WHAT IS THE SIZE AND NATURE OF THE 'DRUG' PROBLEM IN THE UK?

by Matthew Sutton and Alan Maynard

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The Leeds Addiction Unit and the Centre for Health Economics at York are collaborating to provide a number of services for activities relating to substance misuse in the Yorkshire Health Area. The Consortium has three main areas of activities. The aim of the research brief is to disseminate knowledge from national and international researchers to practitioners and stimulate research activities within the Yorkshire area. The training brief is to develop and implement Regional and district training strategies to ensure a high standard of practice amongst specialist agencies and primary care staff throughout the region. The Yorkshire Regional Substance Misuse Database, hosted by the Leeds Addiction Unit, provides basic information required by the Department of Health.

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ABSTRACT

Many commentators assert that the United Kingdom has a "considerable" drugs problem, and yet there is no data to indicate its extent. A wide range of government departments spend millions of pounds each year on policies which aim to reduce the drugs problem. This paper argues that in the absence of basic information on the use of illicit drugs, drug policy cannot be effectively designed and monitored.

The sources of information currently available on drug use can be divided into four broad categories: indirect measures by enforcement agencies, surveys of drug use, surveys of known users and studies of hidden users. Details of the information which is currently available in each category are provided, along with comments on its extent and limitations. The Home Office Addicts Index is used to estimate how heroin prevalence, consumption and expenditure have changed over the period 1979 - 1990. The authors propose that the network of Regional Drug Misuse Databases that has recently been set up cannot be used to estimate the size of the national drugs problem, and argue that the United Kingdom needs a well-designed, regular, national illicit drug use survey.

Contents

1. INTRODUCTION

The use of illicit drugs[1], like the use of legal addictive substances such as alcohol and tobacco, imposes uncompensated costs on society (Maynard et al, 1987). Illicit drug dependence was estimated to be the direct cause of 209 deaths in the UK in 1990 (Faculty of Public Health, 1992), compared to 6100 in 1985 in the United States (Rice et al, 1991). Maynard et al (1987) calculated the social costs of tobacco and alcohol in terms of the associated costs to industry, costs to the NHS, costs of criminal activities and the costs of society's response, but found no such data available for illicit drugs. More data were available to Rice et al (1991) in the United States when they estimated that the economic costs of drug abuse, accruing in terms of medical resource use, reduced or lost productivity, crime enforcement and pain and suffering, would reach $58.3 billion in 1988. However, despite the apparent importance of illicit drug use, current measures of trends in the use of illicit drugs are seriously limited in both their coverage and accuracy.

Few authors have been prepared to make estimates of the nationwide prevalence of drug use. Hartnoll et al (1985) estimated that there were between 40,000 and 50,000 regular opiate users in the UK in 1982, whilst Wagstaff and Maynard's (1988) calculations suggest that the range for the analogous figures had shifted to 41,000 to 100,000 by 1984. Griffin (1992) suggested that by 1992 it was 'widely acknowledged' that there were more than 150,000 regular opiate users in the United Kingdom. A few other authors are prepared to make

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[1] The definition of illicit drug use is complex and wide-ranging. Most drugs whose use is now illegal, were originally legal, prescribable drugs. The analysis in this paper relates to all drugs that are misused illegally, although the paucity of information on many topics forces the focus to be narrowed to more 'traditional' illicit drugs such as cannabis, heroin and cocaine.

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estimates for particular geographical areas, with Haw (1985) suggesting that there were between 1,500 and 4,300 opiate users in Glasgow in 1983, and Newcombe (1989) suggesting that the number of regular opiate users in Mersey Regional Health Authority lay somewhere between 15,000 and 30,000.

Other authors suggest only general trends in heroin use, with Strang et al (1992) suggesting an explanation for the "major heroin epidemic in the United Kingdom during the 1980s", and Crowe (1988) suggesting that after the rapid increase from 1983 to 1985, the heroin market slowed in 1986. However, in neither of these instances were the terms defined or quantitative data offered to sustain these views. By claiming that "[t]he misuse of drugs, and particularly the misuse of heroin and cocaine, is a serious and growing problem"[2], a House of Commons committee has also been drawn into making unquantified statements about the dynamics of the drug problem.

Prevalence figures for the use of other illicit drugs are even more rare or non-existent. One review suggested that at least one million people used cannabis in 1981 (ISDD, 1991), and Hartnoll (1984) argued in 1984 that cannabis prevalence should be measured in terms of millions not thousands.

It seems that there is agreement that the use of illicit drugs is widespread, but that reviews of drug use can barely provide 'ball-park' indications of illicit drug use. This despite the fact that the following series of quotes demonstrates that drug researchers recognise the need for

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[2] Paragraph 105 of the Fourth Report of the Social Services Committee on the Misuse of Drugs (1985) with special reference to the Treatment and Rehabilitation of Misusers of Hard Drugs.

the information:

"The most noticeable deficit in the 1980s debate about drug use in the UK is the almost complete lack of information about how many people are actually using drugs." (Parker et al, 1988, page 11)

"The importance of establishing a baseline for various epidemiological aspects of substance use cannot be over-stressed. Clear and detailed knowledge of this area is crucial for establishing changes in trends, the patterns and the factors influencing substance use. Without such data it is virtually impossible to design and evaluate effective prevention measures". (Swadi, 1988, p.935)

"An accurate assessment of the prevalence of drug misuse and knowledge of the demographic characteristics of users is vital for effective service planning and development". (Peveler et al, 1988, p.513)

"One of the major problems facing clinicians and researchers in the area of opioid treatment is the accurate measurement of recent drug use by clients. Accurate consumption data is necessary, both to make informed clinical management decisions ..., and to adequately evaluate the effectiveness of treatment". (Darke et al, 1991, p.1311)

This paper describes in more detail what information policy-makers require, and reviews existing sources of this information. There are four broad categories into which indicators

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of illicit drug use can be divided: (i) indirect measures of the size of drug markets, (ii) surveys of attitudes, knowledge and experience of drug use, (iii) multi-agency enumeration studies of known users and (iv) fieldwork studies of 'hidden' users. Section 2 outlines which agencies require information on trends in illicit drug use, and highlights the sort of information that each of the different agencies requires. Intelligence information that is collected by various departments in the enforcement sector is reviewed in Section 3, and the extent to which this information can be used to identify trends in illicit drug use is assessed. Section 4 reviews recent attempts to survey the population for its attitudes, knowledge and experience of drug use. By selecting certain important studies in this area, the success with which the results of these surveys can be used to indicate trends in drug use is evaluated. In Section 5, surveys of known drug users are reviewed, and the problems associated with interpretation of the outcomes of these studies are highlighted. Section 6 considers those few studies where the fieldwork has been extended to cover those drug users not in contact with any medical or socio-legal agencies. The latter half of this section collects together the pieces of evidence on the size of the unknown heroin-user population, and uses the Home Office Addicts Index to estimate annual prevalence, consumption and expenditure figures for heroin in the UK, for the years 1979 to 1990.

2. WHO REQUIRES INFORMATION AND WHAT INFORMATION DO THEY REQUIRE?

Measures of trends in illicit drug use can take many different forms. Even when constructing prevalence measures, researchers need to select the correct period over which to measure prevalence. Policy-makers may require figures concerning the prevalence of *ever-users, use in the last twelve months* or *current users*. Alternatively, it may be that policy-makers will want prevalence information focused primarily on problem drug use, however defined.

The most challenging information requirements arise, however, when policy-makers attempt to formulate policy to reduce the harmful effects of illicit drug use. For these purposes, policy-makers need understanding of the causal links with drug use, and forecasts of the reactions of drug users to policy interventions.

The following sections discuss the roles of the three main groups with concerns about illicit drug use: health, education and enforcement agencies. Each section initially outlines what policy needs determine those agencies' demand for information. An estimate of the level of resources directed at the drugs problem is offered where available. Basic prevalence information seems necessary as a back-drop for policy-makers, but different agencies are likely to highlight different problems with drug use, and trends in the prevalence of these problems may not follow trends in overall prevalence figures. Some thoughts are offered under each section as to what aspects of drug use may be of particular interest to these agencies.

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Each of the sections closes with consideration of some of the policy issues facing these agencies, and highlights the need for detailed analysis of drugs users and their drug use.

2.1 Health Agencies: The Department of Health, Regional Health Authorities and Treatment Agencies

The harmful effects of illicit drugs and their associated adulterants on the health of users clearly makes drug use an issue of concern to those involved in providing health services. Health agencies need prevalence information if they are to forecast the level of drug-related harm and treatment demands. The recent link between injecting drug use and the transmission of the HIV virus has changed the research and policy agenda considerably (Strang et al, 1992).

The amount of expenditure devoted by the Department of Health and Regional Health Authorities to drug misuse services is difficult to estimate because of the complexity of the method of allocating funds. The memorandum from the Department of Health to the Social Services Committee (Department of Health, 1992) offers some information on the allocation of funds for drug misuse services, although the actual amount spent on drug misuse services may differ considerably.

The Department of Health memorandum suggests that since the Central Funding Initiative ran out in the financial year 1990/91, expenditure on services for drug misusers, mainly consisting of Regional Health Authority expenditure, reached a total of £16.5m in 1991/92. Other expenditure demands include the £2m grant given in 1991/92 to local authorities for voluntary

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organisations, the National Poisons Information Service, which was allocated £340,000 in 1989/90, and Department of Health "Publicity" estimated to cost £4.7m in 1991/92 (Department of Health, 1992). Another large component of health agencies' expenditure is incurred by the National Health Service. Griffin (1992) estimated that in 1989/90 the NHS could attribute £31.5m to drug misuse (0.1% of its total budget).

It is irrefutable that some important health agency costs have not been included, such as the input of the voluntary sector and the cost of running the Regional Drug Misuse Databases. Nevertheless, the amount already identified is considerable, and can be estimated to have reached £60m in 1991/92.

2.1.1 What information do health agencies require?

Uncertainty surrounding the aspects of drug use which pose particular risk to health means that many measures of drug use are needed by health service providers. A basic prevalence measure of the number of individuals who have used illicit drugs over a certain period of time is of limited use if particular aspects of drug use are more risky for health. Swadi (1988), for example, suggested that poly-drug use was "one of the most serious and potentially damaging aspects of drug taking" (p.936). Griffiths et al (1992), on the other hand, argued that the HIV-risk associated with heroin injection was not the only important risk associated with routes of administration, and noted references investigating the risk of bronchial spasm for heroin 'chasers' (Oliver, 1986) and the risk of adulterants for smokers (Huizer, 1988). Supplementary information will be needed, therefore, in the form of measures of the number of *regular*, *occasional* and *new* (a measure of incidence) users, along with definitions of what

these terms mean and measures of the duration of use. Regular users may also need to be divided further into *heavy* and *average* users if the health effects of drug use are 'dose-responsive'. Much more research is required before users of illicit drugs can be divided, as alcohol drinkers are, into categories which are thought to have some meaning in health risk terms (Foster et al, 1990).

As mentioned earlier, it is sometimes proposed that the adulterants that are added to illicit drugs may pose an even greater threat to health than the drugs themselves (Crowe, 1988). It is alleged that some drugs are 'cut' with substances such as 'Vim' (Haw , 1985), 'Victory-V' lozenges and talcum powder (Ditton and Speirits, 1982), the intravenous injection of which pose a serious health threat. Measures of the 'street-purity' of different drugs are required, therefore, along with indicators of the substances which are frequently used locally during the 'cutting' process, if treatment services are to be planned effectively.

Whilst the individual effects of the use of illicit drugs is uncertain, there is even less information available concerning the health effects of poly-drug use. Studies of the subset of users known to treatment services show little agreement as to the extent of poly-drug use, but it is suggested that poly-drug users suffer a wider range of problems (Melville et al, 1990). As different drugs become more fashionable and more easily obtained, treatment services need to be 'fine-tuned' to respond to the particular needs of patients presenting with particular combinations of drug problems.

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2.1.2 What research is needed for health policy-making?

The Advisory Council on the Misuse of Drugs (ACMD) suggested that it was fundamentally important for the most number of users to be contacted by treatment and advisory agencies (Home Office, 1984). Aside from the added insight that increased contact will give, it is hoped that treatment can be effective at helping drug addicts to quit and detoxify. To evaluate policies policy-makers need accurate estimates of the outcidence rate, that is the rate of successful quitting, for those individuals in treatment on different treatment regimes. In the case of syringe and needle exchange schemes, information is needed on the amount of infection avoided by the offering of 'safe' equipment for the administration of drugs. Moreover, the medical sector needs to analyse the effectiveness of policy-measures implemented to try and prevent drug users from injecting drugs. Ruben and Morrison (1992) present evidence of just such a policy with Temazepam, which it seems has proved counter-productive.

Prescribing practices are extremely diverse throughout the UK, with some agencies offering prescribed opiates only for a short period of detoxification (Melville et al, 1990), and others committing themselves to maintenance prescribing (Marks, 1991). It has been suggested that drug treatment and rehabilitation services are badly co-ordinated and underfunded (House of Commons, 1985), and that it is not known which treatments, if any, are effective (Dale and Keaney, 1992). In order to assess the optimum level of prescribing, information is required concerning the effectiveness of maintenance prescribing in terms of the amount that prescribing reduces the costs arising from drug use (such as reduction in crime, reduced health risks from the consumption of impure heroin) and the effectiveness of detoxification regimes.

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Dale and Keaney (1992) suggest that much could be learned from the United States, where studies of the effectiveness of methadone maintenance have been in operation since the mid-60s. They conclude that research into methadone treatment needs to be undertaken on a regional or national level so that discrepancies in the provision of treatment between the NHS and private clinics can be minimised through the setting of minimum standards of care.

2.2   Department of Education, Schools and Health Educators

Many surveys of drug use exclusively target the young (Bagnall, 1988; Parker et al, 1987; Plant et al, 1984; Swadi, 1988; Wright and Pearl, 1990). Studies suggest that, for some, the age of onset of drug use is less than 11 years of age (Bagnall, 1988; Swadi, 1988). Since a considerable proportion of drug users may be at an age where they are attending school, drug misuse becomes relevant if usage is associated with disciplinary problems such as truancy (Cooke et al, 1988) or with a low level of school-achievement (Parker et al, 1987; Allison, 1992). Moreover, some authors have recently suggested that low expectations, low grades, truancy and the 'streaming' of some children into less advanced classes, may be causal risk factors for drug use in later life (Dryfoos, 1990; Allison, 1992).

No data are published relating to the amount of resources devoted to drugs education by the education authorities. Schools are required by the Education Act 1988 to provide a minimum level of drugs education, but no guidelines are laid down as to the level of resources that should be dedicated, ostensibly so that drug educators can react to local conditions. It seems impossible, therefore, to estimate the amount of resources used by drugs education in schools.

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Some expenditure by the Department of Health on drug publicity has already been noted (see above), and the Health Education Authority devoted £9.5m to HIV/AIDS education, with some inevitable cross-over with drug misuse.

2.2.1 What information do education agencies require?

In order to realise the potential impact of drug misuse on schooling, these bodies require information on the prevalence of drug use amongst individuals of school age and of the drugs being misused. However, as Coggans et al (1991) highlight "perhaps the most important thing to grasp is that young people who experiment with drugs, or use occasionally, will probably not encounter serious health consequences" (p.1109). In some ways, therefore, it is the prevalence of *problem* drug use which may be the primary focus, the kind of drug use that leads to truancy problems, and will detrimentally affect the individual's school-achievement and future life. It is for precisely this reason that Dryfoos (1990) suggests that health promotion should not concern itself with *ever-users*. Clearly, however, for some drugs experimental use can have the most severe of consequences, since, as Newcombe (1992) points out, a significant proportion of ecstasy-attributed deaths have involved only minimal doses of the drug.

