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The economic and social costs of Class A drug use in England and Wales, 2000

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Foreword

Estimates of the economic and social costs of Class A drug use in England and Wales are an important addition to the growing evidence base supporting the Government's anti-drugs strategy. This information is valuable both for policy makers and for directing future research into what works in reducing illicit drug consumption, not least in terms of crime reduction and value for money.

The main findings from the study provide the first real evidence that costs are mostly associated with problematic drug use and drug-related crime, in particular acquisitive crime. In addition, significant cost consequences are identified for health care services, the criminal justice system and state benefits.

As with any modelling exercise, the cost estimates reported in this study are far from perfect, but the key assumptions used and gaps in evidence have been made explicit. Overall, an important step has been made and the model developed in this report provides a good foundation for estimating future economic and social costs of Class A drug misuse when new data become available, and to track the economic impact of the Government's proactive expenditure on anti-drugs policies.

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Introduction: developing the methodology (Chapter 1)

This research study provides estimates of the economic and social costs of Class A drug use in England and Wales for the year 2000. The methodology used to estimate costs will also enable future simulations of the relationship between various streams of government proactive and reactive expenditure.

Figure 1.1 provides an overview of the costing methodology. Class A drug users are first identified by type of user: young recreational, older regular, and problematic. Prevalence estimates are derived for each type of drug user using established methods reported in the literature. Consequences by type of drug user are derived from available treatment data. Unit costs are then applied to the consequences where reliable data are available – mainly health care services, the criminal justice system, and state benefits.

Total economic costs, defined as government reactive expenditure, are estimated by adding all the various cost consequences identified for each drug user type. Adding victim costs of crime and value for premature deaths to other resource costs results in total economic and social costs. Other potential social costs are identified but not included in the final estimates.

An important aspect of the costing methodology is the separation of consequences and costs according to whether or not problem drug users are receiving treatment. Chapter 3 demonstrates that problem drug users account for the majority of total economic and social costs. Consequences and costs are also provided for young recreational and older regular drug users, but in comparison to the costs of problem drug use, these estimates are small.

Further developments of the model are considered in terms of the definition of user groups and consequences (Figure 1.3 and Table 1.1). The proposed typology of consequences comprises five domains (health, work, driving, crime and other social impacts) and six different groups who may bear the costs (users, families/carers, other individuals directly affected, wider community effects, industry, and the public sector).

Estimating the number of drug users (Chapter 2)

Estimates of the total number of users of Class A drugs are presented as well as numbers in different groups. The estimates relate to the year 2000 for England and Wales, and are derived by updating previous estimates reported in the literature.

There is uncertainty with all methods for estimating the number of Class A drug users, but in particular for problematic drug users. Given this uncertainty, three methods are considered to derive a range of estimates for problem drug users: the multivariate indicator method, the treatment coverage method, and the treatment demographic method. The last method produces the lowest estimate of 281,125 (see below), but is closer to previously reported estimates in the literature.

Prevalence estimates for all types of Class A drug user are:

Number of young recreational users of Class A drugs:

399,000 (lowest estimate)

798,000 (highest estimate)

Number of older regular users of Class A drugs:

1,091,000 (lowest estimate)

2,182,000 (highest estimate)

Class A problem users in England and Wales:

281,125 (lowest estimate)

337,350 (medium estimate)

506,025 (highest estimate)

The total number of Class A drug users is the sum of problem drug users, young recreational users and older regular users. The low and high estimates to the nearest thousand are calculated from the sums of appropriate figures. The medium estimate is calculated from summing the low estimate of the young recreational and older regular users with the medium estimate of problem drug users. This yields the following range of estimates:

Total number of Class A drug users:

1,771,000 (low)

1,827,000 (medium)

3,486,000 (high)

Estimating the cost consequences (Chapter 3)

Data with which to estimate the economic and social costs of drug misuse are notoriously scarce. However, significant information was available for problem drug users who account for the majority of total costs. Most data for consequences come from the National Treatment Outcomes Research Study (NTORS) and comprise health care services, the criminal justice system, and employment.

Cost consequences are identified for each type of drug user: recreational, older regular and problematic. For the last group, consequences are identified according to whether or not they are in treatment, and then by duration of treatment (less than or more than one year).

Consequences identified include health care services: GP, Accident and Emergency, hospital days, mental health services; state benefits; and criminal justice system: police arrests/acquisitive crime, police custody, court appearances, and prison. In addition, a number of other health care costs are identified, such as those associated with injecting, but not included in the final estimates.

A total of £6 million a year health service and criminal justice costs was associated with young recreational users. This translates to a cost of £7.50 to £15 per user depending on whether the lower or higher estimate of the number of young recreational users is used. Total social costs for this group was estimated at £28.8 million a year, a cost per user between £36 and £72. These social costs include an estimate of the full costs of premature deaths from ecstasy use. Older regular users were estimated to cost around £6.2 million each year, a cost per user between £3 and £6. Estimates for young recreational and older regular users exclude any allowance for productivity effects and effects from driving and drug taking.

For problem drug users, total economic costs range from £2.9bn to £5.3bn, based on low to high estimates of the number of problem drug users (the medium estimate is £3.5bn) – £10,402 per user per annum. Total economic and social costs for this group increase the range of figures to between £10.1bn and £17.4bn – £35,455 per user per annum.

Problem drug users account for almost all economic and social costs (99%), and drug-related crime accounts for around 88 per cent of total economic and social costs.

Summary and conclusions (Chapter 4)

The economic and social costs of Class A drug misuse provided in this research report represents the first real attempt at assigning monetary values to a difficult problem to society. Estimates are based on the most reliable data available and an innovative model that examines major cost consequences according to the treatment status of problem drug users. The design of the costing model will allow future updates on economic and social costs, as well as future simulations of the relationship between streams of government proactive and reactive expenditure.

As with any modelling exercise there are bound to be a number of assumptions and limitations that need to be considered when interpreting results. These will need to be updated when new data become available. These have been made explicit in each chapter of the report (as well as recommendations for future research), but a few key assumptions are discussed in more detail. Sensitivity analyses of key assumptions suggest that the range of estimates provided for the economic and social costs of Class A drug misuse are fairly robust.

