

Estimates of the Prevalence of Opiate Use and/or Crack Cocaine Use, 2011/12: Sweep 8 report

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Abstract

This report provides estimates of the prevalence of opiate and/or crack cocaine use at the regional and national level in England for 2011/12. It is a follow up to series of comparable prevalence estimates for 2004/05, 2005/06, 2006/07, 2007/08, 2008/09, 2009/10 and 2010/11. Estimates of the prevalence of opiate use, crack cocaine use and drug injecting (by users of opiates and/or crack cocaine) are also presented. Two prevalence estimation methods have been used; the capture-recapture method and the multiple indicator method. The capture-recapture method examines the overlap between different sources of data on individual drug users that are available at the local level to estimate the size of the hidden drug using population at the DAT area level. The multiple indicator method models the relationship between the capture-recapture estimates and readily available drug indicator data, such as numbers of drug offences in an area. It then applies that relationship to the areas where capture-recapture estimates are not available and provides estimates of drug use for those areas. The DAT area estimates are then summed to provide regional and national estimates.

In total there were an estimated 293,879 opiate and/or crack cocaine users aged 15 to 64 in England in 2011/12 (95% confidence interval (CI) 291,029 – 302,146). This converts to 8.40 per thousand population aged 15 to 64 (95% CI 8.32 – 8.63). The estimated prevalence of opiate use was 7.32 per thousand population aged 15 to 64 (95% CI 7.25 – 7.53) and the estimated prevalence of crack cocaine use was 4.76 per thousand (95% CI 4.62 – 4.96). The estimated prevalence of drug injecting was 2.49 per thousand population aged 15 to 64 (95% CI 2.44 – 2.58). Nationally, there was a fall in the prevalence of opiate and/or crack cocaine use between 2010/11 and 2011/12; however this was not statistically significant. There was also a slight non-statistical drop in the prevalence of opiate use from 261,792 in 2010/11 (95% CI 259,260 – 269,025) to 256,163 in 2011/12 (95% CI 253,751 – 263,501). The estimates for the period 2011/12 also show a non-significant decrease in the levels of crack cocaine use from 170,627 in 2010/11 (95% CI 165,877 – 176,692) to 166,640 (95% CI 161,621 – 173,706). The injecting prevalence rates have significantly decreased between 2010/11 and 2011/12, going from 93,401 (95% CI 90,974 – 96,757) to 87,302 (95% CI 85,307 – 90,353).

Keywords

Opiate use; crack cocaine use; drug injecting; prevalence estimation; capture-recapture methods; multiple indicator methods

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Executive Summary

Overview

Information about the prevalence of opiate and / or crack cocaine use is an essential part of the evidence base used to formulate policy, inform service provision, and assess the wider population impact of interventions. Although direct enumeration is not possible, indirect techniques can provide estimates of drug misuse prevalence. This research uses data sources that are available at the local and national level to estimate the prevalence of opiate and / or crack cocaine use.

Estimates are provided for the 151¹ Drug Action Team (DAT)² areas and the nine regions of England previously described as Government Office Regions. Two established prevalence estimation methods are used; the capture-recapture method and the multiple indicator method.

The capture-recapture method has been used to estimate the prevalence of opiate and / or crack cocaine use in the majority of DAT areas in England. The multiple indicator method provided local estimates in the remaining DAT areas. The national estimate for opiate and / or crack cocaine use was derived as the sum of the 151 DAT area estimates.

Data sources

Four sources of data were available within which individual opiate and/or crack users (OCUs), opiate users and crack cocaine users could be identified. These sources of data are drug treatment, probation, police and prison data. Police data do not include sufficient information to identify drug injectors, therefore the fourth source used in the injecting analyses was community assessments carried out within the Drug Interventions Programme (DIP).

Persons resident in each DAT area, in contact with these sources during 2011/12, known to be using heroin, methadone, other opiate drugs, or crack cocaine were included in the analysis. Only those aged 15 to 64 were included. The overlap between data sources was determined via comparison of initials, date of birth and gender within each DAT area. Established statistical modelling techniques were used to examine this overlap and to produce prevalence estimates stratified by age group, gender, and DAT area of residence.

Methods

Two methods have been used to estimate the local and national prevalence; the capture-recapture method, which was used in 88 out of the 151 DAT areas to obtain opiate and/or crack use prevalence estimates and the multiple indicator method, which was used in the remaining 63 DAT areas. The capture-recapture method uses information on the overlap between data sources that are available at the local level (i.e. information on the number of individuals appearing in more than one data source) to provide estimates of the size of the hidden population (i.e. opiate and / or crack cocaine users not identified from any data source). The multiple indicator method models the relationship between the prevalence of opiate and / or crack cocaine drug use and readily available indicators such as aggregate numbers of drug users in treatment or committing drug-related crimes in those areas where

¹ Local Government changes came into effect on 1st April 2009. On that date Bedfordshire split into Bedford and Central Bedfordshire and Cheshire split into Cheshire East and Cheshire West and Chester. Estimates of the prevalence of opiate and / or crack cocaine use are provided for the old areas and the new areas. Estimates of the prevalence of opiate use, crack cocaine use or injecting are not provided for the new areas.

² For consistency with previous reports, the 151 local areas are referred to a Drug Action Team or DAT areas in this report, even though the partnerships covering the local areas do not all use that name. A single partnership covers the two new areas of Bedford and Central Bedfordshire.

these prevalence estimates are available. It can therefore provide prevalence estimates for areas where capture-recapture estimates are not available.

Results

Table 1 presents the national estimates and their associated 95% confidence intervals. Total estimates for opiate and/or crack use (OCU), opiate use and crack use for each region are shown in Tables 2³ to 4.

Table 1: National prevalence estimates and rates per 1,000 population aged 15 to 64 with 95% confidence intervals.

Drug	Estimate	95% Confidence Interval	Rate	95% Confidence Interval
OCU	293,879	291,029 – 302,146	8.40	8.32 – 8.63
Opiate	256,163	253,751 – 263,501	7.32	7.25 – 7.53
Crack	166,640	161,621 – 173,706	4.76	4.62 – 4.96
Injecting	87,302	85,307 – 90,353	2.49	2.44 – 2.58

Table 2: Estimated number of opiate and/or crack (OCU) users by region.