Experimental and casual use, which may well be more highly concentrated in the young for financial reasons, is thought to be encouraged by increased availability (Crowe, 1988; Home Office, 1984). For this reason, those dealing with the young will additionally wish to keep track of illicit drug supply and availability.

2.2.2 What information is needed for education policy-making?

To estimate the effectiveness of school based drug education, prevalence figures need to be continuously collected to see the impact on preventing current and potential future misuse and ending existing misuse. However, in order to assess whether resources would be best directed into education schemes rather than other policies, policy-makers need to know not only whether drug education improves knowledge about drugs, but whether enhanced knowledge will actually change behaviour. Coggans et al (1991), in a rare study of the effectiveness of school-based drug education, concluded that although "[i]t may be disappointing that drug use does not appear to have been influenced by drug education .... [i]t is also important to note that drug education was *not* associated with *increased* drug use, despite being associated with increases in drug-related knowledge" (p.1107). However, the findings of a North American study were not so optimistic. Allison (1992) actually found significantly higher levels of cannabis use in those students who had been exposed to education on that subject. A similar knowledge-behaviour gap was identified in adults by Darke et al (1992) in their study of the HIV risk-taking behaviour of methadone treatment clients, when they proposed that "[t]here was thus no relationship between knowledge of HIV transmission and the actual levels of risk-taking subjects were engaged in" (p.266).

These sorts of study findings raise serious doubts over the effectiveness of drugs education. There is clearly an urgent need for evaluation of the current range of drugs education activities, so that any resources currently devoted to education programmes that do not change drug-use behaviour can be used more cost-effectively. These sorts of questions have already been addressed by the Advisory Council on the Misuse of Drugs (ACMD), who decided that

mass-media was not an appropriate medium for anti-drug messages (Home Office, 1984). However, it may be that the role of drug messages in mass media is for agenda setting, to create an environment in which local initiatives can be implemented, and in order to create a political consensus to support the funding of anti-drug measures. Nevertheless, policy-makers should seriously question the cost-effectiveness of their current range of drug education activities with good quality studies of outcome.

2.3   Enforcement Agencies

Society's drug enforcement policy is implemented through the Home Office's management of the police and HM Customs and Excise. A recent report suggests that the costs of enforcement policy reached £200m in 1990. The importance given to enforcement demands on the funds available in the Seized Assets Fund suggests that the level of resources devoted to enforcement may be the fastest growing component of society's policies on drug misuse (Druglink, March/April 1992)

2.3.1   What information do enforcement agencies require?

Law-and-order decision-makers clearly have options available to them in the form of two alternative agencies that can enforce drug laws, and in the form of the different policy options available to each of these agencies. In order to discriminate between them, resource-allocators need some measure of the cost-effectiveness of the different policy options. Wagstaff and Maynard (1988) have suggested that this monitoring of enforcement output requires at the very minimum a measure of the total supply of illicit drugs in the UK.

For Customs, the total quantity of drugs being shipped into and through the UK is required, along with indicators of the amount entering from different consignment points, through different trafficking methods and of differing purities. For the police, information is needed relating to the supply of drugs at different levels of the domestic market and on the prices and purities of the drugs at different levels of the distribution network. Moreover, both agencies also require a 'head-count' in terms of the numbers of traffickers, couriers, dealers and end-users.

In addition, it has been suggested that a considerable amount of crime is committed that can be viewed as revenue-raising crime for the finance of expensive drug habits. In the United States it is thought that 50% of burglaries are committed by opiate users and that 10% of opiate users have to steal to finance their habits (Newmayer and Johnson, 1976). Research has not produced such figures for the United Kingdom, and there is considerable debate surrounding the nature of the drug-use/crime link. However, since some users confess to raising funds for their drug use through crime (Bean and Wilkinson, 1987; Griffiths et al, 1992) it is clear that a consistent measure of total expenditure on drug use will be required for this research.

2.3.2 What information is required for enforcement policy-making?

The implementation of drug law enforcement is viewed as imposing risks on drug dealers and drug users, which may increase both the nominal price and the effective price of use[3]. As

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[3] The effective price represents the full costs to the individual, including not only the nominal price, but also additional factors such as the time and money costs in finding reliable dealers, and the risks involved in holding the drug prior to consumption (Wagstaff and Maynard, 1988).

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dealers face increased risks, they may seek additional compensation from users, and users, facing increased risks of apprehension and conviction, must now pay an increased (effective) price of use. However, changes in the prices of illicit drugs are not the end-points that should be used to evaluate enforcement effectiveness. Instead it is the impact of the price changes on the external costs of drug use[4]. There is considerable debate as to the effects of price on the overall level of consumption, and these effects will probably depend on the direction of the change in price and the particular types of drug users concerned (Wagstaff and Maynard, 1988). To evaluate enforcement policy, policy-makers need to know the price elasticity of demand for each drug (the effect of price changes in a good on its consumption), and the cross-price elasticities for different drugs (the effects of changes in the price of one drug on the consumption of another).

2.4   Legislators and Policy-Makers

It is clear that drug misuse imposes costs on society in many different ways, and policy concerns over this issue cross many types of agencies. The earlier sections indicate that a considerable amount of resources are devoted to the drug misuse problem already. This paper has listed expenditures that sum to nearly £300m in 1991/92, although the total level of expenditure devoted in the United Kingdom is probably nearer £400-500m.

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[4]External costs are those costs which are imposed on society through the actions of certain individuals for which it receives no compensation.

2.4.1   What information do national policy-makers require?

The allocation of resources at the inter-departmental level and policy-making requires not only the information listed above, but also the relative importance to be attached to each of these measures - ie. an indication of where the external costs accrue. Therefore, at the highest policy-level there is a need not only for basic prevalence information, nor only for the prevalence of drug misuse problems, but also measures of the relative importance of different trends in drug use. It is only with this information at their disposal that policy-makers and those involved in resource allocation can assess the relative merits of different policy options, and plan the optimal mix of interventions to reduce the harm created by illegal drug use.

3   INDIRECT MEASURES OF THE SIZE OF DRUG MARKETS

Information is collected by some agencies in the enforcement sector for intelligence purposes, and has been used in the past to infer trends in illicit drug use. This information, for the most part, is collected in the course of duty, rather than as research into drug misuse. Nevertheless, it is unique, in that is nationally and regularly collected. Furthermore, much of the data relate to supply-side conditions in illicit drug markets. The ACMD noted the importance of supply-side measures when it suggested that increased availability would lead to increased use (Home Office, 1984).

Section 3.1 considers the meaning of trends in the total level of seizures of illicit drugs made by the police and Customs. The economic implications of trends in the price and purity of illicit drugs are considered in Section 3.2.

3.1.   Seizures by HM Customs and the Police

Statistics on seizures of those drugs controlled under the Misuse of Drugs Act 1971 by HM Customs and the police are published annually by the Home Office Statistical Department. The published statistics provide information on the total number and quantity of seizures of different illegal drugs, as well as information on where the drugs were seized and the action taken against those apprehended in connection with drug seizures.

Table I shows the total annual quantities of heroin, cocaine and cannabis seized by both the police and Customs over the period 1979-1990. With rises such as those in cocaine seizures

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in recent years, the press and other agencies suggest that these figures indicate trends (usually 'epidemics') in the supply and use of particular drugs (Guardian, 10 January 1992). These concepts are discussed rather loosely, with Hartnoll (1984), for example, indicating that a direct implication of seizures rising rapidly is more entering the country and more available at the user level. Unfortunately, the information actually contained in these figures is considerably more complex and there are many more factors which can cause rises (falls) in these figures. Five reasons why trends in seizure statistics cannot provide information on trends in drug use are discussed below.

First of all, whilst figures concerning the level of enforcement resources directed at drug law enforcement are extremely patchy, it seems that the real level of resources used by enforcement agencies has increased dramatically over the last decade. Table II contains those indicators of resource use which are available. Unfortunately, an estimate of the amount of resources used by one of the largest branches (CID and Uniformed officers) is only available for one year. Based on this limited information, however, it has been estimated that the *real* level of resources devoted to drug law enforcement by Customs and the police showed 38% and 75% increases respectively, over the period 1979 to 1989 (Sutton et al, 1992). For this reason, it seems unreasonable to suggest that the level of drug seizures is a constant proportion of the total amount of drugs in the UK. An adjustment of an unknown amount must be made for the expected increased output of enforcement agencies over the decade.

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Table I   The Quantity of Heroin, Cocaine and Cannabis Seized by Customs and the Police, 1979-1990 (Kg)

	Heroin			Cocaine			Cannabis		
	Customs	Police	Total	Customs	Police	Total	Customs	Police	Total
1979	43.3	1.6	44.9	21.6	2.4	24.0	11,586	547	12,133
1980	36.4	1.8	38.2	36.0	4.2	40.2	25,500	790	26,290
1981	85.8	7.6	93.4	15.7	5.4	21.1	24,210	547	24,757
1982	185.1	10.3	195.4	12.1	6.6	18.7	16,546	830	17,376
1983	215.9	20.3	236.2	74.0	6.0	80.0	18,892	629	19,521
1984	312.6	49.0	361.6	35.4	30.1	65.5	26,256	2,815	29,071
1985	334.2	32.2	366.4	78.7	6.7	85.4	20,905	1,260	22,165
1986	179.2	43.7	222.9	99.2	3.4	102.6	22,382	2,754	25,136
1987	190.0	45.6	235.6	362.4	44.4	406.8	16,293	643	16,936
1988	211.4	24.3	235.7	263.6	59.6	323.2	42,308	3,168	45,476
1989	330.6	20.8	351.4	426.6	72.2	498.8	51,759	7,611	59,370
1990	575.8	26.9	602.7	561.3	49.6	610.9	24,911	5,978	30,889

Source: Home Office Statistical Department

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There are further reasons why these seizures data are of little value. As well as expecting enforcement agencies' output to change as a result of changes in resource use, it is likely that their *effectiveness* will have varied over the period for the same level of resources (see Wagstaff and Maynard (1988) and Sutton et al (1992) for an estimation of the extent of this variation).

A third consideration is that these figures will reflect the targeting behaviour of the seizing agencies. There are many ways in which the *composition* of total drug seizures may change in response to targeting behaviour. At the macro-level, the proportion of total seizures made by the police will vary from year to year. Changes in the emphasis between the trafficking and domestic distribution levels of the market will produce variations in the proportion of the total supply seized. At a lower level, Customs may switch the priority for its activities between couriers and traffickers, and the police between dealers and users. Moreover, it is likely that enforcement agencies will switch the focus of their activities between different drug classes and types. Melville et al (1990), for example, note how the publicly stated intent of the local Drugs Squad to target 'crack' use will probably feed through into the seizure statistics. The changing composition of drug seizures indicated between year and year could just as likely reflect targeting strategy as shifts in the make-up of the domestic drugs market.

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Table II Expenditure by Customs and the Police on Drug Enforcement Activities, 1979-1990 (£m at 1985 factor cost)

| | HM Customs Expenditure | | Police Expenditure | | | |
| | | | Regional Crime Squads | | Force Drug Squads | CID and Uniformed Officers |
	Drug-Specific Work	Preventive Work	Drugs Wing	Non-Drugs Wing		
1979	7.9	67.2				
1980	8.9	62.7				
1981	9.7	59.0				
1982	11.0	56.4				
1983	12.3	54.5				
1984	13.2	53.1			14.2	
1985	14.9[a] / 23.6[a]	58.5[a] / 51.1[a]			16.2	
1986	25.9	55.7			18.3	
1987	30.4	58.2			18.8	
1988	33.8	51.5[b]	4.2	5.2	18.9	64.2
1989	36.6	56.4	7.6	7.0	19.3	-
1990	-	-	-	7.4	18.7	-

a Two sets of figures have been produced for 1985 because of a discontinuity in the way in which these figures are calculated.

b Staff costs were refined in 1988 after the introduction of an operational planning system. The result was a lower staff cost compared to 1987, despite an 8% increase in manpower.

Source: Sutton et al (1992).

A fourth point to note is that, the average size of seizures fluctuates wildly from one year to the next. This observation arises due to the seizure of extremely large amounts on relatively rare occasions. At the local level, this point is noted by Melville et al (1990), who claimed that seizure rates "can be heavily skewed by one or two spectacular seizures of a particular drug". This effect, however, will still feed through to the national statistics, especially noting the extremely large seizures that have been made in certain years (Guardian, 10 January 1992). This is a further reason for interpreting annual trends in drug seizures with caution.

A final adjustment to trends in seizure statistics that must be made is that for the purity of illicit drugs at different levels of the market. Figure I shows the purity of heroin seizures of different quantities for the period 1979 to 1990. It would appear that the degree of 'cutting' taking place between the distribution level and retail level of the market has declined over the decade. Trends such as this would cause different quantities to be exchanged at each level of the market although the actual level of 'pure' drugs may not be changing. For this reason, drug seizures will additionally reflect trends in the proportion of weight represented by adulterants.

It has been established that movements in the seizure figures of enforcement agencies reflect the effects of a complex set of inter-related factors. Analysed with certain other information available, it is reasonable to suggest that increased seizures are consistent with increasing supply rather than a dramatic increase in the success of drug interception strategies (Lewis et al, 1985). Nevertheless, the fact that all these influences are included and, more importantly, that the information is not available to correct for these influences, means that trends in the supply and use of illicit drugs cannot be inferred from seizure statistics.

Figure 1

The Purity of Heroin Seizures
at various levels of the market, 1980-90
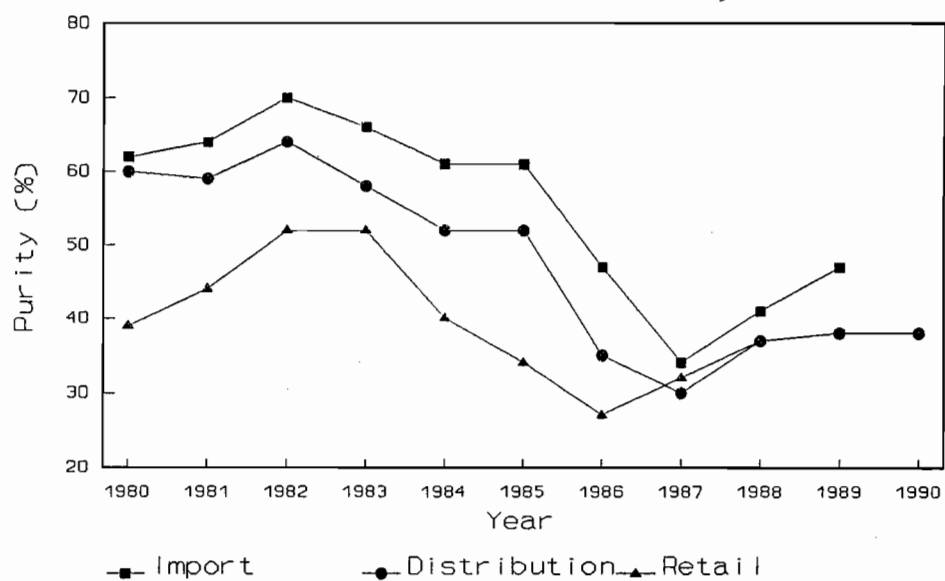
3.2   The price and purity of illicit drugs

The National Drugs Intelligence Unit collects information on the prices of different quantities of illicit drugs based on prices reported by apprehended drug dealers and users, and some fieldwork research. It is of concern that the price figures are largely based not on actual purchases but reports from individuals who are not guaranteed to be truthful, and are unrepresentative purely by the fact that they have been apprehended. Furthermore, it is precarious to rely on individual price figures when studies suggest that, at some time, drugs have been supplied for favours to 85% of users, or purchased on credit at 15-25% higher cost by 76% of users (Bean and Wilkinson, 1987).