1. Introduction: developing the methodology

Aims of the project

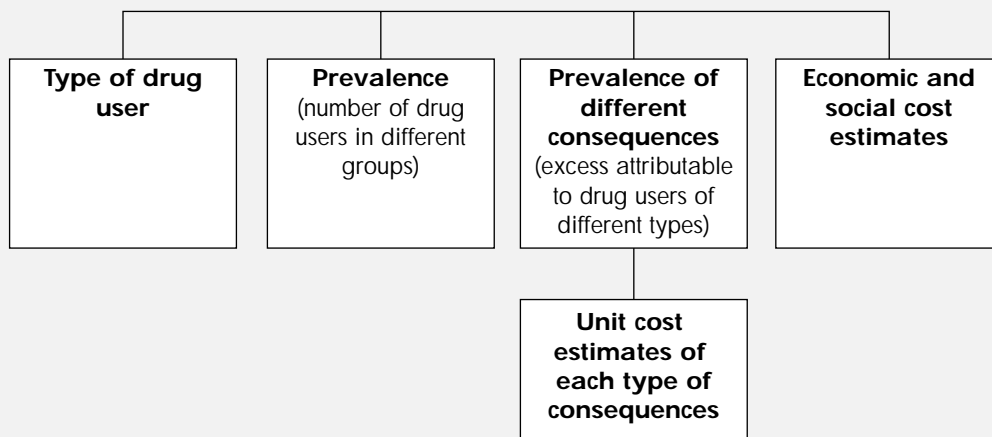
In a previous project, the methodology and evidence to consider the costing of substance misuse were reviewed (Culyer *et al.*, 2002). A costing methodology was required to estimate reactive government expenditure on substance misuse. This research study provides estimates of these economic costs and the wider social costs of Class A drug use in England and Wales for the year 2000.

The methodology also needed to be robust to allow future simulations of the relationship between various streams of government proactive and reactive expenditures. Proactive government expenditure is defined as that spending which has the clearly stated objective of reducing drug use or problems. Reactive government expenditure is expenditure incurred which does not directly reduce either the prevalence of drug use or drug-related consequences but is the result of some consequence related to drug use. Estimating the flows of public expenditure is a necessary component of the regular Comprehensive Spending Reviews (CSR). The full economic and social costs are based on the impact of drug use on resource costs in the economy.

Developing the methodology

The proposed costing model is a general one that could be adapted for all substances, legal and illegal. In Figure 1.1 the links between users and consequences are expanded to indicate how economic estimates could be derived. The first step illustrated by the first box in the diagram involves estimation of the prevalence of total drug users and the numbers in the different groups identified in the typology. The next step involves estimating the prevalence of different consequences that can be attributed to the drug users of different types. This stage of the process will be dependent on the research available to identify these consequences. Prevalence estimates can then be combined with estimates of the unit costs of each type of consequence to yield the economic and social cost estimates. This process would need to distinguish between resource and public expenditure flows.

Figure 1.1: Deriving estimates of the economic and social consequences of drug use

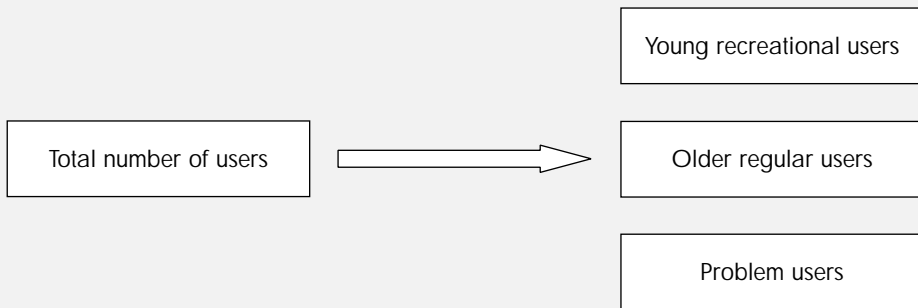


Defining the user groups

In the previous project a typology of illicit drug users was proposed. Three mutually exclusive groups were proposed, see Figure 1.2. These groups were:

- young recreational users – defined as those taking Class A drugs aged under 25 but not in the problem user group;
- older regular users – defined as those regularly taking Class A drugs aged 25 or over but not in the problem user group; and
- problem users – users of any age whose drug use is no longer controlled or undertaken for recreational purposes and where drugs have become a more essential element of the individual's life.

In theory these groups are defined not by the type of drugs consumed but by the intensity of use and problems related to that intensity. That is, if drugs are an essential component of the individual's life and the individual is experiencing problems related to that intensity of use; the individual would be defined as a problem user. If the user does not consume at that level or with problems then those aged under 25 would be in the young recreational user group and those aged 25 and over would be in the older regular user group. This does not mean that younger recreational users or older regular user would not be associated with any harmful consequences but such problems are rarer and/or associated with using drugs in specific circumstances, for example, while driving.

Figure 1.2: Expanding the type of drug users

The total number of users is the sum of the numbers in each of these three groups. Different consequences are linked with these three groups. There are two additional sub-types of drug users. Within the young recreational users group there is a sub-group of particular policy interest. These are the young people with a number of characteristics or in social circumstances which put them at high risk of moving from recreational to problem use. Reducing the number in the high-risk group would result in lower numbers being in the problem use group in future time periods.

The second sub-group is within the problem user group. Injecting drug use is associated with a number of additional health problems. Infectious disease risks in particular could have large consequences for the user, and additional demand for health services and risk of disease in the wider community. It was thought important therefore to define injecting users as a sub-group of problem users. In developing the methodology and attempting to provide empirical estimates, however, further divisions amongst this group seemed desirable. Some risks, for example, infected injecting sites' are related to current injecting status. Other consequences depend on the disease state of the drug user. Past drug injectors may be infected with a different disease but do not know their current disease status. Current drug injectors with disease-free status continue to be at risk. It did prove possible to estimate numbers of current and past injectors but not to provide separate estimates of the consequences of past and current injectors.