Region	OCU		
	Estimate	95% CI	
East of England	21,952	20,103	24,379
East Midlands	24,085	22,134	25,947
London	54,985	53,831	57,864
North East	16,935	16,467	17,762
North West	46,337	44,529	48,643
South East	32,935	30,923	35,390
South West	26,051	25,034	27,561
West Midlands	34,329	32,487	36,644
Yorkshire and the Humber	36,270	34,926	38,301
ENGLAND	293,879	291,029	302,146

Table 3: Estimated number of opiate users by region.

Region	Opiate		
	Estimate	95% CI	
East of England	19,263	17,815	21,345
East Midlands	21,465	19,749	23,155
London	43,918	42,928	46,538
North East	15,276	14,868	16,072
North West	42,073	40,550	44,403
South East	28,068	25,831	30,521
South West	23,082	22,244	24,552
West Midlands	30,706	28,971	32,659
Yorkshire and the Humber	32,312	30,942	34,254
ENGLAND	256,163	253,751	263,501

3 In the body of the report, data within tables are provided at regional. Full tables at the DAT area level are provided in accompanying reports.

Table 4: Estimated number of crack cocaine users by region.

Region	Crack		
	Estimate	95% CI	
East of England	13,163	10,707	15,636
East Midlands	11,687	10,119	13,532
London	40,080	38,300	41,997
North East	5,544	4,600	6,563
North West	25,361	23,219	27,578
South East	18,360	15,585	21,357
South West	13,548	12,145	15,342
West Midlands	19,891	17,795	22,012
Yorkshire and the Humber	19,006	17,488	20,828
ENGLAND	166,640	161,621	173,706

Table 5: Estimated number of drug injectors by region.

Region	Injectors		
	Estimate	95% CI	
East of England	6,650	5,995	7,386
East Midlands	7,808	6,989	8,630
London	11,351	10,711	12,347
North East	6,334	5,948	6,770
North West	13,110	12,233	14,305
South East	11,047	9,635	12,368
South West	10,134	9,474	10,958
West Midlands	9,175	8,281	10,082
Yorkshire and the Humber	11,692	11,024	12,457
ENGLAND	87,302	85,307	90,353

Thus in total there are an estimated 293,879 opiate and/or crack users in England (95% CI 291,029 to 302,146), this corresponds to 8.40 per thousand of the population aged 15 to 64 (95% CI 8.32 to 8.63). In terms of opiate users, there are an estimated 256,163 people (95% CI 253,751 to 263,501) in England who use those drugs (7.32 per thousand population aged 15 to 64, 95% CI 7.25 to 7.53) whereas it is estimated that 166,640 people (95% CI 161,621 to 173,706) use crack cocaine (4.76 per thousand population aged 15 to 64, 95% CI 4.62 to 4.96). It should be noted that the majority of people using crack cocaine are also using opiates and that crack cocaine may neither be their main drug of use or indeed the drug that is causing them the most problems. There were an estimated 87,302 drug injectors (95% CI 85,307 to 90,353).

Tables 6 to 8 present the prevalence rates per thousand of the population aged 15 to 64, again by region for opiate and/or crack use, opiate use and crack cocaine use.

Table 6: Estimated prevalence (rate per 1,000 population aged 15 to 64) of opiate and/or crack use by region.

Region	OCU		
	Estimate	95% CI	
East of England	5.79	5.30	6.43
East Midlands	8.10	7.44	8.72
London	9.55	9.35	10.05
North East	9.89	9.62	10.37
North West	9.99	9.60	10.48
South East	5.86	5.50	6.30
South West	7.69	7.39	8.13
West Midlands	9.45	8.94	10.09
Yorkshire and the Humber	10.44	10.05	11.02
ENGLAND	8.40	8.32	8.63

Table 7: Estimated prevalence (rate per 1,000 population aged 15 to 64) of opiate use by region.

Region	Opiate		
	Estimate	95% CI	
East of England	5.08	4.70	5.63
East Midlands	7.22	6.64	7.78
London	7.63	7.46	8.08
North East	8.92	8.68	9.38
North West	9.07	8.74	9.57
South East	4.99	4.60	5.43
South West	6.81	6.56	7.24
West Midlands	8.45	7.98	8.99
Yorkshire and the Humber	9.30	8.91	9.86
ENGLAND	7.32	7.25	7.53

Table 8: Estimated prevalence (rate per 1,000 population aged 15 to 64) of crack cocaine use by region.

Region	Crack		
	Estimate	95% CI	
East of England	3.47	2.82	4.12
East Midlands	3.93	3.40	4.55
London	6.96	6.65	7.29
North East	3.24	2.69	3.83
North West	5.47	5.00	5.94
South East	3.27	2.77	3.80
South West	4.00	3.58	4.53
West Midlands	5.48	4.90	6.06
Yorkshire and the Humber	5.47	5.03	5.99
ENGLAND	4.76	4.62	4.96

Table 9: Estimated prevalence (rate per 1,000 population aged 15 to 64) of drug injecting by region.

Region	Injecting		
	Estimate	95% CI	
East of England	1.75	1.58	1.95
East Midlands	2.62	2.35	2.90
London	1.97	1.86	2.14
North East	3.70	3.47	3.95
North West	2.83	2.64	3.08
South East	1.97	1.71	2.20
South West	2.99	2.80	3.23
West Midlands	2.53	2.28	2.78
Yorkshire and the Humber	3.37	3.17	3.59
ENGLAND	2.49	2.44	2.58

In terms of regional differences, Yorkshire and the Humber region has the largest prevalence of opiate and/or crack use at just over 10 per thousand population aged 15 to 64 followed closely by the North West and the North East at just under 10 per thousand population. The East of England has the lowest prevalence of opiate and/or crack use at just under 6 per thousand. When comparing opiate use prevalence, the highest prevalence rates are again in Yorkshire and the Humber at just over 9 per thousand population followed closely by the North West region which is also just over 9 per thousand. London has the highest estimated prevalence of crack cocaine use at just under 7 per thousand population, in comparison to prevalence of around 3 per thousand in the North East and South East. The highest injecting prevalence was found in the North East, with just under 4 per thousand.

Discussion and Conclusion

These estimates are the results of the fourth follow-up to a three-year project. This follow-up was carried out five years after the final sweep of the original project, so could therefore be considered as 'sweep 8'. As far as possible, the results of this 8th sweep can be compared with the results of the previous sweeps. This study has demonstrated that it is possible to provide estimates of the prevalence of opiate and/or crack cocaine use as well as the prevalence of opiate use and crack cocaine use at the local, regional and national level and across successive years. Nationally, there was a fall in the prevalence of opiate and/or crack cocaine use, opiate use alone and crack cocaine use alone, between 2010/11 and 2011/12; however these decreases were not statistically significant. There was, however, a statistically significant decrease in the levels of drug injecting.