Despite these problems, market prices are believed to reflect market conditions, particularly availability, and price rises may be used as indicators of the success with which enforcement agencies have restricted supply in different markets. It is tempting to analyse the price of illicit drugs at current prices, however trends in market prices must be adjusted for price increases in other goods. Furthermore, there is an alternative method to raising price by which dealers can react to shortages in supply and maintain their previous income. By 'cutting' the drugs they supply to a greater extent, dealers can ensure they have sufficient volume of supplies albeit of lower quality. The extent to which dealers are free to react in this manner is not known, although Lewis et al (1985) suggested that dilution is much less severe in the UK than in the United States. George and Fraser (1989) cite evidence of consumers reacting to poor quality when certain users cut their £10 'bags' so much that they could not generate demand. Similarly, Lewis et al (1985) report that purity is tested at the retail level by taste and that dissatisfaction is expressed when quality deviates from the 'norm'.

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However, it is clear that the temptation to secure profits in this more covert manner does exist. Alternatively, it may be that price will rise to reflect the increased quality of heroin at retail level, a explanation proposed by Lewis et al (1985) for the rise in prices in London at the end of 1981. Therefore, if drug prices are to serve as an indicator of market conditions, and in order to help estimation of expenditure on drugs, they must be adjusted for market purity.

Indicators of the purity of illicit drugs of different quantities are formed by investigation of the purity of seizures made by the Laboratory of the Government Chemist. Once again, it is not clear how representative the seizures are of the total supply of illicit drugs, and it is possible for the purity of a few particularly large seizures to dominate the figures produced, since the purity figures are weighted averages.

Figures II and III indicate how 'street-level' prices of heroin and cocaine at constant prices, have diverged from quality-adjusted 'street-level' prices. Since both purity and price represent ways in which suppliers and users can react to market conditions, quality-adjusted prices are the preferred indicators of the economic situation.

Figure 2: Price and Quality–Adjusted Price of Heroin per Gram at 'Street–Level', 1980–1989 (1980 prices)
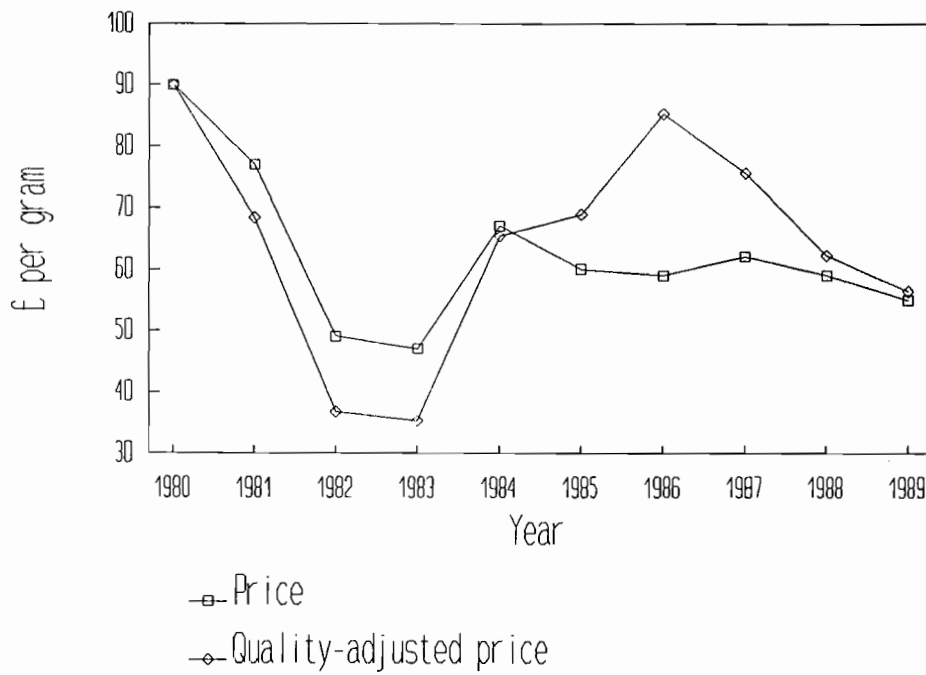
Figure 3: Price and Quality–Adjusted Price of Cocaine per Gram at 'Street–Level', 1980–1989 (1980 prices)
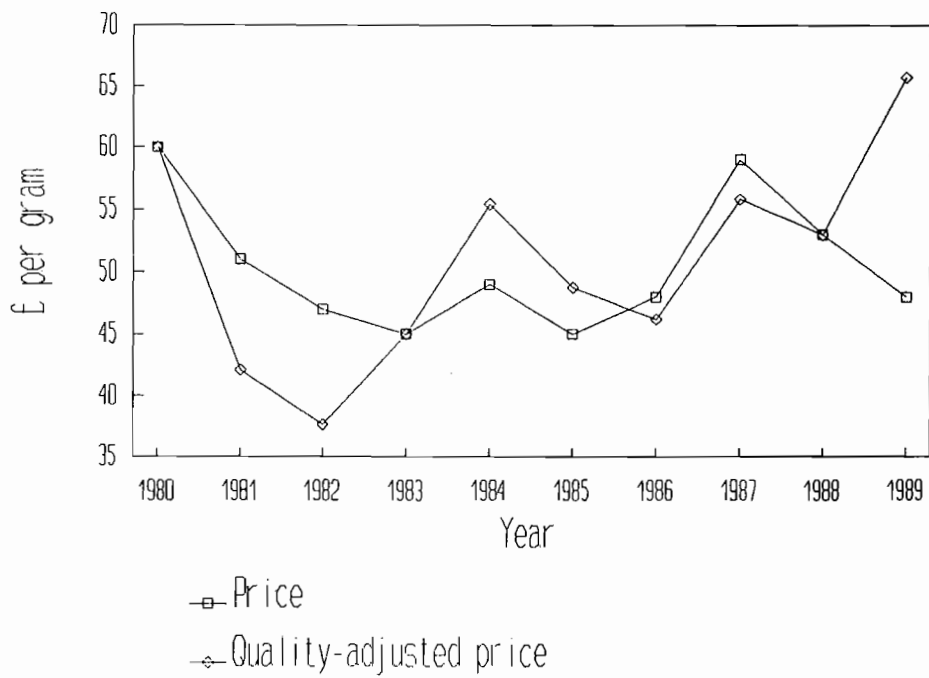
It is tempting to make inferences about drug prevalence based on analysis of drug price and purity changes. However, the complexity of the bargaining process is illustrated by Bean and Wilkinson (1987), who note that price will vary with aggregate supply conditions, the quantity purchased, local supply conditions, relationship with the supplier, purity and competition.

Therefore, inferences made about drug prevalence in the past have been fundamentally determined by the researchers' beliefs about the existing market conditions. The steady decline in amphetamine purity from 1984 to at least 1990 has been interpreted as a response to increasing demand (ISDD, 1991). It is quite feasible for this market reaction to emerge if suppliers are frustrated from maintaining supply by enforcement or other activity. Similarly, the fact that cocaine is an expensive drug, and that its purity is diminishing (ISDD, 1991) could be considerable cause for concern, if this reflects the need of dealers to cut purity in order to meet increasing demand. For these reasons, it is no comfort that ecstasy is an expensive drug compared to LSD and amphetamines, and is therefore unlikely to penetrate the mass youth market (ISDD, 1991), if the difference in price already reflects the fact that suppliers are finding it difficult to meet increasing demand.

In essence, therefore, interpreting trends in illicit drug use from trends in the prices of those drugs (even quality-adjusted prices) is fraught with problems in the absence of other indicators of purity, market structure and consumption. Existing interpretations are likely to reflect commentators' limited knowledge of trends in the use of those drugs.

4. SURVEYS OF DRUG USE ATTITUDES, KNOWLEDGE AND EXPERIENCE

Trends in the individual use of *legal* addictive drugs are most directly estimated using government-sponsored household surveys such as the General Household Survey and the Family Expenditure Survey. The extension of this approach to estimate the prevalence of the use of illicit drugs has apparently been considered by a number of government departments, although it appears that these suggestions have been rejected (Goddard, 1987). Despite government reluctance to entertain this approach a number of surveys have been undertaken of individuals' attitudes, knowledge and experience of drug use, although the main market research organisations have been rarely involved. This observation may be thought to be surprising, given newspaper interest in the subject of drug misuse. However, the existing range of surveys undertaken do provide a reasonable illustration of the problems facing the interpretation of their results.

Section 4.1 considers the importance of ensuring the representativeness of the survey sample, and discusses what measures have been taken to safeguard against sample bias in the past. The method adopted in these surveys is crucially important for the results that will be obtained, and sections 4.2 and 4.3 consider the possible methods available and the ease with which the responses can be interpreted. Section 4.4 concludes the chapter by outlining a case for the implementation of regular, government-sponsored, national surveys of drug use, by examining the experience with national drug use surveys in some other countries.

4.1 Sample Design

For the results of surveys of drug use to be extrapolated to the national level the samples upon which they are constructed must be representative of the national population as a whole. Although the study of drug use has traditionally concentrated on younger individuals, studies often report on users in their 40s, 50s and 60s, and there has been much discussion of the population of opiate users getting older, and new epidemics of younger users (Parker et al, 1988). For this reason, the representativeness of the age-distribution is crucial, and yet, probably because the main objective of many of these studies has been to monitor the effectiveness of drug education, most surveys concentrate on younger users.

The heterogeneity of the age-bands surveyed means that these questionnaires are not only incapable of measuring prevalence in the general population, but also their incomparability makes estimation of the incidence of drug use in new waves of potential users impossible. Surveys also find different rates of drug use across the sexes, and across different socio-economic groups. It is clear that standardisation of the sample in these respects is also desirable.

Another potentially very important consideration in the interpretation of survey results concerns the individuals missing from the sampling frame or missing within the sampling frame. There are two reasons why individuals may be missing from the sample that relate to the age distribution under study, but which have similar overall effects on the results:

(i) Many of the studies concerning younger individuals undertake their studies at school

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or college. It has been suggested that absenteeism from school means that prevalence figures from these surveys represent considerable under-estimates (Cooke et al, 1988). This problem is particularly acute when interpreting time-series figures where the truancy rate varies considerably from one sample year to the next (Wright and Pearl, 1986 and 1990)[4].

(ii) For surveys of more general age distributions, the problem emerges as a failure to sample homeless individuals, and those living in institutions, working in the armed forces or often moving house. In the case of the Family Expenditure Survey, this omission has been believed to account for a considerable proportion of the shortfall in the total amount consumed, as indicated by the summation of the individual responses as compared to National Expenditure figures (Kemsley et al, 1980). For the British Crime Survey (Mott, 1985), this may have had considerable impact on the prevalence figures estimated.

There are a number of sampling problems that cause the extrapolation of existing prevalence surveys to be hazardous. Mott (1985) has suggested that these sampling errors are particularly important given the small rates of prevalence elicited in these surveys. The importance of sampling considerations is highlighted by the suggestive evidence that Merseyside suffered an epidemic of male, young individuals using heroin. Surveys which over or under emphasized the male gender or the young population would have suggested a distorted and unadjustable view of trends in drug use in the region.

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[4]In Wright and Pearls' studies the truancy rate increased from 14% in 1984 to 21% in 1989.

4.2   Questionnaire Design

The questions actually asked or the way in which they are framed crucially affects the usefulness of the results obtained. For the British Crime Survey, Mott (1985) was concerned that subjects may be made more reluctant to admit cannabis use since these questions were framed in terms of committing an offence.

There also exists a debate as to whether self-reported drug use is a valid measure of prevalence or whether alternative questions need to be asked. Wright and Pearl (1990) in a series of surveys have measured knowledge (in terms of 'what drugs do addicts use?') and experience (in terms of 'how many friends use drugs?' and 'have you ever been offered drugs?') of drug use more indirectly. Swadi (1988), on the other hand, considers four different approaches to measuring drug use. Swadi (1988) claimed that the threat of losing anonymity would distort the results from direct interview, and that questions regarding the drug use of 'significant others' were of questionable validity. Turning to the possibility of using biochemical tests, Darke et al (1991) were concerned that urinalysis would only detect use in the last 24 hours (12 hours for cocaine), would not be able to trace hallucinogens and gave no information on the amount used. Swadi (1988) settled for direct self-report questions and cited several studies from the 1970's to support this approach. It is likely, however, that the validity of self-report will reflect contemporary social attitudes to drug use, although this stance is supported by a recent study in America which found a high level of correlation between self-reported use of cannabinoids and benzodiazepines and urinalysis (Hancock et al, 1991).

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4.3   Interpretation of results

Perhaps the greatest problem facing extrapolation of these results is in their actual interpretation, and trends in the actual use of drugs are difficult to infer.

4.3.1 The quantity of drugs used

Some questions asked of respondents are so far removed from measures of drug use that they are clearly not suited for estimation of trends in drug use. For example, it is difficult to interpret the fact that, whereas the percentage quoting cocaine as a drug used by addicts rose from 15% in 1969 to 80% in 1989, the figures for amphetamines fell from 44% to 10% (Wright and Pearl, 1990). Similarly, it is impossible to know whether the fact that opiates overtook cannabis as the most frequently mentioned drug used by addicts reflects drug education on the television, or increased habitualisation of heroin use.

Similarly, questions relating to the drug-taking habits of 'significant others' are difficult to turn into measures of prevalence since they reflect the relative sociability and openness of users and the acceptability of the use of different drugs. The fact that the percentage of youths knowing someone who takes drugs has more than doubled since 1969 from 15% to 30% (Wright and Pearl, 1990), could reflect increased awareness of the signs of drug-taking, as well as contemporary attitudes towards drug-taking, along with a perceived drop in the chances, and the severity of the consequences, of discovery.

The secrecy surrounding the use of different drugs will also be reflected in measures such as

the number of individuals who have been offered drugs, a measure which may reflect the risks facing users and dealers. A rise in the proportion of individuals being offered drugs could reflect a situation where demand for a drug is decreasing, and dealers are having to resort to higher profile sales techniques, as opposed to an equally plausible increase in prevalence. The increase in the percentage of young people being offered drugs from 5% in 1969 to 19% in 1987-1989 (Wright and Pearl, 1990) seems disturbing, but may be misleading if there has been no comparable increase in actual adolescent drug use.

However, the greatest shortcoming of the survey results stems from their grossly inadequate measures of use. Even when individuals are directly asked about their drug use they are simply asked whether they have 'ever tried' drugs, and whether they 'regularly' use them (Bagnall, 1988; Parker et al, 1988; Swadi, 1988; Plant et al, 1984). Responses to the first question, which are effectively period prevalence figures for the entire lifetime of the sample, provide virtually no information on trends in drug use other than information on the age of first experimental use. It has already been noted that Dryfoos (1990) believes this measure of drug use is of no interest to health promoters. Table III tries to bring together some available information. It is quite clear that the results are extremely difficult to interpret in terms of any trends in drug use.

