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Quantifying Problematic Drug Use Within Liverpool and Sefton Drug [and Alcohol] Action Teams (2000/1 and 2001/2)

Capture-Recapture Analysis

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1.0 Executive Summary

The North West of England is a densely populated, mainly urban area where inhabitants generally have poor health overall. In 2001/2 a total of 2,350 residents of Liverpool Drug and Alcohol Action Team (DAAT) and 882 residents of Sefton Drug Action Team (DAT) made demands for structured drug treatment. Monitoring the drug use pattern in Liverpool (and indeed other urban areas) is useful as there tends to be a diffusion of drug use trends from urban to rural settings and therefore provides D[A]ATs in rural areas with advanced warning of changing trends. Liverpool, and to a certain degree Sefton, therefore act as a barometer of drug use issues for Cheshire and Merseyside in general.

Capture-recapture analysis provides a means of determining the size of the drug using population within a particular area where individuals are recorded on multiple independent databases. Here, capture-recapture estimates are reported for all problematic drug users resident in Liverpool and Sefton D[A]ATs in 2000/1 and 2001/2, and comparisons with estimates from previous years are provided. Estimates presented throughout this report represent problematic drug use and do not include those individuals that may use the drugs in question (opiates, crack and cocaine) with no health or legislative problems. Estimates are therefore not a quantification of *everyone* that uses these drugs.

It is envisaged that this report will provide Liverpool and Sefton D[A]ATs with intelligence to supplement regional and national monitoring data and therefore assist in providing a greater understanding of problematic drug use within various population sub-groups within each area.

1.1 Estimated Problematic Drug Use in Liverpool DAAT: Key Findings

Summary of Key Findings: Liverpool DAAT

		Capture-recapture estimates					
		1998			2001/2		
		N	Per 1,000 population	% contacting treatment	N	Per 1,000 population	% contacting treatment
	Total	7121	34.5	26.6	6170	31.6	34.4
Sex	Male	5471	52.2	22.1	4775	51.2	30.2
	Female	1702	16.8	40.1	1339	13.1	50.7
Age (Years)	15-24	1344	19.1	21.0	1563	22.1	11.6
	25-44	5805	42.7	27.8	4753	38.2	40.8

Liverpool DAAT experienced a reduction in the estimated number of problematic drug users between 1998 and 2001/2 (7,121 and 6,170 respectively). This represented a fall in problematic drug use prevalence from 34.5 to 31.6 per 1,000 of population during this timeframe. Despite this fall, treatment data show an increase in the number of problematic drug users that made demands for structured drug treatment. The estimated proportion of problematic drug users seeking assistance therefore correspondingly rose from 26.6% in 1998 to 34.4% in 2001/2. Liverpool DAAT can therefore demonstrate that they have not only increased the number of individuals

demanding treatment (an aim of the National Treatment Agency) but in addition, and equally important, the proportion.

Falls in the estimated number of problematic drug users in Liverpool DAAT between 1998 and 2001/2 have occurred in both sexes. The estimated number of male problematic drug users fell from 5,471 to 4,775 and females fell from 1,702 to 1,339 during this period. When expressed as a proportion of the whole population in Liverpool DAAT (ages 15 to 44 years), male problematic drug use fell slightly (52.2 to 51.2 per 1,000 of population) and female problematic drug use fell more comprehensively (16.8 to 13.1 per 1,000 of population).

It was estimated that the majority of problematic drug users in Liverpool DAAT in 2001/2 were aged between 25 and 44 years with approximately one quarter (24.7%) aged between 15 and 24 years. This compares to 1998, when 18.8% of the estimated total number of problematic drug users were in the younger age category. Estimates for those aged 15 to 24 years have risen from 1,344 in 1998 to 1,563 in 2001/2 with a corresponding increase in prevalence from 19.1 to 22.1 per 1,000 of population. The reverse is true for those in the older age category with estimates declining from 5,805 in 1998 to 4,753 in 2001/2 and the prevalence falling accordingly from 42.7 to 38.2 per 1,000 of population. Dissuading young individuals from starting drug use, or preventing this drug use from becoming problematic is a challenge for Liverpool DAAT.

Calculating the number of individuals having contacted a treatment agency as a proportion of the estimated total number of problematic drug users provides a measure of service penetration. Overall in Liverpool DAAT in 2001/2, an estimated 34.4% of individuals had contact with drug services compared, to 26.6% in 1998. As in 1998, females were more likely to engage in dialogue with treatment services in 2001/2 than their male counterparts. Whilst 50.7% of females had sought structured assistance in 2001/2, only 30.2% of males had done likewise. Liverpool DAAT has been successful in increasing service uptake by older problematic drug users with 27.8% of those aged 25 to 44 years contacting drug services in 1998 compared to 40.8% in 2001/2. However, the increase in the estimated prevalence of problematic drug use of those aged 15 to 24 years between 1998 and 2001/2 was not mirrored by an increase in the number receiving treatment. In 1998, 21.0% of those in this age group had been seen by drug treatment agencies, compared to just 11.6% in 2001/2. Thus, Liverpool DAAT must work hard to attract young drug users and in particular young male drug users into treatment.

1.2 Estimated Problematic Drug Use in Sefton DAT: Key Findings

Summary of Key Findings: Sefton DAT

		Capture-recapture estimates					
		1999			2001/2		
		N	Per 1,000 population	% contacting treatment	N	Per 1,000 population	% contacting treatment
	Total	2395	21.6	30.6	1968	18.6	40.5
Sex	Male	1821	32.6	25.8	1319	25.8	39.3
	Female	550	10.0	48.0	706	13.0	39.5
Age (Years)	15-24	603	19.6	14.1	262	8.5	25.2
	25-44	1793	22.4	36.1	1751	23.5	41.8

Estimated levels of problematic drug use in Sefton DAT have declined between 1999 and 2001/2 (2,395 and 1,968 respectively) despite a small increase between 2000/1 and 2001/2. This relates to an overall fall in estimated prevalence from 21.6 per 1,000 of population in 1999 to 18.6 per 1,000 of population in 2001/2 (16.2 in 2000/1). Sefton DAT should be encouraged by treatment penetration figures for this time period, with an estimated 30.6% of all problematic drug users contacting treatment agencies in 1999, compared to 35.7% in 2000/1 and 40.5% in 2001/2. This increase was despite a fall in the number of individuals contacting drug services between 2000/1 and 2001/2 and illustrates the benefits of capture-recapture analysis in providing improved intelligence of local drug use patterns.

Consideration of stratified estimates show that the fall in number and prevalence of problematic drug use in Sefton DAT was confined to males only. Estimated levels of male problematic drug use fell from 1821 in 1999 (32.6 per 1,000 of population) to 1319 (25.8 per 1,000 of population) in 2001/2. Conversely, estimated female problematic drug use has risen between 1999 and 2001/2. Initially, female rates fell from 10.0 per 1,000 of population in 1999 (or 550 estimated female problematic drug users) to 8.3 per 1,000 of population in 2000/1 (or 450 estimated female problematic drug users). However the estimated number of female drug users increased dramatically the following year to 706 or 13.0 per 1,000 of population.

Falls in the estimated male drug using population has resulted in increased male treatment penetration levels with Sefton DAT being successful in increasing the estimated proportion of males in contact with drug treatment agencies from 25.8% in 1999 to 32.1% in 2000/1 to 39.3% in 2001/2. Increasing estimated levels of female problematic drug use have not been mirrored by increasing service contact, with the estimated proportion of female drug users falling from 48.0% in 1999 to 46.7% in 2000/1 and 39.5% in 2001/2. Sefton DAT must therefore work hard to attract these 'new' female drug users into treatment but should be encouraged by rising male penetration levels as males have traditionally been more reluctant to seek assistance for their drug use.

In 2001/2, the estimated prevalence of problematic drug use among those aged 15 to 24 years remains lower than the estimated prevalence of those aged 25 to 44 years (8.5 and 23.5 per 1,000 of population respectively). The estimated number of problematic drug users aged 15 to 24 years has fallen between 1999 and 2001/2 despite a small rise between 2000/1 and 2001/2 (1999; 603, 2000/1; 216 and 2001/2;

262). Prevalence rates have fallen accordingly. Treatment penetration estimates, however, show that the fall in the number of problematic drug users aged 15 to 24 years has not been mirrored by a fall in those contacting treatment agencies. Therefore, whilst only 14.1% of those aged 15 to 24 years had contacted a drug service in 1999, 25.2% had done likewise in 2001/2.

Estimated rates of problematic drug use in the older age category have fluctuated from 1,793 in 1999 (22.4 per 1,000 of population) to 1,426 in 2000/1 (19.1 per 1,000 of population) and 1,751 in 2001/2 (23.5 per 1,000 of population). However treatment penetration levels for this age group have steadily increased indicating a rise in the proportion of problematic drug users contacting drug services. In 1999, 36.1% of individuals aged between 25 and 44 years had contacted treatment, rising to 38.4% in 2000/1 and 41.8% in 2001/2. Sefton DAT should be pleased with rising treatment penetration levels in both age categories whilst acknowledging the continuing challenges of attracting younger problematic drug users into treatment.

1.3 Future Developments in Capture-Recapture Analysis and Drug Related Intelligence

The Drug Monitoring Unit is currently implementing a comprehensive audit of all treatment data and is involved with collaborative work to develop improved capture-recapture data analysis techniques. It is the intention of the authors of this report to conduct enhanced capture-recapture estimates for 1998 onwards during 2004. This will include estimates for both all problematic drug use and injecting drug use for each year for each D[A]AT. Capture-recapture results will then be utilised to provide prevalence estimates over time. Analyses will be stratified to allow gender and age specific estimates to be generated and treatment penetration levels for each group will be given.