1. Introduction

Information about the number of people who use illicit drugs such as heroin, other opiates or cocaine is a key element of the evidence base used to formulate policy and inform service provision and provides a context in which to understand the population impact of interventions to reduce drug related harm. To direct resources effectively, it is desirable to know about the prevalence of drug use at the local level. To determine the extent to which treatment may reduce harm to communities, it is necessary to know what proportion of the number of drug users in any given area is engaging with treatment. Direct enumeration of those engaged in a largely covert activity such as the use of heroin is not possible and large, household surveys such as the Crime Survey for England and Wales tend to underestimate numbers of those individuals whose drug use is the most problematic and whose lives are often the most chaotic. However, indirect techniques can be applied to provide estimates of drug use prevalence.

This report describes the results of the eighth sweep of a series of studies to use data sources that are available at the local and national level to provide estimates of the prevalence of opiate and/or crack use in all Drug Action Team areas (DATs) in England and thus provide regional and national prevalence estimates. The same methodological approach was used in this sweep as in the third one which was published by the Home Office - <http://rds.homeoffice.gov.uk/rds/pdfs08/horr09.pdf>

Prevalence estimates are presented at the regional and national level. Changes in the prevalence between sweep 7 (2010/11) and sweep 8 (2011/12) of opiate and/or crack use (OCU), opiate use, crack cocaine use and injecting are also presented at the regional and national level, along with information on changes in the prevalence of opiate and/or crack use by age group (15 to 24, 25 to 34 and 35 to 64 years of age). Estimates at the DAT area level are also available.

2. Methods

This research applies two methods, the capture-recapture method and the multiple indicator method (also called the multivariate indicator method or MIM), to estimate the prevalence of opiate and/or crack use in England in 2011/12. These two methods appear to offer the most cost-effective and straightforward approach to establishing valid local and national prevalence estimates. The benefits of these methods are that: they do not rely exclusively on drug users self reported use of substances; it is possible to provide estimates of prevalence stratified by key characteristics such as age and gender; they use a standard set of procedures that are tried and tested and allow for replication; they build upon existing routinely collected data. More details of these methods and the implications for their use can be found in the report of the first two sweeps of this project (Hay *et al*, 2006; Hay *et al*, 2007a) and in a technical report (Hay *et al*, 2007b). This chapter provides a brief overview of the methods and a description of the changes from the first three years of the project.

As with previous sweeps of the project, the first stage of the estimation process was to attempt to obtain capture-recapture (CRC) estimates for all DAT areas. These CRC estimates were then used as anchor points for a multiple indicator method (MIM) model which was used to provide estimates for those areas for which it had not proved possible to obtain a CRC estimate.

The capture-recapture analysis procedure

In simple terms, the capture-recapture analysis involves testing a series of statistical formulae, or 'models', to find one that best matches, or 'fits' the pattern of overlap between data sources. A value, known as the Akaike Information Criterion (AIC) (Hook and Regal, 1997), can be useful in gauging goodness of fit. This model is then used to calculate the number of opiate and/or crack users who do not appear in any source. This estimate is then added to the total number of known opiate and/or crack users, to provide an overall estimate of prevalence.

The first stage of analysis involved testing how well a simple model, that assumed all samples were independent of each other, matched the observed overlap in the contingency table. Increasingly complex models, representing dependencies between single pairs of data samples ('one-way') and then two pairs of samples ('two-way') were then tested. The model that best matched the overlap was chosen using objective statistical criteria; more complex models were only chosen if they provided a better match (on comparing AIC values) than lower-level models. All capture-recapture analyses were carried out using the GLIM4 statistical package.

In most DAT areas, all four sources of data were available to estimate the prevalence of opiate and/or crack use and opiate use. Attempts were made to produce capture-recapture estimates in all 151 DAT areas but in the two smallest DAT areas there were too few data to carry out any meaningful analyses (City of London and Rutland).

In the first stage of the analysis, the 22 simplest models were applied to the overlap data from each of the remaining 149 DAT areas in England. This was initially carried out on unstratified data, i.e. not splitting by gender or age group. This process was then repeated for the data stratified by age group (three strata) and by gender (two strata) giving five stratified estimates. At this stage the data were not stratified by both the age group and gender (e.g. young males, females aged 35 to 64). Such an approach to stratification would have given another six stratified estimates.

Various methods were used to explore whether the model fitted to the unstratified data was a good fit (in particular if the AIC value was less than zero) and whether the resultant estimate was valid. This included checking whether the lowest deviance value indicated a good fit (a lower deviance value signifies a better fit of the model to the observed data), checking whether the estimate derived from applying the best model was similar to a weighted estimate (calculated as a weighted mean of the available 22 estimates) and whether the unstratified estimate was similar to the sum of the stratified estimate for both the age-stratified and

gender-stratified model / estimates. In addition, it was considered whether each estimate was credible (i.e. not unfeasibly low or high in comparison with the known drug using population or underlying general population).

Thus to summarise, if the model fitted to the unstratified data did not offer a valid estimate, then either the summed gender-specific or age group-specific estimates were considered (with gender-specific estimates preferred if there was no discernable difference between the two approaches; again to ensure that the national confidence interval was not excessively wide). If the models fitted at this stage again did not offer a valid estimate then the approach taken was to stratify the males into three age groups but keep the female data unstratified. This was particularly important as, across the country, there were few data on female opiate and/or crack users over the age of 34. If that approach did not work, then the analyses were run on the six age and gender strata and those estimates were considered. If none of those unstratified estimates were deemed to be appropriate then any stratified analysis where the AIC value for one stratum was less than five was considered. If none of those approaches provided a valid estimate then a multiple indicator estimate was used instead.

As with the previous sweeps, estimates stratified by age group, were obtained by first estimating the estimated proportion of drug users falling in each stratum in each DAT area then applying these estimated proportions to the total prevalence estimates for that area, whether it was obtained using capture-recapture method or the multiple indicator method. Estimates stratified by gender were also derived in a similar manner. Once the OCU and opiate use capture-recapture estimates for each case definition were obtained, they were compared against each other at the DAT area level. The first comparison was between the opiate use estimate and the OCU estimate.

