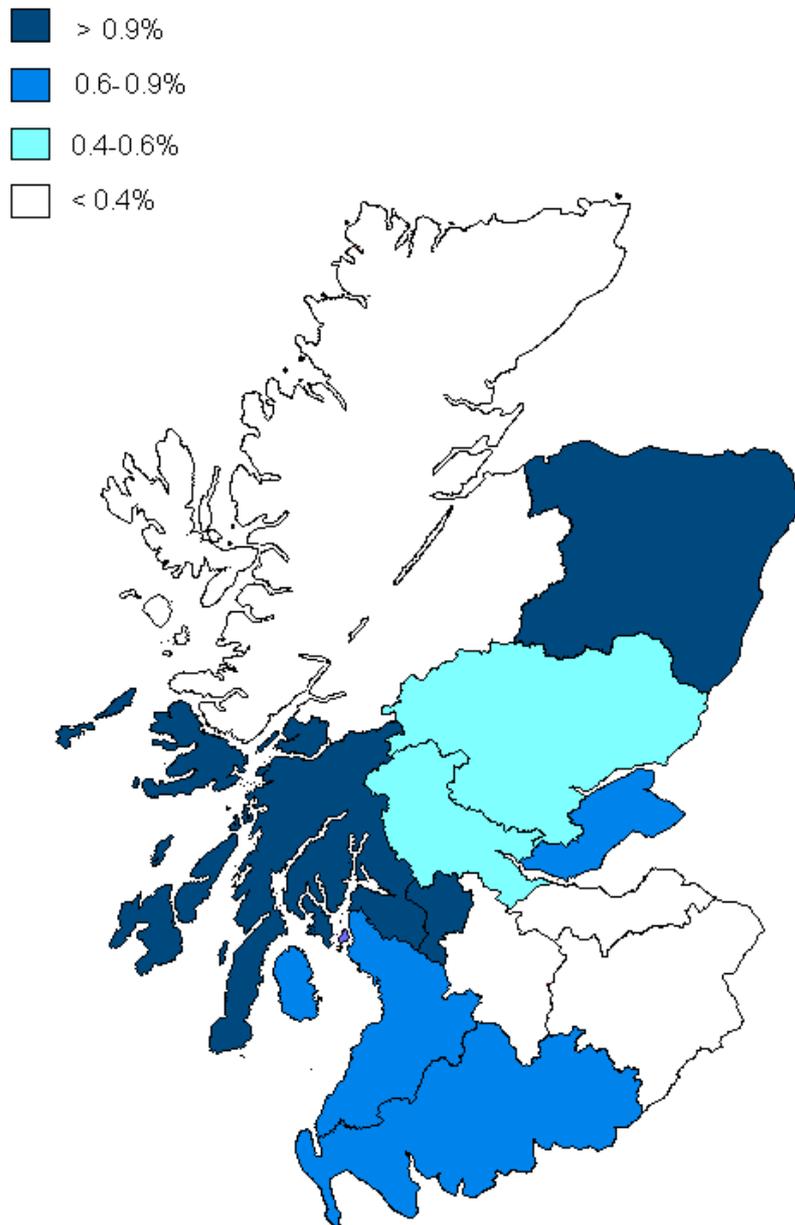
Thus in total it has been estimated that there are 18,737 drug injectors in Scotland in 2003. The highest prevalence rates are to be found in the Greater Glasgow, Argyll & Clyde and Grampian NHS Board areas.

Table 12 Estimates of the number of drug injectors by NHS Board area (mainland Scotland, age 15 to 54)

Area	Total Estimate		Prevalence	
	N	95% CI	%	95% CI
Argyll & Clyde	2,199	1,776-2,801	0.96	0.78-1.23
Ayrshire & Arran	1,715	1,351-2,244	0.88	0.69-1.15
Borders ¹	87	82-94	0.16	0.15-0.17
Dumfries & Galloway	663	512-914	0.89	0.69-1.23
Fife	1,124	965-1,335	0.60	0.51-0.71
Forth Valley	901	703-1,194	0.58	0.45-0.77
Grampian	2,842	2,458-3,327	0.96	0.83-1.12
Greater Glasgow	4,908	4,442-5,458	0.98	0.89-1.09
Highland	373	253-610	0.34	0.23-0.55
Lanarkshire	1,146	816-1,716	0.38	0.27-0.57
Lothian	1,685	1,405-2,075	0.37	0.31-0.46
Tayside	1,094	776-1,656	0.52	0.37-0.79
MAINLAND SCOTLAND	18,737	17,731-20,289	0.67	0.63-0.72