Table III **Percentage of Individuals Who Have Ever Tried Illicit Drugs**

Study, Region and Age-group	Cannabis	Amphetamines	Cocaine	Heroin
British Crime Survey (Mott, 1985), Great Britain				
16 - 19 years	8			
20 - 24 years	13			
25 - 29 years	13			
30 - 34 years	10			
35 - 39 years	5			
40 - 44 years	1			
45+ years	1			
NOP Market Research (1982), 15-21 years				
Scotland	21	8	9	7
The North	15	4	1	<0.5
Midlands, E Anglia, Wales	16	6	1	1
The South (excl. London)	13	3	1	1
London	28	10	3	1
Plant et al (1984), Lothian				
15 - 16 years	7	3	1	1
Bagnall (1988), G Britain				
12 - 13 years	1	0.4	<0.1	0.3
Parker et al (1988), The Wirral				
15 - 16 years	36	8	3	3
16 - 19 years	39	17	4	2
16 - 20 years	32	11	-	3
Swadi (1988), London				
11 - 16 years	12	3	2	2
Smith and Nutbeam (1992), Wales				
15 - 16 years	16	4	1	1

In terms of attempting to measure drug consumption, there is absolutely no attempt made to obtain frequency/quantity information as in the General Household Survey for alcohol (Foster et al, 1990). Smith and Nutbeam (1992) divide 'ever' users of drugs into the arbitrary categories of use 'once or twice' or 'more than three times', and later describe this latter group as 'regular' users. Swadi (1988) suggested that 8.4% of 11-16 year olds 'repeatedly' used drugs, and this rate rose from 2% in 11 year olds to 16% in 16 year olds. He also asserted that one-third of those who try cocaine do so repeatedly, as do half of those who try cannabis and heroin. Parker et al (1988) on the other hand suggest that one-tenth of fifth year school children 'regularly' use drugs, usually cannabis. There have, however, been no attempts to standardise these concepts or to investigate the sort of doses these youths are taking. Darke et al (1991) have suggested that the difficulty of standardising weights of illicit drug use would make methods like Gregson and Stacey's (1982) recent use episodes rather difficult. This is not the impression that emerges from the literature on illicit drug markets, especially that for heroin, where the purchase of regular amounts and quality is common-place. Swadi (1988) criticizes previous surveys for the range of drugs covered and the failure to record poly-drug use, and it is clear that individual consumption estimates are required if risky drug using behaviour is to be identified.

4.3.2 Regional variations

A further problem in interpreting survey results stems from the regional variations that are believed to exist in trends in drug use (Parker et al, 1987). These variations make interpretation of survey results difficult, since survey results in consecutive periods but from different regions may reflect regional variation in drug use rather than temporal trends.

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Indeed, comparable time trend data are the main deficiency in this area of prevalence estimation. The only survey giving detailed information on illicit drugs which appears to have been regularly repeated are those undertaken by Wright and Pearl (every five years since 1969), and the relative infrequency of the survey, and all comments noted earlier on its design, make the information contained therein of little use in the identification of trends in drug use.

4.4. A national survey of illicit drug use

It has been noted in this section that a nationwide survey of illicit drug use is not undertaken regularly in the United Kingdom. This, despite the findings of a feasibility survey commissioned by several Government departments, which suggested that a nationwide survey would be worthwhile (Goddard, 1987). Other authors have also suggested that a solution to the current information shortage would be a well-designed national survey (Wagstaff and Maynard, 1988).

It would seem useful at this stage to present some evidence of national drug use surveys in other countries. In Australia, for example, a national survey of drug use was sponsored by the Government in 1988, with an over-sampling of those in the 14-19 year-old age group. McAllister and Makkai (1991) describe how a new method for reassuring respondents of anonymity was tested, allowing the researchers to investigate the incidence and nature of under-reporting.

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In the United States, the young are over-sampled by means of separate surveys. The National Survey of High School Seniors (NSHSS) has been undertaken every year since 1975 and reaches a sample of 18,000. The National Survey of Drug Abuse, on the other hand, has interviewed a sample of approximately 8000 12-17 year-olds periodically since 1971 (Dryfoos, 1990). Respondents are asked details of *ever use, current use* and *heavy use*, for a wide range of drugs. *Current use* is defined by 'use in the last month', and *heavy use* is defined as daily use for alcohol, cigarettes and marijuana, and *current use* for other hard drugs. Using these data, Dryfoos (1990) estimates that in 1987 there were 3 million current marijuana users and 800,000 current cocaine users in the United States between the ages of 10 and 17. More importantly, information can be drawn from the annual surveys to assert that lifetime prevalence rates have been falling for most substances over the period 1982 - 1988, but that those who do use drugs, have been doing so increasingly frequently.

The main national survey of adult drug use is the National Household Survey of Drug Abuse (NHSDA). This survey has been conducted periodically since 1971, such that the 1991 survey, with a sample size of 32,000 people, is the eleventh in the series. Respondents are questioned on their *ever use, past year use* and *past month use* of a wide range of drugs. The study results can be used to analyse the abuse of prescribed drugs such as stimulants, sedatives, tranquillisers and analgesics (Adams, 1991). Furthermore, the data can be interrogated by area of residence, education level, age group, labour force status and, by grace of an over-sampling of Blacks and Hispanics, race/ethnicity (Hughes, 1992). No indicators are collected on the heaviness of use other than period prevalence figures, but the data can be used to analyse poly-drug use. Moreover, the sample sizes are sufficiently large for statistically significant differences to emerge (Adams, 1991), and even a much smaller survey

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(sample size = 2600) in Australia, found prevalence rates for most types of drugs significantly different from zero.

The existence of a variety of regularly commissioned surveys in the United States led one commentator to suggest that '[n]ational levels and trends of illicit drug use in the general population are well documented' (Hughes, 1992, p.1487). It is difficult to imagine the same being said of the situation in the UK. Concerns over the expense of a national survey are difficult to quantify. Techniques which may improve the accuracy of the results, may prove more expensive. However, in the Unites States research has been undertaken into cost-saving survey methods. Aquilino (1992), for example, reports on a feasibility survey of telephone versus face-to-face interviewing, which may save between 1/2 and 2/3 of the total cost.

The attention paid to national surveys in other countries suggests that the information elicited is of considerable worth. The problems which household surveys face, in terms of their exclusion of the homeless and institutionalised, could be overcome with surveys particulary targeting this group, as has been done with alcohol consumption and the General Household Survey (Harrison, Carr-Hill and Sutton, submitted). Indeed the inclusion of questions on illicit drug use in the GHS would seem one plausible way in which to minimise costs. Incorporated into existing surveys or organised independently, it would seem that the United Kingdom needs a regular, national survey of illicit drug use, with all the accompanying research into improving accuracy and reducing cost (whilst ensuring inter-temporal comparability), and identifying target populations for policy interventions.

5   SURVEYS OF KNOWN USERS

A whole range of studies have been undertaken in the 1980's identifying groups of users known to various authorities and agencies and describing certain of their characteristics and aspects of their drug use. Some of these studies have explicitly set out to estimate prevalence within a certain region, whilst others have merely identified sufficient users to examine their behaviour. Whilst providing interesting insights into the drug using population, the danger has always been that these samples are likely to be unrepresentative and policy risks being formulated based on an atypical sub-group of the drug using population. Furthermore, it seems that information which is easy to obtain is often presented but has little policy use, whereas more crucial information is often lacking.

An influential study in this area was the Drugs Indicator Project that was undertaken in London in the early 80s. A guide on assessing local needs was produced and multi-agency enumeration studies have been the general methodology adopted since this time. Hartnoll (1984) suggested that this approach was more robust since "[w]hilst it is always possible to challenge the validity of any single indicator, information drawn together from very different sources can present a much more compelling picture" (p.1).

The fundamental problem with this approach, however, arises from the fact that the known sector is only a subset of the total user sector, and the proportion becoming known is likely to vary by region and over time. Furthermore, rather than being random fluctuations these variations will be systematically influenced by a number of factors.

In 1987, Parker et al (1987) complained that studies of known users were incomparable because of

> "a lack of agreement between researchers as to the definition of drug misuse (or use), and by a lack of standardization in such parameters as the time-period adopted, the agencies contacted, the information collected , the procedure adopted for eliminating 'double-counts', and the type of estimate made"

(p.148)

They suggested that the 'tools-of-the-trade' needed to be standardised. There is only a certain extent, however, to which the studies can be standardised. It is obvious that the number of users identified will depend on the number of agencies surveyed. Fairly often it seems that surveys are repeated by the same authors in the same region, but the same *group of agencies* cannot be surveyed (Parker et al, 1988; Crombie et al, 1989). However, standardising the agencies approached in each survey will not guarantee comparable results. Different agencies in different regions and time periods will control different levels of resources, have different policies on the treatment of drug users, and face different levels of competition for drug users.

Haw (1985) presented evidence of agencies receiving different levels of funds when reporting on the £1.5 million given to treatment services in April 1984, of which four treatment agencies in Glasgow secured a proportion. Crombie et al (1989) suggested that the increased number of responses at the local Addiction Unit was as a result of increased staff levels and the resulting decrease in waiting times. Bean and Wilkinson (1987), on the other hand, discuss how a local doctor controlled the prescribing policy of surrounding agencies, a feature

that was likely to differentiate their prevalence study from others undertaken at different times and/or in different regions. Parker et al (1988) commented on the arrival of a new agency which attracted many new drug users. This event will probably have increased the proportion of users becoming known, as well as decreasing the proportion seen by other agencies in the area. The arrival of needle and syringe exchange schemes is another example of a factor which is likely to have changed the nature of the known sector over time. Indeed, as Melville et al (1990) suggested rather neatly, these surveys may be better interpreted as *service uptake surveys*, rather than estimates of the prevalence of drug use.

There are a number of additional points worth mentioning concerning these local studies. The first group to be considered relate to the sources of information used by these studies and their implications for the results obtained (Sections 5.1 and 5.2). Following this, the discussion will turn to the range of socio-demographic characteristics that are often presented (Section 5.3), and then the information whose policy-relevance has been more clearly established but which is far less consistently covered (Section 5.4). Finally, in Section 5.5, the Home Office Addicts index will be discussed in some detail, since this is the only *national* indicator of known drug use.

5.1 Sources of information

Hartnoll et al (1985b) distinguish between two different types of sources of information on local drug use as being those that are direct indicators, and those that are indirect. Examples of direct measures include treatment agency figures where a track is kept of the number of individuals using their facilities. Indirect measures, on the other hand, include indicators such

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as Health Authority mortality and morbidity statistics which indicate occasions when ill-health and death are associated with drug use.

The particular sources chosen for each study will crucially determine both the number of drug users and the types of drug users identified. As Haw (1985) has indicated each agency's figures are assumed to have some relationship with prevalence, but the samples are not representative, reflect policy, and will vary geographically and temporally. A number of local studies use police arrest and seizure figures as indicators of the prevalence of local drug use (Haw, 1985; Parker et al, 1988; Melville et al, 1990). The problems inherent in this procedure have already been highlighted at the national level. At the local level these problems become even more acute, with authors such as Haw (1985) noting that the police undertake major changes in policy, such as concentrating on traffickers and dealers, an approach which clearly will lead to a smaller proportion of users being identified. The worry is that arrests reflect policing priorities not local problems, or as Crowe (1988) states "police figures can be misleading in that arrests tend to follow operational objectives" (p.66).

Authors of previous prevalence studies have commented on problems that arise with certain agencies and the significance of these comments will be outlined below.

5.1.1 Response rates

A problem often cited in these studies relates to the fact that the response rates from certain groups of individuals or agencies are very low. In order to be able to correct for these omissions it is necessary for all non-respondents to have no drug use to report, or for there

to be no difference in the respondents and non-respondents. In this latter case the prevalence of known users could be adjusted upwards in proportion to the non-response rate. The problem is that this information, by its very nature, is not obvious to the authors, and no studies that have chased non-respondents appear to indicate whether either of these conditions exist.

A further problem will arise if non-response reflects attitudes towards being prepared to divulge information on known users. Whilst the anonymity of users is usually assured, it is feasible for some agencies to remain unhappy to pass on information relating to individuals' age, sex and initials. Bean and Wilkinson (1987) note this problem with GPs, social services and the Probation service from whom they received little or no assistance. This possibility is especially important if attitudes have changed over time as these studies become more routine, since increased eagerness to comply with these studies over the 1980's would produce information on an increasing proportion of the known users.

5.1.2. Information available on drug use

Whilst all agencies seem to be able to report the age, sex and initials of individuals users, many record very limited data on individuals' drug taking behaviour. Parker et al (1988), for example, report that they were only able to obtain data on individuals' social characteristics and drug use behaviour if they were registered with local General Practitioners, the Drugs Council or the Detoxification Unit. Other agencies report only the main drug used, and therefore offer no insight into the extent of poly-drug use.

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The fact that only certain agencies provide information on drug use can have a profound effect on the generalisability of survey results. Parker et al (1988), for example, report that users at the Detoxification Unit were generally heavier users. These users represent 39% of those for whom consumption data is available, but only 19% of the total number of opioid users identified, thereby having a disproportionate influence on the average consumption figures.

5.1.3 Trends in mortality and morbidity

A number of studies have produced data such as the number of coroner's reports mentioning drug use and the number of hospital admissions for drug-related causes. As Hartnoll et al (1985a) pointed out, this assumes a constant and linear relationship between prevalence and mortality/morbidity. Rates of mortality and morbidity will vary over time with changes in administration routes, drug purity, drug availability and average length of drug using career. For this reason, Crowe (1988) is reluctant to use Hartnoll et al's (1985) estimates of opioid user mortality rates of 1-2% from around the start of the decade, for his prevalence study in 1988.

5.1.4 Unreliable coding of drug users

Particularly in the case of Health Service data on admissions and coroner's reports, several authors have expressed belief that the use of drugs by the subject is unreliably coded (Melville et al, 1990). In particular, Melville et al (1990) allege that the coroner will not record drug use on his/her report if drug use is not directly related to the individual's death.

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This problem will cause significant underestimation of the prevalence of drug use, and wide variance on estimates of prevalence based on multiplication factors. This point is well illustrated in Haw's (1985) study where the number of total users predicted from multiplication of the number of drug-related deaths by the mortality rate was less than the number of users known to be attending local clinics. Furthermore, an increased eagerness to record drug use on hospital admissions or coroners' reports will distort trends in prevalence estimates over time.

5.1.5 Syringe and needle exchange schemes

Recent concerns about the HIV virus and particularly its transmission through shared needles and syringes, lead to many syringe and needle exchanges being set up throughout the UK. Presumably to reduce to a minimum the commitment that users need to make to these schemes, some authors report that they collect information only on the number of visits made in certain periods, rather than the number of individuals visiting. Melville et al (1990) attempt to translate the measure of the number of visits into individual user figures through previously reported average rates of visits per user, but it has not yet been established that users will maintain a constant rate of visits over time, or indeed, that users of different drugs will maintain the same rates.

5.1.6 Trends in prescribing behaviour

Prescribing behaviour, particularly for heroin, has changed over the last twenty years. This observation has had a profound effect on the willingness of heroin users to present to their

GPs with their heroin problem. This willingness-to-present manifests itself as the proportion of total users becoming known to their GPs. At a local level, the attitudes of the GPs and drug clinics may have a profound effect on the size of the known sector (Bean and Wilkinson, 1987; Marks, 1991). The general decline in heroin prescribing over time will also have induced more users to remain 'hidden'. At the local level, dramatic policy changes such as the widespread call for voluntary banning of heroin prescribing in Glasgow in 1983, may have had a significant impact on the number of users identified, both because fewer users present and GPs may be less eager to respond (Haw, 1985). The disillusionment of users with their GPs as a result of their prescribing behaviour was proposed by Parker et al (1988) to be so great that the removal of this group from their second survey would have little impact on the total number of known users identified.

5.1.7 Bias of certain drug agencies to certain drug users

Most multi-agency enumeration studies contact a range of medical, social and legal agencies. It is clear that the roles played by the different agencies will fundamentally affect the types of drug users that they identify. The variety of drug-using groups identified by different agencies is dramatically demonstrated by the proportion of cannabis-only users presenting at treatment agencies and those apprehended by the police. The 13-16% of users in Parker et al's (1988) two surveys are almost exclusively known by enforcement agencies as a result of possession offences. However, it is not clear that police force figures are any more representative of relative prevalence since cannabis users may be less careful about avoiding apprehension since the penalties are lower, and there is evidence that targeting policies of police forces vary from region to region, and from year to year.