Refining the types of consequences

To start estimating costs, decisions need to be taken on the type of consequences that will be included or excluded. Economists in any study can take either a positive or normative viewpoint. The normative viewpoint involves value judgements about what "ought to be". For example, one viewpoint could be that drug users make a choice as to whether to take or not to take drugs. If users are economically rational in this sense it could be assumed that they take potential individual costs and benefits of the drug use into account when making their decisions. This would imply, in the normative framework, that governments should not concern themselves with private individual costs of drug use but only be concerned about those consequences that impact on the rest of society. There has been work on different normative frameworks and their relevance to drugs of addiction and dependence covering concepts such as rational addiction (see for example Buck *et al.*, 1996). Models have been proposed about the range of costs of drug use and the benefits of drug consumption, both of legal and illegal substances, from the user's perspective which should be considered in a policy-making framework under different assumptions. These assumptions include the level of information and the nature of addiction or dependence. The models can be further extended to explore the impact of different types of policies on the patterns of costs and consequences of drug use. For example, tax policies on legal drugs or drug possession enforcement policies can be seen as coercive by reducing the benefits of consumption of those who have not created costs for other members of society. This contrasts to education programmes or voluntary treatments which would not be associated with the same forced behaviour change and loss of consumption benefits (Godfrey and Maynard, 1995). Within the current proposed methodology the pattern of costs and benefits under such normative frameworks would be expected to vary across the different drug user types. Older regular users are by definition assumed to be taking economically rational decisions and do not have a dependent pattern of use.

A positive viewpoint by economists starts from the premise that economists can enumerate all costs and consequences from a neutral standpoint and present these data to the decision-maker in order that they can make a decision based on their values (or democratically reflected values). In costing frameworks, however, it is difficult to maintain an entirely "normative" free framework as all items identified have to be assigned a value and this process of assigning values to concepts such as the loss of life will involve some value judgements. A positive viewpoint was adopted in this project to allow maximum flexibility in the methodology.

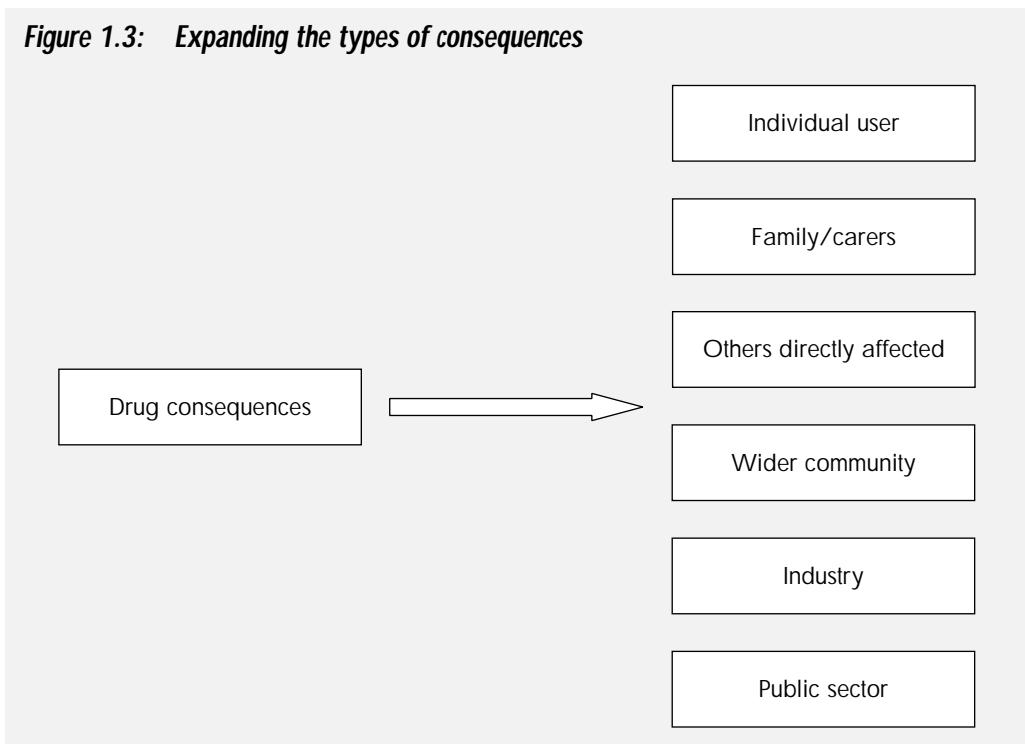
The costing estimates presented here represent the baseline against which the effects of any changes in policy could be assessed. The figures in this report estimate the economic and

social costs, given current policies and other circumstances. Using the methods described in this report, different estimates can then be made under alternative policy assumptions.

Following the positive economic framework, it seems sensible to develop the typology of consequences according to who bears the cost. Six separate groups are identified in Figure 1.3:

- users;
- families/carers;
- other individuals directly affected;
- wider community effects;
- industry; and
- public sector.

Figure 1.3: Expanding the types of consequences



The domains of the effects: health; work; driving; crime and other social consequences can then be considered for each group. The total sum of costs across sectors or across all parties would need adjusting so that there was no double counting of the same consequence. There is also a need, following the logic of the costing model, to map consequences to the different types of drug users as was outlined in Culyer *et al.*, 2002. Another extension of the

model would be to consider the "economic" benefits of drug use especially as experienced by the individual. Such benefits as suggested may be affected by different policies. This was, however, outside the scope of the current project.

Each of the different groups now requires further work to identify all the potential consequences of Class A drugs. Table 1.1 is an attempt to identify consequences for each of the six different groups who may bear the costs of drug use.