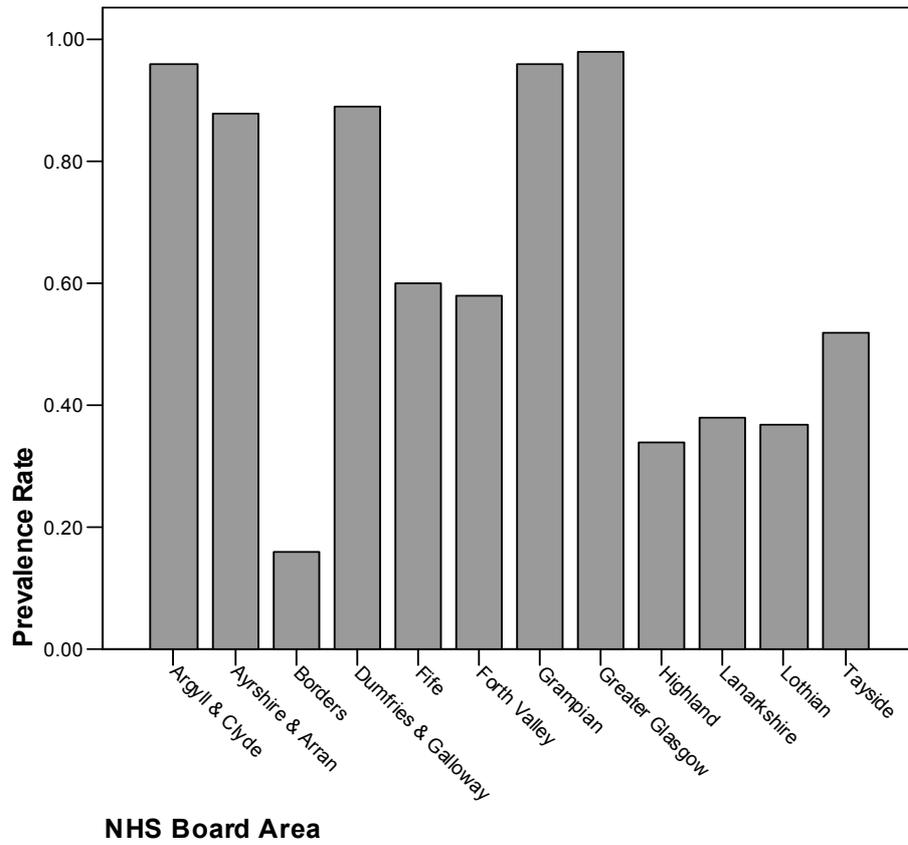
1 Estimate for Borders NHS Board area was produced using the mortality multiplier method (see Chapter 3)

Figure 11 Estimated prevalence of drug injecting by NHS Board area (mainland Scotland, age 15 to 54)



Note: Estimate for Borders NHS Board area was produced using the mortality multiplier method (see Chapter 3)

Figure 12 Estimated prevalence of drug injecting by NHS Board area (age 15 to 54)



Note: Estimate for Borders NHS Board area was produced using the mortality multiplier method (see Chapter 3)

Table 13 presents the estimated number of drug injectors by Council area.

From Table 13, the highest levels of injecting drug use are to be found in Aberdeen City at 1.48% of the population aged 15 to 54, followed by Glasgow City and Renfrewshire with prevalence rates of 1.32% and 1.25% respectively.