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Many studies suggest that anecdotal evidence shows many drug types are more popular than opiates, but that their users are less likely to become known (Parker et al, 1988; Melville et al, 1990). It is believed that opiate users are far more likely to present for treatment since a known treatment program is available, unlike it is for cocaine-addiction (Strang et al, 1990) or the misuse of cannabis, LSD, amphetamines and ecstasy (Lifeline, 1992). Bean and Wilkinson (1987), for example, found that whilst only 12% of their sample of known opioid users had not had treatment, 73% of intravenous amphetamine users and 67% of other drug users had not. Ronald et al (1992) suggested that in Edinburgh those seeking GP help with their addiction primarily used benzodiazepines or pharmacological opiates.

Aside from being biased towards certain drug types, agencies may also show consistent bias towards certain types of drug users. It has already been noted that Detoxification Units have been found to attract heavier users. Parker et al (1988) found that the Detoxification Unit saw three times the proportion of 1g a day users, whilst the Drugs Council saw twice as many 2 bag users. Griffiths et al (1992) suggest known users have severe dependence problems and that they are, therefore, more likely to be injectors (Gossop et al, submitted for publication). Bean and Wilkinson (1987) suggest older and longer term users are more likely to have had treatment, and Crowe (1988) reported that 50% of those users at Drug Concern had been using for more than 4 years.

The agencies directly related to enforcement work (eg police and the Probation Service), however, have been found to identify consistently more male users than in general known samples. This may reflect a greater participation of males at higher levels of the distribution market and police targeting of dealers rather than users, a greater propensity of females to

present for treatment or increased targeting by the police of males *per se*. The questionnaire administered by Bean and Wilkinson (1987) concerning self-reported crime suggested that younger users and female users were less likely to have committed crimes. The effect of a potential male-bias in police samples may feed through to treatment samples since Crowe (1988) suggested that arrest was an important factor in the decision to seek treatment.

5.2   Other issues of comparability between studies

There are a number of other factors which must be taken into account when comparing different regional prevalence studies of known users that are not directly related to the sources of information that they use.

5.2.1   Case definition

The variation in the definitions of cases used in different surveys is quite surprising in its extent, although Crowe (1988) has emphasized the difficulty of defining drug misuse in an applied sense.   Several studies rely on problem drug use being denoted by contact with medical or socio-legal agencies (Parker et al, 1988; Melville et al, 1990).   This definition is actually extremely misleading and relates solely to the fact that these prevalence figures refer only to known users.   In fact, acceptance of this definition leads to the bizarre situation where increased effectiveness of enforcement and treatment agencies in discovering previously hidden users, will indicate a *rise* in the prevalence of drug-related problems.   All drug users have been defined by legislation to have legal drug use problems, however, only a proportion

of them have been apprehended.

The other main issue in case definition relates to the range of substances covered by the sample. Some studies cover a wide range of substances such as Parker et al (1988), who include all cases of the use of opioids, barbiturates, stimulants, psychedelics, inhalants and cannabis. Others make notable exceptions of certain drugs such as cannabis (Melville et al, 1990; Giggs et al, 1989; Crowe, 1988) or include drugs like amphetamines or LSD only if they are injected (Giggs et al, 1989). It is hoped that, in the main, the definition of cases is data-led, so that new drugs such as ecstasy did not appear earlier in the known drug user studies because no-one with this problem emerged. It is likely that multi-agency studies that do not survey enforcement agencies are more likely to exclude cannabis only users.

5.2.2 Population statistics

To allow easier comparison of regional studies, the prevalence of known drug use is usually expressed as the number of known users in every 1000 of certain age-groups of the population. Table IV shows some known opioid use rates. This has enabled certain authors to suggest that drug use in the Wirral is as widespread as it is in London and Glasgow (Parker et al, 1987). Certain authors have complained, however, that the inaccuracy of population statistics may have made such comparisons erroneous (Parker et al, 1988). This comment is particularly pertinent given recent concerns that fear of the Poll Tax Register may have significantly increased non-response in the 1991 census. This finding will cause problems for inter-temporal prevalence comparisons, but may also cause problems for inter-regional comparisons if different Poll Tax bills induce different regional rates of non-response.

Table VIII   Rates of Known Opiate-Use in Great Britain (per 1000)

Study	Age Group	Period	Rate Per 100	Region
Parker J et al (1988)	All	1984/85	0.5	Avon
Haw (1985)	All	1980-83	4.0	Glasgow
Giggs et al (1989)	All	1985/86	0.22	Nottingham
Parker et al (1987)	All	1984/85	3.9	Wirral
Pattison et al (1982)	16+	1981	1.2	South Tyneside
Giggs et al (1989)	16+	1985/86	0.27	Nottingham
Parker et al (1987)	16+	1984/85	4.4	Wirral
Crowe (1988)	16+	1985/86	2.0*	Barnet
Parker et al (1988)	16+	1985/86	17.6*	Wirral
Levy (1985)	15-35	1984	1.5	Brighton
Parker et al (1987)	16-34	1984/85	12.0	Wirral
Hartnoll et al (1985)	16-24	1977-83	12.0*	Camden and Islington
	25-34	1977-83	25.0*	
	35-44	1977-83	5.0*	
Parker et al (1987)	16-24	1984/85	18.2	Wirral
	25-34	1984/85	5.5	
	35-44	1984/85	0.5	

*   These prevalence rates include some unknown opiate-users.

5.2.3 The outcidence rate

The term 'outcidence' rate is the number of users quitting and leaving the prevalence figures.

The problem that this phenomenon causes is highlighted by Parker et al (1988), and illustrated

by their two consecutive surveys of annual known drug use in the Wirral. The high rates of mobility of drug users lead to many of the users in the first year's sample being omitted from the second year's sample. To a certain extent this will reflect the successfulness of treatment and is a legitimate contribution to the outcidence rate. Some other unknown proportion of the apparent outcidence rate will however not be genuine.

The problem, however, is that no reliable estimate of the outcidence rate is available, although Hartnoll and Lewis (1984) suggested that between 5 and 10% of opiate users quit each year. It is likely that the outcidence rate will vary from year to year. A study by the Home Office, for example, found that the outcidence rate was only 10% for users in their first year of treatment, rising to 40% after 10 years treatment. Parker et al (1988) report, however, that the local Detoxification Unit proposed that their outcidence rate was approximately 20%. The validity of this figure is uncertain, but it is likely that the outcidence rate of known users will indeed rise as heroin prescribing rates fall and users begin looking for help when they genuinely want to give up.

5.3   User characteristics

A limited range of user characteristics are often extracted from agency files in order to allow researchers to cross-match users who may have attended more than one agency in the study period. This information is often presented in the final research reports, although its policy relevance is rarely outlined.

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<u>5.3.1 Sex</u>

Studies of known users invariably find a greater number of male users than female users, although there is considerable disagreement on the extent of this imbalance. Parker et al (1988) found evidence that the participation of females in drug use was increasing. In 1984/85 the ratio of male:female opioid users was 3.9:1, by 1985/86 this ratio had fallen to 3.3:1, and the ratio in new users was 2.8:1. In Nottingham, however, the position was less clear. Crombie et al's (1989) surveys suggested a fall from 3.3:1 to 2.4:1 between 1984 to 1987. However, an alternative study found a much higher ratio in 1987 of 3.6:1 (Giggs et al, 1989). It is difficult to see, therefore, whether the ratio of 2.9:1 discovered by Melville et al (1990) in 1990 reflects increased or decreased participation by women. The use of cocaine seems to be largely male dominated also, with Strang et al (1990) reporting that those drug users in treatment who had used cocaine in the last month had a much larger male:female ratio (3.2:1) than those who had not (1.8:1).

These variations in ratios may partly reflect differences between the methodology of the surveys and the relative contribution of enforcement agencies which have already been noted to identify a larger proportion of male users. It may be that this ratio of males to females is indeed closer to the true population average, and that female users are more willing to approach treatment services although Parker et al (1988) have suggested that fears that social services will remove their children is a great disincentive for drug-using mothers to seek treatment.

Little information is produced concerning the relative amount of problems facing users of

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different sexes, and whether their drug-using habits vary significantly. The upper echelons of the drug distribution chain have been suggested to be partly regulated (especially for non-payment) by violence and no indication has been given as to whether females are more likely to be the victims of these crimes, although Bean and Wilkinson (1987) found no self-reported evidence of sexual attacks. Crimes of violence also appear to be relatively rare with only 2% of the Probation sample in Crowe's (1988) study having committed crimes of violence compared to 55% convicted of thefts. Indeed, Mott (1982) suggested that drug use was not involved with violent crime unless compounded by alcohol, although Bean and Wilkinson (1987) suggested that amphetamine users were more likely than opiate users to commit crimes of violence.

5.3.2 Age

Surveys of drug use in the general population have tended to focus on monitoring the effectiveness of drug education and, therefore, in part identifying when individuals are at risk of experimenting with drug use. Some attempts have been made in the known-user literature to retrospectively assess when users began drug use. However, only certain agencies record this information. In Parker et al's (1988) study half of the users attending the Detoxification Unit were found to have started using between the ages of 16 and 18. Obviously no information is available on those who have experimented but not continued on to regular problematic use.

There appears to be considerable variation in the current age of the groups of users in treatment from the various studies. A reasonable proportion of these studies find the average

age for opiate users in late-twenties to early thirties (Melville et al, 1990; Crombie et al, 1989; Bean and Wilkinson, 1987; Crowe, 1988). Other studies have suggested that the new users are younger, with Haw (1985) obtaining information on mostly 20-24 year olds, and the Wirral group more than 50% consisting of individuals in the 18-22 age group.

Strang et al (1990) suggested that users who had used cocaine in the last month were on average younger (25 years) than those who had not (27 years). Other studies suggest, as expected, that amphetamine users are younger than opiate users (Bean and Wilkinson, 1987), whilst a study in Barnet found no amphetamine users under the age of 28 (Crowe, 1988).

5.3.3 Employment

Some studies produce data concerning drug users' current employment status. In some samples virtually all users are unemployed (Parker et al, 1988, rate = 87%; Bean and Wilkinson, 1987, rate = 89%; Griffiths et al, 1992, rate = 80%; Klee et al, 1990, rate=81%). Other surveys find samples where approximately half of the drug users are working (Crowe, 1988; Melville et al, 1990). To a certain extent these figures may reflect differences in general unemployment in the regions, although these percentages may be based on figures from selected agencies (Parker et al, 1988). The differences are likely to depend greatly on the way in which the samples are drawn.

For many the problem of unemployment may be chronic, with Bean and Wilkinson (1987) finding that 80% of those drug users who were currently unemployed had been so for over 12 months. Crowe (1988) suggests that drug users are often employed when they start using

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drugs, and that being unemployed is an additional problem since users need strong motivation to give up which may be very hard for the unemployed. This begs the inevitable question of whether drug use leads to unemployment or whether the unemployed turn to drug use.

5.3.4 Race

Few studies produce information on the racial characteristics of their samples, although those that do find a predominance of caucasians (Bean and Wilkinson, 1987, 92%). The small number of cocaine users identified means that it is difficult to assess whether the use of this drug has become concentrated in the black community as in the United States, and the predominance of caucasians may reflect the failure of treatment agencies to target minority communities. Strang et al (1990), however, suggest that whilst 25% of those who have used cocaine in the past month are from minority groups, this percentage is only 11% for non-cocaine users.

5.4 The characteristics of drug use

It is in the area of converting studies of known users into actual consumption estimates that the main deficiencies in existing research emerge. In terms of reporting information relating to actual drug use most studies fall at the first hurdle. Those studies that attempt some measurement of actual drug use suggest that even known users have widely varying drug use habits, suggesting that this information is of key importance in assessing trends in drug use across regions and over time.

5.4.1 Drugs used

The predominance of heroin and other opiate users in treatment agencies feeds through into surveys of known users. Two studies in London that derived data exclusively from treatment agencies found that 86-88% reported that their primary drug was heroin, and that 8% reported other opiates as the main problem (Strang et al, 1990; Griffiths et al, 1992). Other studies that survey non-treatment organisations find a larger representation of other drugs, but the opiates are still in the majority. The problems with trying to interpret these figures arise because some illicit drugs are explicitly excluded, and others are included in proportion to the relative input of one agency. Therefore, it becomes impossible to talk of the proportion of total drug use represented by the use of particular drugs since these proportions are determined by the design of the different studies.

5.4.2 Poly drug use

Many authors assert the importance of the concept of poly drug use and the associated increase in drug-related problems (Melville et al, 1990), but evidence about its nature and extent is incomplete. The most elementary of these studies report data only on primary drugs of addiction, although Parker et al (1988) suggested that this may partly reflect the extent of the information available from many agencies such as the police and the Home Office addicts index. Other researchers divide drug users into hierarchical clusters with opioid use viewed as implicitly the most problematic and representing the largest group (Parker et al, 1988). The extent of their use of other drugs is somewhat open to debate, with Parker et al (1988) suggesting at least 41% used other drugs, whilst Haw (1985) suggested that opioid users used

cannabis as a matter of course, and Crowe (1988) claimed that amphetamines were often used by casual opiate users. The poly-nature of their drug use is suggested by Melville et al (1990) to be somewhat limited, with only 8% using more than two drugs, whilst an earlier study had suggested that most people reported the use of more than one drug (Crombie et al, 1989). This seems contradictory to the work of Bean and Wilkinson (1987) who found that, on average, users had used four different drugs in the last six months. Strang et al (1990) suggested that the combination of cocaine with opiate use was becoming increasingly popular with 13% of new cases in 1987 having used cocaine in the last month, rising to 29% in 1989. From a survey over the same period, Grapendaal (1992) suggested that cocaine and heroin use were complements, with his sample of opiate users in Amsterdam letting cocaine supply the 'flash', and then consuming heroin to enable them to function in a 'normal' way. All of these estimates are hampered, however, by the limited nature of the records of many agencies on drug-use behaviour (Parker et al, 1988) and the bias of only taking information from certain agencies.

5.4.3 Drug consumption

The other main feature of drug use other than the range of drugs used is the actual amount consumed over a certain period. Health and other problems arising from drug use will to a large extent be a function of the amount consumed. This amount can be constructed from the frequency of use and the dosage, if drug use is sufficiently regular.

It may well be that patterns of drug consumption can be divided into different categories as they are for alcohol. Alcohol consumption patterns can be divided into three categories and

different types of problems can result. The usual distinction made is between problems of intoxication, of regular use and of dependence. However, these categories are often not exclusive. *Intoxication* problems may result from a single occasion where individuals 'over-consume' or overdose, such as the health hazards or other accidents. Users who drink alcohol frequently over a long period of time will experience different *regular use* problems. More severe problems may result as a consequence of *dependence*.

5.4.3.1   Frequency of use

Hartnoll and Lewis (1984) suggested that treating regular heroin users as if they consumed heroin every day would lead to a gross overestimation of national consumption. The amount of data available to these authors was minimal, but they settled for a figure of 7.5 months/year to represent the average frequency of use, compiled from users who use for only part of the year (new users and quitters) and days of (forced) abstinence. No direct attempt to shed light on this proposition has been made in subsequent studies. Parker et al (1988), for example, suggested that more than 95% of heroin users used 'daily' and more than 90% had been doing so for between 6 months and 5 years. In Bean and Wilkinson's (1987) sample of predominantly opiate and intravenous amphetamine users the percentage using daily was 81%. There is, therefore, a virtual complete absence of information concerning the frequency of use of heroin, and an absolute absence of this information for other drugs.

5.4.3.2   Dosage

The range of data concerning the dosage of drugs is also extremely restricted. As in other

areas, the vast majority of information relates to the use of heroin. Hartnoll and Lewis (1984) suggested that heroin users further up the distribution chain would be heavier users, and claimed that strong feelings were expressed about involvement in the distribution chain by non-users. Through interviews with both known and unknown users, and some informed sources, Hartnoll and Lewis (1984) suggested that a typical scenario would be one dealer consuming 1g a day, selling to eight customers, two of whom used 0.25g per day, the other six using 0.125g per day. This scenario suggests an average daily dosage of 0.25g.

