UNIVERSITY of GLASGOW

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

Executive Report

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Summary

In this report we outline the results of a study funded by the Scottish Government and the University of Glasgow to provide estimates of the prevalence of problem drug misuse in Scotland. The estimates refer to the calendar year 2006. The study used the capture-recapture method and focussed on those aged 15-64 years old. Estimates of the prevalence of opiate and / or benzodiazepine misuse have been provided for every Council area, Drug and Alcohol Action Team (ADAT) area, NHS Board area, Community Justice Authority 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 2003.

In addition, this study has also provided estimates of the prevalence of opiate and / or benzodiazepine misuse at the Community Health Partnership (CHP) level within Fife and Glasgow. There were too few data to provide estimates for crack cocaine use. Moreover, there was difficulty obtaining estimates of psychostimulant use more generally.

In terms of the national prevalence of problem drug misuse we estimate that there were 55,328 individuals misusing opiates and / or benzodiazepines in the year 2006. This corresponds to 1.62% of the population aged between 15 and 64. The 95% confidence interval (CI) attached to the national estimate ranges from 54,451 to 57,234 (1.59-1.67%). The proportion estimated to be female is 30% and male 70%. The age breakdown among males was 24% aged between 15 and 24, 48% between 25 and 34 and 28% aged between 35-64.

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 0.53% (95% CI 0.44-0.64%) in Moray and 0.66% (95% CI 0.53-0.85%) in the Scottish Borders through to 3.27% (95% CI 3.15-3.44%) in Glasgow City. The highest prevalence of problem drug misuse within a ADAT area is to be found in the Dundee City ADAT area, with a prevalence rate of 2.60% of those aged 15 to 64 (95% CI 2.33-3.11%), followed by Greater Glasgow with a prevalence of 2.53% of the 15 to 64 age range (95% CI 2.46-2.66%). 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 the Strathclyde Police Force area. This is not entirely unexpected as over half of the known problem drug users in Scotland reside in that area.

In terms of drug injecting we estimate that 23,933 people were injecting opiates and/or benzodiazepines in 2006 (95% CI 21,655-27,143). The

highest drug injecting prevalence rates were identified in the Greater Glasgow and Clyde NHS Board areas; in that area it is estimated that just over 1% of the population inject drugs.

Overall the prevalence of problem drug use increased in Scotland from 51,582 (95% CI 1.84%-2.01%) to 55,328 in 2006. When comparing like for like prevalence for the 15 to 54 age group, the confidence interval for the 2003 estimate was (95% CI 1.84%-2.01%). The approximate adjusted confidence interval for the 2006 estimate is (95% CI 1.95%-2.05%). The confidence intervals have quite a large degree of overlap but changes in methodology between 2003 and 2006 preclude a formal test of significance.

There was however an increase in injecting prevalence nationally. For mainland Scotland, the prevalence increased from 18,737 in 2003 to 23,933 in 2006. The increase in like for like rates (age 15 to 54) is from 0.67% (95% CI 0.63-0.72%) to 0.86% (95% CI 0.77-0.97%). There have, however, been some methodological changes and issues with the data quality that would suggest it may not be appropriate to regard this as true increase in the prevalence of drug injecting in Scotland between 2003 and 2006.

There have been some data quality issues that have caused methodological problems for the study, however this study demonstrates that it is possible to undertake a repeated comparable analysis to provide successive prevalence estimates over time.

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1 Introduction

In this report we outline the results of research funded by the Scottish Government and the University of Glasgow, commissioned by the Information and Statistics Division of the NHS in Scotland. The research was carried out jointly by the Centre for Drug Misuse Research at the University of Glasgow and Health Protection Scotland to provide national and local estimates of the prevalence of problem drug misuse within Scotland for the year 2006. Previously estimates of the prevalence of problem drug use and drug injecting were obtained for 2000 and 2003 (Hay et al, 2005). This study sought to replicate those analyses to provide comparable estimates. 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 2006 with the prevalence estimates from 2003.

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 one of the few 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, ADAT, NHS Board, Community Justice Authority area and Police Force area levels for both problem drug misuse and drug injecting. The Community Health Partnership (CHP) area results have also been derived and can be made available.

2 Aims and Objectives

The aims of the study were to:

- Estimate the national prevalence of problem drug use in 2006
- Estimate the prevalence of problem drug use at the CHP area level in 2006
- Estimate the prevalence of problem drug use at the Council area level in 2006
- Estimate the prevalence of problem drug use at the ADAT area level in 2006
- Estimate the prevalence of problem drug use at the NHS Board area level in 2006
- Estimate the prevalence of problem drug use at the Police Force area level in 2006
- Estimate the prevalence of problem drug use at the Community Justice area level in 2006
- Estimate the prevalence of drug injecting at the Council area level in 2006
- Estimate the prevalence of drug injecting at the NHS Board area level in 2006
- Provide information on the extent of psychostimulant use
- Compare the prevalence estimates with the results of the 2000 and 2003 studies.

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 CHP, Council, ADAT, NHS Board, Community Justice area 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 and 2003 studies
- Adapt the capture-recapture method to provide problem drug use prevalence estimates at the CHP level that are consistent with Council area estimates
- Use 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.

Due to lack of data on crack cocaine use, and uncertainty surrounding the applicability of using capture-recapture methods to estimate the prevalence of other forms of psychostimulant use, the last objective has not been successfully met.

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; 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. It was also necessary to analyse the overlaps between these data sources in order 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, ADAT areas and Police Force areas in Scotland. In addition, a separate analysis was undertaken for the South Lanarkshire Council area as it straddles the Greater Glasgow and Clyde NHS Board boundary.

CHP, 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 64, may differ from the actual Council or NHS Board areas. We can take the AB23 postcode district, which straddles Aberdeen City and Aberdeenshire, as an example. Information from the Postal Address File suggests that 60% of addresses in AB23 postcode district are in the City of Aberdeen therefore 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.

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. It was not possible to differentiate between the small parts of North Lanarkshire Council covered by Greater Glasgow, as that area is comprised of postcode districts that are mainly in Glasgow City.

For most of the Council areas, the estimates were derived using four separate sources of data (treatment, hospital discharges, police and social work). 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 64. The previous Scottish studies employed the age range 15 to 54, however this study altered the range to make it consistent with other UK studies and to meet European Monitoring Centre for Drugs and Drug Addiction reporting standards. It is extremely unlikely that the increase in age range has had significant impact on the estimated number of opiate and / or benzodiazepines users. The prevalence estimates contained in this report relate to the calendar year 2006.

The population figures used in the report are the 2006 mid-year estimates (© Crown copyright, data supplied by General Register Office for Scotland). Population figures for age group / gender strata have also been obtained from the published mid year estimates.

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 Orkney Isles Council area. This has a minimal impact on the Northern Constabulary estimate due to the relatively small number of drug users found in this area.

Drug Injecting

Four data sources were used in the capture-recapture analyses to estimate the prevalence of drug injecting at NHS Board area level. Those sources were treatment data collated from ISD, Social Enquiry Reports, drug-related acute hospital discharges and hepatitis C virus tests. Further details on the definitions used for identifying injecting drug users are provided in Chapter 4. Although data on injecting were collected from a number of treatment services across Scotland, it was not possible to use such data in a beneficial manner in the analyses.

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 discharges source to include non-injectors. In the case of the hepatitis C virus data, the tests carried out in 2006 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 discharges 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 (see section 4.2 for full list of conditions). It is however possible that this data source could include opiate users who have those conditions but do not inject.

For the Council area injecting estimates we constructed four samples: the ISD treatment data for 2006/07, Social Enquiry Reports, hospital discharges and ISD treatment data for 2005/06. Despite using two separate years of ISD treatment data, we still contend that the estimates will refer to the calendar year 2006 as it is likely that the vast majority of those identified as drug injectors in the period 1st April 2005 to 31st December 2005 or the period 1st January 2007 to 31st March 2007 would have been injecting drugs at some point in the calendar year 2006 As with previous studies, these Council area estimates were adjusted 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 were very few hospital discharges data and only three individuals identified through the Social Enquiry Report source. The previous study in 2003 had used a mortality multiplier method to estimate the prevalence of injecting in that NHS Board area. The mortality rate in that analysis was derived from a study carried out in 2001. It was not thought to be appropriate to use such an out of date mortality rate to obtain the 2006 estimate. To derive an estimate for the Borders we simply applied the proportion of problem drug users estimated to be injectors in the rest of mainland Scotland to derive an approximate injecting estimate for the Borders.

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. Thus again there were insufficient data to obtain an injecting prevalence estimate using the capture-recapture method.

CHP Estimates

Only 3 Council areas have CHP areas within them. These are Fife, Glasgow City and Highland. All other CHP areas are coterminous with Council area. Each CHP area in Fife, Glasgow or Highland was constructed as one or more postcode districts and each postcode district in Scotland was assigned to a CHP area on the basis of where most of the residents live. CHP area estimates were obtained for Glasgow and Fife, but due to there being extremely small numbers of people identified as resident in the North Highland CHP it was not possible to provide CHP level estimates for that Council area. The CHP estimates within the Glasgow Council 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 Glasgow area total estimate. There did appear to be a specific problem with the Glasgow data as many individuals appeared to be turning up in more than one CHP area. That caused issues with deriving CHP level estimates for Glasgow as the CHP estimates appear very large compared to the total estimate for Glasgow, even though they look acceptable from a statistical point of view. This problem was not present in the Fife data where the summed CHP estimates appeared to be similar to the estimates derived for Fife as a whole. We therefore took the best estimate for the Fife NHS Board / Fife Council area to be the sum of the three CHP area estimates within Fife as, although other estimates at the NHS Board level were similar, in the CHP level analyses the models provided a better fit to the data.

Comparisons between 2003 and 2006

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 and in the reports from previous studies, such as the use of postcode district data instead of postcode sector data and the use of hospital admissions data in 2003 and 2006. In general the quality of the data collated in 2006 was not as good as that available in 2000 or 2003. This did cause problems in fitting models to the available data in some areas and steps were taken (described below) to remedy this.

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 2006. 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**. Where a data source notes that an individual has injected any illicit drug at any point within 2006 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. The data on drug users held on the Scottish Drug Misuse Database was augmented by data held by specialist agencies on the total numbers in treatment. Although this was not always of assistance when deriving estimates as including data collected directly from some treatment agencies affected the statistical analyses and the resultant estimates, to the extent that the quality of the data could be questionable.

The data from all treatment agencies that contributed to the study were combined with the agency returns to the Scottish Drug Misuse Database to obtain a single data source at the Council area level. This dataset 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 injecting status.

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 that contribute to the Scottish Drug Misuse Database have not been included in the Scottish Drug Misuse Database source.

It was not possible to augment the ISD treatment data with locally collected data in Aberdeen City, Highland or Stirling. When this was attempted, it was not possible to fit appropriate models to the overlap pattern. This could be indicative of data quality issues, however it was not possible within the scope of this study to examine that issue in great detail. However, when comparing estimates for the rest of Scotland, sensitivity analyses suggest that restricting the treatment data to those collected directly from ISD does not unduly impact on the prevalence estimates.

4.2 Hospital Discharges

The Information Services Division (ISD) of National Services Scotland collates information on all hospital discharges 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 data did not distinguish whether the individual died in hospital or not, however people who did die in hospital in the relevant time period were still classed as drug injectors. 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. This is the same approach to constructing an injecting data source from hospital data as taken in the 2003 study.

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 available reports pertaining to 2005/06 and 2006/07 were screened by trained data collectors. Those reports relevant to calendar year 2006 were used in the analyses. It is not possible to summarise the actual numbers of reports screened, however in 2005/06 there were 42,023 reports submitted to Scottish Courts, pertaining to 27,466 individuals. The figures for 2006/07 were 41,359 reports on 28,349 individuals (Scottish Government, 2008). 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 cocaine 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 cocaine use were also requested, however for most 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 Health Protection Scotland (Hepatitis C Virus)

Health Protection Scotland collates information on those receiving a test 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 CHP 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 'hard matching' approach was taken, where two (or more) records were classed as a match if the forename initial, surname initial, gender and date of birth were the same (as opposed to the 'soft matching' that would allow different forename initials). It should be noted that the previous 2003 study used soft matching. The decision to change to hard matching was based on work completed during a Home Office funded study in England, where soft matching and hard matching were compared. The sensitivity analyses that examined this issue were not published,

however it was shown, using data from England, that switching from soft matching to hard matching would probably increase the estimate. The Home Office Study did, however conclude that hard matching was more appropriate. A hard matching approach was therefore taken in this study. 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. The treatment data column also provides (in brackets) the total amount of the data obtained from ISD as an extract from the Scottish Drug Misuse Database. Table 2 presents data on drug injecting by NHS Board area, again excluding the three island NHS Board areas. The only treatment data used within the injecting analyses came directly from the Scottish Drug Misuse Database.