2.0 Introduction

2.1 Project Introduction

This work was commissioned by Liverpool and Sefton Drug [and Alcohol] Action Teams (D[A]ATs) and aimed to quantify the total number of problematic drug users resident within these two areas in 2000/1 and 2001/2. Comparable estimates for 1998 (Liverpool DAAT) and 1999 (Sefton DAT) have been reported previously (Beynon et al., 2001a) and are quoted throughout this report. However, the Drug Monitoring Unit is currently involved in collaborative work to develop and enhance capture-recapture data analysis to improve the robustness of the data and provide estimates for injecting drug use. The Unit is also currently involved in an audit of all data supplied by treatment providers. It is therefore the intention of the authors of this report to conduct enhanced capture-recapture estimates for Liverpool and Sefton D[A]ATs for the years 1998 onwards during 2004.

2.2 Drug Monitoring and ‘Hidden’ Drug Use

A key Government target is to increase the number of drug users in contact with treatment agencies (Department of Health, 2002), acknowledging that engagement in treatment programmes has a positive effect both in terms of improving the health of the individual drug user and reducing recidivism often associated with problematic drug use (Squires et al., 1995; Merrill et al., 1999; Gossop, 2000). A number of local and national monitoring systems exist which can be utilised to quantify the number of drug users in contact with treatment services in any particular geographical area. On a national level, the National Drug Treatment Monitoring System (NDTMS), which became operational on 1st April 2001, records data on drug users who present for structured treatment (Tiers 3 and 4 as defined in the Models of Care Document) (National Treatment Agency, 2002). However, the use of monitoring systems to determine the size of a drug using population is inexact, with high numbers of notifications possibly reflecting a high level of service provision and engagement as much as high levels of drug use. Therefore, whilst increasing the number of drug users engaged in treatment is important, it is critical to increase the *proportion* of drug users engaged in treatment, with the total number of drug users within a population changing over time.

Determining the proportion of drug users within a population that are in contact with treatment demands intelligence outside the scope of existing monitoring systems. Similarly, it is difficult to use such systems to monitor other key Government targets which require the consideration of proportions; reducing the proportion of people under the age of 25 years reporting the use of illegal drugs (Department of Health, 2002). Such proportional information can only be calculated if the total number of drug users, both those in contact and not in contact with drug services, is known. Quantifying the ‘hidden’ population of drug users, those not in contact with treatment services, poses problems due to the illicit and therefore covert nature of the activity. It is impossible to conduct a survey simply asking every member of a given population if they use drugs and even extrapolating sample data to give population estimates proves problematic. This has been demonstrated by the 2001 British Crime

Survey where the number of heroin users estimated by the survey (Aust et al., 2002) was lower than the number known to have presented to treatment agencies and GPs (Department of Health, 2001). However, quantifying the number of drug users not in contact with services is equally important from a strategic planning perspective, as knowing the number already engaged in treatment.

2.3 Capture-Recapture Analysis

Prevalence estimates of the hidden drug using population have often involved extensive field work which can prove time consuming and expensive to conduct (Squires et al., 1995). Capture-recapture analysis provides an alternative means by which the hidden population of drug users can be estimated. Combining the hidden population with that known to be in contact with services provides an estimate for the total number of drug users. The technique was originally employed to estimate the size of certain animal populations (Begon, 1976) but has, more recently, been used to estimate the size of human populations to provide a prevalence for certain conditions, including drug use (Bloor et al., 1991; Squires et al., 1995; Hay and McKeganey, 1996; Hickman et al., 1999; Beynon et al., 2001a; Hickman et al., in press). For human populations, the capture-recapture technique utilises multiple databases all of which are capable of capturing, or recording, individuals exhibiting the particular condition or behaviour in question. The pattern of overlap is, using log linear modelling (Cormack, 1989), used to estimate the number of individuals within the population that have the particular characteristic but who do not appear on any of the databases: the hidden population. Stratifying the capture-recapture estimates (i.e. providing estimates by age or sex) provides a more in depth understanding of changing patterns of drug use, facilitates the evaluation of effectiveness of interventions and services in attracting sub-groups of drug users into treatment and enables resources to be targeted at the most appropriate and under served sub-sections of the population.

2.4 Drug Monitoring and Associated Databases in Merseyside

The Drug Monitoring Unit at Liverpool John Moores University (and previously sited in the University of Liverpool) has been involved with national drug monitoring since 1990/1991 when the national Drug Misuse Database (DMD) became operational (the database pre-dating the current NDTMS). Data on drug users in contact with drug services in the Cheshire and Merseyside area were collected by the regional DMD and more recently the NDTMS and collated at the Drug Monitoring Unit, with (non-attributable) information feeding into the central system situated at the National Treatment Agency (previously at the Department of Health). Data were collected using these systems in regional centres across the country. Whilst this national system formed the only source of drug monitoring data in the majority of the country, the North West of England was somewhat unique in its development of additional systems of monitoring to co-exist with national requirements. The Prevalence and Outcomes Database in Cheshire and Merseyside became operational in 1996 and collected data on all drug users in contact with treatment services each year, rather than only considering new contacts as the DMD was designed to do. Due to the similarities between the two databases, the Prevalence and Outcomes Database ceased

collecting data when the NDTMS became operational. Syringe exchange data have been collected by the Drug Monitoring Unit since 1990 and data collection from both agency and pharmacy based syringe exchange schemes is well established. The Merseyside Inter Agency Drug Misuse Database (IAD) was established in 1997 and added Prison, Police and Probation data to that which was already collected. Since this time, the IAD has endeavoured to expand its sources of drug related data and further enhance drug monitoring. The Drug Monitoring Unit is also responsible for the collation of Cheshire and Merseyside data for the national Arrest Referral scheme with collation commencing in 2000. It is the collection of a range of data sources that makes capture-recapture analyses in the Merseyside region possible as a minimum of three independent databases are required.

Data relating to drug use are therefore received by the Drug Monitoring Unit from a variety of health and criminal justice related sources. It is vital from a monitoring, epidemiological and research perspective, that data received by the unit can be attributed to a particular individual. It is important to ascertain if ten records relate to ten different individuals, or the same individual on ten different occasions. However, drug use is a sensitive issue and it is vital to maintain the anonymity of those whose data are stored within the various databases. An individual is therefore assigned their own unique attributor code comprised of their initials, date of birth and sex. Use of an attributor code has been previously validated (Crabbe and Donmall, 1996) and provides a means by which data can be attributed to an individual without the need to store names or other pieces of information that would identify a particular person. It is this attributor code that is used to ascertain the overlap of individuals across databases and produce capture-recapture estimates. In addition to the attributor code, each agency providing drug monitoring data is required to provide some geographical data relating to each individual, usually the area and district part of the individual's postcode. This allows for the estimation of the total number of drug users by individual D[A]AT areas. Here only estimates for Liverpool and Sefton D[A]ATs are presented, although estimates for the whole of Merseyside have previously been reported (Beynon et al., 2001a).

2.5 Problematic Drug Use

In recent years there has been a shift in emphasis towards targeting interventions at those most at risk of harm to themselves or society, recognising that some individuals use some drugs with less apparent consequences. As a result, the term 'problematic drug use' has become established. It is now problematic drug users, or those individuals 'whose addiction and chaotic lifestyles are most harmful, both to themselves and others' that form the main focus of government policy (Department of Health, 2002). How problematic the use of a particular drug is depends on a range of factors including the drug, how frequently it is used, the mode of administration and a set of psychosocial factors personal to the individual. Problematic drug use is often associated with the use of opiates, cocaine and crack. However, even prescription drugs can be problematic if administered contrary to directions and used in high dosages. To allow for robust analyses, only those who were recorded by a syringe exchange scheme (excluding steroid users) or who were recorded by the other datasets as users of opiates, crack or cocaine are commented upon in this report because use of other drugs was not sufficiently represented in the NDTMS system. This report

focuses on problematic drug use only as it considers individuals recorded in drug treatment, at syringe exchange schemes and those in contact with criminal justice organisations, contact with any such organisation indicating problematic drug use. Estimates presented throughout this report are not a quantification of everyone that uses opiates, crack and cocaine in that they do not include those that use heroin, crack and cocaine, possibly infrequently, and whose use is not problematic in terms of having adverse health, social or legislative consequences.

2.6 Drug Use in Liverpool and Sefton D[A]ATs

The North West of England is predominantly urban and densely populated, with inhabitants having poor health overall compared to the national average (Donaldson, 2003). According to the 2001 population census, the Merseyside metropolitan county had 647,269 and 714,765 male and female inhabitants respectively. Of the five Local Authorities (LA) in Merseyside, Liverpool LA had the highest number of residents: 209,785 and 229,691 males and females respectively in 2001, whilst Sefton LA had 133,485 male and 149,471 female residents. Between 1st April 2001 and 31st March 2002, 2,350 individuals resident in Liverpool DAAT and 882 individuals resident in Sefton DAT made demands for treatment to drug services within Cheshire and Merseyside Strategic Health Authority (SHA) (Jones and Beynon, 2003). These figures include both those who made new demands for treatment within the year and also those that were in contact with a treatment agency on 1st April 2001. Figures represent an increase on the previous year in the number of individuals resident in Liverpool DAAT contacting services and a small decrease in Sefton DAT. In both D[A]ATs, females constituted approximately one third of those contacting services, a similar pattern being evident in previous years (Birtles and Bellis, 2000; Beynon et al., 2001b). Heroin continued to be the drug which the majority of individuals perceived to be the most problematic although over 30% of Liverpool DAAT residents were users of crack (Beynon et al., 2003). Monitoring the pattern of drug use in Liverpool, and to a lesser degree Sefton, is useful in that trends tend to diffuse from urban to rural areas. Trends developing in Liverpool and Sefton can therefore be monitored by more rural D[A]ATs to provide advanced warning of developing issues (McVeigh et al., 2003).