Table 13 Estimates of the number of drug injectors by Council area (mainland Scotland, age 15 to 54)

Area	Total Estimate	Prevalence Rate
Aberdeen City	2,050	1.48
Aberdeenshire	681	0.61
Angus	322	0.62
Argyll & Bute	144	0.32
Clackmannanshire	219	0.77
Dumfries & Galloway	663	0.89
Dundee City	475	0.53
East Ayrshire	559	0.77
East Dunbartonshire	115	0.20
East Lothian	83	0.18
East Renfrewshire	102	0.20
Edinburgh, City of	1,260	0.47
Falkirk	395	0.50
Fife	1,124	0.60
Glasgow City	4,473	1.32
Highland	373	0.34
Inverclyde	393	0.86
Midlothian	91	0.21
Moray	111	0.24
North Ayrshire	644	0.89
North Lanarkshire	630	0.35
Perth & Kinross	297	0.44
Renfrewshire	1,195	1.25
Scottish Borders	87	0.16
South Ayrshire	512	1.01
South Lanarkshire	650	0.40
Stirling	287	0.60
West Dunbartonshire	551	1.03
West Lothian	251	0.27
MAINLAND SCOTLAND	18,737	0.67

5.3 Psychostimulants

As noted in Chapter 4, data on psychostimulant use was obtained from all of the treatment, Police and Social Enquiry Report data sources across Scotland. It was not possible to ascertain the severity of an individual's psychostimulant use or their level of dependency from the Police data source. For example, someone who only takes amphetamines in social settings such as a night club could not be differentiated from someone who is becoming dependent on the drug or injecting it. Therefore the psychostimulant users identified from the treatment data source could be substantially different from some of the psychostimulant users identified from the police data thus breaching one of the assumptions of the capture-recapture methodology. Assuming that all contributing data sources encompassed similar cohorts of psychostimulant users, i.e. they did not include infrequent or recreational users along with heavy users or those experiencing problems due to addiction to those drugs, various capture-recapture analyses could be undertaken. However only one such analysis offered valid estimates and that was for the use of one specific psychostimulant in one Council area. We can therefore present an estimate of the prevalence of crack cocaine use in Aberdeen City.

In total there were 254 individuals identified as using crack cocaine in Aberdeen City in 2003. The largest source of data was the treatment data (again excluding needle exchange data) with 172 individuals. There were 57 individuals identified from the Social Enquiry Report data source and 43 individuals identified from the Police data. The three-sample capture-recapture analysis estimates the number of crack cocaine users to be 1,070 (95% CI 736 to 1,672). This corresponds to 0.72% of the population aged 15 to 54 (95% CI 0.53-1.20%). From the Social Enquiry Report data for Aberdeen, only one person (1.8%) out of those identified as using crack cocaine was noted as solely using that drug. A similar picture emerges from the treatment data where only five out of the 172 individuals (2.9%) identified as using crack cocaine from the treatment data are not also noted using opiates. This suggests that the estimate of 1,070 crack users refers to opiate users who also use crack cocaine i.e. 38% of those estimated to be using opiates or benzodiazepines in Aberdeen City in 2003.

Elsewhere in Scotland the numbers identified as using crack cocaine from both the combined treatment and the Social Enquiry Report data sources are sparse, as evidenced by Table 14 that compared the numbers identified in Aberdeen City with the rest of Scotland.

Table 14 Crack cocaine users identified from Scottish Drug Misuse Database (SDMD) and Social Enquiry Report (SER) data sources (age 15 to 54)

Area	SDMD data			SER data		
	Total	Crack Cocaine	%	Total	Crack Cocaine	%
Aberdeen City	614	131	21.3	577	57	9.9
Rest of Scotland	7,269	249	3.4	6,594	89	1.3
Total	7,883	380	4.8	7,371	146	2.0

Several interesting points arise from Table 14. First, although every Social Enquiry Report completed in 2003 in Scotland was screened, only 146 (2.0%) were found which mentioned that the individual was using crack cocaine. A different pattern was however found in Aberdeen City where almost 10% were using crack cocaine. Similarly although just over 20% of individuals identified within the Scottish Drug Misuse Database in 2003 in Aberdeen City (excluding needle exchanges) were using crack cocaine, across Scotland as a whole that figure drops to just under 5%. The Social Enquiry Report data is particularly interesting as that perhaps cannot be criticised as being 'opiate-centric' in the way that treatment service data can be. Indeed, given the perceived nature of crack cocaine use in terms of cost of the drug and related criminal behaviour it could indeed be assumed that crack cocaine users would be more visible to the criminal justice system. The data collated within this study therefore suggests that while crack cocaine use is found across Scotland at a comparatively low level, there is an increased prevalence of crack cocaine use in Aberdeen City.