Table 1 Summary of data on known problem drug users by Council area (aged 15 to 64)

Council Area	Treatment (SDMD only)	Hospital Admissions	Social Enquiry Reports	Police	Total[1]
Aberdeen City	586 (362)	314	494	331	1,381
Aberdeenshire	650 (290)	73	72	154	778
Angus	318 (127)	17	129	46	430
Argyll & Bute	104 (81)	16	43	106	220
Clackmannanshire	118 (101)	16	76	36	206
Dumfries & Galloway	512 (250)	65	159	115	684
Dundee City	1,107 (510)	59	450	179	1,411
East Ayrshire	749 (368)	136	114	289	1,022
East Dunbartonshire	85 (64)	12	37	44	157
East Lothian	369 (232)	37	37	38	433
East Renfrewshire	65 (50)	23	43	96	196
Edinburgh, City of	2,343 (1,115)	330	372	362	2,868
Falkirk	329 (234)	35	141	86	480
Fife	1,365 (1,045)	216	437	187	1,776
Glasgow City	6,755 (1,476)	476	872	1,881	8,283
Highland	648 (260)	40	128	126	803
Inverclyde	296 (291)	56	137	247	589
Midlothian	382 (137)	40	54	39	433
Moray	122 (80)	19	40	47	178
North Ayrshire	800 (353)	163	98	330	1,086
North Lanarkshire	667 (238)	94	221	452	1,217
Perth & Kinross	298 (121)	53	122	78	443
Renfrewshire	428 (323)	96	225	402	934
Scottish Borders	182 (94)	22	57	22	235
South Ayrshire	417 (184)	86	105	171	604
South Lanarkshire	1,076 (332)	70	244	428	1,751
Stirling	262 (124)	31	108	75	402
West Dunbartonshire	562 (336)	33	132	255	804
West Lothian	569 (406)	62	149	59	677
MAINLAND SCOTLAND	**22,474 (9,584)**	**2,690**	**5,296**	**6,681**	**30,481**

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 64)

NHS Board Area	Treatment	Hospital Admissions	Social Enquiry Reports	Hepatitis C	Total[1]
Ayrshire & Arran	287	154	67	34	489
Borders	15	*	*	*	23
Dumfries & Galloway	133	28	34	44	209
Fife	492	59	107	24	609
Forth Valley	287	35	77	33	374
Grampian	431	166	69	105	713
Greater Glasgow and Clyde	638	329	245	383	1,498
Highland	119	*	*	24	168
Lanarkshire	200	41	58	33	314
Lothian	540	96	72	121	766
Tayside	335	34	142	*	470
MAINLAND SCOTLAND	**3,477**	**953**	**900**	**812**	**5,633**

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).

2 Data suppressed to prevent disclosure of small numbers.

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, ADAT, NHS Board, Community Justice Authority area 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 and associated 95% confidence intervals. We also derived estimates of the prevalence of opiate and / or benzodiazepine use at the CHP level, and these are available on request. We then provide estimates of the prevalence of drug injecting at the NHS Board and Council area levels. It was not possible to provide meaningful 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 2006, we have summed the local estimates for each of the 32 Council areas in Scotland. On this basis, we estimate that there are 55,328 individuals who are misusing opiates or benzodiazepines within Scotland. The 95% confidence interval attached to this estimate is 54,451 to 57,234. This corresponds to a prevalence rate of 1.62% of the Scottish population aged between 15 and 64 (95% CI 1.59-1.67%).

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 3.27% of the population aged 15 to 64 (95% CI 3.15-3.44%). The next highest is West Dunbartonshire at 2.61% (95% CI 2.33-2.96%). The third highest is Dundee City at 2.60% (95% CI 2.33-3.11%). 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

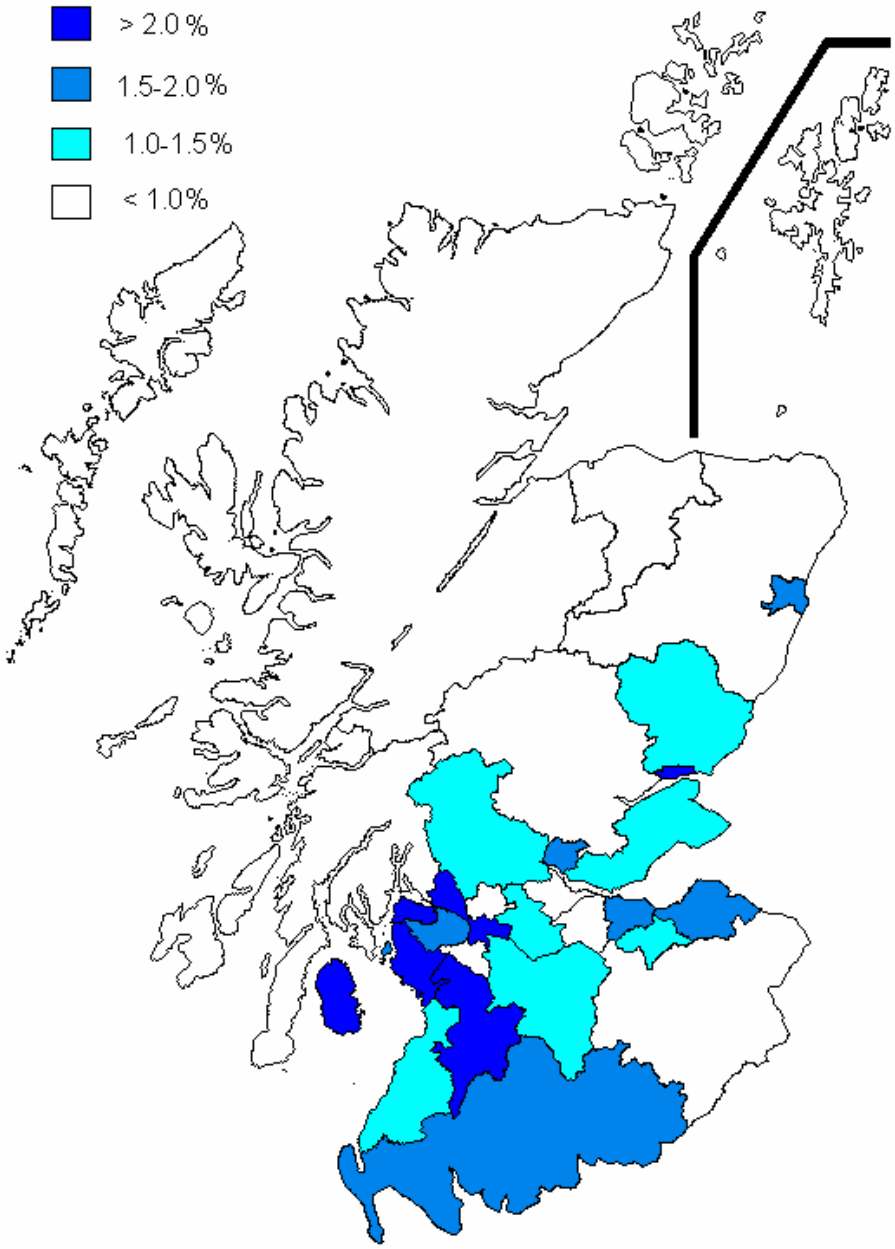
non-rural areas. Indeed, comparatively high levels of problem drug use are found in East Ayrshire.

Table 3 Estimates of the number of problem drug users by Council area (age 15 to 64)

Area	Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	2,597	2,339-2,896	1.80	1.62-2.01
Aberdeenshire	1,257	1,139-1,400	0.80	0.73-0.89
Angus	868	738-1,039	1.24	1.05-1.48
Argyll & Bute	548	424-738	0.94	0.72-1.26
Clackmannanshire	505	392-678	1.54	1.20-2.07
Dumfries & Galloway	1,452	1,225-1,760	1.55	1.31-1.88
Dundee City	2,454	2,204-2,935	2.60	2.33-3.11
East Ayrshire	1,834	1,680-2,034	2.32	2.13-2.58
East Dunbartonshire	457	330-673	0.67	0.48-0.98
East Lothian	895	738-1,116	1.51	1.25-1.89
East Renfrewshire	543	414-742	0.95	0.72-1.29
Edinburgh, City of	5,315	4,933-5,778	1.61	1.50-1.75
Eilean Siar[1]	63	30-204	0.38	0.18-1.21
Falkirk	888	782-1,019	0.89	0.78-1.02
Fife	3,015	2,817-3,271	1.27	1.18-1.37
Glasgow City	13,256	12,762-13,931	3.27	3.15-3.44
Highland	1,023	790-1,585	0.73	0.56-1.13
Inverclyde	1,385	1,171-1,718	2.57	2.18-3.19
Midlothian	648	574-744	1.24	1.10-1.43
Moray	299	251-365	0.53	0.44-0.64
North Ayrshire	1,808	1,656-2,033	2.04	1.87-2.30
North Lanarkshire	3,247	2,908-3,690	1.49	1.34-1.70
Orkney Isles[1]	19		0.15	
Perth & Kinross	873	737-1,099	0.97	0.82-1.22
Renfrewshire	2,083	1,858-2,355	1.84	1.64-2.08
Scottish Borders	466	376-600	0.66	0.53-0.85
Shetland Isles	81	77-97	0.56	0.53-0.67
South Ayrshire	1,055	948-1,184	1.47	1.32-1.65
South Lanarkshire	3,014	2,714-3,376	1.47	1.32-1.65
Stirling	756	602-970	1.30	1.04-1.67
West Dunbartonshire	1,601	1,428-1,813	2.61	2.33-2.96
West Lothian	1,023	933-1,132	0.91	0.83-1.00
SCOTLAND	**55,328**	**54,451-57,234**	**1.62**	**1.59-1.67**

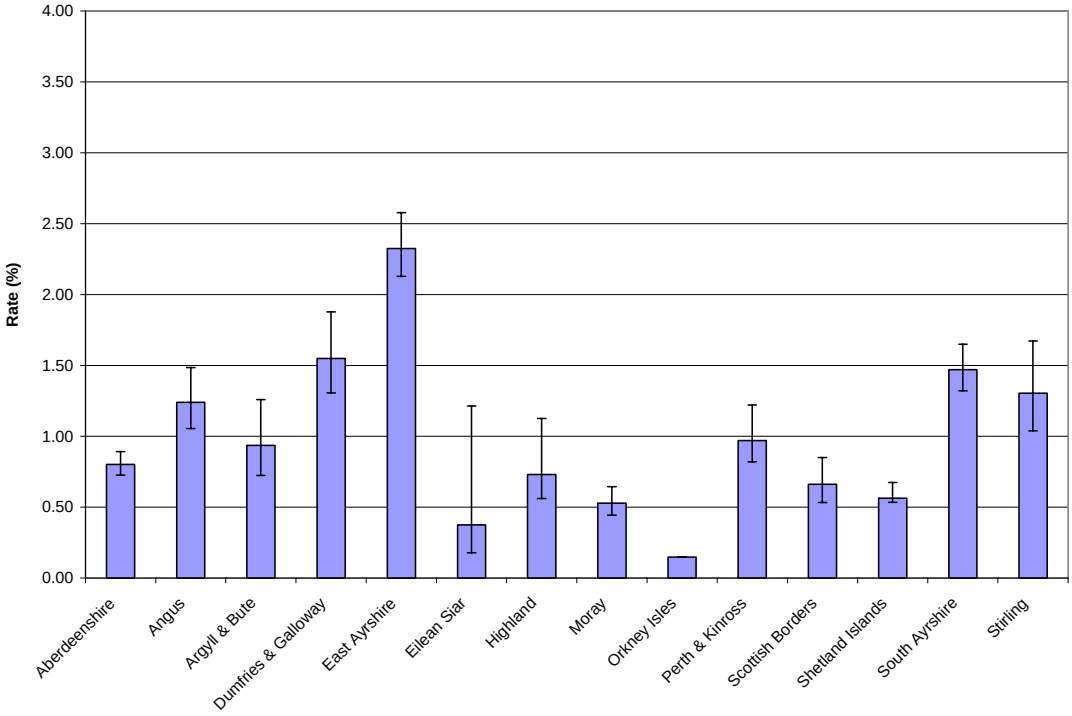
1 Estimates for the Orkney Isles Council areas produced using the multiplier method (see Chapter 3)

Figure 1 Estimated prevalence of problem drug use by Council area (age 15 to 64)