2.7 Aims of the Study

The aims of the study were as follows;

- Quantify the number of problematic drug users resident within Liverpool and Sefton D[A]ATs between 1998/9 and 2001/2.
- Quantify the number of injecting drug users in Liverpool and Sefton D[A]ATs during the same time period.
- Explore sex and age differences relating to the number of problematic drug users and injecting drug users within Liverpool and Sefton D[A]ATs.
- Provide estimates for service penetration, stratified by sex and age, of problematic drug use and injecting drug use within Liverpool and Sefton D[A]ATs.

3.0 Methodology

Three data sources were required for each capture-recapture analysis (Bishop et al., 1995). To estimate the total number of drug users in Liverpool and Sefton D[A]ATs, NDTMS/Prevalence, Probation and Police datasets were used. Analyses for injectors were run using the NDTMS/Prevalence, Arrest Referral and agency based syringe exchange datasets and NDTMS/Prevalence, agency based syringe exchange and pharmacy based syringe exchange datasets to estimate the total number of injecting drug users in each D[A]AT area. A short description of each data source is given in Box 1. In each case, individuals were considered to be problematic drug users if they were recorded as being in contact with a syringe exchange scheme and thus an injector (with the exception of steroid users) or they were recorded by any other data source as a user of opiates, cocaine or crack (main and secondary drugs were considered). The exception to this rule was Probation data for 2000/1 where users of other drugs could not be removed from the analyses due to limitations in the reporting of drug data from the Probation Service for this year. Individuals who were users of other drugs were excluded from the analyses as other drug types were not sufficiently represented on the NDTMS database to allow prevalence estimates to be made.

It was possible for an individual to be recorded more than once on a single database between 1st April 2001 and 31st March 2002, for example, where an individual had been recorded by the NDTMS as being in contact with two or more treatment agencies. Where this occurred in the NDTMS, Arrest Referral and agency and pharmacy based syringe exchange databases the individual's last record of the reporting period was used to determine drug information and area of residence. Where multiple records occurred in the Probation or Police databases the individual's most 'serious' record was included. For example if an individual had a conviction associated with cannabis use and a second associated with heroin use the second record was included to ensure users of opiates, crack and cocaine were not inadvertently eliminated from analyses.

In a small number of cases, conflicting information for an individual's area of residence was evident when the multiple databases were combined. Where this occurred, residency was decided by using the information in the datasets in the following order (decreasing priority):

1. NDTMS D[A]AT of residence;
2. NDTMS D[A]AT of agency;
3. Arrest Referral D[A]AT or residence;
4. Probation D[A]AT of residence;
5. Police D[A]AT of residence;
6. Agency based syringe exchange schemes D[A]AT of residence;
7. Agency based syringe exchange schemes D[A]AT of agency;
8. Pharmacy based syringe exchange scheme D[A]AT of residence;
9. Pharmacy based syringe exchange scheme D[A]AT of agency.

Therefore an individual was deemed to be a resident of Liverpool DAAT if they were recorded as a resident of Liverpool by the NDTMS and a resident of St. Helens by an agency based syringe exchange scheme. Area of residence was calculated using the individuals' postcode (area and district part of postcode required by all databases). Individuals were excluded from the analyses if they could not be assigned to a D[A]AT due to missing postcode or agency name. An individual recorded by the

NDTMS as having no fixed abode was included in the analysis if their D[A]AT of residence had been provided.

Box 1. Datasets Used in Capture-Recapture Analyses

1. National Drug Treatment Monitoring System (NDTMS)

The NDTMS collects data on every individual that presents for structure treatment (Tiers 3 and 4 of the National Treatment Agency's Models of Care document (National Treatment Agency, 2002)) including both community-based and inpatient services. Data are mainly comprised of reports from statutory and non-statutory drug treatment agencies, such as Community Drug Teams and Drug Dependency Units, inpatient detoxification services and residential rehabilitation facilities, although any organisation providing structured drug treatment is now required to provide data to be included in NDTMS dataset. Treatment data for 2001/2 estimates were supplied by the NDTMS.

2. Prevalence and Outcomes Database and Drug Misuse Database

Prior to the inception of the NDTMS, treatment data for each drug user in contact with statutory and non-statutory drug services were collected by the Prevalence and Outcomes Database. This local database did not collect drug information but individual drug profiles could be matched from the national Drug Misuse Database. These two databases were utilised to provide treatment data for 2000/1 estimates.

3. Arrest Referral

Data from the Arrest Referral scheme comprise drug-related information gathered in custody suites at the time of an individual's arrest or within courts soon after arrest. Arrestees are asked if they wish to see an Arrest Referral drugs worker and a detailed assessment is undertaken on those that concur.

4. Probation

Probation data consist of pre sentence reports conducted by the Probation Service of individuals who have disclosed a drug problem, irrespective of the crime committed. These data are supplied by the Inter Agency Drug Misuse Database (IAD).

5. Police

Police data comprise reports of any individual arrested for a drug crime under the Misuse of Drugs Act (1971). These offences include production, possession, possession with the intent to supply, supply and trafficking. These data are supplied by the Inter Agency Drug Misuse Database (IAD).

6. Agency Based Syringe Exchange Schemes

Drug agencies operating a syringe exchange scheme collect data each time an individual attends to collect or return injecting equipment. A small number of additional data items are collected the first time an individual contacts the syringe exchange. These data are supplied by the Inter Agency Drug Misuse Database (IAD).

7. Pharmacy Based Syringe Exchange Schemes

Data are again supplied by the IAD. Syringe exchanges based in pharmacies record data on individuals who receive or return injecting equipment.

The area and district part of the postcode were collected by all databases and used to calculate D[A]AT of residence. Occasionally postcodes crossed two D[A]AT areas. In these cases, individuals were assigned to the D[A]AT using postcode population data supplied by the North West Public Health Observatory to ascertain which D[A]AT the majority of residents of a particular postcode fitted (postcode to D[A]AT allocation for the 2001/2 NDTMS report (Beynon et al., 2003) conducted using identical methodology). Box 2 reports which postcodes were included in the capture-recapture analyses;

Box 2. Postcodes Included in Analyses

Liverpool DAAT	Sefton DAT
L1 - L9	L10
L11 – L19	L20 - L23
L24 – L25	L29 - L31
L27	L37 - L38
	PR8 – PR9

The majority of drug users recorded by the databases were aged between 15 and 44 years (94.8% and 94.7% for Liverpool DAAT and Sefton DAT respectively). Age refers to the age the individual was on 30th September 2000 or 2001, the mid-point of each reporting period. To provide more robust prevalence estimates and to allow age specific rates to be calculated, any individual aged less than 15 years or over 44 years was removed from the analyses. All capture-recapture analyses were undertaken using SPSS (Norussis, 1993) and Generalised Linear Interactive Modelling (GLIM) (Francis et al., 1993) statistical software.

4.0 Results

4.1 Results: Liverpool DAAT

4.1.1 Problematic Drug Use in Liverpool DAAT, 2000/1

Data were not a good fit to the capture-recapture models and reliable estimates for problematic drug use in Liverpool DAAT in 2000/1 could not be generated.

4.1.2 Problematic Drug Use in Liverpool DAAT, 2001/2

Table 1 reports the number of individuals from each dataset used in capture-recapture analyses for Liverpool DAAT in 2001/2. Capture-recapture estimates of the number of problematic drug users in Liverpool DAAT in 2001/2 are presented in Table 2, along with estimated rates of problematic drug use per 1,000 of population. Figure 1 shows changes in the estimated number of problematic drug users in Liverpool DAAT between 1998 and 2001/2.

Table 1. Total Number, Sex and Age of Problematic Drug Users Included in Capture-Recapture Models by Reporting Agencies: Liverpool DAAT, 2001/2

	Total*	Sex				Age (Years)				
		Male		Female		15-24		25-44		Mean age*
		N	%	N	%	N	%	N	%	
NDTMS	2120	1441	68.0	679	32.0	181	8.5	1939	91.5	32.6
Police	296	277	93.6	19	6.4	143	48.3	153	51.7	26.8
Probation	537	431	80.3	106	19.7	112	20.9	425	79.1	30.4

*only those aged between 15 and 44 years were included in analyses

Table 2. Capture-Recapture Estimates of Problematic Drug Use: Liverpool DAAT, 2001/2

		Estimates	
		N	Prevalence (per 1,000 of population)**
	Total*	6170 [†]	31.6
Sex	Male	4775 [†]	51.2
	Female	1339 [†]	13.1
Age (Years)	15-24	1563 [†]	22.1
	25-44	4753 [†]	38.2