6 Comparison between 2000 and 2003

In this section comparisons are drawn between the results of the 2003 study and the previous study that presented estimates for 2000. As noted in Chapter 4 a distinct GP source was not used in the 2003 study and as noted in Chapter 3 the methodology was more systematically applied across Scotland in the 2003 study in that a single year's worth of data were used across Scotland and estimates by gender were provided for all 29 mainland Council areas. The 'males' estimates were further broken down into three age groups providing information on the age and gender distribution across the country. One drawback of this approach is that the confidence intervals for 2003 are wider than they could have been if different stratifications had been carried out.

Table 15 presents a comparison between the prevalence rates estimated in the 2000 study and those estimate in the 2003 study by council area. As noted in Chapter 3, it is more appropriate to focus on the prevalence rates as the 2003 estimates are based on postcode district approximations to the Council areas. Those areas where there has been a significant increase or decrease (as seen by the confidence intervals not overlapping) are highlighted in bold. As noted in Chapter 3, a more computer intensive approach was taken to gauge whether there has been a statistically significant difference in the national prevalence between 2000 and 2003.

Table 15 Comparison between the 2000 and 2003 problem drug use prevalence estimates by Council area (age 15 to 54)

Area	2000		2003		Change
	%	95% CI	%	95% CI	%
Aberdeen City	2.96	2.59-4.09	2.03	1.87-2.27	-31
Aberdeenshire	1.07	0.94-1.30	1.10	0.95-1.42	3
Angus	1.20	0.95-1.58	1.99	1.50-3.53	66
Argyll & Bute	0.99	0.72-1.47	1.35	1.09-2.16	36
Clackmannanshire	1.36	0.97-2.15	1.05	0.88-1.53	-23
Dumfries & Galloway	1.60	1.41-1.86	2.43	2.15-2.94	52
Dundee City	3.53	2.96-4.65	2.80	2.51-3.22	-21
East Ayrshire	1.80	1.43-2.35	1.92	1.73-2.22	7
East Dunbartonshire	0.97	0.68-1.53	0.69	0.51-1.50	-29
East Lothian	1.58	1.12-2.40	1.74	1.40-2.86	10
East Renfrewshire	1.29	1.09-1.66	1.40	1.09-3.67	9
Edinburgh, City of	2.17	1.97-2.47	2.10	1.92-2.37	-3
Falkirk	1.45	1.09-2.28	1.08	0.94-1.34	-26
Fife	1.49	1.34-1.73	1.60	1.43-1.97	7
Glasgow City	3.88	3.69-4.13	3.31	3.16-3.49	-15
Highland	0.93	0.69-1.49	0.81	0.63-1.46	-13
Inverclyde	2.78	2.52-3.26	2.57	2.35-2.91	-8
Midlothian	1.56	1.05-2.86	1.46	1.25-2.22	-6
Moray	0.87	0.54-1.58	0.66	0.39-3.48	-24
North Ayrshire	1.83	1.47-2.36	1.85	1.69-2.11	1
North Lanarkshire	1.56	1.30-1.78	1.06	0.96-1.22	-32
Perth & Kinross	1.29	1.03-1.86	1.76	1.44-2.44	36
Renfrewshire	2.50	2.12-3.12	2.41	2.05-3.01	-4
Scottish Borders	1.07	0.52-2.52	1.25	0.95-2.38	17
South Ayrshire	0.84	0.70-1.06	1.88	1.55-2.61	124
South Lanarkshire	1.86	1.43-1.99	1.72	1.40-2.77	-8
Stirling	1.43	0.96-2.79	1.49	1.05-3.62	4
West Dunbartonshire	2.14	1.86-2.54	2.22	1.81-2.46	4
West Lothian	1.21	0.90-1.70	1.11	1.00-1.34	-8
SCOTLAND¹	1.96	1.92-2.09	1.84	1.84-2.01	-6

1 The Scotland rate includes the Island Council areas.

From Table 15 the national prevalence has decreased from 1.96% in 2000 to 1.84% in 2003. In terms of the estimated number of problem drug users the decrease was from 55,800 in 2000 to 51,582 in 2003, a difference of 4,218. The 95% confidence interval for this difference is from -6,740 to 300. As this range includes zero, it cannot be stated that the decrease was statistically significant at the 95% level. However, it was possible to ascertain at what level the decrease would be significant at, such as the 90% level (corresponding to the situation where the 90% confidence interval for the difference does not include

zero). That analysis demonstrates that the difference would be significant at the 93% level. The 93% confidence interval for the difference between 2000 and 2003 was -6,471 to -9 which does not include zero. Furthermore the 90% confidence interval for the difference is from -6,158 to -355. It can therefore be stated the prevalence of problem drug use in Scotland has shown a statistically significant decrease from 2000 to 2003, using the 90% level of significance.