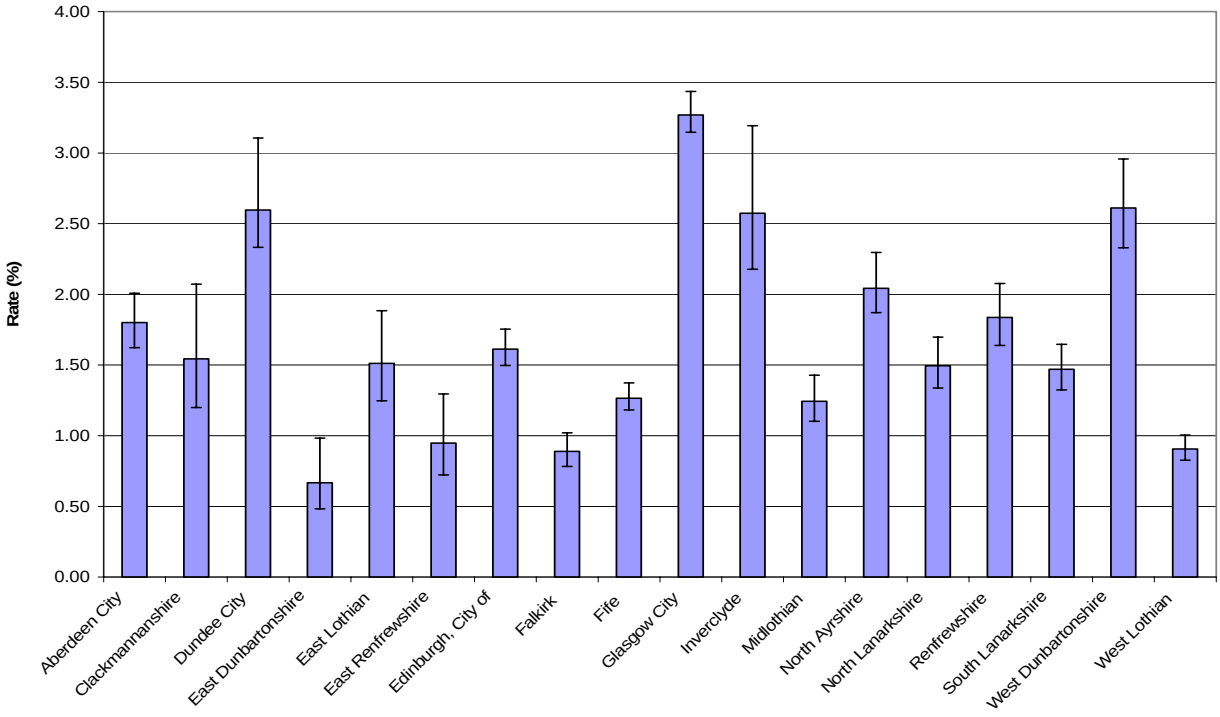
Note: Estimates for Orkney Isles Council area produced using the multiplier method (see Chapter 3)

Figure 2 Estimated prevalence of problem drug use by Council area (rural areas, age 15 to 64)



Note: Estimates for the Orkney Isles Council area produced using the multiplier method (see Chapter 3). This estimate does not have error bars attached to it, but is subject to error.

Figure 3 Estimated prevalence of problem drug use by Council area (non-rural areas, age 15 to 64)



5.1.3 ADAT Areas

ADATs 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 ADATs have divided in accordance with Council boundaries. In Figure 4 we present a graphical representation of drug misuse prevalence across the 22 ADATs. Figure 5 presents the prevalence estimates by ADAT area in the form of a bar chart whereas Table 4 summarises those data in a table.

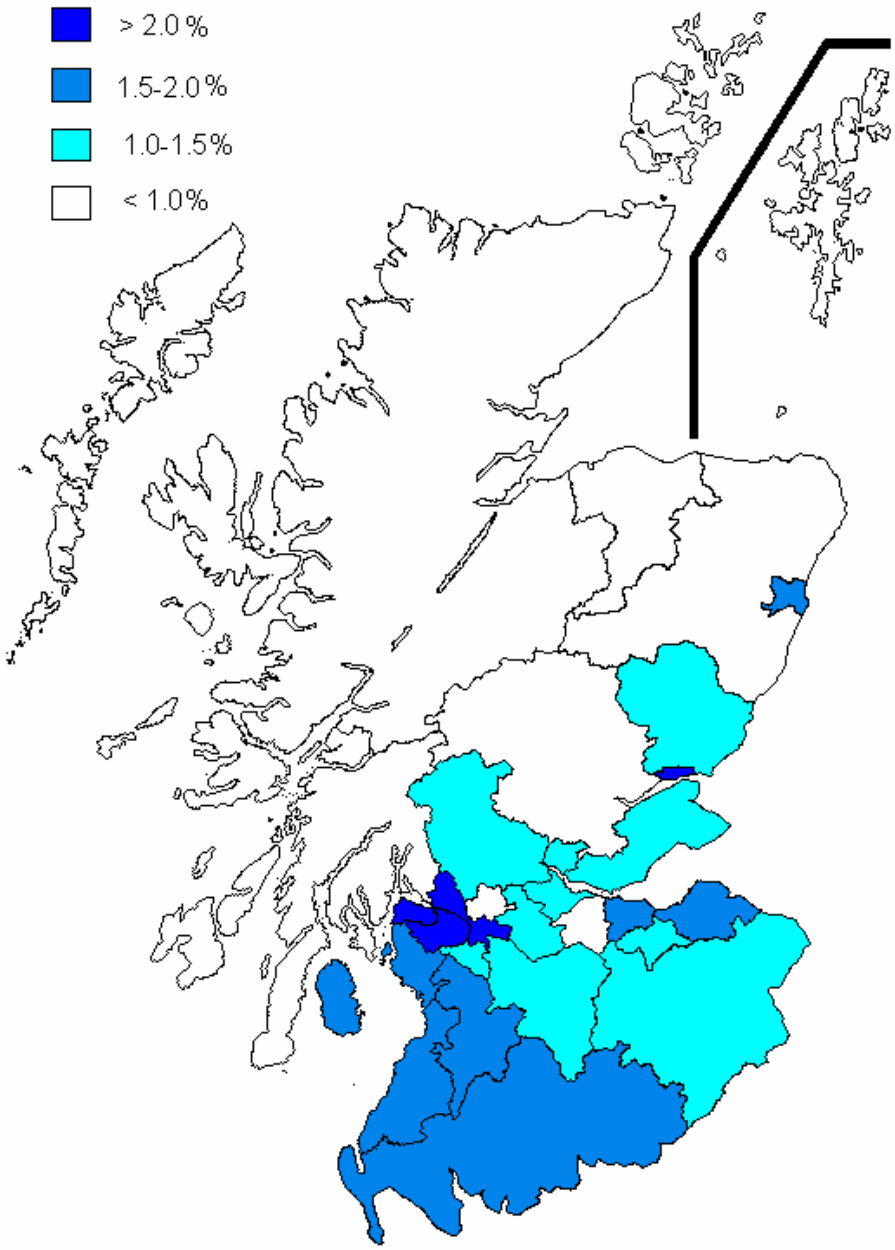
We see here that the Dundee City ADAT area has the highest prevalence rate at 2.60% (95% CI 2.33-3.11%), followed by the Greater Glasgow ADAT area at 2.53% (95% CI 2.46-2.66%). The Ayrshire & Arran ADAT area follows with a prevalence rate of 1.96% (95% CI 1.86-2.10%).

Table 4 Estimates of the number of problem drug users by ADAT area (age 15 to 64)

Area	Total Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	2,597	2,339-2,896	1.80	1.62-2.01
Aberdeenshire	1,257	1,139-1,400	0.80	0.73-0.89
Angus	868	738-1,039	1.24	1.05-1.48
Argyll & Bute	548	424-738	0.94	0.72-1.26
Ayrshire & Arran	4,697	4,454-5,029	1.96	1.86-2.10
Borders	466	376-600	0.66	0.53-0.85
Dumfries & Galloway	1,452	1,225-1,760	1.55	1.31-1.88
Dundee City	2,454	2,204-2,935	2.60	2.33-3.11
East Lothian	895	738-1,116	1.51	1.25-1.89
Edinburgh City	5,315	4,933-5,778	1.61	1.50-1.75
Fife	3,015	2,817-3,271	1.27	1.18-1.37
Forth Valley	2,149	1,930-2,468	1.13	1.01-1.29
Greater Glasgow & Clyde	20,502	19,881-21,487	2.53	2.46-2.66
Highland	1,023	790-1,585	0.73	0.56-1.13
Lanarkshire	5,084	4,543-5,725	1.36	1.22-1.53
Midlothian	648	574-744	1.24	1.10-1.43
Moray	299	251-365	0.53	0.44-0.64
Orkney Isles[1]	19		0.15	
Perth & Kinross	873	737-1,099	0.97	0.82-1.22
Shetland Isles	81	77-97	0.56	0.53-0.67
West Lothian	1,023	933-1,132	0.91	0.83-1.0
Western Isles	63	30-204	0.38	0.18-1.21
SCOTLAND	**55,328**	**54,451-57,234**	**1.62**	**1.59-1.67**

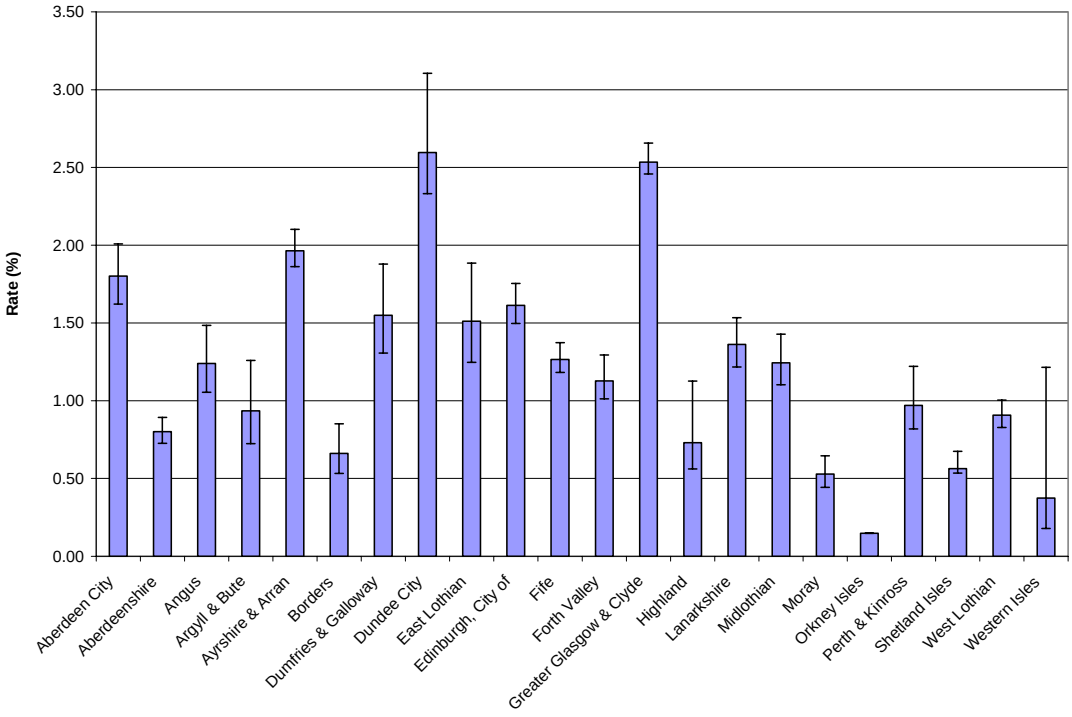
1 Estimates for the Orkney Isles ADAT area were produced using multiplier method (see Chapter 3).

Figure 4 Estimated prevalence of problem drug use by ADAT area (age 15 to 64)



Note: Estimate for the Orkney Isles and ADAT areas produce using multiplier method (see Chapter 3).

Figure 5 Estimated prevalence of problem drug use by ADAT area (age 15 to 64)



Note: Estimates for the Orkney Isles ADAT area produced using the multiplier method (see Chapter 3). This estimate does not have error bars attached to it, but is subject to error.

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 64, 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 & Clyde at 2.53% (95% CI 2.46-2.66%). The next highest is Ayrshire & Arran at 1.96% (95% CI 1.86-2.10%). The third highest is Tayside at 1.65% (95% CI 1.53-1.87%).