* only those aged between 15 and 44 years were included in analyses

** population based on 2001 census data

[†]data are a good fit and estimates are highly reliable

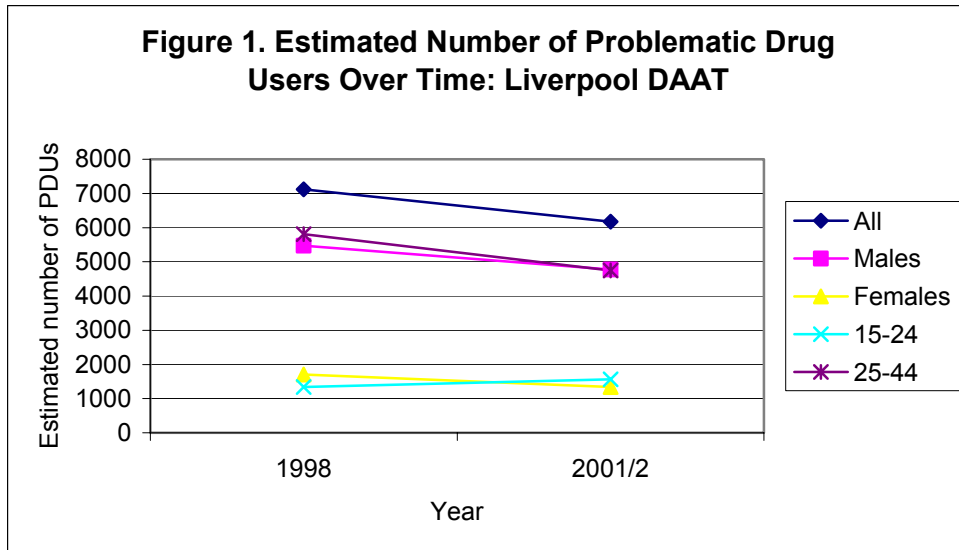
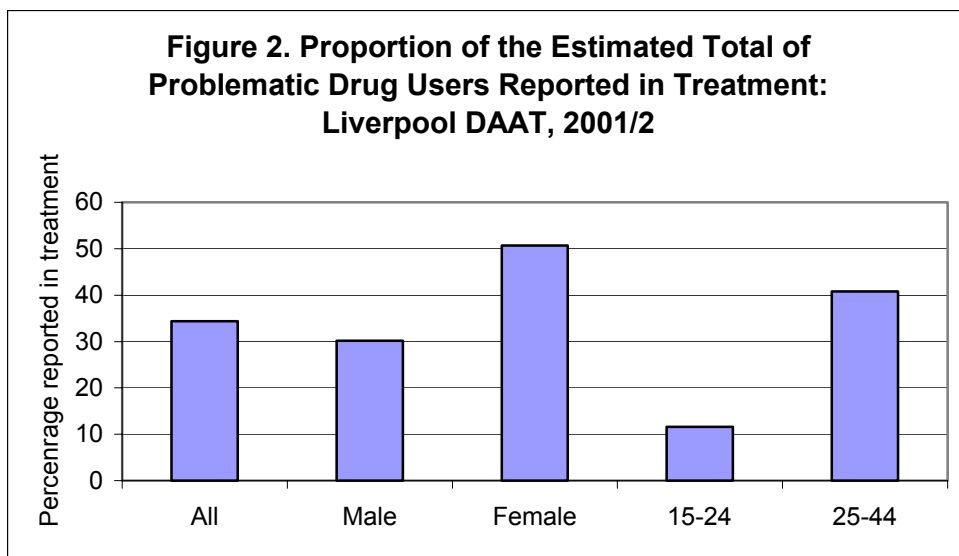


Figure 2 shows the proportion of the estimated total number of drug users in Liverpool DAAT reported by treatment agencies in 2001/2, thus giving a measure of treatment utilisation within this year. Estimated levels of service contact for treatment, Police and Probation are presented in Appendix 1.



4.2 Results: Sefton DAT

4.2.1 Problematic Drug Use in Sefton DAT, 2000/1

The number of individuals from each dataset used in capture-recapture analyses for Sefton DAT in 2000/1 is displayed in Table 3. Capture-recapture estimates of the number of problematic drug users in Sefton DAT in 2000/1 are presented in Table 4. Table 4 also reports the estimated rates of problematic drug use per 1,000 of population.

Table 3. Total Number, Sex and Age of Problematic Drug Users Included in Capture-Recapture Models by Reporting Agencies: Sefton DAT, 2000/1

	Total*	Sex				Age (Years)				Mean age*
		Male		Female		15-24		25-44		
		N	%	N	%	N	%	N	%	
Prevalence	609	399	65.5	210	34.5	61	10.0	548	90.0	31.8
Police	38	27	71.1	11	28.9	10	26.3	28	73.7	28.6
Probation	219	165	75.3	54	24.7	48	21.9	171	78.1	29.8

*only those aged between 15 and 44 years were included in analyses

Table 4. Capture-Recapture Estimates of Problematic Drug Use: Sefton DAT, 2000/1

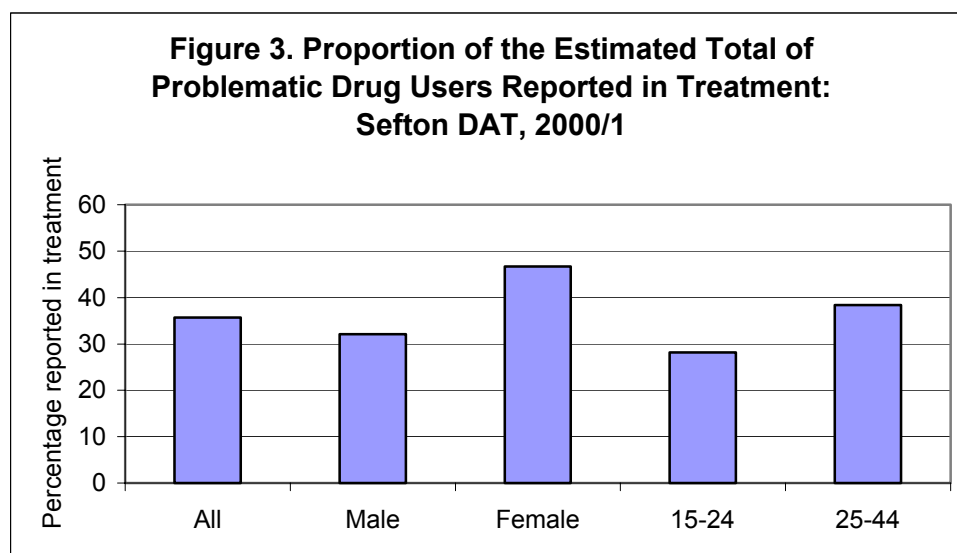
		Estimates	
		N	Prevalence (per 1,000 of population)**
	Total*	1708 ⁱ	16.2
Sex	Male	1244 ⁱ	24.3
	Female	450 ⁱ	8.3
Age (Years)	15-24	216 ⁱ	7.0
	25-44	1426 ⁱ	19.1

* only those aged between 15 and 44 years were included in analyses

** population based on 2001 census data

ⁱdata are a good fit and estimates are highly reliable

Figure 3 reports the proportion of the estimated total number of problematic drug users in Sefton DAT in 2000/1 that were reported to be in treatment during that year. Estimated levels of service contact for treatment, Police and Probation are given in Appendix 1.



4.2.2 Problematic Drug Use in Sefton DAT, 2001/2

Table 5 reports the number of individuals from each dataset used in capture-recapture analyses for Sefton DAT in 2001/2. Capture-recapture estimates of the number of problematic drug users in Sefton DAT in 2001/2 are presented in Table 6, along with estimated rates of problematic drug use per 1,000 of population. Figure 4 illustrates

the estimated number of problematic drug users in Sefton DAT between 1999 and 2001/2.

Table 5. Total Number, Sex and Age of Problematic Drug Users Included in Capture-Recapture Models by Reporting Agencies: Sefton DAT, 2001/2

	Total*	Sex				Age (Years)				
		Male		Female		15-24		25-44		Mean age*
		N	%	N	%	N	%	N	%	
NDTMS	798	519	65.0	279	35.0	66	8.3	732	91.7	32.8
Police	83	71	85.5	12	14.5	23	27.7	60	72.3	29.8
Probation	174	129	74.1	45	25.9	29	16.7	145	83.3	31.2

*only those aged between 15 and 44 years were included in analyses

Table 6. Capture-Recapture Estimates of Problematic Drug Use: Sefton DAT, 2001/2

		Estimates	
		N	Prevalence (per 1,000 of population)**
	Total*	1968	18.6
Sex	Male	1319 ⁱ	25.8
	Female	706 ⁱ	13.0
Age (Years)	15-24	262 ⁱ	8.5
	25-44	1751	23.5