To a certain extent the approach described above was carried out to estimate the prevalence of crack cocaine use or injecting at the DAT area level. The crack cocaine estimates were compared to the opiate and/or crack use estimates to ensure consistency and where it was not possible to obtain a valid or feasible crack cocaine estimate using the capture-recapture method then a multiple indicator estimate was used instead. Estimates stratified by age group or gender were not derived for crack cocaine use or injecting.

3. Data and Analysis

Case definitions

The case definition of the prevalence estimates depends heavily on the case definitions used by the contributing sources. Moreover, the case definitions of the resultant prevalence estimates need to reflect case definitions that are common across all data sources. The study therefore employed the following as the case definition for problem drug use:

- Use of opiates and/or the use of crack cocaine.

It should be noted that the case definition focuses on the 'use' of opiates and/or crack cocaine rather than the 'misuse' of these drugs or addiction to either drug. The case definition does not include the use of cocaine in a powder form, the use of amphetamine, ecstasy or cannabis, or the injecting of drugs by people who do not use opiates or cocaine.

The study also provides separate estimates of the prevalence of opiate use, and of the prevalence of crack cocaine use. Estimates of the number of drug injectors who use either opiate and / or crack cocaine are also presented. This definition of drug injecting does not include people who would, for example, inject amphetamines but do not use either opiates or crack cocaine.

All data refer to the financial year from 1st April 2011 to 31st March 2012. The age range employed within the study is from 15 to 64 and where the estimates have been stratified by age group, these are 15 to 24, 25 to 34 and 35 to 64 years of age. To derive age from date of birth, the individual's age on the 1st of October 2011 (the mid-point in the financial year 2011/12) was calculated and those who were under the age of 15 or over the age of 64 were excluded. Individuals with missing data fields, such as gender, forename initial or surname initial were also excluded, as were individuals where it was not possible to assign DAT area of residence (or those that were resident outside England).

Due to the case definitions outlined above and the confidence intervals associated with each estimate the figures must be used with care. More information on the how the estimates can be used and the limitations associated with them can be found in Man (2007)⁴.

Data

Data used in the capture-recapture analysis

Four main sources of data on opiate and/or crack use, which were suitable for use in the capture-recapture analyses, were available at the national level:

- The National Drug Treatment Monitoring System (NDTMS)
- The National Probation Service Offender Assessment System (OASys)
- Drug users convicted under the Misuse of Drugs Act (1971) for offences involving possession (or possession with intent to supply) heroin, methadone and/or crack cocaine from the Police National Computer (PNC)
- Drug Interventions Programme assessments completed in prisons (DIP-Prison).

In addition, Drug Interventions Programme assessments completed in the community (DIP-community) were employed within the drug injecting analyses as Police data did not include information on an individual's injecting status.

Data sources used in the Multiple Indicator Method analysis

There is a wide range of indicator data that may be correlated with drug use prevalence at the DAT area level that could be useful within a multiple indicator analysis. Three main types of

⁴ http://www.nta.nhs.uk/uploads/guidance_using_pdu_estimates.pdf

indicator data could be used within this type of analysis; data that are currently in the public domain (e.g. published data on crime or income support claimants), data that are not currently in the public domain but have been provided to the study team (e.g. drug-related hospital admissions) and data that have been collected for use within the capture-recapture analyses (such as the NDTMS data).

As in the previous two sweeps of the study, a decision was made not to use crime data as these data referred to the place where the crime was committed, not the place where the person responsible for the crime lived. Therefore such indicator data could artificially inflate the estimates for some places where crimes are committed by people who do not live there (e.g. Westminster). Population density was used as an indicator in sweeps one, two and three but has not been used in later sweeps. In previous sweeps, the use of data that were not in the public domain did not appear to improve the analyses therefore the data used in the multiple indicator method analyses were the same as those used in the capture-recapture analyses.

Multiple Indicator Method analyses

In this chapter the specific application of the multiple indicator method within this sweep of the study is considered. All of the indicator data and the anchor point data were converted to rates per 1,000 population aged 15 to 64 prior to inclusion in the analyses.

The capture-recapture analyses derived estimates of the prevalence of different types of problem drug use (opiate and/or crack cocaine use; opiate use; crack use; injecting drug use). From these estimates a set of anchor point DAT areas were constructed for use within the multiple indicator analyses. Overall there were 88 DAT areas that were used as anchor points in the final multiple indicator analyses, although other provisional multiple indicator analyses were carried out to examine the credibility of the capture-recapture estimates and their use in a multiple indicator model.

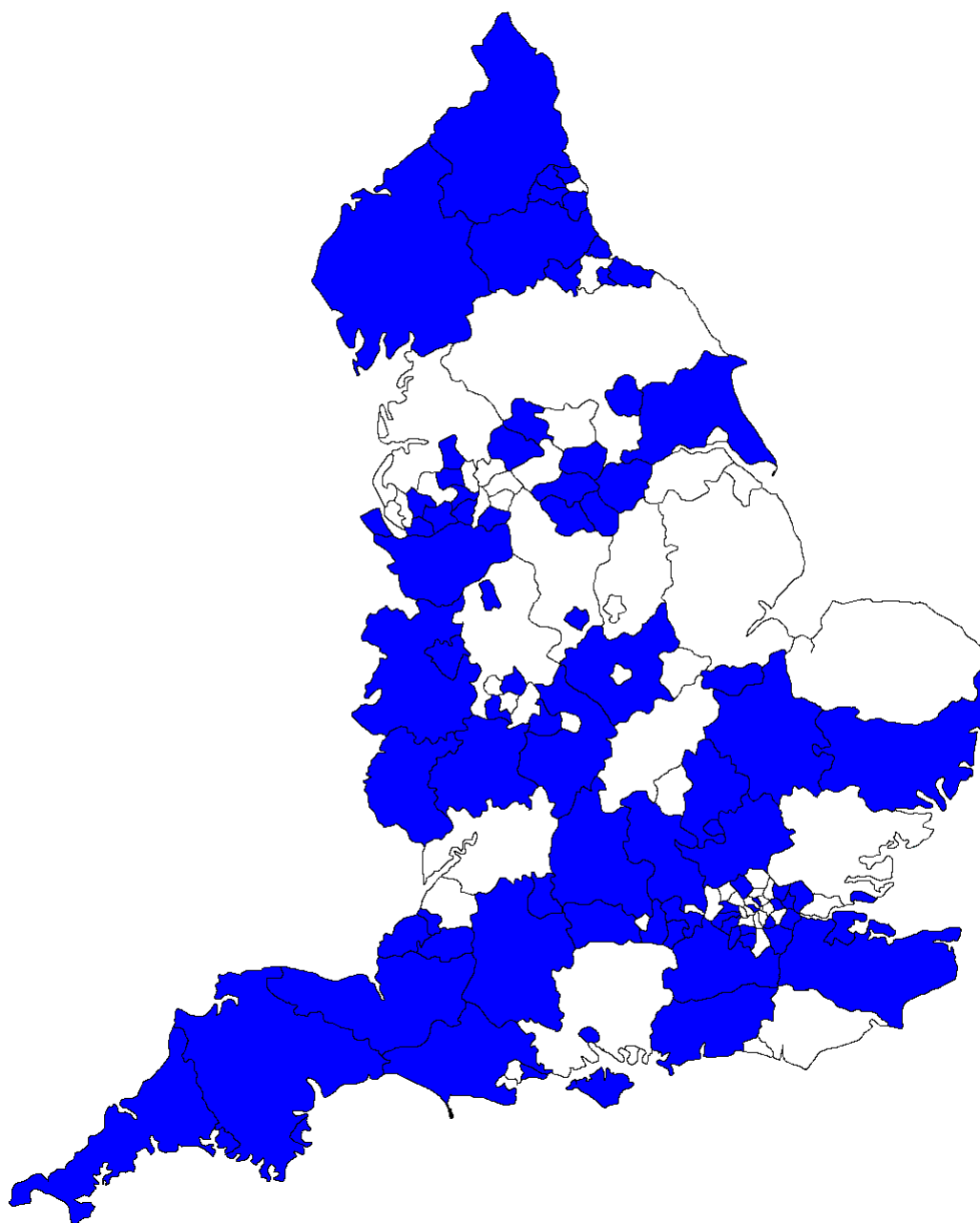
The number of DAT areas that were used as multiple indicator anchor points is summarised by region in Table 3.1.