Parker et al (1988) emphasized the wide variance in heroin dosage reported by their known user sample. They reported that the majority used between two 'bags' and one gram, but their figures showing 53% using between 0.25g and 0.5g per session suggests a higher average than Hartnoll and Lewis (1984). Crowe's (1988) fieldwork with a varied group of users suggested that 0.25g a day was the minimum amount that represented a 'real habit'. His results, and Grapendaal's (1992) average figure of 0.33g per day, agree with Parker et al's (1988) information that regular users usually use 0.25g to 0.5g a day, although Crowe (1988) emphasized the fact that larger habits were not uncommon and that 1g a day was a common quantity quoted. Crowe's (1988) fieldwork also suggested that further up the network where greater quantities are available the amount consumed grew further. He suggested that multi-ounce dealers would consume as much as one or two ounces per day.

It may be thought that users in treatment would consume more per day since they experience greater dependence problems. Fraser and George (1988), however, suggested that users further up the distribution network are unlikely to present for treatment. Nevertheless, Griffiths et al's (1992) Community Drug Team sample were found to consume on average

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700mg (standard deviation = 500mg) per day.

The paucity of information on daily dosage means that it is difficult to establish trends in daily dosage or even a sensible average figure. The four studies that have provided consumption data have taken place amongst different sub-groups of users, at different times and in different regions where market purities vary. It seems reasonable to suggest that the average amount consumed will lie between 0.25g and 0.5g per day, but the extent to which these figures reflect contradictory biases, that arise from treatment agencies basically seeing end-users but yet more dependent users, is not known.

Other consumption information is available from selected research studies for amphetamines, ecstasy and Temazepam. Strictly speaking the amphetamine figures are not consumption data, but relate instead to the amount purchased. Two studies that report such figures suggest that the minimum amount purchased is 1g (Bean and Wilkinson, 1987; Crowe, 1988). It is likely, therefore, that this figure will represent the lower bound for average dosage figures for amphetamines. Fieldwork research by Newcombe (1992) in the North-West of England suggested that most ecstasy users would consume 1-2 tablets of ecstasy, containing 100-200mg, on a night. A group of Temazepam misusers in Liverpool were reported to be injecting on average 610mg of Temazepam per day (Ruben and Morrison, 1992).

The Institute for the Study of Drug Dependence does provide some impression of the amount of other drugs that are traditionally consumed in its National Audit of Drug Misuse Statistics (ISDD, 1991). It is suggested that regular cannabis smokers might consume approximately 1/16 ounce a week, whilst amphetamine users consume anything from 1/8g a week to 6g a

day. The report also suggests that cocaine users might consume anything from 1/4g on a weekend, to 3g a day (this compares to Grapendaal's (1992) average consumption figure of almost 1/2g a day). In the absence of prevalence information on different types of drug users, these ranges are difficult to translate into average consumption figures.

The lack of reliable data relating to the dosages of different drugs, and their associated ranges, is alarming, since the police are reported to be treating anyone found with more than one day's supply of drugs as a dealer (Haw, 1985). The current situation provides very approximate average figures for some drugs, and only extremely wide ranges for others, but no indication of temporal or regional variations in reaction to trends in drug purities, routes of administration, prices or availability.

5.4.4 Route of administration

The advent of concerns over the HIV virus and its transmission through shared needles has led the focus of much drug use research onto routes of administration. Most studies concentrate on the use of heroin, and data relating to the administration of other drugs are missing from other studies because their use is only included if they are injected (Bean and Wilkinson, 1987).

The transition to injecting has often been presumed to be inevitable for heroin users (Haw, 1985; Crowe, 1988; Power, 1990; Strang, 1988). However, the Wirral research project identified many long-term users who continued to smoke heroin. Indeed, smoking was the exclusive method for 80% of users, only 10-12% injecting in combination with other methods,

and only 4% exclusively. Hartnoll et al (1985) and Griffiths et al (1992) have suggested that there has been a trend away from injecting in London, with Hartnoll et al (1985) finding only 22% either smoking or snorting at the local drugs clinic in 1983, and Griffiths et al (1992) reporting that only 52% of their sample of known users from 1987-1989 were injectors. This possibility is corroborated by the survey by Crowe (1988) in Barnet in 1985 who found an intermediate percentage injecting of 70%. There has also been a slight decrease in the percentage injecting in Nottinghamshire from 40% in 1987 (Crombie et al, 1989), to 35% in 1990 (Melville et al, 1990). However the use of heroin in Scotland is thought to have not followed such a trend (Griffiths et al, 1992), and Haw (1985), Robertson et al (1986) and Frischer (1991) all find a great predominance of injecting.

It might be thought that a trend towards smoking heroin would increase the dosage consumed each session since smoking is thought to be a less efficient mode of administration. The economic justification for this was certainly suggested by Haw (1985) who claimed that by moving to injecting heroin, users could cut their daily expenditure from £35 to £10. However, recent research suggests that there was no significant difference in the amount consumed between smokers and injectors, although no reference was made to possible differences in the purity of the heroin smoked or injected, and therefore the level of pure heroin consumed by each group (Griffiths et al, 1992). Drug seizures in Scotland suggest purity is extraordinarily low, which may account for the continued popularity of intravenous use.

Strang et al (1990) produced figures for the routes of administration of cocaine in London from 1987 to 1989. The percentage of users smoking cocaine was found to increase from

15% in 1987 to 75% in 1989. In contrast, the rate of snorting fell from 45% to 6%, and the rate of intravenous use from 40% to 19%. Strang et al (1990) also found a high level of association between the mode of administration for heroin and cocaine. They suggested that smoking cocaine had an increased dependence risk, and may not necessarily reduce HIV risk because free-base was associated with increased sexual risk from HIV.

5.4.5 Price elasticity of demand

The price elasticity of demand is a measure of the effect on the quantity consumed of a change in price. Some econometric work on this topic has been undertaken in the United States by Silverman and Spruill (1977). Their results suggested that the long-run price elasticity of demand for heroin was -0.25 (ie. a 10% increase in price results in a 2.5% decrease in consumption). However, the short run price elasticity was found to be higher, meaning that when heroin becomes scarce and its street price rises, heroin addicts switch their consumption to other drugs or they detoxify in the short term. Alternatively, if there is an over-supply of heroin and prices fall, there is greater use of heroin immediately, although consumption tails-off in the longer term.

Grapendaal's (1992) analysis of the economic behaviour of opiate users in Amsterdam suggested that the amount of money available crucially determined the amount of drugs purchased. This observation suggests that the *income* elasticity of demand for heroin may be high, but no estimate of the magnitude of this or the *price* elasticity of demand was produced.

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In the UK, the only real investigation of drug users responses to price changes was reported by Bean and Wilkinson (1987). Users were asked how they would react to a 10% increase in price. 93% of users said that this would not affect the *amount* that they purchased, only 3% of which would switch to cheaper quality. Based on these responses, therefore, it would seem that only 10% of users would react by consuming less drugs, although no mention is made of the estimated extent of their reaction.

Estimation of the price elasticity of demand for legal addictive goods, particularly tobacco, can now take account of two different effects. The double-hurdle model considers two distinct decisions that must be made before an individual will start consuming tobacco (Atkinson et al, 1984). Individuals may not consume either because they will never consume tobacco under any circumstances, or because the current conditions are not right for them to consume tobacco (eg. the price is too high). Different factors are allowed to determine the different decisions, and the effect of price on the prevalence of use and consumption can be isolated. The data required for this sort of analysis is evidently not available for illicit drugs, but this sort of approach would be very useful for policy analysis.

5.4.6 Cross-price elasticity of demand

The cross-price elasticity of demand represents the change in the consumption of one good, in reaction to a price change in another good. This effect may be a particularly important policy consideration in the field of illicit drugs since it is thought that there is a high degree of substitutability of illicit drugs, and the extent of poly drug use may be large. There are no empirical estimates of the size of the cross-price elasticities of demand for certain drugs

but many studies describe such switching behaviour.

George and Fraser (1989), for example, described how following the raiding of a social centre and a dramatic increase in the effective price of consumption of heroin, former addicts switched to classic drugs of retreat like alcohol and benzodiazepines. There was a considerable amount of poly-drug abuse: tranquillisers, sleeping tablets, Diazepam and Tamazepam. George and Fraser (1989) also suggested that those who combined alcohol and benzodiazepines suffered an increase in problems, showed by their increase in offending and a deterioration in their physical and mental health. When heroin came back and the effective price fell again, these users found it very difficult to readjust and became trapped in dependency on their new drug combination.

In a similar way, Morrison (1989) described the notable reduction in heroin availability in Edinburgh over the previous three years, and noted the high rate of use of licit prescribed substances. It has been suggested that the culture attached to ecstasy use is anti-alcohol, i.e. the use of ecstasy may be a strong substitute for alcohol (Matthews, 1992). Grapendaal (1992), on the other hand, described a situation where heroin and cocaine were used as 'complements', thus suggesting a positive cross-price elasticity between these two drugs. In this case, a rise in the price of one drug would lead to a decrease in the use of the other drug.

These sort of considerations are an important aspect of the measurement of benefit from policies which restrict the supply of particular drugs and/or increase their (effective) price. A policy cannot be seen to have succeeded if displaced demand for one drug shifts to another more harmful drug which imposes greater costs on society.

5.5 The Home Office Addicts Index

A potential problem in evaluating the usefulness of local prevalence study results for national policy is in determining the legitimacy of generalising local circumstances to the national level. Giggs et al (1989), for example, have suggested that there is a massive spatial variation in drug use. Prevalence studies have been undertaken throughout the UK, but rarely are surveys repeated in the same area unless by the same authors. The recent initiative undertaken by the Government to construct Regional Drug Misuse Databases in each Health Authority is a good opportunity for consistent methods of measuring known drug use prevalence to be applied across the UK and in consecutive years. It is unclear whether all regions will use the Home Office addicts index as a source for their information, but some certainly do and have found their database to be identifying twice as many users (Hanvey et al, 1992). This reflects Strang et al's (1990) hopes that the new databases will be good at tapping into information from the voluntary sector and NHS funded agencies. However, until this network is more fully implemented and produces a better time-series of figures, the Home Office data represent the only national indicator of known drug use. The index, however, has been criticised in the past, and some of those criticisms are outlined below.

The Home Office index is not designed to be a comprehensive list of all drug users but has been used by some to calculate estimates of the national prevalence of heroin use (Wagstaff and Maynard, 1988). Studies in the early eighties suggested that for every heroin user who did present themselves for treatment, there were between 4 and 9 users who remained 'hidden' (Hartnoll et al, 1985; Ditton and Speirits, 1982). Based on these estimates, Wagstaff and Maynard (1988) suggested that there were between 41,000 and 100,000 users of heroin in the

UK in 1985. Griffin (1992), however, has suggested that in 1991 only 5 to 10% of opiate addicts had been notified to the Home Office.

5.5.1 Response rate

There are two factors relating to the Home Office Index which may be considered problems with response rates. The first problem relates to the response of General Practitioners to the Government's demand that they should be notified of all addicts. Haw (1985) suggests that GPs were suspicious that the index was available to enforcement agencies. There are problems in treating the HO index as a time-series indicator of the prevalence of drug use if GPs have become generally more willing to notify addicts over time. In this way, the HO index may have begun to identify an increasing proportion of known drug users, and will overestimate any increase in the prevalence of drug use. These points may be particularly pertinent when related to the fact that efforts were made in 1984 to increase awareness amongst doctors as to their notification requirements (Home Office, 1985). This reminder may have encouraged many GPs to have notified when they otherwise might not have done, thereby causing an 'extraordinary' increase in the figures. This may relate to Crowe's (1988) assertion that many medical practitioners were not clear on their duty to notify.

The other aspect relating to the response to the HO index, relates to users' response to the offer of treatment for their addiction. There has been a marked trend away from the prescribing of heroin since the 1970s. This is believed to have led to many users becoming disillusioned with their GPs (Parker et al, 1988). Haw (1985) reported that it was suggested

that the prescribing of opiates should be voluntarily banned in Glasgow in 1983, which apparently led to a fall in the number of new referrals to local Drug Clinics being notified from 40% to 27%. Many others suggest that the trend away from prescribing heroin has led to a smaller proportion of users presenting for treatment (Peveler et al, 1988). Crowe (1988) suggested that there was less motivation to become notified since opiates were only available on a short-term detoxification basis. In this way time trends in the addicts index will once more be misleading. The Home Office index will represent a decreasing proportion of total users, as treatment services make contact with a smaller proportion of users and, therefore, the index will underestimate any true growth in drug use.

5.5.2 Bias towards certain users

In 1990 82% of drug users on the Home Office Addicts index were addicted to heroin. The figures for the apprehension of individuals for possession of drugs by the police for the same year give less than 3% being apprehended for possession of heroin. It is widely accepted that the Home Office index basically contains information on opiate users, some suggest because there is a highly visible treatment program available for heroin, whereas there is not for other drugs (Strang et al, 1990).

5.5.3 Information on drug use

The predominance of opiate users in the HO index figures may also reflect the fact that only the primary drug of addiction for each user is recorded. Details of poly drug use are certainly not (Parker et al, 1988), although tables of the drugs to which the notified addicts are addicted

to do add up to greater than the total number of addicts. Information is provided giving the sex and age distributions of the notified addicts, but none is available concerning the racial characteristics or the economic status of the sample. Furthermore, data on drug use are not collected or published apart from sparse data on administration route, and Melville et al (1990) report that during their study only 22% of HO records contained this information.

5.5.4 Case definition

Addicts should be notified to the Home Office if they are addicted to drugs that are controlled under the Misuse of Drugs Act 1971. Haw (1985) suggests, however, that doctors are not willing to notify drug use on the basis of suspicion. This factor may cause problems in time-series interpretation if this willingness has changed over time.

5.5.5 Outcidence rate

The Home Office index originally collected data on three types of addicts, but now these data are restricted to two categories. Until 1987 information was collected on the number of addicts in treatment based on former notifications who had not been notified as having ceased treatment. It was thought in 1987, however, that this figure had been incorrectly measuring the outcidence rate and that since 1985 the figure had been artificially inflating as GPs were not notifying the Home Office when addicts left their care. In 1990, Melville et al (1990) reported that changes from 1987 in the HO index may reflect changes in attitudes to renotification. These changes lead to a biased measure of the prevalence of drug use and an inconsistent measure of trends in drug use over time.

5.5.6 Estimating prevalence

These problems with the Home Office Index, and in particular changes in the attitudes of GPs to prescribing heroin were believed by Haw (1985) to have caused the Home Office Index to become a better indicator of prescribing policy than the need for services. However, if it is possible to identify an indicator of the way in which the Home Office Index has changed as a proportion of the total using population over time, it would be possible to estimate trends in the national prevalence of heroin use. This analysis is undertaken in Sections 6.2 and 6.3 later in this paper.

A further problem with the HO index series is the change in the different types of addicts notified. Griffin (1992) and the Institute for the Study of Drug Dependence (1991) have approached the problem by producing two separate time-series with a discontinuity in 1987. Personal communication with the Home Office, however, suggests that the total number of addicts calculated for 1984 is comparable to the total number of addicts calculated for 1987 under the new system. Only the figures for those in treatment in 1985 and 1986 cause problems because they are artificially inflating. It has been suggested that a sensible approximation to the total figures for 1985 and 1986 may be reached using the method outlined in Table V.