* only those aged between 15 and 44 years were included in analyses

** population based on 2001 census data

ⁱdata are a good fit and estimates are highly reliable

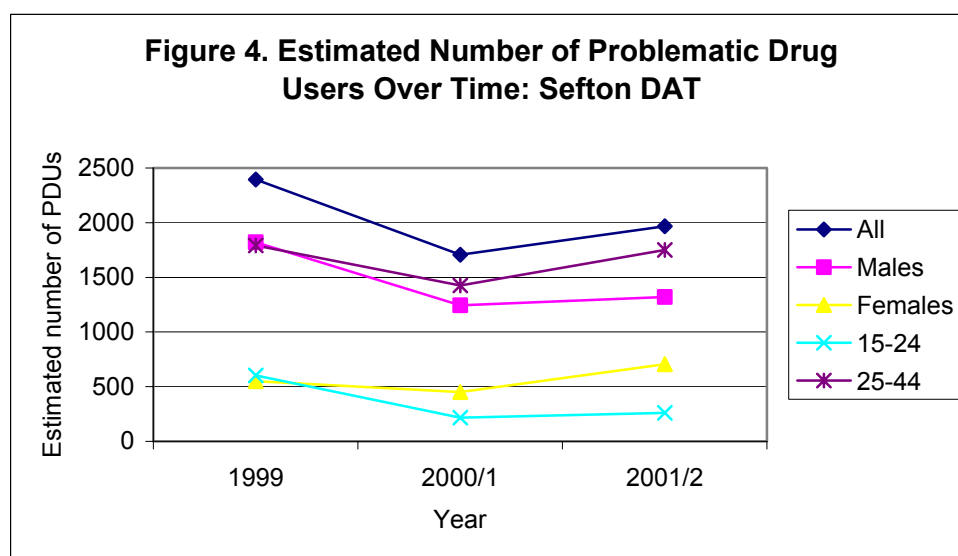
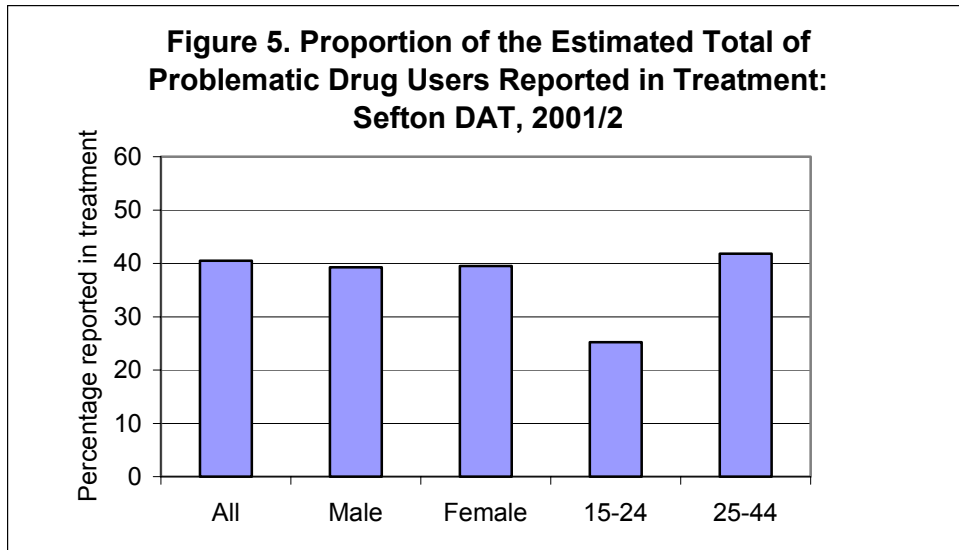


Figure 5 reports the proportion of the estimated total of problematic drug users known to have had contact with treatment in Sefton DAT in 2001/2. Appendix 1 reports estimated levels of service contact for treatment, Police and Probation.



4.3 Results: Injecting Drug Use in Liverpool and Sefton D[A]ATs

Capture-recapture analyses were run a number of times using different combinations of databases. Reliable estimates for injecting drug use could not be generated for either D[A]AT in either year.

5.0 Discussion

(1998/9 capture-recapture figures quoted throughout the discussion relate to Beynon et al., 2001a)

5.1 Overall Levels of Problematic Drug Use

5.1.1 Overall Levels of Problematic Drug Use in Liverpool DAAT

An estimated 6,170 problematic drug users were resident in Liverpool DAAT in 2001/2 compared to an estimated total of 7,121 in 1998. Clearly Liverpool DAAT have been successful in reducing the number of problematic drug users resident in their area by one thousand but it is more meaningful to consider the number of problematic drug users as a proportion of the total population. In 1998, Liverpool DAAT had an estimated prevalence of 34.5 problematic drug users per 1,000 of population compared to 31.6 in 2001/2, indicating a real decline in problematic drug use in this DAAT.

5.1.2 Overall Levels of Problematic Drug Use in Sefton DAT

In 1999, 2000/1 and 2001/2, an estimated total of 2,395, 1,708 and 1,968 problematic drug users respectively were resident in Sefton DAT, indicating an overall decline of approximately 400 between 1999 and 2001/2. When expressed as prevalence, the estimated total of problematic drug users per 1,000 of population for the three years was 21.6, 16.2 and 18.6 respectively. Therefore, despite annual population migrations, Sefton DAT has experienced a real reduction in problematic drug use between 1999 and 2001/2 although a slight increase has been observed between 2000/1 and 2001/2. It should be noted that, the 2001/2 estimate for overall problematic drug use was *slightly* less robust than other estimates as the data were a less good fit to the capture-recapture models. However, combining male and female estimates gives a total of 2,025 and combining the age group totals gives an total of 2,013; both close to the overall estimate of 1,968.

5.1.3 Overall Levels of Problematic Drug Use – Implications for Liverpool and Sefton D[A]ATs

The NTA aims to increase the number of individuals accessing treatment programmes nationally from 118,500 in 2000/1 to 200,000 by 2008 (National Treatment Agency, 2003) with the National Drugs Strategy setting each D[A]AT a target of increasing the number of individuals accessing services by 100% in 2008 based on 1998 baseline figures (UKADC, 2000). Such increases in the number of problematic drug users contacting treatment may be difficult if the overall total number of problematic drug users and the prevalence of problematic drug users are shown to be falling. Capture-recapture estimates provide a means by which to gauge changes in the overall population of problematic drug users.

Liverpool DAAT should be encouraged that, despite the fall in the estimated total number of problematic drug users within their area, data held within the Centre for Public Health show an increase in the numbers requesting treatment in this timeframe.

Correspondingly the number of problematic drug users known to be in contact with services as a proportion of the estimated total number of problematic drug users has increased during these three years from 26.6% in 1998 to 34.4% in 2001/2.

Acknowledging that 2001/2 was the initial operational year of the NDTMS system (and the reporting difficulties associated with implementing a new system), treatment figures showed that Sefton DAT experienced a reduction in the number of individuals contacting treatment services between 2000/1 and 2001/2 (NDTMS, 2003). However, capture-recapture results show a more positive picture with Sefton DAT experiencing an increase in the proportion of all problematic drug users in contact with treatment services between 1999 and 2001/2. In 1999, 2000/1 and 2001/2, 30.6% 35.7% and 40.5% respectively of the estimated total of problematic drug users in Sefton DAT made contact with treatment services.

Results presented here illustrate the benefits of employing capture-recapture techniques on routinely collected data. The utilisation of capture-recapture estimates, treatment figures and population data in combination provides a valuable means by which the scale of local drug use can be assessed and provides greater intelligence than treatment figures alone.

5.1 Key Findings

- Sefton and Liverpool D[A]ATs have both experienced a net reduction in the estimated number of problematic drug users resident in their area between 1998/1999 (Liverpool/Sefton) and 2001/2, and a corresponding fall in the prevalence of problematic drug use (although Sefton DAT experienced a small rise between 2000/1 and 2001/2).
- Both D[A]ATs have increased the proportion of the estimated total of problematic drug users in contact with treatment services between 1998/9 (Liverpool/Sefton) and 2001/2.

5.2 Sex Differences in Problematic Drug Use

5.2.1 Male and Female Levels of Problematic Drug Use in Liverpool DAAT

In 2001/2 an estimated 4,775 male problematic drug users and an estimated 1,339 female problematic drug users lived within Liverpool DAAT. This compares to an estimated 5,471 and 1,702 male and female problematic drug users respectively residing within Liverpool DAAT in 1998. This equates to a real fall in the prevalence of problematic drug use for both sexes. Male problematic drug use fell slightly from 52.2 to 51.2 per 1,000 of population between 1998 and 2001/2 whilst female problematic drug use declined from 16.8 to 13.1 per 1,000 of population over the same period of time. Capture-recapture estimates for 2001/2 show the ratio of male to female problematic drug users to be 3.6:1.

5.2.2 Male and Female Levels of Problematic Drug Use in Sefton DAT

Sefton DAT has experienced an overall fall in the estimated number of male problematic drug users, 1,821, 1,244 and 1,319 for 1999, 2000/1 and 2001/2 respectively. Conversely, despite a fall between 1999 and 2000/1, female problematic drug use in Sefton DAT has increased from 550 in 1999 to 706 in 2001/2 (having initially fallen to 450 in 2000/1). Changes in the number of problematic drug users over time may reflect growth/decline in the population as a whole, but expressing these changes as a prevalence indicates a real decrease in male problematic drug use and a real increase in female problematic drug use. Prevalence for male drug use in 1999 and 2001/2 fell from 32.6 to 25.8 per 1,000 of population (24.3 in 2000/1) whilst female prevalence rose from 10.0 to 13.0 per 1,000 of population. The rise in female problematic drug use is of particular concern when figures for 2000/1 are considered as the estimated prevalence had declined to 8.3 per 1,000 of population during this year. This situation results in Sefton DAT having a low estimated male to female ratio of 1.9:1, compared to the estimated national male to female ratio of 3:1 (National Treatment Agency, 2002).

5.2.3 Male and Female Problematic Drug Use – Implications for Liverpool and Sefton D[A]ATs

Regional reports considering the sex of individuals have consistently reported more male than female drug users engaged in treatment programmes (Beynon et al., 2001b; Beynon et al., 2003; Jones and Beynon, 2003). On a national level, the male to female ratio of those accessing treatment has consistently been 3:1 (National Treatment Agency, 2002). This finding could be attributed to a higher proportion of male than female drug users in contact with drug treatment agencies or more male drug users in the population as a whole. Capture-recapture estimates for 2000/1 and 2001/2 show the latter premise to be true in both Liverpool and Sefton D[A]ATs, with a higher number of males than females engaged in problematic drug use and higher male prevalence rates. Capture-recapture estimates for Liverpool and Sefton in 1998 and 1999 respectively showed a similar pattern.

The higher level of male drug use in Liverpool and Sefton D[A]ATs in 2000/1 and 2001/2 is consistent with previous findings. Focusing on literature published between 1990 and 2000, Thom (2003) reported that overall, men were 1.4 times more likely to have taken drugs in the ‘last year’ and ‘last month’ than females with the greatest difference between male and female drug use occurring in those in their mid to late 20s. Findings from the British Crime Survey, which uses a sample of 10,000 individuals in England and Wales, are reported in Table 7 and show similar results.