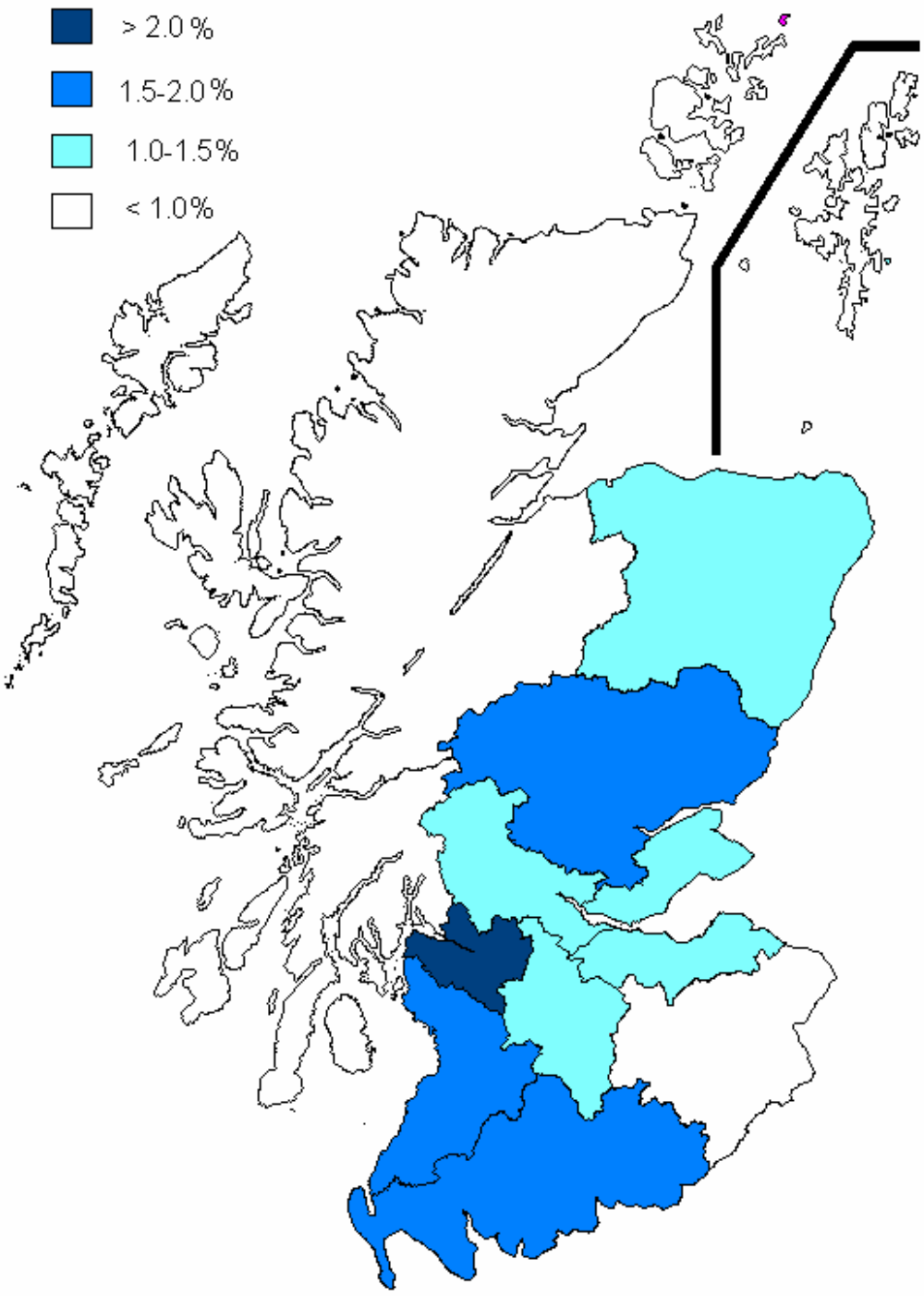
The NHS Board area with the highest number of problem drug users is Greater Glasgow, where the estimated total is 20,502 (95% confidence interval 19,881 to 21,487). The next highest area is Lothian, where the estimated total is 7,881, (95% confidence interval 7,468-8,434).

Table 5 Estimates of the number of problem drug users by NHS Board area (age 15 to 64)

Area	Total Estimate		Prevalence	
	N	95% CI	%	95% CI
Ayrshire & Arran	4,697	4,454-5,029	1.96	1.86-2.10
Borders	466	376-600	0.66	0.53-0.85
Dumfries & Galloway	1,452	1,225-1,760	1.55	1.31-1.88
Fife	3,015	2,817-3,271	1.27	1.18-1.37
Forth Valley	2,149	1,930-2,468	1.13	1.01-1.29
Grampian	4,153	3,867-4,498	1.16	1.08-1.26
Greater Glasgow & Clyde	20,502	19,881-21,487	2.53	2.46-2.66
Highland	1,571	1,300-2,166	0.79	0.65-1.09
Lanarkshire	5,084	4,543-5,725	1.36	1.22-1.53
Lothian	7,881	7,468-8,434	1.42	1.35-1.52
Orkney Isles[1]	19		0.15	
Shetland Isles	81	77-99	0.56	0.53-0.69
Tayside	4,195	3,885-4,747	1.65	1.53-1.87
Western Isles	63	31-230	0.38	0.18-1.37
SCOTLAND	**55,328**	**54,451-57,234**	**1.62**	**1.59-1.67**

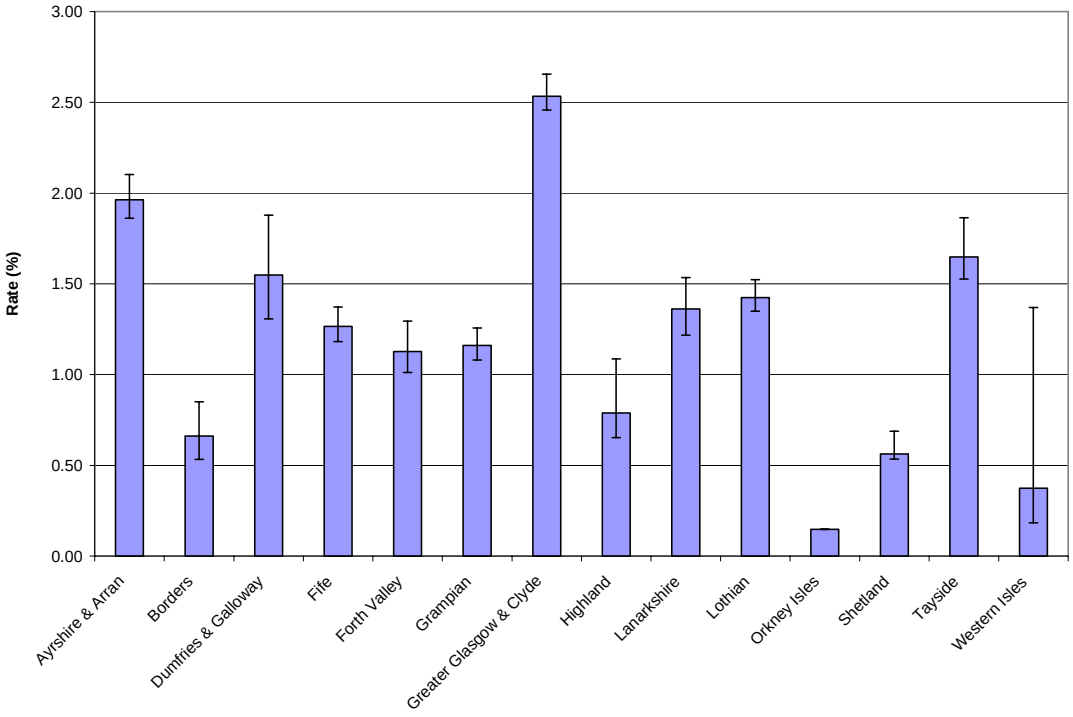
1 Estimates for Orkney Isles NHS Board areas were produced using multiplier method (see Chapter 3)

Figure 6 Estimated prevalence of problem drug use by NHS Board area (age 15 to 64)



Note: Estimates for Orkney 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 64)



Note: Estimates for Orkney Isles NHS Board areas produced using multiplier method (see Chapter 3). This estimate does not have error bars attached to it, but is subject to error.

5.1.5 Community Justice Authority Areas

The following set of estimates relate to the Community Justice Authority (CJA) areas established in April 2006. The results for each of the eight areas are summarised in Table 6 and illustrated in Figures 8 and 9.

The prevalence of problem drug use is highest in the Glasgow CJA area at 3.27% of the population aged 15-64 (95% CI 3.15–3.44%). The area with the second highest prevalence is the South West Scotland CJA with a prevalence rate of 1.85% (95% CI 1.75–1.98%) The area with the lowest prevalence is Northern with a rate of 0.98% (95% CI 0.92–1.11%).

Table 6 Estimates of the number of problem drug users by Community Justice Authority area (age 15 to 64)

Area	**Total Estimate**		**Prevalence**	
	N	95% CI	**%**	95% CI
Fife & Forth Valley	5,164	4,870-5,569	1.20	1.14-1.30
Glasgow	13,256	12,762-13,931	3.27	3.15-3.44
Lanarkshire	6,261	5,808-6,859	1.48	1.38-1.62
Lothian & Borders	8,347	7,930-8,921	1.34	1.27-1.43
North Strathclyde	6,617	6,214-7,217	1.60	1.51-1.75
Northern	5,339	4,964-6,039	0.98	0.92-1.11
South West Scotland	6,149	5,821-6,608	1.85	1.75-1.98
Tayside	4,195	3,885-4,747	1.65	1.53-1.87
SCOTLAND	**55,328**	**54,451-57,234**	**1.62**	**1.59-1.67**

Figure 8 Estimated prevalence of problem drug use by Community Justice Authority area (age 15 to 64)

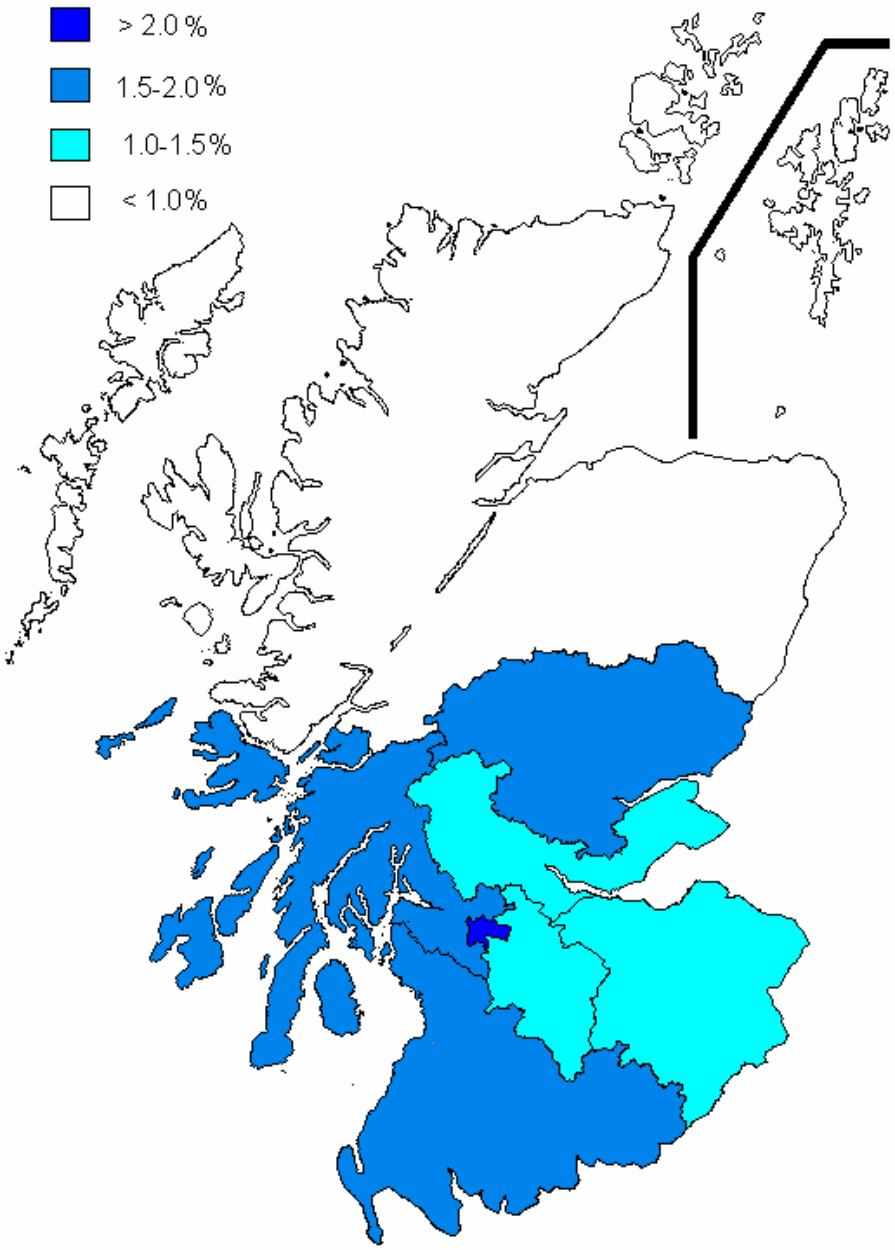
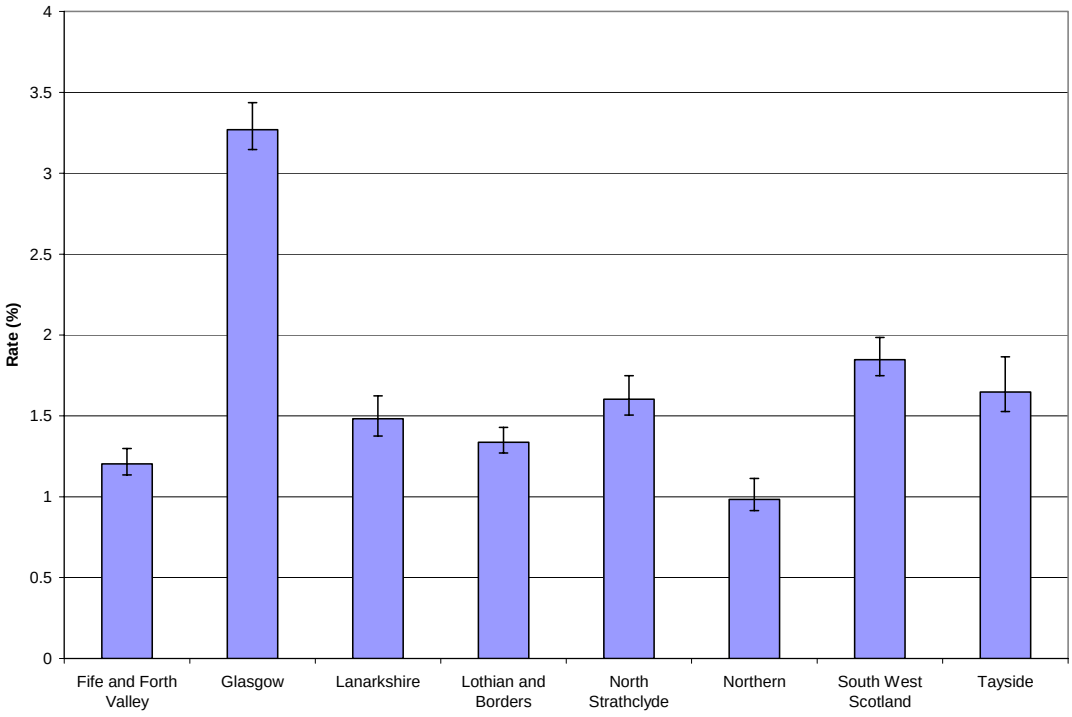