Table V   The Number of Heroin Addicts Notified to the Home Office, 1979-1990

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New addicts	1110	1151	1660	2117	3559	4926	5930	4855	4082	4630	4883	5819
Former addicts re-notified	449	506	674	889	1227	1685	2160	2549	2730	3140		
Other addicts re-notified							1753[a]	2132[a]	2371	3038		
Total addicts re-notified									5101	6178	7601	8678
Addicts in treatment at 1st Jan[b]	1369	1605	1804	2579	3195	4292	5259	6396				
Estimated Total	2928	3236	4138	5585	7981	10903	9843	9536	9183	10,808	12,484	14,497

a   :   Estimated to be equal to be one-third of the number of addicts in treatment at 1st January in 1985 and 1986.

b   :   The proportion of addicts in treatment still addicted to heroin is assumed to be equal to the proportion of former addicts re-notified that are addicted to heroin in the same year.

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6   STUDIES OF HIDDEN USERS

Whilst studies of known users may be widespread, there has been little work published containing data relating to users that are not known to treatment or legal agencies. Without these data, it is impossible to know the importance of contacting 'hidden' users, and policy makers continue to be at risk of formulating policy based on an atypical sample of the drug using population.

This observation shows the limited usefulness of the setting-up of the new network of Regional Drug Misuse Databases. Whilst consistent methods of counting the number of known users may be employed throughout the country, only two pages may be devoted to informal fieldwork reports from known users about the hidden sector (Hanvey et al, 1992). Therefore, despite the fact that agencies may be reaching an increasing proportion of total users because of new agencies such as needle and syringe exchange schemes, there are still no national prevalence figures available.

The following sections will review some evidence for surveys that have contained a number of hidden users. First, section 6.1 will review the evidence concerning the difference between known and unknown users. Following this, section 6.2 will attempt to estimate the discrepancy between the number of total users and the number of users that are known and notified to the Home Office. Section 6.3 will conclude by attempting to generate prevalence, consumption and expenditure estimates for heroin in the UK over the period 1979 to 1990 based on the Home Office Addicts Index.

6.1 Characteristics of hidden users

Very few studies produce data on the characteristics of hidden users exclusively, data on mixed known and unknown groups are more often provided.

6.1.1 Sex

The ratio of males to females in samples of hidden users and mixed-user groups vary as much as do those for exclusively known-user groups. Parker et al (1988) suggested that their sample of hidden users contained a greater proportion of women than the known sample because women are less likely to be apprehended by the police, and mothers are often scared that if they contact treatment agencies, social services will take their children into care.

A recent article concerning drug policy and women in the United States highlights the historical bias of drug policy and treatment towards male addicts, thereby ignoring the procreative and care-giving roles of female addicts (King, 1991). King (1991) suggests that the debate between the two extremes of legalisation and vigorous criminal law enforcement needs to be extended through a different approach to modelling the mother-fetus/mother-child relationship. She proposes a softer approach to helping all fetuses, children and women at potential harm from drug use, and suggests that the way in which society morally regards a woman's obligation to her offspring will have a significant impact on policy.

A more recent survey in the United States found important gender disparities in the treatment of *alcohol* problems. Women were found to be more likely to have used mental health

services for alcohol problems, whilst men entered alcohol-specific treatment agencies more often, frequently after encounters with criminal justice agencies (Weisner and Schmidt, 1992). The data also suggested that women delayed seeking care until their drinking problems were more serious compared to men.

There is some independent evidence that there is sexual inequality in the success with which current methods of identification contact drug users. Peveler et al's (1988) mixed group of known and unknown users showed a male to female ratio of 3:1, which is approximately equal to the average ratio found in known user groups (see Section 5.3.1). However, most other studies of mixed groups have male:female ratios below this figure (Frischer et al, 1991, 2.5:1 ; Hartnoll, 1984, 2:1 ; Hartnoll et al, 1985, 1.8:1 ; Strang et al, 1992, 1.6:1). Haw (1985) suggested that increased female involvement was taking place in the new group of younger users since in the total sample the male:female ratio was 3:1, but in the 15-19 year old group there were as many females as males. This, however, may reflect observations concerning the greater involvement of women in the use of other addictive goods around the age of sixteen (Lader and Matheson, 1991).

6.1.2 Age

In 1981, Ditton and Speirits (1982) suggested that the inadequacy of statistics about known users was demonstrated by the fact that official statistics showed the average age of heroin users was rising, whilst informal evidence suggested that average age was actually decreasing. Bean and Wilkinson (1987) also suggested that older users are more likely to be in treatment, and Parker et al (1988) found that their group of 'hidden' users were, on average, eighteen

months younger than the group in contact with official agencies.

However, other studies suggest that the average age of the hidden sector does not deviate much from those who seek treatment. Haw (1985) suggested that the age distribution of the hidden group that she identified was similar to that of the new referrals to the local drugs clinic. Other studies of mixed-groups of known and unknown users report age characteristics not very different from those reported for exclusively known user groups in section 5.3.2. (Peveler et al, 1988; Strang et al, 1992; Hartnoll et al, 1985).

6.1.3 Other characteristics

Information on the aspects of other 'hidden' user characteristics is very sparse. Strang et al's (1992) mixed group of known and unknown users were in the main unemployed (76%). Bean and Wilkinson (1987) suggested that longer-term users were more likely to be in treatment, and Parker et al (1988) reported that 75% of those not in treatment had been using for less than two years. Confirming Griffiths et al's (1992) suggestion that more dependent users would be in treatment, and Gossop et al's (submitted for publication) claim that injecting users were more dependent, Hartnoll et al (1985) found that a greater proportion of users were injectors at the Drugs Clinic (78%) than identified during fieldwork (67%).

6.2 Estimates of the size of the hidden sector

Another important component of the study of the hidden sector is the estimation of its size. There is virtually no information on the total prevalence of the use of drugs other than heroin,

and certainly no time-series indicator such as the Home Office Addicts Index. Wagstaff and Maynard (1988) used the Addicts Index as a basis for calculating the total prevalence of heroin use, and this section will review the evidence on the size of the hidden sector in order to estimate addict multipliers.

A number of studies collect information on users known to treatment agencies, and then undertake some fieldwork to identify some unknown users. In some cases it is difficult to assess whether the unknown users have been identified to enhance the representativeness of the sample or in an attempt to calculate total prevalence within a region (Bean and Wilkinson, 1987). Where it is not clear that an attempt to calculate total prevalence has been made, it is difficult to know whether the number of unknown users identified will purely reflect the diligence of the researchers in finding unknown users. Bean and Wilkinson (1987), for example, identified 177 users in total, only 26 of which were identified during fieldwork. Strang et al's (1992) sample of 400 heroin users, on the other hand, contained only 25% Drug Clinic attenders, and 51% were currently out of contact with treatment services. It is similarly difficult to interpret the surveys by George and Fraser (George and Fraser, 1989; Fraser and George, 1988) in which they found 118 users in 1989 (63 of which were known) and 101 users in 1988 (37 of which were known, 31 of which were notified to the Home Office). If these studies do not purport to estimate total heroin use in the area, multipliers based on these figures will be underestimates of the true situation.

At this stage it is important to distinguish between the notified, known and unknown sectors. Studies of known users identify many users that are known to treatment and legal agencies but have not been notified to the Home Office. Studies which undertake some fieldwork

usually find some users who are not in contact with treatment or legal agencies. Therefore there are two multipliers which need to be considered. First of all, there is the ratio of known users to notified users. Through encouraging medical practitioners to notify, and reminding them of their duty to notify, the Home Office has sought to reduce this ratio. In addition, however, the ratio of total prevalence to known-user prevalence must be taken into consideration. Changes in prescribing policy and increases in the effectiveness of treatment agencies will affect this ratio.

The Wirral Research Project attempted to estimate these two ratios separately. A series of surveys of drug agencies seemed to show a steady improvement in the number of known users being notified to the Home Office (Parker et al, 1986 and 1988; Chadwick and Parker, 1988 and 1989). The Addicts Index was becoming increasingly effective at recording the size of the known user sector in the Wirral. In 1985/86, Parker et al (1988) also attempted to penetrate the hidden sector. Using four different fieldwork techniques, Parker et al (1988) attempted to estimate the ratio of unknown to known heroin users in four different areas. These methods produced modal ratios that ranged from 1.1:1 to 4:1 depending on the prevalence of known use and the rate of unemployment. The total prevalence figures for the four townships, however, produced an overall ratio of 2.5:1.

Other studies make more direct estimates of the total prevalence of heroin use in certain regions. Hartnoll et al (1985) used a combination of indirect, direct and fieldwork methods to estimate the total prevalence of heroin use in Camden and Islington over the period 1978 to 1983. Their best estimates were expressed in terms of prevalence rates per 1000 of the population aged 16-44, and the authors suggested that these rates were probably twice the rate

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for Greater London as a whole. Crowe (1988) surveyed the prevalence of heroin use in Barnet in 1985 an, using a series of indicator techniques, suggested that there were between 456 and 560 dependent heroin users in the borough, compared to the Home Office notifications for the region which were 96 in 1984 and 116 in 1986.

Following fieldwork in Glasgow in 1984, Haw (1985) estimated that there were 200-600 regular opiate users in a certain locality, which was between 6 and 18 times the number known to treatment agencies. Frischer et al (1991) used a more sophisticated version of the capture-recapture technique to calculate the total number of injecting drug users in Glasgow in 1989. This method produced an estimate of 9424 [95% confidence interval = 2460] injecting drug users, compared to 1300 users known to be in treatment.

Peveler et al (1988) attempted to estimate the prevalence of heroin and methadone use in Oxford in 1984/5. Their combination of direct, indirect and fieldwork methods produced a list of 184 users, 62 of which were suspect and 39 of which were probable. These figures compare with a total of only 13 users identified to the Home Office for the area.

These figures produce a variety of different addict multipliers. Tables VI, VII and VIII summarise these results. Where possible, the multipliers relate only to heroin users, but in some cases it is only possible to estimate these multipliers for the more general group of opiate addicts.

Table VI lists the notified to known addict multipliers that have been identified over the period 1984-1990. There is considerable regional and temporal variation in these multipliers.

The main sources of information are the studies undertaken in the Wirral by Parker, Chadwick and others (Parker et al, 1988; Chadwick and Parker, 1988, 1989). This series shows a dramatic decrease in the discrepancy between those addicts known to official and voluntary agencies and the sub-set known to the Home Office. The Home Office appears to have become considerably more efficient at recording the size of the known sector in the Wirral over this time. The only other multipliers that can be compared over time, are those for Nottingham Regional Health Authority. In contrast to the Wirral multipliers, the discrepancy between notified and known addicts actually grew over the period 1984 to 1987, although there is some evidence of a comparable decrease taking place later.

Table VI Notified to Known Addict Multipliers, 1984-1990

Region	1984	1985	1986	1987	1988	1989	1990
Wirral[a]	4.8	4.7	3.9	2.7	2.0		
Worthing[b]			1.2				
Avon[c]	2.2						
Nottingham[d]	3.2			3.5			<2.0

a   Source: Parker et al (1986), Chadwick and Parker (1988) and Chadwick and Parker (1989)
b   Source: Fraser and George (1988)
c   Source: Parker J et al (1988)
d   Source: Crombie et al (1989) and Melville et al (1990).

The figures in Table VII relate to the size of the hidden user sector. There appears to be considerable regional variation in the ability of agencies to reach the hidden sector, with areas such as Glasgow and the Wirral, where there are considerable numbers of known users, identifying smaller proportions of the total heroin-using population.

Table VII Known to Total Addict Multipliers, 1984-1989

Region	1984	1985	1986	1987	1988	1989
Wirral[a]		3.5				
Worthing[b]			2.7		1.9	
Glasgow[c]	6.0-18.0					7.2
Avon[d]	1.2-2.4					

a   Source: Parker et al (1986) and Chadwick and Parker (1988 and 1989)
b   Source: Fraser and George (1988) and George and Fraser (1989)
c   Source: Haw (1985) and Frischer et al (1991)
d   Source: Parker J et al (1988)

Table VIII brings together the data from Tables VI and VII where appropriate to estimate notified to total addict multipliers. Also included are multipliers based on pure total user prevalence figures. The vast majority of information on different regions is available from 1984-1986. The only truly comparable figures over time are available for London over the period 1979-1983. In order to calculate a 'point' estimate of the size of the addict multiplier, this information has been combined in Table IX for 1985, in proportion to the numbers of addicts notified from the corresponding police force areas. Where ranges have been offered, mid-points of these ranges have been used. This combination method gives a national average notified to total addict multiplier approximately equal to seven. This result is largely driven by the London multiplier of 4.9 and the Wirral multiplier of 16.1.

Table VIII   Notified to Total Addict Multiplier, 1979-1989

Region	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
London[a]	4.0	4.3	5.1	5.4	4.7		4.9				
Worthing[b]								3.3			
Oxford[c]							15.1				
Wirral[d]							16.1				
Avon[e]						3.9					
Glasgow[f]					6.6						

Mid points have been used where ranges were offered.

a   Source: Hartnoll et al (1985) and Crowe (1988)
b   Source: Fraser and George (1988)
c   Source: Peveler et al (1988)
d   Source: Parker et al (1988)
e   Source: Parker J et al (1988)
f   Source: Haw (1985)

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It is thought that the addict multiplier may have varied over time as GP's willingness to notify addicts changed, and as agencies identified different proportions of the total population of heroin users. Variations in local multipliers are demonstrated by the series of multipliers from London and the Wirral. However, multipliers from different regions indicate that changes in these multipliers are highly localised. Therefore, the combined multiplier of seven calculated for 1985 can be extrapolated backwards and forwards in time based on movements in the London and Wirral multipliers. However, the influence of regional multipliers has been restricted to the relative importance of the region in terms of total notified addicts. For those regions for which there is no information available it is implicitly assumed that there has been no change. Approximately 15% of addicts are notified from Merseyside Police force area, and 40% from the Metropolitan District.

Table IX   Calculation of a National Notified to Total Addict Multiplier for 1985

Police Force Authority	Percentage of All Addicts Notified in the UK in 1985	(a) Valid Percentage	(b) Addict Multiplier	(a) x (b)
Avon and Somerset	2%	3%	3.9	0.117
Merseyside	11%	19%	16.1	3.059
London	40%	68%	4.9	3.332
Strathclyde	5%	8%	6.6	0.528
Thames Valley	1%	2%	15.1	0.302
Total	59%	100%		7.338

Allowing these proportions of the national addict multiplier to vary to the extent indicated by the regional multiplier figures gives a range of addict multipliers between 6.5 and 7.6 over the period 1979-1988. For this reason it has been decided that an addict multiplier of seven is a sensible approximation for the whole period. This seems to be the best approach to adopt given the paucity of studies of changes in the discrepancy between the number of addicts notified and the total number of addicts. The figure of seven is, also, the mid-point of the range of addict multipliers utilised by Wagstaff and Maynard (1988).

6.3   Prevalence, consumption and expenditure estimates for heroin

Evidence from the previous section has suggested that the addict index may be used to estimate the prevalence of heroin use if the addicts total is multiplied by a factor of seven. This is to allow for the fact that not all addicts are known, and not all known addicts are notified. As noted earlier, the Home Office Index is inappropriate for the measurement of the prevalence of the use of drugs other than opiates. These estimates are restricted to heroin, and draw heavily on the methodology outlined by Hartnoll and Lewis (1984).

6.3.1 Estimating the prevalence of heroin use

Table X shows the estimated total number of addicts during each of the years 1979 to 1990. The figure estimated for 1982 is very close to Hartnoll et al's (1985) estimate of 40,000 to 50,000 regular opiate users. As expected, the figure for 1984 is approximately the mid-point of the range offered by Wagstaff and Maynard (1988). The figure for 1990 does suggest, however, that Griffin's (1992) estimate was an over-estimate of about 50%.