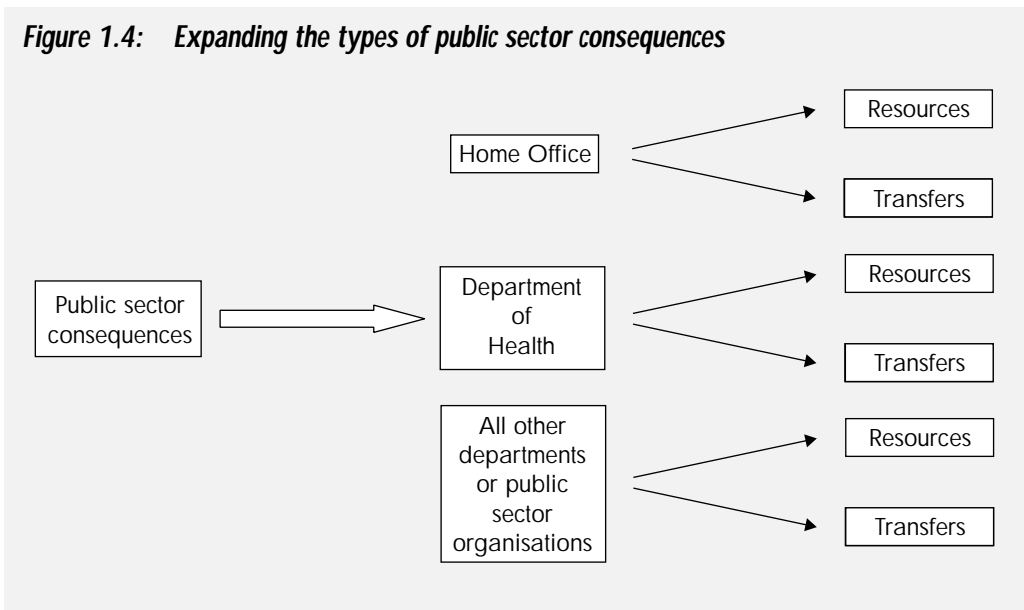
Table 1.1: Examples of the typology of costs

Group – Bearer of Cost	Examples of cost
Users	Premature death Loss of quality of life – mental and physical health; relationships; etc. Impact on educational achievement, training opportunities etc. Excess unemployment and loss of lifetime earnings
Families/carers	Impact on children of drug users Transmission of infections Intergeneration impact on drug use Financial problems Concern/worry for users Caring for drug users or drug users' dependants
Other individuals directly affected	Victims of drug driving; drug-related violence; drug-related crime Transmission of infections from drug users
Wider community effects	Fear of crime Environmental aspects of drug markets – needles, effects of drug dealing in community etc.
Industry	Sickness absence Theft in the workplace Security expenditure to prevent drug-related crime Productivity losses Impact of illicit markets on legitimate markets
Public sector	Health care expenditure Criminal justice expenditure Social care services Social security benefits

The consequences outlined in Table 1.1 would need to be identified, measured and valued. There are concerns about how to measure and value different consequences. Productivity losses frequently account for a large proportion of estimated social costs of drugs, but it is unclear how to estimate and value lower productivity associated with health or drug problems. In the short-term, the loss of productivity may be partially compensated by other workers and in the longer-term the labour market may adjust to these impacts especially from general recreational use. Also some consequences are difficult to value in monetary terms, for example, what value can be put on the loss of life or the fear of crime. Table 1.1 provides a checklist against which available empirical estimates can be compared. In practice it proved difficult to find any empirical data to measure and value a number of items, particularly those borne by families and carers.

As shown in Figure 1.4 some of the consequences can be further sub-divided. In particular it is important for the public sector to distinguish resource consequences from transfers. Transfers refer to public finance expenditures, e.g., social security benefits, which do not in themselves affect the total resources in the economy but signal a movement of resources from one section of the population (tax payers) to another (benefit-claiming drug users).

Figure 1.4: Expanding the types of public sector consequences



For illicit drugs there is clearly a lack of information at many points, from prevalence of drug use, consequences and the effectiveness and costs of policies. The current model is therefore proposed not as a part of any exact decision-making model but rather as an exploratory tool.

The estimation of the number of users in the different groups is given in Chapter 2 with cost consequences detailed in Chapter 3. Chapters 2 and 3 contain a summary of the assumptions made, i.e. an assumptions log. Comments are also provided on further research and gaps in data currently available for Chapters 1-3. Chapter 4 provides a summary of the results and a discussion of the limitations of the research.

Further research

- All the current work depends on the rapid review undertaken for Culyer *et al.*, (2002). There is potential to expand and improve on the model with more specific reviews and adopting other modelling methodology techniques (Godfrey *et al.*, 2001).
- The normative framework of costing studies and, in particular, the techniques required to obtain an estimate of the benefits of drug use under different assumptions, would provide a fuller range of estimates for the policy-makers to consider.

2.

Estimating the number of drug users

Introduction

This chapter provides estimates of numbers of users of Class A drugs: cocaine, crack, ecstasy, heroin, methadone, LSD and magic mushrooms. It is not concerned with dipipanone, morphine, opium, pethidine, phenylcyclidine, cannabinal and cannabinal derivatives nor does it directly consider Class B drugs prepared for injecting, except amphetamine. Sources for all estimates are discussed within the chapter. A full assumption log is provided and suggestions made for future research and data gathering which may improve these estimates. Prevalence estimates are provided for England and Wales for the year 2000.

The total number of drug users is the sum of young recreational users, older regular users and problem drug users. If an estimate of the total number of users is available and problem use can be defined, the other groups would be defined by default.

Problem drug use would ideally be defined in relationship to an individual's experiences. There is no agreed definition of a problem user (see review in Culyer *et al.*, 2002). Problem drug users are generally understood to be those whose drug use is no longer controlled or undertaken for recreational purposes and where drugs have become a more essential element of an individual's life. Estimates are generally based on the numbers in treatment or with other identified major drug-related problems. Problem use can be assumed as starting some time before people report for treatment, or some estimate is made of the proportion of the problem drug using population actually receiving treatment at any one point of time. It proved, however, more difficult to define non-problem users without making some assumptions based on the drugs used.

Problem drug use is associated with certain drugs, opiates and cocaine, as well as injecting drug use of amphetamines. However, not all consumers of these drugs are currently problem users. The estimates of problem drug users were higher than the estimate of all users of these drugs based on population surveys. Therefore, to estimate the number of young recreational and older regular users, some division had to be made from these surveys of problematic and non-problematic use. It was assumed therefore that all opiate use and crack use reported in such surveys is problematic; this assumption may be revised in time if better evidence and monitoring data become available. All ecstasy, LSD and magic mushroom use

is assumed not to be problematic. Cocaine use, on the basis of evidence from the BCS for 2000 (Ramsey *et al.*, 2001), can be assumed to be both recreational and problematic. These issues and more detailed estimates are provided in the following text.