Table 3.1: Summary of the number of DAT areas used as multiple indicator anchor points by region.

Region	Number of DAT Areas	OCU	Opiate	Crack	Injecting
East of England	11	7	7	5	5
East Midlands	9	2	2	4	3
London	33	16	17	10	15
North East	12	10	11	1	4
North West	23	11	9	7	5
South East	19	12	9	7	8
South West	15	12	11	6	8
West Midlands	14	9	7	7	5
Yorkshire and the Humber	15	9	7	9	5
ENGLAND	151	88	80	56	58

The DAT areas that were used as anchor points in the OCU multiple indicator analyses are shown as the darker shaded areas in Figure 3.1 (map).

Fig 3.1: Map showing the opiate and/or crack user anchor point areas (darker shaded areas).



With just under 90 anchor points available there was no need to use a technique known as principal component analyses that multiple indicator studies often use to ensure that the number of indicators is effectively less than the number of available anchor points (a prerequisite of the regression analysis), instead, the stepwise regression method (simple linear multiple regression with Normal errors) in Minitab release 13.30 was used. For each different drug definition only one multiple indicator model was constructed for the whole of England and we did not include region as a categorical indicator.

The stepwise regression approach considers all available indicators and only includes a particular indicator in the final regression model if it is significantly related to the available prevalence estimates. The stepwise regression approach alternates at each step between adding significant or deleting non-significant indicators⁵ and can result in models that offer a

5 In these analyses α to enter and α to remove were both set to 0.15

good fit to the available data with a minimal number of indicators. This is in contrast to the forward selection approach which starts with no indicators in the model and keeps including indicators until there are no more significant indicators, and the backward elimination approach which starts with all indicators in the model and removes non-significant ones until all remaining ones are significantly related to the available prevalence estimates. The stepwise regression approach resulted in the following indicators remaining in the best regression model (in order of significance starting with the most significant indicator):

- NDTMS
- DIP-Prison

This model explained 94% of the variance (i.e. provided a good fit to the available data) with the first indicator (NDTMS) explaining 86% of the variance.

Analysis: prevalence of opiate use, crack cocaine use and drug injecting

The general approach outlined above for opiate and/or crack use was also taken to estimating the prevalence of opiate use or crack cocaine use and the prevalence of drug injecting. The stepwise regression approach resulted in the following indicators remaining in the best regression models (in descending order of significance) for each definition;

Opiate use:

- NDTMS
- DIP-Prison

Crack cocaine use:

- NDTMS
- DIP-Prison

Injecting:

- NDTMS
- DIP-Prison

For the opiate use analyses, the indicators explained 94% of the variance (87% for crack cocaine and 92% for injecting).

As described in the Sweep 2 Technical Report (Hay *et al.* 2007b), comparisons between the opiate use and crack cocaine use and the opiate and/or crack cocaine use estimates were made to gauge the validity of the different estimates. Capture-recapture estimates for each definition were compared with multiple indicator estimates. The impact of including capture-recapture estimates that unduly influenced the multiple indicator model was also considered. This 'consistency checking' will always have some element of subjectivity in it due to the issue of having to have consistency of estimates derived from two different methods across three case definitions.

4. Results

In this section we first provide a summary of the overall results relating to the prevalence estimates at the national and regional level for 2011/12. We then present a series of tables describing the age group estimates for 2011/12 and then compare the estimates of the prevalence of opiate and/or crack use for sweep 8 (2011/12) against those derived for sweep 7 (2010/11). These comparisons across time are made for the estimated number of opiate and/or crack users. The changes in absolute numbers do not take into account any difference in the underlying population size in the 15 to 64 age group. A negative difference shows that there appears to have been a decrease in prevalence whereas a positive difference suggests an increase. A 95% confidence interval is given for each estimate. Similar tables are provided to consider changes over time for opiate use, crack cocaine use and drug injecting.

Prevalence estimates

In total there were 88⁶ areas where the capture-recapture analyses offered valid estimates of the prevalence of opiate and/or crack use. In those areas the prevalence of opiate and/or crack use was provided by the capture-recapture estimate whereas in the remaining 63 areas the multiple indicator estimates were used. There were 80 areas that had capture-recapture estimates for opiate use and in terms of crack cocaine use, 56 areas had capture-recapture estimates. There were 58 areas with injecting capture-recapture estimates. The decision to use a capture-recapture estimate instead of a multiple indicator method estimate was always taken on the basis of the validity of the capture-recapture estimate, both in terms of how well the capture-recapture model fitted the available data and how feasible the estimate was compared to the known population and the estimates for other drugs.