Table X   The Prevalence of Heroin Use in the UK, 1979-1990

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total number of heroin addicts notified[a]	2928	3262	4138	5585	7981	10,903	9843	9536	9183	10,808	12,484	14,497
National addict multiplier[b]	7	7	7	7	7	7	7	7	7	7	7	7
Total number of heroin users in the UK	20,496	22,834	28,966	39,095	55,867	76,321	68,901	66,752	64,281	75,656	87,388	101,479

a   Source: Table V
b   Source: Table IX

6.3.2 Translating prevalence estimates into consumption estimates

In order to calculate the weight of heroin consumed each year in the UK, the data about the prevalence of heroin use must be combined with figures for the frequency of use and daily dosage. A preliminary attempt to estimate the demand for illicit heroin was outlined by Hartnoll and Lewis (1984). In the first instance, Hartnoll and Lewis (1984) stated that it would be misleading to assume that all heroin users used heroin every day. Based on both research interviews and clinical experience, Hartnoll and Lewis (1984) stated that, on average, individuals would use heroin for seven-and-a-half months of the year. It was noted in section 5.4.3.1. that other authors have not mentioned this phenomenon, but merely describe users as 'daily' users. In the absence of better information it has been decided to adhere to Hartnoll and Lewis' (1984) estimate.

Following on from this adjustment, Hartnoll and Lewis (1984) highlight how an estimate must allow for the fact that some regular users will be in treatment and receiving opioids on prescription. In 1982, Hartnoll and Lewis (1984) estimated that approximately 10% of heroin used would not originate in the illicit market. It is possible, however, to estimate the proportion of users obtaining heroin on prescription through the use of Home Office statistical tables. These tables give figures for the drugs used to treat those notified as receiving treatment with notifiable drugs. Table VII suggests that approximately 1 in 3 users were in contact with official or voluntary agencies. The percentage of users receiving heroin on prescription has been calculated in Table XI, therefore, based on a third of the proportion of notified users receiving heroin on prescription. This series of figures has declined steadily throughout the period, in accordance with beliefs on prescribing practices.

The final estimate that needs to be made concerns the actual dosage of heroin consumed daily. The few studies reviewed in section 5.4.3.2 suggested that regular users usually consume 0.25g to 0.5g per day, with the amount consumed rising further up the distribution network. With no information available as to how daily dosage may have changed over the years, it is sensible to adopt a constant estimate of daily dosage of 0.25g for non-dealing users, and one gram for retailers.

The only further assumption needed is the ratio of users to retailers. An example given in the work of Hartnoll and Lewis (1984) predicted that there was typically eight regular users for each dealer. The work of Bean and Wilkinson (1987) also suggested a ratio of 8:1, if retailers were defined as those who purchased heroin in quantities greater than a gram. The fieldwork of Fraser and George (1988) in Worthing suggested that there were 6-10 retailers at any one time, supplying 62 users. It seems reasonable, therefore, to suggest that nationwide there are probably eight users for each retailer, given the tendency for heroin users to prefer the pyramid-style distribution network, with its accompanying stable levels of purity and prices (Fraser and George, 1989). With eight non-dealing users consuming 0.25g and one retailer consuming one gram per day, the overall average daily consumption is one-third of a gram.

Table XI shows the calculation of the total amount of illicit heroin consumed annually in the UK since 1979. It is clear that the consumption of heroin in the UK has increased since 1979. Total annual consumption rose almost four-fold over the period 1979-1984, before falling by 15% by 1987. Since this time, however, consumption has risen dramatically each year.

Table XI   The Consumption of Heroin in the UK, 1979-1990 (Kg)

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total number of heroin addicts in the UK[a]	20496	22834	28966	39095	55867	76321	68901	66752	64281	75656	87388	101,479
% receiving heroin on prescription[b]	4.6	3.4	3.8	2.8	2.0	1.4	1.8	1.3	1.2	1.0	0.2	0.3
Frequency of use (months/year)[c]	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Number using illicit heroin at one time	12221	13786	17416	23750	34219	47033	42288	41178	39694	46812	54508	63234
Dosage per day	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g	0.33g
Total annual UK Consumption (Kg)[d]	1490	1680	2120	2890	4160	5720	5150	5010	4830	5700	6630	7690

a   Source: Table X
b   It has been estimated that the known total addict multiplier equals three.   The percentage receiving heroin on prescription is calculated as the number of individuals receiving heroin on prescription divided by the total number of individuals notified as addicted to heroin, divided by three.
c   Based on Hartnoll and Lewis (1984).
d   To nearest 10 Kg.

6.3.3. Expenditure on illicit heroin

With the information available, it is also possible to estimate expenditure on illicit heroin each year, and therefore analyse how the value of the heroin market has changed over time. It is at this point that it becomes pertinent to note that heroin retailers are invariably heroin users themselves (Lewis et al, 1985). This fact is important since retailers face a lower price for their heroin than do non-dealing users, and also tend to consume more heroin. Therefore, assuming that all of the heroin consumed in the UK is bought at street-level price would lead to a substantial over-estimate of the value of the market.

Retail and wholesale price estimates are available from the National Drugs Intelligence Unit for heroin at different levels of the market. Table XII calculates the total expenditure on illicit heroin in each year by first estimating the numbers of users and retailers, and then calculating how much each group spent on heroin.

Nominal expenditure on illicit heroin shows very similar trends over the period as the figures for total consumption. This observation is largely caused by the fact that the nominal price of heroin has remained relatively constant over time. The main exceptions to this statement occur in 1982 and 1983 when the retail price fell to around two-third of its 'normal' level. As a result of this, expenditure rises slower in 1982 and 1983 than does consumption, but then expenditure almost doubles in 1984. In real terms, the value of the illicit heroin market reached its peak in 1984. Despite larger figures for total annual consumption in the last few years of the decade, the real price of heroin fell considerably over the period 1984 to 1990.

Table XII Expenditure on Illicit Heroin in the UK, 1979-1990

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total annual UK consumption Kg[a]	1487	1677	2119	2890	4163	5722	5145	5010	4829	5695	6632	7693
Number of users/retailer	8	8	8	8	8	8	8	8	8	8	8	8
Number of non-dealing users at one time	10863	12254	15481	21111	30417	41807	37589	36603	35284	41611	48452	56208
Daily intake	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g	0.25g
Price to users per gram[b]	90	90	86	60	60	90	85	86	95	95	93	93
Expenditure by users £m	89.2	100.6	121.5	115.6	166.5	343.3	291.5	287.2	305.9	360.7	411.2	477.0
Number of retailers	1358	1532	1935	2639	3802	5226	4699	4575	4410	5201	6056	7026
Daily intake	1g	1g	1g	1g	1g	1g	1g	1g	1g	1g	1g	1g
Price to retailers[b]	38	38	42	43	38	41	38	39	43	43	42	42
Expenditure by retailers	18.8	21.2	29.7	41.4	52.7	78.2	65.2	65.1	69.2	81.6	92.8	107.7
Total expenditure	108.0	121.8	151.2	157.0	219.2	421.5	356.7	352.3	375.1	442.3	504.0	584.7
Expend at 1990 prices	228.6	226.1	256.1	244.9	327.1	599.0	478.0	456.6	466.7	524.5	554.5	584.7

a   Source: Table XI

b   Source: Sutton et al (1992)

The estimated value of the heroin market of £580m in 1990, and the estimated consumption figure in Table XI, are somewhat larger than the estimate provided by Customs and the National Criminal Intelligence Service for 1991 (Guardian, 17 August, 1992). Heroin seizures were estimated to be worth £40m in 1991, and the Guardian article suggests that Customs seize approximately 10% of the drugs in this country. This estimate suggests the value of the heroin market was £400m in 1991, although the actual proportion of heroin shipments seized by Customs may differ significantly from 10% (Wagstaff and Maynard, 1988; Sutton et al, 1992).

7.   SUMMARY AND CONCLUSIONS

Despite the fact that many drug researchers have clearly highlighted the need for information on the size of the UK's drug problem, it is impossible to estimate the costs of drug use on society. Few authors have suggested a magnitude for the problem, and comments on changes in the size of the illicit drug market cannot be supported with available quantitative data.

Illicit drug use spans the responsibilities of many different agencies. The direct health effects of drug use, which will vary with the range of drugs used, route of administration and the heaviness and regularity of use, are of concern for health and treatment agencies. Good quality information is required if treatment services and prescribing practices are to be effectively planned. Since it is thought that individuals experiment with drugs at a young age, drug use is also important to the education sector, especially if drug use is associated with truancy or under-achievement. In order to determine the effectiveness of drug education at ending existing drug misuse and preventing potential future misuse, reliable data on the prevalence of drug use, and the characteristics of drug use and drug users, need to be collected, along with data on drug availability which is believed to determine the level of experimental use (Home Office, 1984).

The Home Office oversees two departments which have responsibility for drug use. The work of the police and Customs imposes risks on drug trafficking, dealing and use, thereby increasing its (effective) price. However, price rises themselves are not the measure of benefit for these interventions, rather the effect of these price rises on consumption. Firstly, information is required on the economic behaviour of individuals involved at each level of

drug markets to see what the impact on price will be of increased enforcement activity. Secondly, these estimated price changes must be examined for their impact on the social costs of drug use, via changes in expenditure (and fund-raising crime) and changes in the consumption of all drugs. It is only with this information available on the effectiveness of health, education and enforcement agencies' interventions that national drug policy can be optimised.

Despite the need for data to design and evaluate policy interventions, the Government prefers to work in ignorance, using a range of data which is seriously inadequate. The four broad categories into which indicators of illicit drug use can be divided are: indirect measures by enforcement agencies, surveys of drug use, surveys of known users and studies of hidden users.

Intelligence information giving indirect measures of the size of illicit drug markets are collected by various agencies in the enforcement sector. The problem with this information is that its collection reflects the needs of enforcement policy rather than the needs of data gathering to identify underlying trends in drug markets. Seizure statistics, for example, reflect enforcement agency output, targeting behaviour and trends in drug purity, as well as changes in the size of illicit drug markets. Similarly, price changes are impossible to interpret in the absence of information on market structure and consumption.

It was argued in 1987 that a national survey of drug use would be feasible (Goddard, 1987). Despite this, only two nationally representative surveys have been undertaken, one of which concentrated solely on the use of cannabis (Mott, 1985). Other surveys of attitudes,

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knowledge and experience of drug use focus exclusively on the young. These surveys produce figures on attitudes towards, and beliefs about, drug use, and reflect actual drug use only in terms of first use or current regular use. The samples are rarely representative, the surveys not regularly repeated and no estimates of actual consumption are produced. It is impossible, therefore, to determine regional or temporal trends in drug use.

By extracting certain information from different agencies' records, multi-agency enumeration studies seek to produce estimates of the prevalence and characteristics of drug use within a certain region and period. The problem with this type of approach is that only a subset of drug users are contacted, and the combination of agencies surveyed will determine the number and nature of the drug users contacted. It has been suggested that the 'tools-of-the-trade' be standardised (Parker et al, 1987). This, however, would be difficult given variations in resources available to agencies and agency effectiveness and policy, in different regions and over time. It is impossible to determine the proportion of drug users that have become known over the survey period, and, therefore, the representativeness of any results, without also estimating the size and characteristics of the hidden sector.

Apart from being potentially biased, the results of these surveys are limited by the range of information collected by the agencies. Many agencies collect basic demographic information, but do not provide satisfactory data on the range of drugs used, and levels of drug consumption and expenditure. Neither do they offer indications of how these factors may be affected by changes in policy. For many policy purposes, increased prevalence of the use of one drug will be misleading if the use of other drugs has declined, along with overall drug consumption and expenditure.

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These problems highlight the limited usefulness of Regional Drug Misuse Databases. Increases in the number of users on the database lists may reflect database effectiveness as much as prevalence changes. Policy recommendations risk being based on an atypical sample of users. Nevertheless, some drug misuse databases do seem to be identifying a greater number of users, and presenting information on the use of many other drugs, than the opiate-dominated Home Office Addicts Index (Hanvey et al, 1992).

Studies that have attempted to estimate what proportion of drug users become known to medical and socio-legal agencies are few and far between. Once again, it is difficult to standardise these studies, and figures for the number of 'hidden' users discovered are likely to be determined by the effectiveness of the researchers' methods at infiltrating the 'hidden' user sector. Nevertheless, there is agreement that women are less likely to come into contact with official or voluntary agencies. It seems that enforcement agencies are far more likely to apprehend male users, and some women may be reluctant to approach treatment agencies for fear that their children may be taken into care (Parker et al, 1988). The evidence relating to the hypothesis that users in treatment are likely to be older is more mixed.

Estimates of the ratio of known to unknown opiate users suggest that this figure varies across regions and over time. The limited number of studies do suggest, however, that areas with high rates of known opiate-use contact lower proportions of the total opiate-using population. Therefore, known-user rates underestimate the true differences between the prevalence of opiate use across different regions (see Section 6.2.).

In 1985, the year for which the greatest amount of evidence is available, a combination of

results from different studies suggest that the national notified to total addict multiplier was approximately equal to seven (Table IX). Studies from the Wirral suggest that the notified to known user multiplier may have been declining since 1984, but this trend is not corroborated by evidence from other regions. Using a constant addict multiplier of seven throughout the decade, the prevalence of heroin use in the UK appears to have risen from 20,000 in 1979 to over 100,000 in 1990 (Section 6.3.). Further assumptions, based on the limited data available, permitted estimation of heroin consumption and expenditure over the same period. Total annual UK consumption of heroin was estimated to have risen from 1,500Kg in 1979 to over 7,000Kg in 1990, with total expenditure rising from £100m in 1979 to nearly £600m in 1990. In real terms this expenditure rise is 156% over the decade, although real expenditure on heroin peaked in 1984 (Table XII).

It is only possible to calculate prevalence figures for heroin, and these calculations involve many assumptions which are not supported by many studies. The limited information available on drug trends is a clear indication of the extent to which national drug policy is being formulated behind a veil of ignorance. Under these circumstances, it is highly unlikely that drug policy is being designed and executed efficiently. The most obvious way in which to improve policy-making in this area would be to improve the range of data available.

The current policy for increasing the information available on drug use is led by the introduction of the Regional Drug Misuse Databases. However, these databases still only include known drug users. In this way, the database figures reflect the uptake of treatment services and the effectiveness of enforcement activity. In fact, the database network is a form of national 'indicator' technique, a technique which Mott (1987) describes as 'the most

flexible, quickest and least costly way of monitoring *problem* drug use' (p.13). Nevertheless, Mott (1987) also notes that this technique cannot be used to estimate the total number of drug users.

Whilst brevity and low-cost may be important attractions of this method, the accuracy and quality of information are more important considerations. The databases will identify an unknown proportion of the total drug using population. Even if monitoring techniques are standardised throughout the country, the proportion of total users included will be unknown and will fluctuate, and the identified users are likely to be unrepresentative of the general drug using population. Therefore, the size of the problem will remain unknown, changes and trends in the statistics will be impossible to interpret, and researchers and policy-makers will be presented with an atypical picture of drug users.

The introduction of Regional Drug Misuse Databases is certainly an improvement on the Home Office Addicts Index, but is of little use if it is not supported by studies which seek to measure trends in the size and characteristics of the 'hidden' user sector. Treatment and socio-legal agencies must also improve their databases by collecting information on poly-drug use, consumption patterns and expected reactions to policy changes. It is likely also that a regular national survey of drug use would be a useful source of additional information, as has already been suggested elsewhere (Goddard, 1987; Wagstaff and Maynard, 1988). Without such data the agencies of Government will continue to assert that the drug problem is "considerable" and their efforts to contain it are "successful" and there will be inadequate evidence to substantiate such claims. At present Government is spending hundreds of millions of pounds on a policy problem whose magnitude and trends are unknown. It should not be

surprised that its success appears to be limited but taxpayers should be concerned that their money is spent with so little regard to value for money issues. Perhaps it is time to measure rather than assert the size and nature of the "drug problem" in the UK?

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