Figure 9 Estimated prevalence of problem drug use by Community Justice Authority area (age 15 to 64)



Note: Estimates for the Orkney Isles part of the Northern Community Justice Authority area are produced using multiplier method (see Chapter 3)

5.1.6 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.

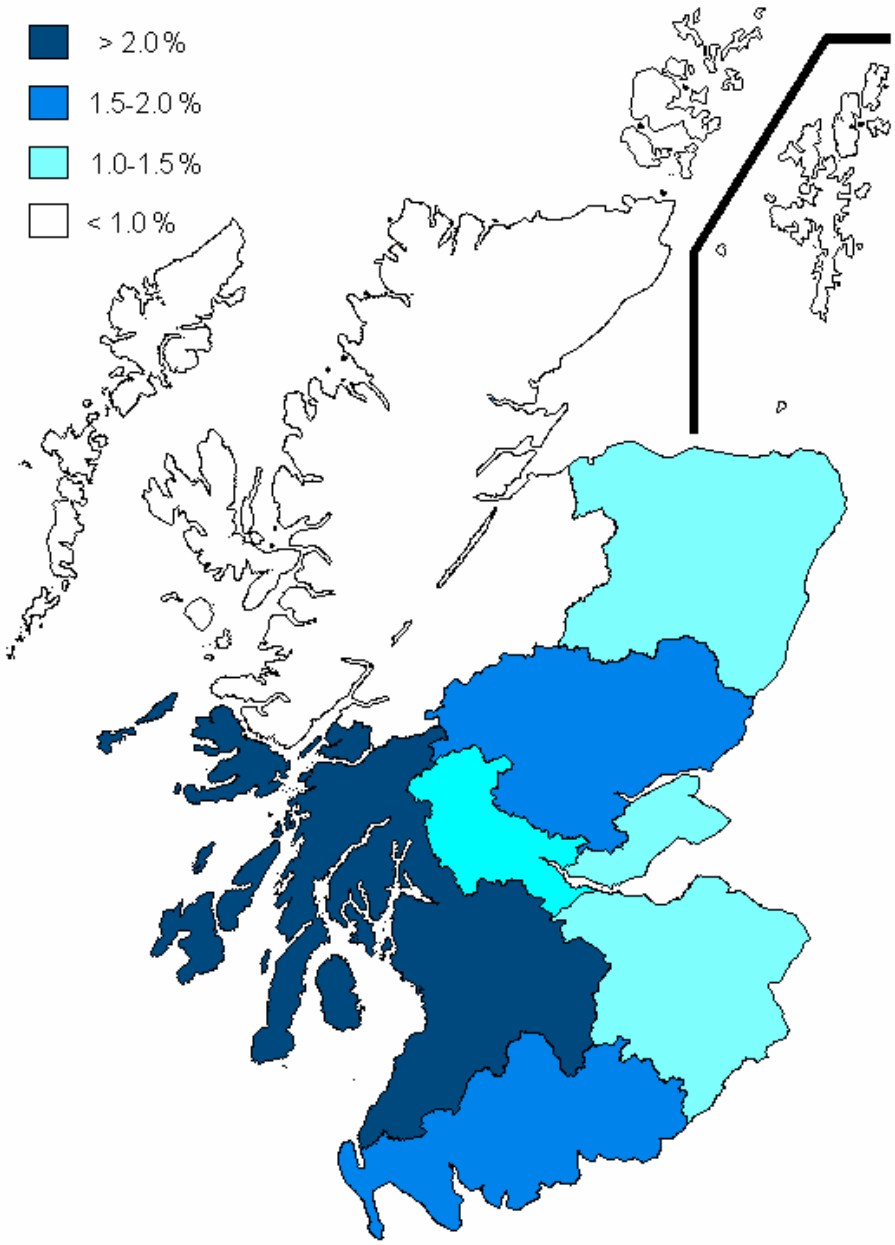
Whilst drug misuse is clearly occurring in all Force areas, the prevalence of drug misuse is highest in the Strathclyde area at 2.08% of the population within the 15 to 64 age range (95% CI 2.03-2.17%). The area with the second highest prevalence is Tayside at 1.65% (95% CI 1.53-1.87%). The area with the lowest prevalence is the Northern Constabulary area at 0.64% (95% CI 0.51-0.97%).

Table 7 Estimates of the number of problem drug users by Police Force area (age 15 to 64)

Area	**Total Estimate**		**Prevalence**	
	N	95% CI	**%**	95% CI
Central	2,149	1,930-2,468	1.13	1.01-1.29
Dumfries & Galloway	1,452	1,225-1,760	1.55	1.31-1.88
Fife	3,015	2,817-3,271	1.27	1.18-1.37
Grampian	4,153	3,867-4,498	1.16	1.08-1.26
Lothian & Borders	8,347	7,930-8,921	1.34	1.27-1.43
Northern[1]	1,186	948-1,784	0.64	0.51-0.97
Strathclyde	30,831	30,077-32,049	2.08	2.03-2.17
Tayside	4,195	3,885-4,747	1.65	1.53-1.87
SCOTLAND	**55,328**	**54,451-57,234**	**1.62**	**1.59-1.67**

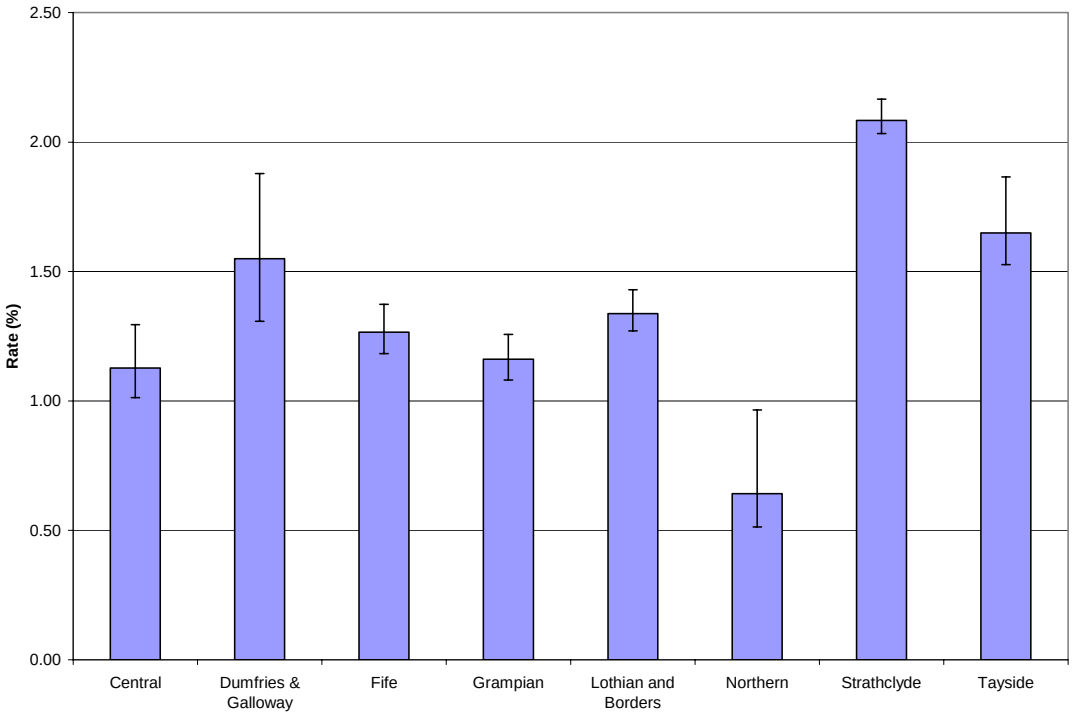
Note: Estimates for Orkney Isles parts of the Northern Constabulary area are produced using multiplier method (see Chapter 3)

Figure 10 Estimated prevalence of problem drug use by Police Force area (age 15 to 64)



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

Figure 11 Estimated prevalence of problem drug use by Police Force area (age 15 to 64)



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

5.1.7 Community Heath Partnership Areas

Most Community Health Partnership (CHP) Areas are coterminous with the Council areas, and those results are provided in Section 5.1.2 above. Only in three Council areas are there more than one CHP area, these are Fife, Glasgow City and Highland. There were insufficient data to carry out a capture-recapture analysis in at least one of the Highland CHP areas. We present in Table 8 the CHP estimates for Glasgow City and Fife.

Table 8 Estimates of the number of problem drug users by Community Health Partnership area (age 15 to 64) in Glasgow City and Fife

Area	Total Estimate		Prevalence	
	N	95% CI	%	95% CI
Dunfermline	988	866-1,140	1.06	0.93-1.23
Glenrothes and North East Fife	689	585-831	0.83	0.70-1.00
Kirkcaldy and Levenmouth	1,338	1,226-1,473	2.16	1.98-2.38
East Glasgow	3,935	3,528-4,423	4.70	4.21-5.28
North Glasgow	2,514	2,247-2,847	3.64	3.25-4.12
South East Glasgow	1,650	1,489-1,847	2.29	2.06-2.56
South West Glasgow	1,891	1,705-2,116	2.42	2.18-2.70
West Glasgow	3,266	2,848-3,790	3.20	2.79-3.71

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).