Problem drug users

A number of reports base estimates of prevalence of problem drug use on modelling techniques identified by EMCDDA (1997) and tested by Frischer *et al.* (2001) for the UK. Estimates are for different types of problems; problem drug users, problem opiate users, opiate users at risk of death and injecting drug users; each estimated through using one or more models.

Estimates provided by Frischer *et al.* are for 1996 and, while considered plausible by the authors, limitations of methods are noted. In the previous project (Culyer *et al.*, 2002), it was suggested prevalence be based, where possible, on these modelling techniques to provide more up-to-date estimates of use of Class A drugs for England and Wales.

The *Multivariate Indicator Method* combines information on prevalence that is available in only a few localities and 'indicators' or 'predictors' of drug use that are available in all areas: convictions for drug offences; seizures of controlled drugs; treatment populations; numbers of drug-related HIV and drug-related deaths. A key assumption is that the relationship between prevalence in a few localities and the predictors is transferable to all locations. From this method, the 1996 estimate for problem drug users in the UK was 268,000. There are a number of limitations for replication of this method, not least the lack of time-relevant prevalence data. We therefore do not attempt to use this method to estimate prevalence of problem use of Class A drugs in England and Wales.

The *Treatment Demographic Method*, used to estimate the number of problem opiate users, involves calculating the product of the number of users entering treatment in any year for the first time and the average life duration of problem opiate use prior to entering treatment. The total number of incident cases was estimated from the Regional Drug Misuse Database (RDMD). Mean duration was estimated to be eight years by Frischer *et al.*, 2001. For the UK, in 1996, 162,544 problem opiate users were estimated.

This method for estimating the number of problem users of Class A drugs has been replicated using data on those reporting for treatment from October 1999 to September 2000, the latest available data (Department of Health, 2001a). Extrapolation from the

Regional Drug Misuse Databases (RDMD) requires two six-monthly reporting periods being added together and therefore there may be double counting of individuals reporting twice within a twelve month period, although this is assumed to be small. Frischer *et al.* (2001) used an estimate of eight years before a user would enter treatment. This could be thought excessive, especially given the recent expansion of available treatment. A more realistic time-scale for duration of problem use to entry into treatment has been taken to be five years, based on Coid *et al.* (2000). However, this assumption is based on only one study. Shortening the time period in this way acts to reduce the estimate of problem drug users.

For England and Wales RDMD data suggest 55,043 problem opiate and cocaine users new to treatment. There were, in addition, 2,955 users reporting amphetamines as main drug, between 38 per cent and 41 per cent, (of these an average of 40%), 1,182, report injecting (and are therefore classed as Class A users). 56,225 users of Class A drugs newly reporting, multiplied by five years is equal to 281,125 problem Class A users. This is a much higher estimate than reported for 1996 for the UK for opiate users.

Treatment Demographic Method:

Number of Class A problem users in England and Wales is 281,125

A second method of estimating the number of problem opiate users tested by Frischer *et al.* is the *Treatment Coverage Method*. This method extrapolates from the number of opiate users in treatment in a given year and assumes a 25 per cent coverage. These assumptions (as with the previous method) are not based on strong evidence, but often on expert opinion or limited observational studies. To use this method requires extrapolating from the RDMD, which currently reports only on new episodes; Frischer *et al.* assume this to represent a third of those in treatment. Based on this method they estimate 243,820 problem opiate users in the UK.

Using this method to estimate problem use of Class A drugs in England and Wales, it is also assumed new episodes represent a third of those in treatment. This assumption will soon be able to be tested via the new treatment monitoring system, the National Drugs Treatment Monitoring System (NDTMS), which will be prevalence-based, rather than incidence-based. It is also assumed, given an increase in treatment following new funding, there will be a greater coverage and it is assumed to be between 33 per cent and 50 per cent currently in treatment rather than 25 per cent assumed by Frischer *et al.* With 56,225 users of Class A drugs new to treatment from October 1999 to September 2000 we assume 168,675 in treatment. Assuming a 50 per cent coverage we estimate approximately 337,350 problem

Class A users in England and Wales. Assuming a 33 per cent coverage we estimate approximately 506,025 problem Class A users in England and Wales.

Treatment Coverage Method:

Number of Class A problem users in England and Wales between 337,350 and 506,025

Both of these estimates of problem users may require revision on the basis of improved monitoring now being established, and further research evidence.

Applying these methods yields three estimates and it is suggested that these are used as high, low and medium estimates.

Number of Class A problem users in England and Wales:

281,125 (lowest estimate)

337,350 (medium estimate)

506,025(highest estimate)

Injecting users

Frischer *et al.* applied the *HIV Multiplier Method* to estimate the number of injecting drug users. Estimates of the number of injectors with HIV infection are multiplied by estimates of the proportion of the injecting population infected with HIV. From this method they estimate 161, 200 injecting users in the UK.

This method relates only to lifetime injecting drug users and assumes that all alive HIV positive injectors are still current injectors and also that the prevalence of HIV and the number infected move in unison. Both estimates are assumed by Frischer *et al.* (2001) to be suspect.

They also provided an estimate based on the BCS and Anderson and Frischer (1997), suggesting 168,905 injecting users in the UK. Both estimates are similar and the mean is 165,000.

It is not possible to use these methods, given the problem with the first method and the fact that the BCS no longer asks respondents about injecting. However, from models used by Frischer *et al.*, injecting drug users represent 80 per cent (165,000 injecting users as a

percentage of 203,000 problem opiate users) of all problem opiate users (this will not include injectors of cocaine-based drugs and amphetamines).

If it is assumed that 80 per cent of problem Class A users inject, it can be estimated that there are 224,900 injecting users (based on the *Treatment Demographic Method* estimate of 281,125 problem Class A users) and between 269,880 and 404,820 (based on the *Treatment Coverage Method* estimate of between 337,350 and 506,025 problem Class A users).