Table 7. Drug Use by Sex (ages 16-59, England and Wales, 1998)

	Ever/lifetime	Last year	Last month
Male	37.6%	13.7%	8.3%
Female	26.7%	7.8%	4.4%
Ratio of female to male	1:1.4	1:1.8	1:2.0

(Ramsay et al., 1999)

That males are more likely to use drugs than their female contemporaries is well documented with differences being evident from a young age. Results from ongoing

research conducted by the National Centre for Social Research (NatCen) and the National Foundation for Educational Research (NFER) on school children aged between 11 and 15 years showed that 12% of males compared to 9% of females had used drugs in the month prior to questioning in 2002 (Boreham and McManus, 2003). Numerous studies report the different ways in which male and female stereotypes play a role in child development. Risk taking is more strongly associated with the masculine role, with males given greater leeway to experiment and with them expected to take greater risks. Indications of this are the many deaths of older boys due to accidents such as car crashes and incidents involving firearms (UNICEF, 1998), and the higher prevalence of male alcohol and drug use may be a result of this socialising process. In all developed countries, females on average, live at least five years longer than males whilst in poorer countries the difference in longevity is three years. Mortality rates of children under the age of 20 also favour girls (Thom, 2003). Whilst biological factors play a role, behavioural differences are also important.

'Most of the leading causes of death among men are a result of men's behaviours that leave men more vulnerable to certain illnesses'
(Kimmel and Messner, 1995).

Not only are males more likely to use drugs, they may also be more likely to engage in risky drug taking behaviour. Drug treatment figures for 2001/2 indicate that 68% and 65%, for Liverpool and Sefton respectively, of those in contact with drug agencies were male (Beynon et al., 2003). Capture-recapture estimates presented here show that 78.1% of all problematic drug users resident in Liverpool and 65.1% resident in Sefton were male in 2001/2. According to Coroners reports in England and Wales in 2002, 84% of individuals whose cause of death was attributed to drug use were male (Allan, 2003). Therefore, whilst acknowledging differences in the geographical area in question (England and Wales compared to Liverpool or Sefton), males are over represented in drug-related death figures, possibly indicating the involvement in riskier drug practices and the importance of attracting male drug users into treatment.

5.2.4 Sex Differences and Drug Service Utilisation in Liverpool and Sefton D[A]ATs

It is often reported that female drug users experience 'barriers to service utilisation' and that services cater for the majority of the population that access them: white opiate using males aged less than 35 years (National Treatment Agency, 2002). Calculating the number of drug users known to treatment services as a proportion of the estimated total number of drug users gives a measure of service engagement. In Liverpool DAAT in 2001/2, a higher male to female ratio was observed in the estimated total compared to the known (recorded by NDTMS, Police and Probation) populations, 3.6:1 and 2.6:1 respectively, indicating higher service penetration by female drug users. Whilst only 30.2% of males had been in contact with treatment agencies in the year, 50.7% of females had done likewise. This compares to 22.1% of males and 40.1% of females being in contact with services in 1998. The National Treatment Agency's Models of Care document demands a greater emphasis on attracting females into drug treatment services (National Treatment Agency, 2002)

and results presented here suggest that Liverpool DAAT's drug treatment agencies are already successful in this respect.

The situation in Sefton DAT is more complex. In 1999, service penetration for male and female problematic drug users was 25.8% and 48.0% respectively indicating a much higher proportion of the total number of female drug users engaged in treatment than the total number of males. A similar pattern existed in 2000/1, with 32.1% of males and 46.7% of females having treatment service contact. However, by 2001/2 the proportion of males in contact with services had further increased to 39.3% whilst the proportion of females in contact with services had fallen to 39.5%. The increase in the estimated number of female problematic drug users resident in Sefton DAT in 2001/2 has therefore not been mirrored by an increase in the number of females contacting drug agencies and Sefton DAT may need to work hard to attract these 'new' female drug users into treatment. Conversely, Sefton DAT has been increasingly successful in achieving male service penetration.

The higher number of males contacting drug services often supports the perception of female reluctance regarding treatment engagement. Results here indicate the reverse, with females, in general, contacting services more readily than their male counterparts. Evidence suggests that females initiate drug use at a later stage in life but contact services more quickly, possibly due to a 'telescoping' effect which means that females experience adverse physical and psychological reactions to drug use in a smaller timeframe as a result of greater vulnerability to those effects (National Treatment Agency, 2002). However, similar gender differences, in terms of male lack of engagement, have been observed in service contact for other health-related conditions (Green and Pope, 1999). Morbidity studies show males have poorer prognoses than females for diseases common to both sexes possibly as a result of failure to contact treatment services at an early stage (Thom, 2003). Sex differences in drug service utilisation are therefore likely to result from men's reluctance to seek assistance. As mentioned above, males are over represented in national drug death figures (Allan, 2003) and men's lack of engagement with treatment services may be a contributing factor to this finding with some research indicating a connection between service contact and a reduced risk of non-fatal overdose (Stewart et al., 2002)

A situation therefore exists in Liverpool and Sefton D[A]ATs where males are more likely to initiate drug use, have a higher likelihood of suffering a drug-related death but are less likely to engage in treatment. Conversely, agencies in Liverpool DAAT (and historically also in Sefton DAT, although less so in 2001/2) have been successful in attracting female drug users into treatment. Greater emphasis on shared care arrangements (as promoted by the NTA) are likely to facilitate service utilisation by females presenting with a range of issues including physical and/or sexual abuse, self-mutilation, eating disorders and child care issues including pregnancy (National Treatment Agency, 2002).

5.2 Key Findings

- The prevalence of male problematic drug use is higher than that of females indicating more male than female problematic drug users in both D[A]ATs.
- Sex differences in drug use are evident from a young age.
- Males are less likely to contact treatment services for both their drug use and other health-related conditions.
- Liverpool DAAT has been increasingly successful in attracting both male and female problematic drug users into treatment.
- Sefton DAT has increased service penetration by male problematic drug users but the proportion of female problematic drug users contacting services has consistently fallen between 1999 and 2001/2.

5.3 Age Differences in Problematic Drug Use

5.3.1 Age Differences in Problematic Drug Use in Liverpool DAAT

When 2001/2 estimates for age groups were considered, a total of 1,563 (24.7%) problematic drug users were aged between 15 and 24 years and 4,753 (75.3%) were aged between 25 and 44 years. This compares to figures for 1998 when there were an estimated 1,344 (18.8%) and 5,805 (81.2%) problematic drug users aged between 15 and 24 years, and 25 and 44 years respectively. The prevalence of drug use by those aged 15 to 24 years has increased from 19.1 per 1,000 of population in 1998 to 22.1 in 2001/2 indicating a small increase in drug use in this age category. Conversely, there has been a reduction in the prevalence of problematic drug use in those aged between 25 and 44 years, 42.7 and 38.2 per 1,000 of population for 1998 and 2001/2 respectively.

5.3.2 Age Differences in Problematic Drug Use in Sefton DAT

Despite a small increase in the estimated number of problematic drug users aged between 15 and 24 years from 2000/1 to 2001/2, there has been a large reduction in the number of problematic drug users in this age category in Sefton DAT between 1999 and 2001/2 (1999; 603, 2000/1; 216 and 2001/2; 262). This has resulted in a corresponding fall in the prevalence of problematic drug use in this age group from 19.6 per 1,000 of population in 1999 to 8.5 in 2001/2 (7.0 in 2000/1) indicating success in reducing problematic drug use among those aged less than 25 years in Sefton DAT. The prevalence of drug use among those aged 25 to 44 years has largely remained stable between 1999 and 2001/2 despite a fall in 2000/1. The estimated total number of problematic drug users aged between 25 and 44 years was 1,793 in 1999 (22.4 per 1,000 of population), 1,426 in 2000/1 (19.1 per 1,000 of population) and 1751 in 2001/2 (23.5 per 1,000 of population).

5.3.3 Age Differences in Problematic Drug Use – Implications for Liverpool and Sefton D[A]ATs

Evidence from a range of sources suggest there has been an increase in drug use in the last 10 years amongst those aged less than 18 years, with levels of drug and alcohol use among young people in the UK being amongst the highest in the European Union (EMCDDA, 2000). Whilst the main drug used by the majority of young people is cannabis (Boreham and McManus, 2002; National Treatment Agency, 2002), treatment data for 2001/2 showed that cocaine use by new clients in Liverpool DAAT ('new' in terms of starting a new period of drug treatment) was initiated by some individuals as young as 10 years, heroin and methadone by the age of 11 years and crack by the age of 14 years. When the mean age was considered, the mean age at which heroin, methadone, cocaine and crack were first used was 20.6, 24.5, 22.8 and 24.9 years respectively. Similar results were observed for those contacting treatment in Sefton DAT (Beynon et al., 2003).

In recognition of the young age at which children first have contact with drugs, 80% and 96% of primary and secondary schools respectively have adopted drugs education (Department of Health, 2002) and a number of Government initiatives exist to provide children and parents with credible and reliable information, including the recent 'Talk to Frank' campaign launched in May 2003. Despite such interventions, research involving secondary school children (11 to 15 year olds) reported that 8% of 15 year olds reported use of a Class A drug in the 12 months prior to questioning (Boreham and McManus, 2002). Table 14 reports differences in drug use over the last year and last month of those aged 20 to 24 years and those aged 25 to 29 years with almost a quarter of all males aged between 20 and 24 years indicating drug use in the month prior to questioning.