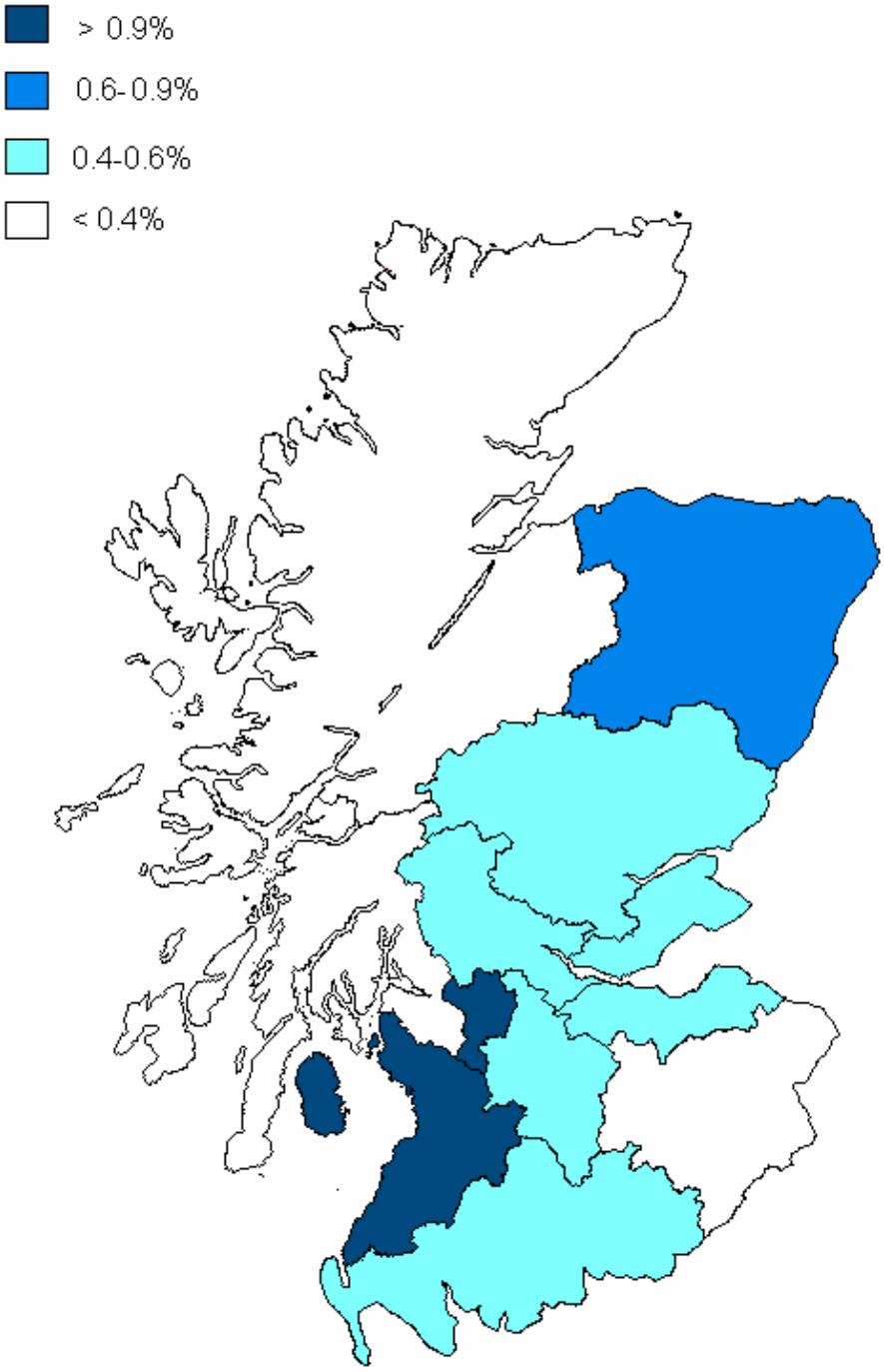
As noted in Chapter 3, a multiplier method was used in the Borders NHS Board area such that the proportion of opiate and / or benzodiazepines users who were estimated to be injecting in the Borders was set to be the same as the average across mainland Scotland. As also noted in Chapter 3 there were insufficient data to provide comparable estimates for the three Island NHS Board areas. The following tables provide the injecting prevalence estimate for mainland Scotland. Thus in total it has been estimated that there were 23,933 drug injectors in Scotland in 2006. The highest prevalence rates are to be found in the Greater Glasgow & Clyde, Ayrshire & Arran and Grampian NHS Board areas.

Table 9 Estimates of the number of drug injectors by NHS Board area (mainland Scotland, age 15 to 64)

Area	Total Estimate		Prevalence	
	N	95% CI	%	95% CI
Ayrshire & Arran	2,373	1,716-3,461	0.99	0.72-1.45
Borders[1]	201		0.29	
Dumfries & Galloway	486	371-669	0.52	0.40-0.71
Fife	1,270	1,077-1,527	0.53	0.45-0.64
Forth Valley	786	656-964	0.41	0.34-0.51
Grampian	3,056	2,457-3,887	0.85	0.69-1.09
Greater Glasgow & Clyde	8,862	7,091-11,330	1.10	0.88-1.40
Highland	734	458-1,325	0.37	0.23-0.66
Lanarkshire	1,649	1,122-2,606	0.44	0.30-0.70
Lothian	3,262	2,520-4,370	0.59	0.46-0.79
Tayside	1,254	1,016-1,592	0.49	0.40-0.63
MAINLAND SCOTLAND	**23,933**	**21,655-27,143**	**0.71**	**0.64-0.80**

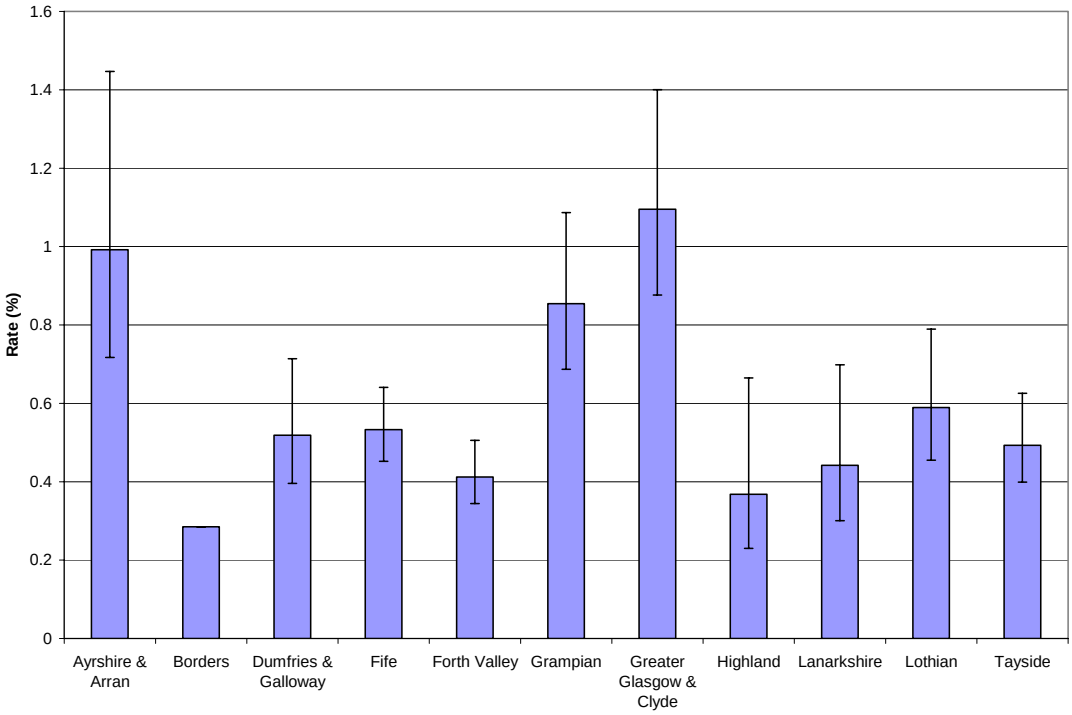
1 Estimate for Borders NHS Board area was produced using a multiplier method (see Chapter 3)

Figure 12 Estimated prevalence of drug injecting by NHS Board area (mainland Scotland, age 15 to 64)



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

Figure 13 Estimated prevalence of drug injecting by NHS Board area (age 15 to 64)



Note: Estimate for Borders NHS Board area was produced using a multiplier method (see Chapter 3). This estimate does not have error bars attached to it, but is subject to error.

Table 10 presents the estimated number of drug injectors by Council area.

From Table 10, the highest levels of injecting drug use are to be found in Inverclyde at 1.63% of the population aged 15 to 64, followed by Aberdeen City and Glasgow City with prevalence rates of 1.56% and 1.35% respectively.

Table 10 Estimates of the number of drug injectors by Council area (mainland Scotland, age 15 to 64)

Area	Estimate		Prevalence	
	n	95% CI	%	95% CI
Aberdeen City	2,246	1,806-2,857	1.56	1.25-1.98
Aberdeenshire	683	549-868	0.43	0.35-0.55
Angus	217	176-275	0.31	0.25-0.39
Argyll & Bute	286	179-517	0.49	0.31-0.88
Clackmannanshire	215	180-264	0.66	0.55-0.81
Dumfries & Galloway	486	371-669	0.52	0.40-0.71
Dundee City	845	684-1,073	0.89	0.72-1.14
East Ayrshire	998	722-1,456	1.27	0.92-1.85
East Dunbartonshire	172	138-219	0.25	0.20-0.32
East Lothian	108	84-145	0.18	0.14-0.24
East Renfrewshire	185	148-236	0.32	0.26-0.41
Edinburgh, City of	2,432	1,878-3,257	0.74	0.57-0.99
Falkirk	417	348-512	0.42	0.35-0.51
Fife	1,270	1,077-1,527	0.53	0.45-0.64
Glasgow City	5,458	4,368-6,960	1.35	1.08-1.72
Highland	448	279-808	0.32	0.13-0.57
Inverclyde	874	700-1,115	1.63	1.30-2.07
Midlothian	273	211-366	0.52	0.40-0.70
Moray	127	102-162	0.22	0.18-0.29
North Ayrshire	756	547-1,103	0.85	0.62-1.25
North Lanarkshire	1,048	713-1657	0.48	0.33-0.76
Perth & Kinross	193	156-244	0.21	0.17-0.27
Renfrewshire	1,024	819-1,305	0.90	0.72-1.15
Scottish Borders[1]	201		0.29	
South Ayrshire	618	447-902	0.86	0.62-1.26
South Lanarkshire	1,056	773-1,529	0.52	0.38-0.75
Stirling	153	128-188	0.26	0.22-0.32
West Dunbartonshire	693	554-884	1.13	0.90-1.44
West Lothian	449	347-602	0.40	0.31-0.53
MAINLAND SCOTLAND	**23,933**	**21,655-27,143**	**0.71**	**0.64-0.80**

Figure 14 Estimated prevalence of drug injecting by Council (non-rural area, age 15 to 64)

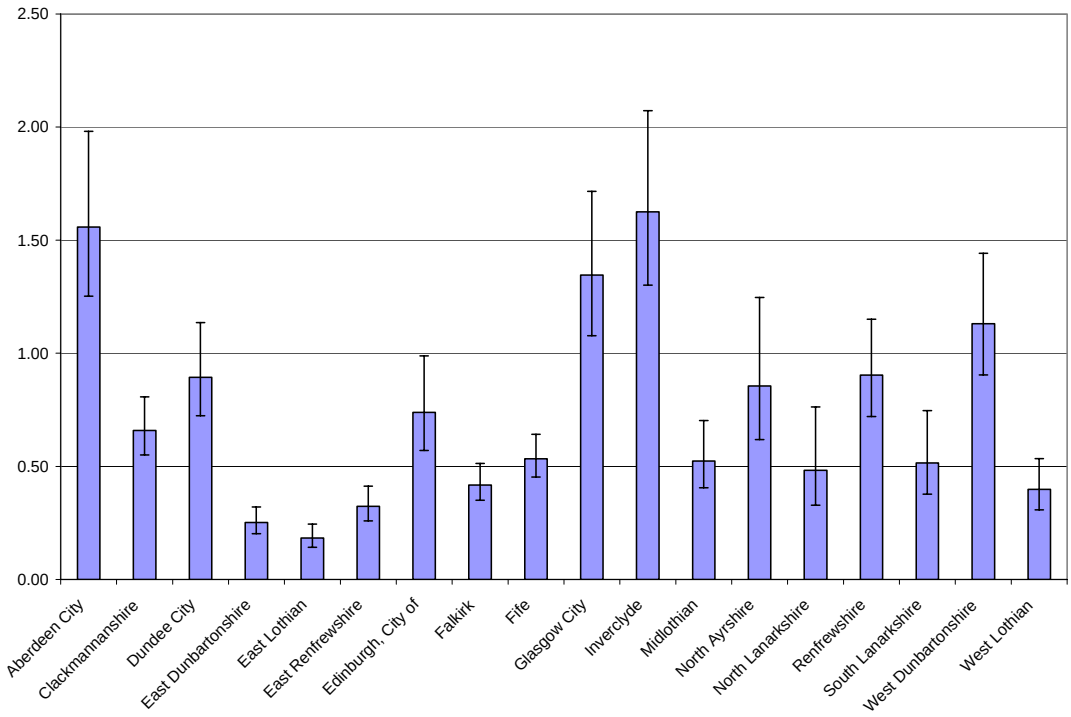
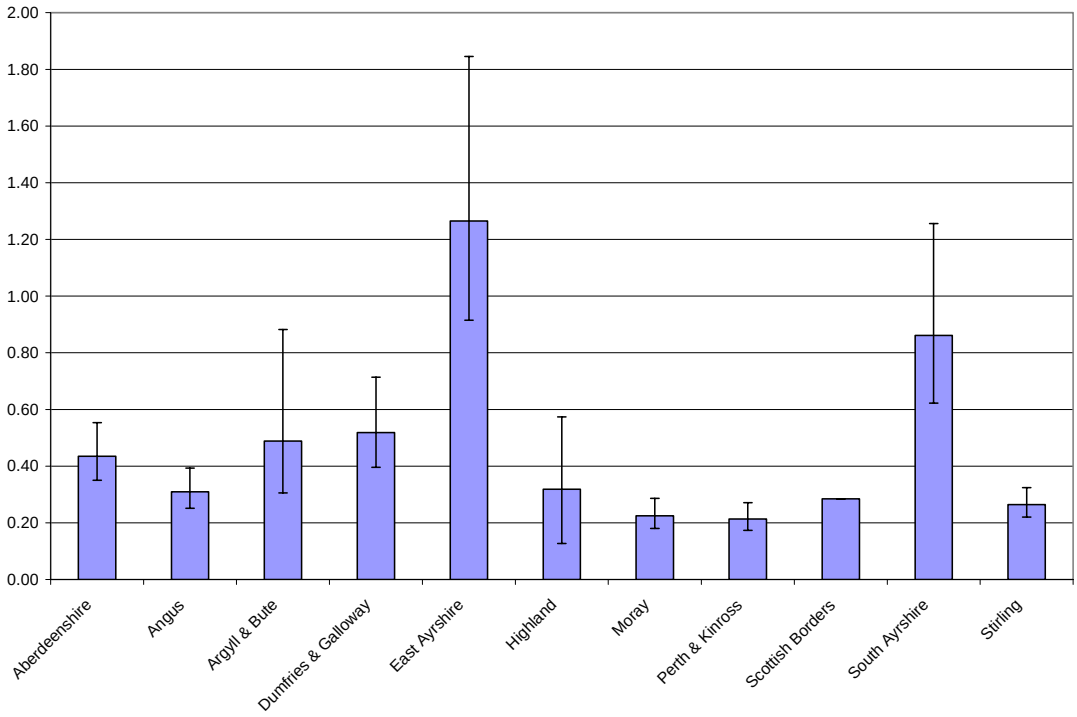


Figure 15 Estimated prevalence of drug injecting by Council (rural area, age 15 to 64)



Note Estimate for Scottish NHS Board area was produced using a multiplier method (see Chapter 3). It is subject to error.