There were an estimated 293,879 opiate and/or crack users in 2011/12 in England (95% CI 291,029 to 302,146). This corresponds to 8.40 per thousand population aged 15 to 64 (95% CI 8.32 to 8.63). In terms of opiate users, there were an estimated 256,163 people in England who use those drugs (7.32 per thousand population aged 15 to 64) whereas it is estimated that 166,640 people use crack cocaine (4.76 per thousand population aged 15 to 64). It should be noted that the majority of people using crack cocaine are also using opiates and that crack cocaine may neither be their main drug of use or indeed the drug that is causing them the most problems. There were an estimated 87,302 drug injectors which corresponds to 2.49 per thousand population aged 15 to 64.

Table 4.1 summarises the national prevalence estimates along with their associated confidence intervals.

Table 4.1: National prevalence estimates and rates per thousand aged 15 to 64 with 95% confidence intervals

Drug	Estimate	95% Confidence Interval	Rate	95% Confidence Interval
OCU	293,879	291,029 – 302,146	8.40	8.32 – 8.63
Opiate	256,163	253,751 – 263,501	7.32	7.25 – 7.53
Crack	166,640	161,621 – 173,706	4.76	4.62 – 4.96
Injecting	87,302	85,307 – 90,353	2.49	2.44 – 2.58

⁶ For comparability with previous years, estimates were first derived for the higher level areas of Bedfordshire and Cheshire and although the capture-recapture method was attempted, both areas received estimates derived using the multiple indicator method. Estimates for the newer areas of Bedfordshire, Central Bedfordshire, Cheshire East and Cheshire West and Chester were derived using the same multiple indicator model, with a correction factor applied to ensure that the lower level estimates sum to the relevant higher level estimates.

Table 4.2 presents the prevalence estimates by region for OCU, opiate use, crack cocaine use and drug injecting. Table 4.3 presents the prevalence estimates per thousand of the population aged 15 to 64. Confidence intervals for these estimates are shown in the later tables which consider the difference between the two sweeps.

Table 4.2: Estimated number of opiate and/or crack users (OCUs), opiate users, crack cocaine users and drug injectors by region.

Region	OCU	Opiate	Crack	Injecting
East of England	21,952	19,263	13,163	6,650
East Midlands	24,085	21,465	11,687	7,808
London	54,985	43,918	40,080	11,351
North East	16,935	15,276	5,544	6,334
North West	46,337	42,073	25,361	13,110
South East	32,935	28,068	18,360	11,047
South West	26,051	23,082	13,548	10,134
West Midlands	34,329	30,706	19,891	9,175
Yorkshire and the Humber	36,270	32,312	19,006	11,692
ENGLAND	293,879	256,163	166,640	87,302

Table 4.3: Estimated prevalence of opiate and/or crack use (OCU), opiate use, crack cocaine use and drug injecting by region (per thousand population aged 15 to 64).

Region	OCU	Opiate	Crack	Injecting
East of England	5.79	5.08	3.47	1.75
East Midlands	8.10	7.22	3.93	2.62
London	9.55	7.63	6.96	1.97
North East	9.89	8.92	3.24	3.70
North West	9.99	9.07	5.47	2.83
South East	5.86	4.99	3.27	1.97
South West	7.69	6.81	4.00	2.99
West Midlands	9.45	8.45	5.48	2.53
Yorkshire and the Humber	10.44	9.30	5.47	3.37
ENGLAND	8.40	7.32	4.76	2.49

In terms of regional differences, Yorkshire and the Humber has the highest prevalence of opiate and/or crack use at 10.44 per thousand population aged 15 to 64 followed by the North West at 9.99 and the North East at 9.89. The East of England and the South East have the lowest prevalence of opiate and/or crack use at 5.79 and 5.86 per thousand population, respectively. When considering opiate use prevalence, the highest prevalence rates are in Yorkshire and the Humber at 9.30 and the North West at 9.07. The lowest prevalence rates of opiate use are in the South East and the East of England at 4.99 and 5.08 per thousand population, respectively. London has the highest estimated prevalence of crack cocaine use at 6.96 per thousand population followed by 5.48 in the West Midlands and 5.47 in both the North West and Yorkshire and the Humber. The North East has the highest injecting prevalence at 3.70 per thousand population.

Stratified Prevalence Estimates: Age group

Information on the differing prevalence of opiate and/or crack use in three different age groups is presented in Tables 4.4 to 4.6. The prevalence estimates (and 95% confidence intervals) are presented first, then the estimates as percentages of the total number of OCUs within the age groups 15 to 24, 25 to 34 and 35 to 64, followed by the corresponding prevalence rates.

Table 4.4: Estimated number of opiate and/or crack users (OCUs) by age group and region with 95% confidence intervals.

Region	15 to 24 years			25 to 34 years			35 to 64 years		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	2,546	2,195	3,157	7,775	7,017	8,617	11,631	10,461	12,921
East Midlands	3,087	2,604	3,937	10,495	9,445	11,386	10,504	9,436	11,372
London	7,648	7,076	8,957	17,660	16,957	18,732	29,677	28,452	30,988
North East	2,093	1,904	2,481	7,988	7,566	8,310	6,854	6,546	7,265
North West	3,578	3,159	4,585	13,150	12,362	14,089	29,610	27,883	30,755
South East	4,202	3,797	4,931	11,557	10,728	12,549	17,176	15,950	18,479
South West	3,123	2,482	4,365	9,515	8,871	10,204	13,413	12,620	14,245
West Midlands	3,369	3,003	4,105	15,686	14,671	16,812	15,273	14,167	16,500
Yorkshire and the Humber	2,983	2,653	3,852	15,298	14,464	16,136	17,989	17,101	19,015
ENGLAND	32,628	31,168	36,992	109,124	106,530	111,795	152,127	148,576	155,156

Table 4.5 Estimated age group breakdown for opiate and/or crack use by region with 95% confidence intervals. (Row percentages)

Region	15 to 24 years			25 to 34 years			35 to 64 years		
	%	95% CI		%	95% CI		%	95% CI	
East of England	11.60	11.14	13.81	35.42	33.35	36.88	52.99	50.49	54.86
East Midlands	12.81	11.64	16.25	43.58	41.39	44.90	43.61	41.17	45.11
London	13.91	13.91	15.97	32.12	30.89	33.04	53.97	52.04	54.42
North East	12.36	12.26	14.53	47.17	45.04	47.69	40.47	38.94	41.69
North West	7.72	7.72	9.83	28.38	26.99	29.72	63.90	61.39	64.49
South East	12.76	12.47	14.56	35.09	33.47	36.30	52.15	50.04	53.51
South West	11.99	10.28	16.36	36.52	34.29	38.09	51.49	48.67	52.85
West Midlands	9.81	9.47	11.65	45.69	43.39	47.26	44.49	42.36	46.41
Yorkshire and the Humber	8.22	8.12	10.37	42.18	40.42	42.91	49.60	47.93	50.61
ENGLAND	11.10	11.10	12.45	37.13	36.33	37.36	51.77	50.68	51.82

Table 4.6: Opiate and/or crack use prevalence rates per thousand population, by age group and region with 95% confidence intervals.