At the 95% confidence levels, statistically significant decreases were found in Aberdeen City, Glasgow City and North Lanarkshire. It would, however, be wrong to conclude that decreases in the drug misuse prevalence rates occurred only in those three areas. Rather it has been possible to demonstrate significant decreases due to the large numbers of drug users for which we had information in those areas. Thus there was increased statistical power in those areas that was not present in smaller areas that also showed a decrease, such as South Lanarkshire or Inverclyde.

In terms of increases, there has clearly been a large increase in the Dumfries and Galloway area, something that has also been borne out in the drug injecting estimates. This increase is statistically significant, as is the one in South Ayrshire where the prevalence of problem drug use has more than doubled. The comparatively large increase in Angus was, however, not statistically significant.

In summary, it appears that the overall level of problem drug use has decreased; however in some areas there have been increases. It also appears from Table 15 that problem drug use is significantly increasing in southwest Scotland, in particular South Ayrshire and Dumfries and Galloway.

Notwithstanding the caveats attached to any comparisons between injecting estimates between 2000 and 2003 there appears to have been a decrease in injecting prevalence nationally, with the prevalence decreasing from 22,805 for mainland Scotland in 2000 to 17,022 in 2003 (excluding Ayrshire & Arran estimates for comparative purposes), although such a decrease is not statistically significant due to the large confidence intervals. There was a statistically significant decrease in the Greater Glasgow NHS Board area, decreasing from 1.4% (95% CI 1.0 – 2.6) in 2000 to 0.98% (95% CI 0.89-1.09) in 2003. A similar, but not significant decrease was seen in the Grampian NHS Board area where the prevalence also dropped from approximate 1.4% to approximately 1.0%. However there has been increases (though not statistically significant) in some other areas, particularly Dumfries & Galloway.

7 Discussion and Conclusions

This study has obtained comparable and consistent estimates of the prevalence of problem drug use (opiate and/or benzodiazepine) for every Council, DAAT, NHS Board and Police Force area in Scotland and estimates of the prevalence of drug injecting at the NHS Board and Council area levels. These local estimates have been summed to provide a national prevalence estimate that can be directly compared with the prevalence of problem drug use in Scotland in 2000. The main results of the study are:

- there are an estimated 51,582 problem drug users in Scotland in 2003 (95% CI 51,456-56,379),
- it is therefore estimated that 1.84% of the population aged 15 to 54 (95% CI 1.84-2.01%) are problem drug users,
- the prevalence of problem drug use in Scotland has decreased from 55,800 (1.96%) in 2000,
- there are an estimated 18,737 drug injectors in Scotland in 2003 (95% CI 17,731-20,289),
- the prevalence of drug injecting has also decreased since 2000, dropping from 0.87% to 0.67%,
- across the 22 DAAT areas of Scotland, the highest prevalence of problem drug use was found in Dundee where the prevalence was estimated to be 2.80% (95% CI 2.51-3.22),
- the Council area with the highest prevalence of problem drug use was Glasgow City where the prevalence was estimated to be 3.31% (95% CI 3.16-3.49).

One aim of the study was to provide information on the extent of psychostimulant use and an estimate of the prevalence of crack cocaine use has been obtained in one Council area. However estimates could not be obtained for the remaining Council areas due to the scarcity of data on crack cocaine use, particularly within the Social Enquiry and Police data sources. In terms of the more widely defined psychostimulant use, the main finding that can be drawn from our various analyses is that further development work is needed to ensure that similar cohorts of psychostimulant users, in terms of the severity of their drug use, can be identified from all contributing data sources within a capture-recapture analysis. Within this study it was not possible to refine the Police data in such a manner, or to a lesser extent the Social Enquiry Report data.