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 (such as their cocaine use) or their level of dependency from the Police data source. For example, someone who only takes amphetamines in social settings such as a nightclub 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. These have been done and the results are available on request. It should be noted, however, that although estimates have been produced it is unclear as

to what they actually refer to, i.e. ever use of cocaine in 2006, regular use, problematic use etc.

In contrast to the 2003 study it was not possible to derive any estimates of the prevalence of crack cocaine use, not even in Aberdeen City where there were large enough numbers of people identified by treatment data sources or Social Enquiry reports. Unfortunately it is not possible to identify crack cocaine use from Hospital data and the data supplied by Scotland's Police forces included very few identifiable cases of crack cocaine possession, not least because some forces did not differentiate between cocaine powder and crack cocaine offences.

6 Comparison between 2003 and 2006 estimates

In this section brief comparisons are drawn between the results of the 2006 study and the previous study that presented estimates for 2003. Table 11 presents a comparison between the prevalence rates estimated in the 2003 study and those estimate in the 2006 study by council area. In contrast to the earlier sections in this report, the 2006 estimates have been converted to rates using the populations aged 15 to 54 as the baseline. As previously noted, there were minimal numbers of people identified in the 55 to 64 age category (approximately half of 1% of cases). This would have virtually no impact on the estimated numbers therefore we contend that this table presents like for like comparisons.

Table 11 Comparison between the 2003 and 2006 problem drug use prevalence estimates by Council area (age 15 to 54)

Area	2003		2006	
	%	95% CI	%	95% CI
Aberdeen City	2.03	1.87-2.27	2.14	1.93-2.39
Aberdeenshire	1.10	0.95-1.42	1.00	0.91-1.12
Angus	1.99	1.50-3.53	1.59	1.35-1.91
Argyll & Bute	1.35	1.09-2.16	1.22	0.94-1.64
Clackmannanshire	1.05	0.88-1.53	1.93	1.50-2.59
Dumfries & Galloway	2.43	2.15-2.94	2.03	1.71-2.46
Dundee City	2.80	2.51-3.22	3.13	2.81-3.75
East Ayrshire	1.92	1.73-2.22	2.90	2.66-3.22
East Dunbartonshire	0.69	0.51-1.50	0.84	0.60-1.23
East Lothian	1.74	1.40-2.86	1.89	1.56-2.35
East Renfrewshire	1.40	1.09-3.67	1.17	0.89-1.60
Edinburgh, City of	2.10	1.92-2.37	1.88	1.75-2.04
Falkirk	1.08	0.94-1.34	1.09	0.96-1.25
Fife	1.60	1.43-1.97	1.57	1.47-1.70
Glasgow City	3.31	3.16-3.49	3.77	3.63-3.97
Highland	0.81	0.63-1.46	0.93	0.72-1.44
Inverclyde	2.57	2.35-2.91	3.18	2.69-3.94
Midlothian	1.46	1.25-2.22	1.55	1.38-1.78
Moray	0.66	0.39-3.48	0.66	0.56-0.81
North Ayrshire	1.85	1.69-2.11	2.57	2.35-2.89
North Lanarkshire	1.06	0.96-1.22	1.80	1.62-2.05
Perth & Kinross	1.76	1.44-2.44	1.24	1.05-1.56
Renfrewshire	2.41	2.05-3.01	2.25	2.01-2.55
Scottish Borders	1.25	0.95-2.38	0.85	0.69-1.09
South Ayrshire	1.88	1.55-2.61	1.88	1.69-2.11
South Lanarkshire	1.72	1.40-2.77	1.80	1.62-2.01
Stirling	1.49	1.05-3.62	1.61	1.28-2.06
West Dunbartonshire	2.22	1.81-2.46	3.18	2.84-3.60
West Lothian	1.11	1.00-1.34	1.10	1.00-1.21
SCOTLAND[1]	**1.84**	**1.84-2.01**	**1.98**	**1.95-2.05**

1 The Scotland rate includes the Island Council areas.

From Table 11 the national prevalence has increased from 1.84% in 2003 to 1.98% in 2006. However, there have been changes in methodology between 2003 and 2006, including the use of hard matching to replace soft matching and the extension of the age range to include 55-64 year olds, both of which will tend to inflate the estimate for 2006 compared to that for 2003. Thus it is not possible to carry out a formal test of statistical significance between years.

When looking at the changes in prevalence at the local level, there are five Council areas where the prevalence has increased to the extent that the confidence interval for the 2006 estimate does not overlap with the confidence interval for the 2003 (thus being indicative of a statistically significant increase). It should, however, be noted that when making multiple comparisons at the 95% level of significance, it would be expected that around 5% of comparisons would appear to be significant even when there has not been a true increase or decrease in prevalence.

There appears to have been statistically significant increases in prevalence in East Ayrshire and North Ayrshire, with the prevalence in East Ayrshire rising from 1.92% (95% CI 1.73-2.22%) to 2.90% (95% CI 2.66-3.22%) and the prevalence in North Ayrshire rising from 1.85% (95% CI 1.69-2.11%) to 2.57% (2.35-2.89%). As these Council areas are neighbouring each other (and within the same NHS Board area) the increase could be due to an underlying increasing trend in the prevalence of problem drug use in that part of Scotland. Alternatively it could be due to an issue with the data from NHS Ayrshire and Arran (or other data collated at the NHS area level within that area) either in 2003 or 2006. Interestingly the prevalence rate in South Ayrshire remained exactly the same at 1.88%.

There also appears to have been a statistically significant increase in the North Lanarkshire Council area. The prevalence in 2003 was 1.06% (95% CI 0.96-1.22%); a prevalence rate that appeared low compared to neighbouring Council areas that year. The prevalence rate in 2006 is 1.80% (95% CI 1.62-2.05%).

The prevalence rate in West Dumbartonshire also seems to have significantly increased, from 2.2% (95% CI 1.81-2.46%) to 3.18 (95% CI 2.84-3.60%). West Dumbartonshire therefore continues to be one of the Council areas with the highest prevalence in Scotland. Finally Glasgow, the largest Council area, with the highest prevalence rate, has seen a statistically significant increase between 2003 and 2006, with the prevalence increasing from 3.31% (95 CI 3.16-3.49%) to 3.77% (95% CI 3.63-3.97%). It is, however, worth noting that the actual increase is relatively small compared to other Council areas, but the size of the Council area means that it is often easier to find significant changes in Glasgow compared to the areas with smaller population bases.

In terms of drug injecting the prevalence increased from 18,737 in 2003 to 23,933 in 2006. The increase in like for like rates (age 15 to 54) is from 0.67% (95% CI 0.63-0.72%) to 0.86% (95% CI 0.77-0.97%). There have, however, been some data quality issues and resultant methodological changes that would suggest it may not be appropriate to regard this as true increase in the prevalence of drug injecting in Scotland between 2003 and 2006.

7 Discussion and Conclusions

This report provided estimates of the prevalence of opiate and / or benzodiazepine use at the Council, ADAT, NHS Board, Community Justice Authority and Police Force level. These estimates have been combined to provide a national estimate of the number of people in Scotland in 2006 who use drugs such as heroin, other opiates (including methadone) or illicitly use benzodiazepines. The estimates can be directly compared with previous estimates for 2000 and 2003 (and to a certain extent other areas within the United Kingdom and Europe). There appears to be a small rise in the number of people estimated to be opiate and / or benzodiazepine users, however the figures in this report are estimates and therefore have to be considered along with their associated confidence intervals. The confidence intervals have quite a large degree of overlap but changes in methodology between 2000 and 2006 preclude a formal test of significance. However, it is probably appropriate to conclude that, over the time period 2000 to 2006 the level of opiate and / or benzodiazepine use in Scotland has remained stable, and at a level that is significantly higher than in other parts of the UK. The reasons why opiate and / or benzodiazepine use in Scotland is higher than England are beyond the scope of this study, but we would contend that it is unlikely to be due to the differences in case definitions between the Scotland and England estimates. Compared to previous Scottish studies, this study has been more rigorous in identifying opiate use separately from opiate and / or benzodiazepine use. Less than half of 1% of those identified from treatment were using benzodiazepines without also using opiates, similarly less that 1% of the Social Enquiry Report sample referred to people using benzodiazepines only. Thus it is highly unlikely that the estimate of 55,328 includes significant numbers of benzodiazepines only users.

Methodological Issues

We have collated information from four distinct sources of data on opiate and / or benzodiazepine use in Scotland. Each of these data sources has a national coverage; however many of the sources are primary local databases that are collated at the national level, either specifically as part of this study or by national organisations.

The Scottish Drug Misuse Database and the SMR01 data (hospital discharges) are national databases collated by the NHS in Scotland. As

each rely on local data providers supplying information to the national database, it is possible that there are regional or local variations in the quality or completeness of the databases. Comparability should not be too much of an issue for the SMR01 data, but the Scottish Drug Misuse Database collates information from a wide range of treatment and support agencies across Scotland and therefore the possibility of local variations in reporting practices is greater in that database. Regardless of data quality or completeness, as the Scottish Drug Misuse Database records new contacts at treatment or support services, the chance that an individual drug user appears in the database could depend on local issues, such as retention rates within services, varying service provision and varying rates of incidence (as opposed to prevalence rates). More generally, the nature and extent of treatment / service provision (including length of waiting lists) may mean that some drug users are more likely to appear in treatment data than others.

The Social Enquiry Report data were collected by the study team. Access was negotiated to all Social Enquiry Reports completed within the relevant time period, however it is possible that reports were missing or that the data collectors overlooked files containing valid Social Enquiry Reports. Moreover there may be regional or local differences in the way that Social Enquiry Reports are completed, such that some areas may be more rigorous in recording drug use. This issue, coupled with the issue that there may be local differences in the propensity for a drug user to commit crime (and also that such crimes are detected) will again possibly make some drug users more likely to appear in the Social Enquiry Report data than others. Local variations in crime rates and the policing response may also mean that there are local variations in the chance that a drug user appears in the Police data due to Misuse of Drugs Act crimes.

These issues may combine to mean that capture-recapture propensities may differ across areas. This should not be a problem for the analysis if the variation is at the Council area level (or higher area level) as the best log-linear model is fitted to the data at the Council area level. Thus the model fitted to the data in, for example, Aberdeen City may be completely different to the model fitted in Aberdeenshire. The strategy used within the analyses was to fit the simplest 22 models to the available data (including to the data stratified by age group and / or gender) and this approach was sufficient to allow good-fitting models to be fitted in each area apart from Orkney (where there were too few data).