Table 8. Drug Use by Age and Sex in Last Year and Last Month (England and Wales, 1998)

Age (years)	Sex	Last Year	Last Month
20-24	Male	37%	24%
	Female	22%	12%
25-29	Male	29%	17%
	Female	11%	6%

British Crime Survey (Ramsey et al., 1999)

In the light of such research Sefton DAT should be encouraged by the falling prevalence of problematic drug use of those aged 15 to 24 years. Dissuading those aged less than 25 years from initiating drug use, or rather preventing this drug use from becoming problematic appears to be more of a challenge for Liverpool DAAT.

5.3.4 Age Differences and Drug Service Utilisation in Liverpool and Sefton D[A]ATs

Considering only Liverpool DAAT, the proportion of the estimated total of problematic drug users aged 15 to 24 years that were in contact with treatment agencies fell from 21.0% in 1998 to 11.6% in 2001/2. Therefore Liverpool DAAT has experienced an increase in the number and prevalence of problematic drug use in this age category in 2001/2 without a corresponding increase in the number of young

users contacting agencies for help. Liverpool has, however, been successful in attracting older drug users into treatment with 27.8% of those problematic drug users aged between 25 and 44 years having service contact in 1998 compared to 40.8% in 2001/2.

The fall in the estimated number of problematic drug users aged 15 to 24 years experienced in Sefton DAT between 1999 and 2001/2 has been achieved without a corresponding reduction in the proportion in contact with treatment services. Indeed the proportion of 15 to 24 year olds in contact with agencies has increased from 14.1% in 1999 to 25.2% in 2001/2 (28.2% in 2000/1). Treatment penetration figures for those aged 25 to 44 years in Sefton DAT have shown a steady increase over the three years in question, from 36.1% in 1999 to 38.4% in 2000/1 and 41.8% in 2001/2.

That young people will experiment with drugs is widely accepted and a number of these young people will progress to have serious drug problems. Engaging young drug users in treatment is important before problems escalate. In both Sefton and Liverpool D[A]ATs, a higher proportion of the estimated total number of problematic drug users aged 25 to 44 years had accessed treatment during the year than those aged 15 to 24 years indicating a reluctance of those aged less than 25 to see their drug use as problematic and the difficulty of agencies to engage younger people in treatment. Generic services offering advice and information to young people are valuable and operate in both D[A]ATs and such activity will not be represented in treatment figures. However estimates here are for problematic drug users engaged in the use of opiates, crack, cocaine, practices suggesting the need for some structured interventions.

Attracting those aged less than 25 years into treatment, particularly male drug users is a challenge for agencies in both D[A]ATs. Sefton and Liverpool are, however, not unique in this respect with similar findings being observed in Wirral DAAT (Potts et al., 2003; Duffy and McVeigh, 2003) and the challenge of engaging young people in treatment services recognised by the NTA (National Treatment Agency, 2002). A range of opportunities exist to identify drug use in those aged less than 18 years (school, Connexions, Youth Offending Teams, General Practitioners) but contact with those aged between 18 and 25 years may be less easy with services largely having to rely on an individual self-referring in some way (even criminal justice initiatives such as the Arrest Referral scheme relies on self-referral). This is unlikely to happen if individuals do not perceive their drug use as problematic. Additionally the 'macho' image regarding drug use is likely to deter young males, in particular, from seeking assistance (Thom, 2003).

5.3 Key Findings

- Liverpool DAAT has experienced a small increase in problematic drug use in those aged 15 to 24 years but a reduction in those aged 25 to 44 years.
- Sefton DAT has been successful in reducing problematic drug use in those aged 15 to 24 years, with the prevalence of drug use in the older age category remaining largely stable.
- Both D[A]ATs are more successful in attracting older problematic drug users into treatment with both increasing service penetration of those aged 25 to 44 years in 2001/2.
- Younger drug users have a greater reluctance to contact drug agencies, although Sefton DAT has increased the proportion of those aged 15 to 24 years in treatment between 1999 and 2001/2.

5.4 Injecting Drug Use

Capture-recapture analyses failed to generate reliable estimates for injecting drug use in either D[A]AT in either year using a number of database combinations. Once enhanced capture-recapture techniques have been finalised, the injecting data for 2000/1 and 2001/2 will be analysed again in the hope of providing more reliable estimates.

6.0 Key Findings

6.1 Key Findings for Liverpool DAAT

- Problematic drug use in Liverpool DAAT declined from an estimated 7,121 in 1998 to 6,170 in 2001/2 representing a fall in the prevalence of problematic drug use from 34.5 to 31.6 per 1,000 of population between these two years.
- Despite this fall in the estimated total number of problematic drug users, data show that Liverpool DAAT increased the number of drug users in treatment.
- Liverpool DAAT has therefore successfully been able to increase the estimated proportion of problematic drug users in treatment from 26.6% in 1998 to 34.4% in 2001/2.
- Drug use among males remains higher than that among their female counterparts.
- Falls in the estimated number of problematic drug users were evident for both sexes with the estimated number of males falling from 5,471 (52.2 per 1,000 of population) in 1998 to 4,775 (51.2 per 1,000 of population) in 2001/2 and female estimates declining from 1,702 (16.8 per 1,000 of population) to 1,339 (13.1 per 1,000 of population) during the same time period.
- Liverpool DAAT have increased both the proportion of male and female problematic drug users in contact with treatment services between 1998 and 2001/2 from 22.1% to 30.2%, and 40.1% to 50.7% for males and females respectively.
- Liverpool DAAT should be encouraged by female treatment penetration figures for 2001/2. The National Treatment Agency's Models of Care document emphasises the need to attract female drug users into treatment and Liverpool DAAT is clearly already successful in doing so with, an estimated half of all female drug users in treatment in 2001/2.
- Liverpool DAAT finds it harder to attract (or retain) male problematic drug users into treatment.
- The prevalence of problematic drug use in those aged 15 to 24 years has increased from 19.1 per 1,000 of population in 1998 to 22.1 in 2001/2 indicating increasing drug use and a challenge to all agencies involved in working with individuals in this age group.
- Service utilisation by those aged 15 to 24 years has declined between 1998 and 2001/2 from 21.0% to just 11.6%. Therefore the increase in the number and prevalence of problematic drug users aged 15 to 24 years has not been mirrored by a corresponding increase in the number of individuals accessing services.
- Liverpool is not unique in having difficulties in attracting younger problematic drug users into treatment but should channel resources into improving treatment uptake figures in this younger age group, and in particular in improving service uptake by young male drug users.
- Conversely, Liverpool DAAT has been successful in reducing the prevalence of problematic drug use of those aged between 25 and 44 years, from 42.7 per 1,000 of population in 1998 to 38.2 in 2001/2.

- This corresponds to large improvements in treatment uptake figures for this older age category, with the estimated proportion of those aged 25 to 44 years in contact with treatment increasing from 27.8% in 1998 to 40.8% in 2001/2.

6.2 Key Findings for Sefton DAT

- Generally, in Sefton DAT, levels of drug use have decreased between 1999 and 2000/1 then increased slightly in 2001/2.
- Whilst the estimated total number of problematic drug users in Sefton DAT increased between 2000/1 (1,708) and 2001/2 (1,968) there was an overall decline from 1999 (2,395).
- Estimated prevalence rates per 1,000 of population were 21.6, 16.2 and 18.6 for 1999, 2000/1 and 2001/2 respectively.
- Treatment figures for 2001/2 showed a decrease from the previous year in the number of individuals contacting treatment services. However, capture-recapture estimates show that Sefton DAT actually increased the estimated *proportion* of all problematic drug users in contact with treatment agencies with 30.6% of all problematic drug users in contact with agencies in 1999 compared to 35.7% in 2000/1 and 40.5% in 2001/2.
- Sefton DAT has therefore increased service uptake and retention between 1999 and 2001/2.
- The fall in the estimated number and prevalence of problematic drug use is, however, confined only to males with the number of problematic male drug users falling from 1821 (32.6 per 1,000 of population) in 1999 to 1319 (25.8 per 1,000 of population) in 2001/2 (acknowledging a small rise between 2000/1 and 2001/2).
- Of concern is the rise in female problematic drug use which fell between 1999 and 2000/1 (estimates of 550 or 10.0 per 1,000 of population and 450 or 8.3 per 1,000 of population for 1999 and 2000/1 respectively) but rose dramatically the following year to levels exceeding those of 1999 (706 or 13.0 per 1,000 of population).
- Despite this rise in female problematic drug use, drug use by males remains higher than that practiced by their female contemporaries.
- Sefton DAT has been successful in increasing service penetration by male drug users with only 25.8% of males engaged in treatment in 1999 compared to 32.1% in 2000/1 and 39.3% in 2001/2.
- Conversely, there has been a fall in estimated service penetration by females during the three years, 48.0%, 46.7% and 39.5% for 1999, 2000/1 and 2001/2 respectively.
- The increase in the estimated number of female problematic drug users in 2001/2 in Sefton DAT has therefore not been mirrored by an increase in the number of females contacting treatment and agencies must work hard to attract these 'new' females into services.
- The estimated number and prevalence of drug users aged between 15 and 24 declined considerably between 1999 and 2001/2, whilst acknowledging a small rise between 2000/1 and 2001/2. Prevalence figures for this age group were 19.6, 7.0 and 8.5 per 1,000 of population for 1999, 2000/1 and 2001/2

respectively indicating a real fall in problematic drug use within this age group.