Region	15 to 24 years			25 to 34 years			35 to 64 years		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	3.57	3.08	4.42	10.67	9.63	11.82	4.95	4.45	5.50
East Midlands	5.13	4.33	6.55	19.18	17.26	20.81	5.75	5.17	6.23
London	6.99	6.46	8.18	10.76	10.33	11.41	9.82	9.42	10.26
North East	5.96	5.42	7.06	25.25	23.92	26.27	6.56	6.26	6.95
North West	3.79	3.35	4.86	14.64	13.76	15.68	10.58	9.97	10.99
South East	3.90	3.53	4.58	10.82	10.05	11.75	4.94	4.59	5.32
South West	4.72	3.75	6.60	15.66	14.61	16.80	6.33	5.95	6.72
West Midlands	4.50	4.01	5.48	22.14	20.71	23.73	7.02	6.51	7.59
Yorkshire and the Humber	4.09	3.64	5.29	22.80	21.56	24.05	8.67	8.24	9.16
ENGLAND	4.71	4.50	5.35	15.18	14.82	15.56	7.28	7.11	7.43

Table 4.6 shows that there is regional variation in the age distribution of opiate and/or crack use. The North West has the highest prevalence rate in the 35 to 64 age range at over 10 per thousand. London has the highest prevalence rate in the 15 to 24 age range, followed by the North East. Meanwhile the North East has the highest prevalence rate in the 25 to 34 age range which, at just over 25 per thousand, is much greater than the other regions.

Comparing estimates from different sweeps

Table 4.7 presents information on the change between sweep 7 and sweep 8 in the opiate and/or crack use estimates at the regional and national level. A negative difference, for example between sweep 7 and sweep 8, demonstrates that the prevalence has gone down. Where there has been a statistically significant difference, this has been noted by *↓ (for a decrease) or *↑ (for an increase).

Table 4.7: Estimated number of opiate and/or crack users by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	23,851	21,264	26,738	21,952	20,103	24,379	-1,900	-5,531	1,624
East Midlands	24,208	22,398	26,054	24,085	22,134	25,947	-123	-2,965	2,602
London	52,623	50,844	54,660	54,985	53,831	57,864	2,362	478	5,770
North East	18,290	17,729	19,689	16,935	16,467	17,762	-1,355	-2,681	-392
North West	49,426	47,465	52,032	46,337	44,529	48,643	-3,089	-6,245	-171
South East	33,170	30,990	35,950	32,935	30,923	35,390	-234	-3,681	2,887
South West	27,379	26,334	29,106	26,051	25,034	27,561	-1,328	-3,193	401
West Midlands	34,498	32,693	36,591	34,329	32,487	36,644	-169	-2,827	2,700
Yorkshire and the Humber	35,308	33,841	37,294	36,270	34,926	38,301	963	-1,198	3,599
ENGLAND	298,752	294,858	307,225	293,879	291,029	302,146	-4,873	-13,424	3,833

*↑
*↓
*↓

Table 4.8: Estimated number of opiate users by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	20,586	18,571	22,916	19,263	17,815	21,345	-1,322	-4,082	1,664
East Midlands	20,756	19,594	22,060	21,465	19,749	23,155	709	-1,606	2,577
London	42,588	41,537	44,635	43,918	42,928	46,538	1,330	-778	4,127
North East	16,455	16,042	17,400	15,276	14,868	16,072	-1,179	-2,185	-340
North West	43,704	42,061	46,043	42,073	40,550	44,403	-1,632	-4,488	1,173
South East	29,260	27,812	31,328	28,068	25,831	30,521	-1,192	-4,235	1,575
South West	24,632	23,905	26,380	23,082	22,244	24,552	-1,550	-3,414	-69
West Midlands	31,046	29,722	32,897	30,706	28,971	32,659	-339	-2,825	1,878
Yorkshire and the Humber	32,765	31,700	34,469	32,312	30,942	34,254	-453	-2,594	1,557
ENGLAND	261,792	259,260	269,025	256,163	253,751	263,501	-5,629	-12,310	1,623

*↓

*↓

Table 4.9: Estimated number of crack cocaine users by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	13,093	10,947	15,304	13,163	10,707	15,636	70	-3,205	3,588
East Midlands	12,110	10,444	13,855	11,687	10,119	13,532	-423	-2,684	1,935
London	39,934	38,375	41,757	40,080	38,300	41,997	146	-2,292	2,577
North East	5,567	4,630	6,649	5,544	4,600	6,563	-24	-1,556	1,370
North West	27,407	25,432	29,496	25,361	23,219	27,578	-2,046	-5,084	893
South East	18,583	16,444	20,759	18,360	15,585	21,357	-223	-3,924	3,464
South West	14,386	12,886	16,092	13,548	12,145	15,342	-838	-3,148	1,455
West Midlands	20,754	18,822	22,745	19,891	17,795	22,012	-863	-3,731	1,885
Yorkshire and the Humber	18,793	17,318	20,541	19,006	17,488	20,828	213	-2,177	2,504
ENGLAND	170,627	165,877	176,692	166,640	161,621	173,706	-3,987	-11,992	3,861

Thus comparing the estimated numbers between sweep 7 and sweep 8, there has been a fall in the number of opiate and/or crack cocaine users. The estimated number of opiate users and crack cocaine users has also reduced. While none of these reductions were statistically significant at the national level, there have been statistically significant reductions in opiate and/or crack cocaine use and opiate use at the regional level in some regions.