Number of Class A injecting drug users in England and Wales:

224,900 (lowest estimate) (80% of 281,125)

269,880 (medium estimate) (80% of 337,350)

404,820 (highest estimate) (80% of 506,025)

To estimate consequences, estimates of both current and past injectors could be useful. Current injectors are at higher risk of physical health problems associated with injecting, and at higher risk of overdose and death. Those current injectors not already infected with HIV, and/or hepatitis B, and/or hepatitis C also risk infection. Those already infected must be estimated separately. Former injectors will not currently be at risk of physical health problems associated with injecting, and at less risk of overdose and death. However, some may be infected already and these need to be estimated. Other former injectors will not have acquired infection but are at risk of relapse into injecting.

One means of estimating current and past injecting is to base assumptions on the proportion of injecting users in treatment, both current and ever injectors. From October 1999 to September 2000, of those whose injecting status was reported, 59 per cent were known current injectors and 41 per cent past injectors.

Using the *Treatment Demographic Method* estimate of 224,900 problem Class A injecting users, would suggest 132,691 current injectors, and based on the *Treatment Coverage Method* estimate of between 269,880 and 404,820 of injecting problem Class A users, between 199,036 and 238,844 current injectors.

Number of current injectors of Class A drugs in England and Wales:

132,691 (lowest estimate) (59% of 224,900)

159,229 (medium estimate) (59% of 269,880)

238,844 (highest estimate) (59% of 404,820)

Similarly, using the *Treatment Demographic Method* this would yield an estimate of 92,209 past injectors, and based on the *Treatment Coverage Method* between 110,651 and 165,976 past injectors.

Number of past injectors of Class A drugs in England and Wales:

92,209 (lowest estimate) (41% of 224,900)

110,651 (medium estimate) (41% of 269,880)

165,976 (highest estimate) (41% of 404,820)

Young recreational users

It could be expected that household and school surveys may provide the estimate of total drug users and therefore younger recreational users and older regular users would be defined as the residual after having excluded problem users. However, surveys yield estimates of users of Class A drugs such as opiates below those estimated above from treatment data. Without better data, therefore, all use of ecstasy, LSD and magic mushrooms estimated from these surveys is assumed to be recreational. Despite some indication of a very small amount of non-problematic opiate use, there is no real evidence as to its nature and extent, and therefore all opiate use estimated from such surveys is assumed to be problematic. As the estimated opiate use from population surveys is so small, this does not significantly impact on the estimates of the numbers of drug users in this group. However, there is evidence that cocaine use, while associated with problem drug use, is also used recreationally. One assumption, following evidence from BCS (Ramsey *et al.*, 2001), is that 50 per cent of users are problematic and 50 per cent are not, for estimates of both young recreational and older regular users. These assumptions may need to be revised in the light of future evidence.

Young recreational users include all young people aged 11 to 24. Estimates for school age young people are based on 1998 England data (Goddard and Higgins, 1999); school data for Wales in 1998 includes only young people aged 15. School surveys undertaken in England and in Wales in 2000 sample 11 to 15 year olds, but results of these surveys were not made available to us. Preliminary results are not detailed enough for our purpose (Boreham and Shaw, 2001).

Population estimates for recreational drug use among young people for England and Wales are shown in Table 2.1. The estimates presented are based on the assumption that the use of all opiates is problematic, and that half of cocaine use is problematic. Higher estimates

are obtained by figures given for the use of any drug in the 'last year' and lower estimates by the use of the 'last month' figures. Estimates are based upon actual percentages from the survey data supplied to the project rather than rounded-up published percentages.

Table 2.1: Prevalence of recreational drug users amongst young people under 25

	Last year	Last month
LSD	235,000	137,000
Magic mushrooms	562,000	28,000
Ecstasy	781,000	384,000
Cocaine*	199,000	27,000
Any of above	798,000	399,000

Source: Data analysis taken from original surveys, Ramsey *et al.*, 2001; Goddard and Higgins, 1999.

Note: * assumes 50% is problematic therefore only, half of cocaine use prevalence is estimated as recreational.

Based on this table the following estimates are for the total number of young recreational users:

Number of young recreational users of Class A drugs:

399,000 (lowest estimate)

798,000 (highest estimate)

An alternative method would be to make assumptions from the 1998 Youth Lifestyle Survey (YLS), reported in *At the Margins* (Goulden and Sondhi, 2001). This survey asks about regularity of drug use, establishing a more refined definition of regular use, reporting on use:

- once or twice this year;
- once every couple of months;
- once a month;
- two or three times a month;
- once or twice a week;
- three to five days a week; and
- everyday.

Such data would be nearer the desired definition by type of user rather than based as a proxy on type of drug use. However, numbers from this survey are extremely small (19 reporting use of crack, 23 use of heroin and nine use of methadone in last year) and estimation based upon this evidence must be treated with extreme caution.

Using these categories it seems sensible to suggest that amongst 12–30-year-olds those who use more than once a week use problematically, that is:

- 7 per cent of cocaine users;
- 13 per cent of crack users;
- 51 per cent of heroin users; and
- 40 per cent of methadone users.

On the basis of this survey it could be assumed that some crack use is not problematic and a much smaller proportion of cocaine use is problematic. Just over half of heroin use is problematic. A major problem here however might be that data are skewed with the inclusion of very young users, and might be more precisely extrapolated for those over 15. For the basis of this exercise we have therefore not based assumptions on this evidence, but suggest this may provide a more precise estimate for future use of the model if questions on frequency of use are incorporated into larger population and school-based surveys.

High risk groups among young people

There is compelling evidence that a small but significant minority of young people, particularly those with a variety of specific domestic and social disadvantages, are more likely to use drugs, to use them more often and to consume more. In this model they are therefore likely to form a specific sub-section of young recreational users at high risk of moving into problem drug use. Specific estimates of numbers, or the patterns of causality between problems and drug use, are currently hard to come by.

The high-risk groups for whom any estimates in terms of numbers can be made are: the homeless, those in care, young offenders and truants and excludées. Information in terms of numbers about other groups – those with drug-using families and comorbidity are not available.

- Number of homeless young people: 12,400 drift in and out of sleeping rough in any year.