- This fall in the estimated number of problematic drug users aged 15 to 24 years has largely been achieved without a fall in the numbers engaged in treatment. Whilst only 14.1% of those aged 15 to 24 years had contact with services in 1999, 25.2% did likewise in 2001/2 (28.2% in 2000/1).
- The estimated prevalence of problematic drug use of those aged 25 to 44 years has remained relatively stable in Sefton DAT (22.4, 19.1 and 23.5 per 1,000 of population for 1999, 2000/1 and 2001/2 respectively).
- However, treatment penetration for this older age group has steadily increased from 36.1% in 1999 to 38.4% in 2000/1 to 41.8% in 2001/2.
- Sefton DAT should be encouraged by the rising treatment penetration levels in both age categories but particularly for younger problematic drug users who are traditionally more reluctant to engage in agency contact.
- Service utilisation by younger problematic drug users still remains a challenge for Sefton DAT with penetration levels for the 15 to 24 age group remaining considerably lower than the 25 to 44 age group.

7.0 References

- Allan, R. (2003). *Deaths Reported to Coroners, England and Wales, 2002*. London: Home Office.
- Aust, R., Sharp, C. and Goulden, C. (2002). *Prevalence of drug use: key findings from 2001/2 British Crime Survey. Findings 182*. London: Home Office.
- Begon, M. (1976). *Investigating animal abundance*. London: Edward Arnold.
- Beynon, C., Bellis, M.A., Millar, T., Meier, P., Thomson, R. and Mackway Jones, K. (2001a). Hidden need for drug treatment services: measuring levels of problematic drug use in the North West of England. *Journal of Public Health Medicine*, **23**, 286-291.
- Beynon, C., Birtles, R.L. and Bellis, M.A. (2001b). *Drug Services in Merseyside and Cheshire 2000/1. Prevalence and Outcomes*. Liverpool John Moores University. ISBN 1-902051-27-0.
- Beynon, C., McVeigh, J. and Bellis, M.A. (2003). *Drug Treatment in Cheshire and Merseyside. The First year of the National Drug Treatment Monitoring System (NDTMS) 2001/2*. Liverpool John Moores University. ISBN 1-902051-44-0
- Birtles, R.L. and Bellis, M.A. (2000). *Drug Services in Merseyside and Cheshire 1999. Prevalence and Outcomes*. Liverpool John Moores University. ISBN 1-902051-17-3.
- Bishop, Y., Fienberg, S.E. and Holland, PW (1995). *Discrete multivariate analysis*. Cambridge, MA: MIT Press, 229-256.
- Bloor, M., Leyland, A., Barnard, M. and McKeganey, N. (1991). Estimating hidden populations: a new method of calculating the prevalence of drug-injecting and non-injecting female street prostitution. *British Journal of Addiction*, **86**, 1477-1483.
- Boreham, R. and McManus, S. (2003). *Smoking, drinking and drug use among young people in England in 2002*. www.official-documents.co.uk Accessed October 2003.
- Cormack, RM. (1989). Log-linear models for capture-recapture. *Biometrics*, **45**, 395-413.
- Crabbe, T. and Donmall, M. (1996) The optimal size for attributor for use with the University of Manchester Drug Misuse Database. *Addiction*, **91**, 1547-1550.
- Department of Health (2001). Statistics from the Regional Drug Misuse Databases on drug misusers in treatment in England, 2000/1. *Department of Health Statistical Bulletin*, 2001:33. London: Department of Health.
- Department of Health (2002). *Tackling drugs to build a better Britain. Updated Drugs Strategy*. www.drugs.gov.uk Accessed May 2003.

- Donaldson, L. (2003). *Public Health in England*. www.doh.gov.uk Accessed July 2003.
- Duffy, P. and McVeigh, J. (2003). *The relationship between acquisitive crime and substance misuse on the Wirral. Phase 2: Assessing the number of drug using acquisitive crime offenders*. Liverpool John Moores University.
- European Monitoring Centre for Drugs and Drug Addiction (2000). *Report of the European Monitoring Centre for Drugs and Drug Addiction*. Luxembourg: ODOPEC.
- Francis, B., Green, M., Payne, C. (1993). *The GLIM system release 4 manual*. Oxford: Oxford University Press.
- Gossop, M., Marsden, J., Stewart, D. and Rolfe, A. (2000). Reductions in acquisitive crime and drug use after treatment of addiction problems: 1-year follow-up outcomes. *Drug & Alcohol Dependence*, **58**, 165-172.
- Green, C.A. and Pope, C.R. (1999). Gender, psychosocial factors and the use of medical services: a longitudinal analysis. *Social Science and Medicine*, **48**, 1363-1372.
- Hay, G. and McKeganey, N. (1996). Estimating the prevalence of drug misuse in Dundee, Scotland: An application of capture-recapture methods. *Epidemiology and Community Health*, **50**, 469-472.
- Hickman, M., Cox, S., Harvey, J., Howes, S., Farrell, M., Frischer, M., Stimson, G., Taylor, C. and Tilling, K. (1999). Estimating the prevalence of problem drug use in inner-London: a discussion of three capture-recapture studies. *Addiction*, **94**, 1653-1662.
- Hickman, M., Higgins, V., Hope, V., Bellis, M., Tilling, K., Walker, A. and Henry, J. (in press). Injecting drug use in Brighton, Liverpool and London: best estimates of prevalence and coverage of public health indicators.
- Jones, A. and Beynon, C. (2003). *Treating Drug Misuse in the North West of England. National Drug Treatment Monitoring System (NDTMS) contact data for the North West of England, 2001/2 – summary report*. University of Manchester. ISBN 1-902051-440.
- Kimmel, M.S. and Messner, M.A. (1995). *Men's Lives. Third edition*. Neddham Heights, Mass: M.A. Simon and Schuster.
- McVeigh, J., Hughes, K., Hounscome, J. and Bellis, M.A. (2003). *Over a Decade of Drug Use Epidemiology: Implications for Strategy and Service Provision Summary of Key Findings*. Liverpool John Moores University. ISBN 1-902051-46-7.
- Merrill, J., Alterman, A., Cacciola, J. and Rutherford, M. (1999). Prior treatment history and its impact on criminal recidivism. *Journal of Substance Abuse Treatment*, **17**, 313-319.

National Treatment Agency (2002). *Models of Care for Substance Misuse*. London: National Treatment Agency.

National Treatment Agency (2003). *Annual Report 2002/3*. www.nta.nhs.uk Accessed November 2003.

Norussis, M. (1993). *SPSS for Windows: base system users' guide: release 6.0*. Chicago, IL: SPSS Inc..

Potts, E., Beynon, C., Duffy, P. and McVeigh, J. (2003). *Problematic Drug use in Wirral: Prevalence, Characteristics and Implication for Service Provision*. Liverpool John Moores University.

Ramsey, M., Partridge, S. and Burton, C. (1999). *Drug use declared in 1998: Results from the British Crime Survey*. London: Home Office.

Squire, NF., Beeching, NJ., Schlect, BMJ. and Ruten, SM. (1995). An estimation of the prevalence of drug misuse in Liverpool and a spatial analysis of know addiction. *Journal of Public Health Medicine*, **17**, 102-109.

Stewart, D., Gossop, M. and Marsden, J. (2002). Reductions in non-fatal overdose after drug misuse treatment, results from the National Treatment Outcome Research Study. *Journal of Substance Abuse Treatment*, **22**, 1-9.

The United Kingdom Anti-drugs Co-ordinator's (2000) *Second National Plan*. London: Central Office of Information.

Thom, B. (2003). *Risk-taking behaviour in men. Substance use and gender*. London: Health Development Agency. ISBN 1-84279-148-6.

UNICEF (1998). *The Progress of Nations*. London: Nations Children Fund

Appendix 1. Estimated Levels of Agency Contact**Liverpool DAAT 2001/2**

All problematic drug users (aged 15 to 44 years): Estimated total 6,170

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	2120	296	537
Estimated agency contact	34.4%	4.8%	8.7%

Males (aged 15 to 44 years): Estimated total 4,775

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	1441	277	431
Estimated agency contact	30.2%	5.8%	9.0%

Females (aged 15 to 44 years): Estimated total 1,339

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	679	19	106
Estimated agency contact	50.7%	1.4%	7.9%

15 to 24 years: Estimated total 1,563

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	181	143	112
Estimated agency contact	11.6%	9.1%	7.2%

25 to 44 years: Estimated total 4,753

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	1939	153	425
Estimated agency contact	40.8%	3.2%	8.9%

Sefton DAT 2000/1

All problematic drug users (aged 15 to 44 years): Estimated total 1,708

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	609	38	219
Estimated agency contact	35.7%	2.2%	12.8%

Males (aged 15 to 44 years): Estimated total 1,244

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	399	27	165
Estimated agency contact	32.1%	2.2%	13.3%

Females (aged 15 to 44 years): Estimated total 450

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	210	11	54
Estimated agency contact	46.7%	2.4%	12.0%

15 to 24 years: Estimated total 216

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	61	10	48
Estimated agency contact	28.2%	4.6%	22.2%

25 to 44 years: Estimated total 1,426

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	548	28	171
Estimated agency contact	38.4%	2.0%	12.0%

Sefton DAT 2001/2

All problematic drug users (aged 15 to 44 years): Estimated total 1,968

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	798	83	174
Estimated agency contact	40.5%	4.2%	8.8%

Males (aged 15 to 44 years): Estimated total 1,319

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	519	71	129
Estimated agency contact	39.3%	5.4%	9.8%

Females (aged 15 to 44 years): Estimated total 706

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	279	12	45
Estimated agency contact	39.5%	1.7%	6.4%

15 to 24 years: Estimated total 262

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	66	23	29
Estimated agency contact	25.2%	8.8%	11.1%

25 to 44 years: Estimated total 1,751

	Agency		
	Treatment	Police	Probation
Number of PDUs identified by monitoring	732	60	145
Estimated agency contact	41.8%	3.4%	8.3%