In producing the prevalence estimates, this study has had to balance two issues that may at first all seem related but in fact can compete against each other. First and foremost, the prevalence estimates have to be unbiased and accurate. They have to truly represent the prevalence of problem drug use, defined in this case as the use of opiates or benzodiazepines, in each area. The analyses therefore

should make the maximum use of the available data, for example by using the hospital admissions data even when that source was not used in the previous study. Secondly the prevalence estimates must be consistent and comparable, not just across the different geographical areas but also between 2000 and 2003. The consistency across geographical areas comes from applying a systematic approach to stratification and model selection across each local area. In the 29 mainland Council areas we stratified the available data into four groups – females, males aged 15 to 24, males aged 25 to 34 and males aged between 35 and 54. This approach enabled the production of prevalence estimates by gender and by age group. However taking that systematic approach within the 2003 study slightly lessens the comparability with the 2000 study. One drawback of this approach was however that the confidence intervals attached to some of the estimates were wider than would have been desired and this also affected the size of the confidence interval for the national estimate. Therefore there was a trade-off between being able to show a statistically significant change in prevalence at the national level and maximising the information by gender and age group at the local level.

Notwithstanding those issues, this study has provided comparable estimates of the prevalence of problem drug use across Scotland and has shown how the size of Scotland's drug problem has changed between 2000 and 2003. Nationally, there was a small but statistically significant decrease in the prevalence of problem drug between 2000 and 2003.

The most striking change has been in Dumfries and Galloway, where the prevalence of problem drug use has jumped from 1.60% (95% CI 1.41 – 1.86%) in 2000 to 2.43% (95% CI 2.15 – 2.94%) in 2003 making this predominantly rural Council area the fourth highest in Scotland in terms of problem drug use prevalence. A similar increase in the prevalence of drug injecting has also been found for this area. Moreover there appears to be worrying increases in the neighbouring Ayrshire Council areas, particularly South Ayrshire and East Ayrshire. Indeed, if the main theme developing out of the 2000 study was the spread of increased levels of problem drug use west from Glasgow to Inverclyde, Renfrewshire and West Dunbartonshire (and to a lesser extent North Ayrshire) then the main theme from this latest study is that higher levels of prevalence are now encompassing almost all of southwest Scotland.

The prevalence of drug injecting in Scotland has also decreased between 2000 and 2003 although direct comparisons between the 2000 estimate and the 2003 estimate are harder to draw partly due to the possible impact of including a hospital admissions source instead of a separate GP source in the 2003 study, but also due to lack of a prevalence estimate for the Ayrshire & Arran NHS Board area in 2000. Comparing the summed total for the 11 NHS Board areas where estimates are available for both years, the number of drug injectors has

decreased from 22,805 to 17,022. This decrease is not a statistically significant decrease due to the large confidence intervals attached to both estimates.

The other main finding from this study is the worrying level of crack cocaine use found in Aberdeen City where we have estimated that there were 1,070 crack cocaine users in 2003 (95% CI 736 – 1,672). The available data for Aberdeen City suggests that there are very few individuals identified as only using crack cocaine and not other drugs such as heroin therefore it can be suggested that over a third of the city's opiate and/or benzodiazepine users also are using crack cocaine.

Although data on crack cocaine use were not analysed in the 2000 study, it does appear from the available data that in a relatively short period of time crack cocaine has been completely integrated into what was a predominantly opiate / benzodiazepine using or injecting culture. What is perhaps surprising is that aside from Aberdeen, the available data on crack cocaine use across Scotland is comparatively sparse. This suggests that the nature of problem drug use in the northeast of Scotland is different to the rest of the country, something that was also found in the previous study in terms of the estimated proportion of drug users thought to be injecting. Examining the reasons why the northeast has a different drug problem than the rest of Scotland was, however, beyond the scope of this present study.

The recording of information on cocaine and particularly crack cocaine use should be improved, particularly as the current approach to collecting information on those in contact with treatment services in Scotland focuses on new contacts to drug services and therefore could miss any changes in the proportion of existing opiate users also using crack cocaine. Thus any information on local increases in the prevalence of crack cocaine use may not be picked up on through routinely collected treatment data and therefore specific prevalence studies could be required to identify changes. Further systematic collection and analysis of Social Enquiry Report or arrest referral type data may, however, be a better tool for identifying any changes in the extent of psychostimulant use, particularly in relation to the perceived links between crack cocaine and criminal behaviour.