- Number of young people in care: approximately 50,000 young people are 'looked after' at any time.
- Number of young offenders: YLS estimates that eight per cent of people aged 12 to 30 are serious or persistent offenders. This translates, in population terms, to 1,038,272 for this age group.
- Truants and excludées: at least one million young people truant, 13,000 are permanently excluded and 100,000 are temporarily excluded.

While there is evidence of higher prevalence of recreational drug use amongst at risk groups, evidence of 'added' use of Class A drugs is limited. Estimates of added use are based on evidence from *At The Margins* (Goulden and Sondhi, 2001); this provides information on use of drugs amongst high-risk groups in the last year. Based on this information the following estimates are made:

- 12,400 drift in and out of sleeping rough in any year. Based on 'rough sleepers', it is suggested that there is no difference in use of cocaine and ecstasy, but for:
 - LSD: 2.5 times more likely (rough sleepers 5% never homeless 2%);
 - Magic mushrooms: at least 11.3 times more likely (rough sleepers 11%: never homeless 3%).
- Extrapolating from this, approximately 620 use LSD and approximately 1,364 young 'rough sleepers' use magic mushrooms.
- Approximately 50,000 young people are 'looked after' at any time. At the Margins could not identify these young people in the YLS.
- *At the Margins* estimates that eight per cent of people aged 12 to 30 are serious or persistent offenders, this translates, in population terms, to 1,038,272 for this age group.
 - Cocaine: at least 13 times more likely (serious offenders 13%: non-offenders less than 1%);
 - Ecstasy: at least 12 times more likely (serious offenders 12%: non-offenders less than 1%);
 - LSD: at least 16 times more likely (serious offenders 8%: non-offenders less than 0.5%);
 - Magic mushrooms: at least 12 times more likely (serious offenders 6%: non-offenders less than 0.5%).

- Extrapolating from this it is estimated that amongst young offenders age 12 to 30:
 - 134,975 use cocaine; based upon assumptions that half of this will be recreational, we assume 67,488 use cocaine recreationally;
 - 124,593 use ecstasy recreationally;
 - 83,061 use LSD;
 - 62,296 use magic mushrooms.

- At least one million young people truant. Based on 12 to 16-year-olds estimates are:
 - Cocaine: at least 4 times more likely (truants 2%: non-truant less than 0.5%);
 - Ecstasy: at least 4 times more likely (truants 2%: non-truant less than 0.5%);
 - LSD: at least 8 times more likely (truants 4%: non-truant less than 0.5%);
 - Magic mushrooms: at least 10 times more likely (truants 5%: non-truant less than 0.5%).

- Extrapolating from this, it is estimated that amongst truants aged 12 to 16 years 20,000 use cocaine. Assuming half use is recreational we estimate:
 - 10,000 truants use cocaine recreationally;
 - 20,000 use ecstasy;
 - 40,000 use LSD; and
 - 50,000 use magic mushrooms.

- 13,000 are permanently excluded from school and 100,000 are temporarily excluded. Estimates are for temporary exclusions only. Amongst excludees:
 - Cocaine: at least 6 times more likely (excludees 3%: non-excludees less than 0.5%);
 - Ecstasy: At least 10 times more likely (excludees 5%: non-excludees less than 0.5%);
 - LSD: at least 14 times more likely (excludees 7%: non-excludees less than 0.5%);
 - Magic mushrooms: at least 16 times more likely (excludees 8%: non-excludees truant less than 0.5%).

- Extrapolating from this it is estimated that amongst excludees, 3,000 use cocaine. Assuming half use is recreational, we estimate that 1,500 truants use cocaine recreationally:
 - 5,000 use ecstasy;
 - 7,000 use LSD; and
 - 8,000 use magic mushrooms.

These estimates are provided to give some insight into the high-risk groups. However, no data or models could be identified to use these estimates in the costing model.

Older regular users

Given the lack of data from the population surveys, it was necessary to define older regular users in terms of the drug used rather than actual pattern of use in a similar way to that adopted in estimating young recreational users. Opiate use and crack use amongst persons over 25 from such surveys are assumed to be problematic, but as with younger recreational users, only half cocaine use is so assumed. In Table 2.2 estimates of the numbers of older regular users based upon this assumption are presented. The numbers are based upon extrapolation from the 2000 BCS and 2000 population estimates (Ramsey *et al.*, 2001; National Statistics, 2001).

Table 2.2: Older regular users

	Last year	Last month
LSD	1,271,000	708,000
Magic mushrooms	1,609,000	804,000
Ecstasy	938,000	218,000
Cocaine*	545,000	148,000
Any of the above	2,182,000	1,091,000

Source: Data analysis taken from original survey, Ramsey *et al.*, 2001; Goddard and Higgins, 1999.

Note: * assumes 50% is problematic, therefore only half of cocaine use prevalence is estimated as recreational.

Based on the above the following estimates are for the total number of older regular users:

Number of older regular users of Class A drugs:

1,091,000 (lowest estimate)

2,182,000 (highest estimate)

Conclusions

The estimate of the number of users is a key component of the costing model. It had been expected that a total number of users could be estimated from population surveys and problem drug users estimated using a variety of modelling techniques. The difference between the total estimate and that of problem drug users would then have yielded the total

non-problematic users: younger recreational users and older regular users. In practice, the estimates of problem drug users, even using the most conservative assumptions, were larger than the population estimates from general surveys for specific Class A drugs. It was therefore necessary to define the younger recreational users and older regular users from population surveys by drug use, that is all possible problem drug users captured in the survey were excluded from the estimate. This is likely to lead to an underestimate of these two groups of drug users.