Table 4.10: Estimated number of opiate and/or crack users aged 15 to 24 by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference			
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI		
East of England	3,795	3,227	4,468	2,546	2,195	3,157	-1,250	-1,920	-470	*↓
East Midlands	3,545	3,106	4,280	3,087	2,604	3,937	-459	-1,280	488	
London	8,394	7,728	9,102	7,648	7,076	8,957	-745	-1,499	484	
North East	2,793	2,537	3,161	2,093	1,904	2,481	-700	-1,102	-342	*↓
North West	5,450	4,926	6,162	3,578	3,159	4,585	-1,872	-2,584	-973	*↓
South East	4,735	4,223	5,267	4,202	3,797	4,931	-533	-1,205	150	
South West	2,997	2,753	3,284	3,123	2,482	4,365	126	-557	1,270	
West Midlands	5,006	4,607	5,531	3,369	3,003	4,105	-1,636	-2,168	-927	*↓
Yorkshire and the Humber	4,794	4,261	5,402	2,983	2,653	3,852	-1,811	-2,350	-950	*↓
ENGLAND	41,508	39,859	43,141	32,628	31,168	36,992	-8,881	-10,219	-5,566	*↓

Table 4.11: Estimated number of opiate and/or crack users aged 25 to 34 by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	8,600	7,621	9,673	7,775	7,017	8,617	-825	-2,132	447
East Midlands	10,592	9,660	11,502	10,495	9,445	11,386	-97	-1,508	1,327
London	16,865	16,002	17,639	17,660	16,957	18,732	795	-217	2,285
North East	8,972	8,520	9,657	7,988	7,566	8,310	-984	-1,830	-481
North West	14,916	14,110	15,837	13,150	12,362	14,089	-1,767	-2,967	-558
South East	12,327	11,354	13,374	11,557	10,728	12,549	-770	-2,170	522
South West	10,562	9,928	11,311	9,515	8,871	10,204	-1,047	-2,075	-135
West Midlands	15,564	14,550	16,549	15,686	14,671	16,812	122	-1,263	1,697
Yorkshire and the Humber	15,067	14,277	15,878	15,298	14,464	16,136	231	-867	1,377
ENGLAND	113,466	110,867	116,238	109,124	106,530	111,795	-4,342	-8,133	-417

*↓
*↓
*↓
*↓

Table 4.12: Estimated number of opiate and/or crack users aged 35 to 64 by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	11,456	10,164	12,880	11,631	10,461	12,921	175	-1,810	1,967
East Midlands	10,071	9,249	10,919	10,504	9,436	11,372	433	-973	1,613
London	27,364	26,023	28,406	29,677	28,452	30,988	2,312	881	4,237
North East	6,525	6,199	7,076	6,854	6,546	7,265	329	-261	854
North West	29,060	27,566	30,444	29,610	27,883	30,755	550	-1,672	2,343
South East	16,107	15,076	17,663	17,176	15,950	18,479	1,069	-1,040	2,709
South West	13,820	13,178	14,628	13,413	12,620	14,245	-407	-1,581	541
West Midlands	13,928	12,983	14,888	15,273	14,167	16,500	1,346	-109	2,792
Yorkshire and the Humber	15,447	14,665	16,352	17,989	17,101	19,015	2,543	1,248	3,855
ENGLAND	143,778	140,952	147,331	152,127	148,576	155,156	8,350	2,903	12,439

*↑
*↑
*↑

Tables 4.10 to 4.12 compare the age-specific opiate and/or crack cocaine estimates between sweep 7 and sweep 8. There were significant decreases in the 15 to 24 age group and the 25 to 34 age group estimates. There was, however, a significant increase in the number of opiate and/or crack cocaine users in

the older 35 to 64 age group. The increase in the older age group may be mainly due to a cohort of drug users ageing and moving from the 25 to 34 age group to the 35 to 64 age group rather than people beginning to use drugs.

Table 4.13 compares the estimated number of drug injectors by region between sweep 7 and sweep 8.

Table 4.13: Estimated number of drug injectors by region in 2010/11 (sweep 7) and 2011/12 (sweep 8).

Region	Sweep 7			Sweep 8			Difference		
	Estimate	95% CI		Estimate	95% CI		Estimate	95% CI	
East of England	7,260	6,042	8,634	6,650	5,995	7,386	-610	-2,031	871
East Midlands	8,593	7,729	9,541	7,808	6,989	8,630	-785	-2,025	377
London	11,586	10,918	12,439	11,351	10,711	12,347	-234	-1,254	978
North East	7,383	6,923	7,922	6,334	5,948	6,770	-1,049	-1,682	-438
North West	14,731	13,706	15,895	13,110	12,233	14,305	-1,621	-3,028	35
South East	10,007	8,756	11,488	11,047	9,635	12,368	1,040	-908	2,789
South West	11,119	10,384	11,943	10,134	9,474	10,958	-984	-2,010	167
West Midlands	9,844	8,928	10,792	9,175	8,281	10,082	-669	-2,047	631
Yorkshire and the Humber	12,880	12,064	13,760	11,692	11,024	12,457	-1,187	-2,318	-71
ENGLAND	93,401	90,974	96,757	87,302	85,307	90,353	-6,099	-9,796	-1,998

*↓

*↓

*↓

There has been a significant decrease in the number of injectors between sweep 7 (2010/11) and sweep 8 (2011/12).

5. Discussion and Conclusion

This report has presented estimates for the prevalence of problem drug use (defined as opiate and/or crack cocaine), opiate use, crack cocaine use and drug injecting for the financial year 2011/12. A similar approach was taken to producing these estimates as for the three consecutive sweeps for the years 2004/05, 2005/06 and 2006/07 and three consecutive sweeps for 2008/09, 2009/10 and 2010/11 (sweep 5, sweep 6 and sweep 7). Comparisons between the results of sweep 7 (2010/11) and the sweep 8 (2011/12) at the regional and national level have been presented in this report. DAT area comparisons have also been made and those results are to be found in a series of regional reports.

Nationally, there was a reduction in prevalence of opiate and/or crack cocaine use between 2010/11 and 2011/12 and there was also a decrease in the prevalence of opiate use. Neither of these reductions were statistically significant. The crack cocaine estimate decreased and this decrease was not statistically significant. There were also statistically significant decreases in the prevalence of opiate and/or crack cocaine use within the 15 to 24 and 25-34 age groups and an increase in the number of opiate and/or crack cocaine users in the older 35 to 64 age group. The prevalence of drug injecting has also significantly decreased between 2010/11 and 2011/12.

The study has again demonstrated that it is possible to use the capture-recapture method and the multiple indicator method to successfully estimate the prevalence of opiate and/or crack cocaine use in a systematic manner.

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