Over and above the issue that data sources could vary across Scotland due to them being primarily local data sources collated up to the national level, there did appear to be issues with certain data sources in certain areas. We have to stress that this is in no way a criticism of the contributing data sources. If there are data quality issues, they could have occurred at any point in the data collection or analysis process, therefore it does not automatically mean that if we had

difficulty using the data in the analyses, then there is a problem with the organisation or agency that supplied it. The capture-recapture method only works when it is possible to fit a statistical model to the overlap data. If there are problems with an individual data source, then usually it is not possible to fit a model to the data. For example if the initials in a data source were switched, with forename initial switching with surname initial in one data source, it usually becomes immediately apparent that something is wrong somewhere in the analysis. Another feature of the capture-recapture method is that the size of the contributing data sources should not adversely affect the size of the estimates. Thus increasing treatment coverage should not automatically mean higher prevalence estimates. An increase in the size of a contributing data source should only increase the accuracy of the estimate, for example by decreasing the width of the associated 95% confidence interval, unless there are problems with the data source such as data quality issues or inclusion of individuals who do not meet the case definition. In most council areas, the inclusion of data collected directly from treatment agencies did not substantially alter the estimate prevalence rate for that area, apart from in three areas where not only did the estimate substantially change, but there was a significant deterioration in how well the statistical models fit the overlap data. This could be for a number of reasons, many of which could be due to data quality issues in contributing agency or problems occurring within the analysis. Where such problems have occurred (in Aberdeen City, Highland and Stirling) we have omitted the data collected directly from the treatment services. As this would not significantly have decreased or increased the prevalence rates had we done this in the remaining areas in Scotland, it is perhaps safe to assume that the estimates derived without the directly collected treatment service data are reliable.

In contrast to the 2003 analyses, this study used hard matching to identify overlaps between data sources. It is to be expected that, by switching from soft matching to hard matching, the number of individuals identified in more than one source would decrease. In a two-sample capture-recapture analysis this reduction in the overlap cases would automatically result in an increase in the estimate. Although it does not always follow that this would happen in a four-sample capture-recapture analysis (as model selection will have an impact on the estimates), previous unpublished reports for the Home Office suggest that hard matching does tend to increase the estimates, although not at a level that would statistically significantly increase them.

We have increased the upper limit of the age range to 64. Less than half of one percent of the ‘known’ population were in the 55 to 64 age range. It would be beyond the scope of this project to re-run all the analyses again excluding the 55 to 64 year olds, but it is likely that increasing the age range to 64 would have a very minimal effect on the estimated number of problem drug users. It could, however, have the

effect of decreasing the prevalence rate as the denominator population would have increased. We have therefore made comparisons using the same baseline populations.

Data issues

The study has also provided estimates of the prevalence of drug injecting at the Council and NHS Board area levels. It has to be stated that there were difficulties in obtaining injecting estimates. It is difficult to gauge how these issues would affect the estimates. The available data on injecting drug use is sparse. As noted in the relevant chapter, there are issues about assuming that hepatitis C test data refer to current injectors. Over and above that issue there may be issues with the reliability of the identifier information contained in blood-borne virus databases. It has to be clearly stressed that this should not be seen as a criticism of such databases or the clinicians completing the forms. It is more that such databases were not specifically set up for the purpose of contributing to a capture-recapture study and problems with missing identifiers or possible confusion about the ordering of initials would be a fairly minor issue for a surveillance system. Such issues if they were present would, however, be fairly problematic for this type of prevalence estimation study. Thus although the increase in the prevalence of injecting does appear to be statistically significant, we contend that methodological differences coupled with potential data quality issues would make such a reliance on a statistical measure of significance wrong. We would suggest that, just with opiate and / or benzodiazepine use, the prevalence of drug injecting appears to be stable over the six year period 2000 to 2006.

This study has been particularly difficult to carry out, far harder than in similar studies (with same research design carried out by the same study team) in 2000 or 2003. There were substantial problems in getting access to Social Enquiry Reports in at least one Council area. Eventually the data protection issues were resolved, but it took a substantial time to sort them out. Also in the 2006 study, there was a substantial delay in getting approval from NHS Board's Research & Development departments (which was a stipulation of the Research Ethics agreement).

More importantly, and perhaps more worryingly, the quality of data that the study team could access from drug treatment services was often patchy. Again, this should not be seen as a criticism of drug treatment services; the data requirements of a capture-recapture study are quite specific such that whilst an information system within a treatment service may be good at providing staff with the required information for the successful running of their service it might at the same time be actually be pretty poor at providing relevant data for capture-recapture studies. The study encountered various different systems across Scotland. Some agencies could provide identifier information on their

clients (such as initials, dates of birth) but did not routinely collate information on the drugs someone used in an easily accessible format. This resulted in the study team having to make data requests to other parts of the NHS to access the data and piece together the information in order to construct a viable data source. In some areas the only option was to cross-reference the data from treatment agencies with the information collated within the Scottish Drug Misuse Database. As this database has been up and running for over 10 years and should record information on every new contact at a drug treatment service, it would be thought unlikely that drug users in contact with services in 2006 would never appear in the national database. However the attempts at cross-referencing treatment data collated from agencies with the Scottish Drug Misuse Database was not completely successful. It is beyond the scope of this study to identify why. Moreover, it was interesting to note that some of the areas where we had to resort to cross-referencing with the Drug Misuse Database were the ones where it was not possible to fit models to the resultant overlap data. This could be because such cross-referencing between the databases somehow violated one of the assumptions of the capture-recapture method, such that only those for whom we can link with the Scottish Drug Misuse Database have any chance of appearing in the treatment data. There may be (possibly unknown) reasons why we cannot cross-reference some individuals, and thus there could be a group of drug users that have no chance of appearing in the analysis, thus contributing to a violation of the equal catchability assumption.

Conclusions

It is lamentable that, given the significant harm caused to individuals and society because of drug use and the clearly higher levels of opiate use in Scotland, the 'drugs information infrastructure' has not developed in this part of the UK as well as in England. Our judgement is informed by our experience of carrying similar exercises for the Home Office, where all relevant data is held centrally and relatively readily available. In England, all Police data and Probation data (the equivalent of Scotland's Social Enquiry Report Data) are all held centrally by the Ministry of Justice and subject to appropriate data security, ethical and confidentiality controls, available for inclusion in prevalence estimation studies. The Drugs Intervention Programme in England also provides two national databases on drug misuse: drug users in prison and drug users receiving criminal justice interventions in the community.

However the most concerning problem with the drugs information infrastructure in Scotland is the fact that nobody has a clear idea of the number of drug users in contact with treatment services. Within England this information is readily available from the National Drug Treatment Monitoring System, to the extent that Drug Action Teams in England can access reports on a monthly basis charting the numbers

of clients in treatment (not just new clients or numbers on the waiting lists). Within the context of the research which this report is based upon we have had to piece together the equivalent information for Scotland. On that basis we would suggest that the 22,474 individuals identified as being in treatment in 2006 should only be seen as a minimum number of individuals in treatment.

These data quality issues have partly been resolved by adjusting the methodology (such as excluding data collected directly from treatment agencies when they clearly cause the models not to fit to the overlap pattern). Various sensitivity analyses carried out but not summarised in this report appear to demonstrate that such methodological adjustments do not seem to adversely impact on the prevalence rates, but that assertion cannot be tested. For opiate and / benzodiazepine use we are confident that the estimates are valid and comparisons between the 2006 estimates and previous ones are appropriate. However the data quality issues, coupled with the relatively sparse number of injectors identified from the contributing data sources, lead us to recommend that the available injecting estimates (for 2000, 2003 and 2006) should be considered with caution and care should be taken in ascribing any trend information.

Finally, it does have to be clearly recommended that a lot of the problems with carrying out a prevalence estimation study in Scotland would be eliminated if such a programme of research was funded on a yearly 'rolling' basis. Our experience in carrying out three Scottish studies on a staccato basis every three years is that every time the research is initiated to produce prevalence estimates the research team effectively have to start from scratch in negotiating access to the relevant data in resolving data quality issues and in negotiating the increasing complexity that is the world of ethical approval in research. Each iteration in the prevalence estimation research in Scotland has also involved a heavy workload in securing the necessary NHS research and development approval coupled with the need to familiarise data providers and other colleagues about the methods of prevalence calculation and data capture. This is in stark contrast to the programme of research that was carried out in England across all 149 Drug Action Team areas (funded by the Home Office and undertaken by the same research team that has completed the present and previous problem drug misuse prevalence studies in Scotland) where large numbers of policy relevant estimates, including different case definitions, could be generated relatively easily and more importantly regularly through the period of that three year study.

Notwithstanding the above methodological cautions, the study has provided policy-relevant estimates of the number of opiate and / or benzodiazepine users in Scotland that can be directly compared with previous years, across the different areas within Scotland and against other areas of the UK. The estimates we have produced appear to be

stable and at a rate far higher than in England. This is not something that we can afford to be at all complacent about in Scotland.

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

Appendix
Baseline population sizes

April 2008

Table A1 Estimated population sizes and composition of NHS Board areas in terms of Council areas and postcode districts used to assign area

NHS Board area	Council Area	Estimated population (15-64)	Total	Postcode districts used to assign to area
Ayrshire & Arran	East Ayrshire	78,900		KA1-KA5, KA16-KA18
	North Ayrshire	88,500		KA11-KA15, KA20-KA25, KA26-KA30, PA17
	South Ayrshire	71,800		KA6-KA10, KA19, KA26
	Total		**239,000**	
Borders	Scottish Borders	70,500	**70,500**	EH38, EH43-EH46, TD1-TD14
Dumfries & Galloway	Dumfries & Galloway	93,700	**93,700**	DG1-DG15, DG16
Fife	Fife	238,200	**238,200**	DD6, KY1-KY12, KY14-KY16
Forth Valley	Clackmannanshire	32,700		FK10-FK14
	Falkirk	99,900		EH51, FK1-FK6
	Stirling	58,000		FK7-FK9, FK15-FK21, G63
	Total		**190,400**	
Grampian	Aberdeen City	144,200		AB10-AB16, AB21-25
	Aberdeenshire	156,900		AB30-AB36, AB39, AB41-AB45, A51-AB54
	Moray	56,600		AB37, AB38, AB55, AB56, IV30-IV32, IV36
	Total		**357,900**	
Greater Glasgow & Clyde	East Dunbartonshire	68,400		G61, G63, G64, G66
	East Renfrewshire	57,300		G46, G76-G78
	Glasgow City	405,500		G1-G5, G11-G15, G20-G23, G31-G34, G40-G45, G51-G53, G69
	Inverclyde	53,800		PA13-PA16, PA18, PA19
	Renfrewshire	113,400		PA1-PA12
	West Dunbartonshire	61,300		G60, G81-G83
	South Lanarkshire (part)	49,400		G72, G73
	Total		**809,100**	
Highland	Argyll & Bute	58,600		G84, PA20-PA38, PA41-PA49, PA60-PA78
	Highland	140,700		IV1-IV28, IV40-IV49, IV51-IV56, IV63, KW1 - KW3, KW5-KW9, PH19-PH26, PH30-PH44, PH49, PH50
	Total		**199,400**	
Lanarkshire	North Lanarkshire	217,300		G65, G67, G68, G71, ML1, ML2, ML4-ML7
	South Lanarkshire (part)	155,900		G74, G75, ML3, ML8-ML12
	Total		**373,200**	
Lothian	East Lothian	59,200		EH21, EH31-EH36, EH39-EH42
	Edinburgh, City of	329,500		EH1-EH17, EH28-EH30
	Midlothian	52,100		EH18-EH20, EH22-EH26, EH37
	West Lothian	112,800		EH27, EH47-EH49, EH52-EH55
	Total		**553,500**	
Orkney Isles	Orkney Isles	12,900	**12,900**	KW15-KW17
Shetland Isles	Shetland Isles	14,400	**14,400**	ZE1-ZE3
Tayside	Angus	70,000		DD7-DD11, PH12
	Dundee City	94,500		DD1-DD5
	Perth & Kinross	90,000		KY13, PH1-PH11, PH13-PH18
	Total		**254,500**	
Western Isles	Eilean Siar	16,800	**16,800**	HS1-HS9
SCOTLAND	**TOTAL**		**3,423,500**	

Notes

The population sizes (aged 15 to 64 years of age) for Council areas and NHS Board areas are taken from the mid-year estimates for 2006[1]. For CHP areas (not presented), the proportion of the population (aged 16 to 64 years of age in mid 2006)[2] of the relevant NHS Board areas that live in the constituent CHP areas was applied to the NHS Board totals.

In general the postcode districts (e.g. EH7) listed in Tables A1 to A4 were used to indicate the area of residence of individual found within the contributing data sources. However there were some cases in the postcode sector (e.g. EH7 6), when available, was used to allocate area of residence, particularly if the postcode district straddled more than one area. In the absence of postcode district or postcode sector information, other relevant geographical information (such as town of residence) was used where appropriate. The mapping from postcode information to area of residence is based on information the proportion of live postal addresses in each postcode district / sector residing the Council / NHS Board area. For example, all of the postal addresses in the EH7 postcode district refer to City of Edinburgh address there all drug users identified with a EH7 postcode district will be assigned to the City of Edinburgh. For the EH49 postcode district, 91% of the postal addresses refer to a West Lothian address and thus all drug users with a EH49 postcode district would be allocated to West Lothian

All population estimates have been rounded to the nearest 100. Columns may not add up due to this rounding.

[1] http://www.statistics.gov.uk/statbase/Product.asp?vlnk=15106
[2] http://www.scotpho.org.uk/profiles/