This study has demonstrated that it is possible to systematically estimate the prevalence of problem drug use and drug injecting at a range of different geographical levels and provide comparisons between 2000 and 2003. That process is not just a statistical exercise, indeed a large part of the study was taken up with negotiating access to a range of data sources and addressing the very real issues of client confidentiality and data protection. In a way the study was hampered by the fact that it had been three years since the preceding study in that it was starting completely from scratch in relation to the data collection, such as establishing the best person to act as a contact within each Police Force or Social Work department or allaying any

fears of treatment agencies that collating the required data was an overly onerous task. The study did, however, find that a much larger proportion of the data were already computerised therefore the actual time and effort spent collecting data, particularly data from treatment services, was reduced. While it would be impractical to assume that this type of study could be carried out without some primary data collection, in particular the systematic screening of Social Enquiry Reports by trained data collectors, it should be possible to be more efficient in the use of drug treatment data by targeting data collection towards specific large drug treatment services. Moreover, a move to a re-reporting approach to the Scottish Drug Misuse Database would further minimise the costs of a further prevalence estimation exercise and the associated impact on contributing treatment services, however the potential benefits of re-reporting should be balanced against the possible adverse impact on the breadth of coverage if services perceived it as onerous.

In general the approach employed within the study worked well in that virtually every agency who were approached to provide data could do so while protecting client confidentiality and privacy. The study did, however, rely more heavily on the Scottish Drug Misuse Database in that the centrally held data provided much of the information on the drugs used and injecting status whereas the data collated directly from treatment agencies was more useful in establishing their current client base. This reduced the amount of information requested from some treatment services while maximising the usefulness of the Scottish Drug Misuse database.

We recommend a follow-up national prevalence study in 2004 or 2005 on a scaled-down level, further maximising the use of the Scottish Drug Misuse Database and other readily available computerised data. Such a study would build upon the wealth of data collated in the course of this study and could further chart changes in drug misuse prevalence at the national and local level across Scotland.

References

Bird, S., Hutchinson, S. and Goldberg, D. (2003), Drug-related deaths by region, sex and age group per 100 injecting drug users in Scotland, 2000-01. *Lancet* 362 (9388), 941-944.

Cormack, R. (1992), Interval estimates for mark-recapture studies of closed populations. *Biometrics* 48, 567-576.

Gemmell, I., Millar, T. and Hay, G. (2004), Capture-recapture estimates of problem drug use and the use of simulation based confidence intervals in a stratified analysis. *Journal of Epidemiology and Community Health*, 58, 758-765.

General Register Office for Scotland (2004), *Drug related deaths in Scotland in 2003*. Edinburgh, GROS.

Hay, G. and Gannon, M. (forthcoming), Capture-recapture estimates of the local and national prevalence of problem drug use in Scotland. *International Journal of Drug Policy*.

Hay, G., McKeganey, N and Hutchinson, S. (2001), *Estimating the National and Local Prevalence of Problem Drug use in Scotland*. Edinburgh, ISD Scotland.

<http://www.drugmisuse.isdscotland.org/publications/abstracts/prevalence.htm>

Hickman, M., Higgins, V., Hope, V., Bellis, M., Tilling, K., Walker, A. and Henry, J. (2004), Injecting drug use in Brighton, Liverpool, and London: best estimates of prevalence and coverage of public health indicators. *Journal of Epidemiology and Community Health*, 58, 766-771.

Scottish Executive (2000), *Rural Scotland: A New Approach*. Edinburgh, The Scottish Executive.

Acknowledgements

This research was funded by the Substance Misuse Division of the Scottish Executive and commissioned by the Information and Statistics Division of the National Health Service in Scotland. The views contained within this report are those of the authors and should not be attributed to the funding or commissioning agency.

The authors would like to thank all of the organisations that contributed data to the study and the Association of Chief Police Officers in Scotland and the Association of Directors of Social Work for supporting the study. We thank the project advisory group and Lesley Graham, Stephen Pavis and Caroline Round from the Drug Misuse Strategy Team at ISD; Rod Muir and Patricia Ruddy from ISD; Islay Gemmell and Tim Millar from the University of Manchester and the participants at the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) workshop on prevalence estimation in Ljubljana, Slovenia in July 2004.