High and low estimates were calculated for young recreational users and older problem users. Three estimates were made of problem drug users. These could be combined in a number of ways to estimate the total number of Class A drug users for England and Wales for 2000. The low estimate was taken as the low estimate of all three groups giving an estimate of 1.77 million users. The high estimate is similarly estimated at 3.49 million users. One medium estimate would be to take a midpoint between these figures but this would lose the link with the specific estimates. The medium estimate was therefore taken as the conservative estimate of the low figure of the young recreational and older regular users, and the medium estimate of problem users which, at 1.82 million users, is only slightly higher than the low total estimate. However, this total estimate is not used as a key figure in estimating costs as the consequences are estimated separately for the different drug using groups. In the rest of the study the medium figure is generally used to provide the main estimate of drug related consequences. A larger range of estimates from varying the assumptions could be used in the model simulations, but there is little other evidence to guide such variations. The high, low and medium estimates given here are used as a means to illustrate how estimates may vary with estimates of the numbers of users.

Assumptions log

For each chapter a log of the main assumptions is presented. In estimating prevalence the assumptions taken from a number of published sources are:

- The duration of problem use to entry into treatment is five years.
- New episodes represent a third of those in treatment.
- Treatment coverage of problem drug use is between a third and a half.
- All use of opiates and crack is problematic, only half cocaine use is problematic.
- Estimates of problem Class A drug use prevalence are based upon modelling techniques identified by EDMMA.
- 80 per cent of Class A problem drug users have or continue to inject.

- 59 per cent of ever injectors are current injectors and 41 per cent are past injectors.
- Young recreational use is distinguished from regular use by age, the latter represented by those 25 years and older.
- Recreational use is distinguished from problem drug use.
- Recreational use cannot necessarily be defined by drug type.
- All ecstasy, LSD and magic mushroom use is recreational.
- Half of cocaine use is recreational.

Research and additional data required to improve estimates

- Attempts to estimate prevalence of drug use, for costing with respect to consequences, have highlighted a number of weaknesses in current evidence.
- A major problem is with definitions of recreational, regular and problem use, or rather the lack of information on regularity of use amongst users. Use of drugs, 'ever', in 'last year', and in 'last month' provide little understanding as to the nature of drug use, failing to provide a distinction between experimental, one-off trying, occasional and regular sustained use as part of lifestyle. While 'last month' use is commonly used as a proxy for regular use, it cannot truly be seen to represent this behaviour. The YLS style of questioning with respect to regularity of use would be more helpful in providing insight into not only problem and persistent use but also transitions from recreational to problem use. Much of this research requires longitudinal cohorts.
- Injecting of drugs is associated with major health, and long-term cost consequences; large-scale surveys used to estimate prevalence have not asked respondents about administration of drugs. Also, much of the literature on problem drug use fails to distinguish between injecting and non-injecting use. There are several other issues including poly-drug user and alcohol use within the drug using population.
- The transition process between different types of drug use – experimental to recreational to regular and finally to problem drug use – is under-researched, leading to a number of unsustainable assumptions about drug use and its consequences. The issues around use of cocaine have been highlighted above.

- Opiate use again is assumed to be associated with problem drug use, though it is reported by a small proportion of young users, including those as young as 11; indeed, prevalence amongst young people aged 11 to 15 for 'last year' use is as high as for 16 to 24-year-olds. The nature of this use – whether it is experimental, occasional or regular, or the problems associated with it – is not well understood. Similarly with older users, there is little understanding of the use of opiates and cocaine as recreational drugs.
- To provide better evidence of number of years of drug use before entering treatment, it is recommended that this information be provided through treatment monitoring systems.
- Estimates of prevalence are crucial not only to the methodology proposed in this report but to all other costing models. More particularly, if costs are to be monitored over time through successive CSR exercises, it becomes very important to be able to constantly monitor changes in prevalence over time.

Introduction

The aim of this chapter is to examine the consequences of Class A drug use in England and Wales for the year 2000. Consequences were considered for all types of users.

Table 1.1 gives a starting point to consider different consequences. The main domains for costs are health, work, driving, crime and other economic and social impacts. In practice, however, there are limited data to estimate these effects. Also even when there are some known and measured consequences there may be difficulties in assigning values for some concepts.

In the following sections the available estimates are presented for the different groups of users. Where possible, ranges of figures are presented along with estimates per user.

Young recreational users

As reviewed in the previous project (Culyer *et al.*, 2002) most consequences of drug use are not available in the form of the risk probabilities, given the level of use. For young recreational users the data are available simply on the current level of consequences. Figures are therefore based on data such as the current level of Class A drug-related deaths. This implies that the higher the current estimate of use the lower the estimate of the cost per user.

Health

Young recreational users are at risk from toxicity and overdose which exceptionally lead to death. Such deaths have public finance consequences (health care use) and obviously involve a social loss (the additional health resources and the years of life lost). There are additional health care consequences from toxicity and overdose that do not result in mortality.

It is assumed that any death reported related to cocaine use from those aged under 25 should be attributed to problem use. Twenty deaths from ecstasy were reported by coroners in 2000 (Pollard, 2001). It is difficult to know whether some deaths from ecstasy or other Class A drugs by young recreational users are not identified through the current system. The estimated number of young people taking ecstasy in 2000 was between 384,000 and 781,000 (Chapter 2).

This information is on an observed consequence, ecstasy-related deaths, rather than as suggested being in the form of a risk relationship. This means that in terms of the consequences only one estimate is available.

There are a number of issues that arise in putting a value on the loss of life in this way. For this project, estimates of the costs of deaths are based on those used for valuing road traffic accidents (Department of the Environment, Transport and the Regions (DETR), 1999). These values were gathered using a variety of methods and divided between the medical and ambulance costs; a lost output calculation and the human cost. The estimate of lost output is calculated as the present value of the expected loss of earnings plus any non-wage payments (national insurance contributions etc.) paid by the employer. The human cost element is based on the average population willingness to pay to avoid the risk of death. This figure was derived from a literature survey of such values. Including both a human cost and lost output elements for a death is debatable. Also, other elements could be valued in this type of calculation, for example, saving in the lifetime health care costs of those in this group who may have developed problem use. There are little data, however, to make such calculations or adjustments for this group of currently young recreational users. The DETR value of life was therefore used as an example of a value currently used in policy decisions.

Current valuation gives an estimate of £670 for the medical and ambulance costs; £750,640 for the human costs and £393,580 for the lost output component. The £670 element relates to health care costs of a road traffic accident death. It is unclear whether an ecstasy-related death would be more or less expensive and this figure is used in the absence of other estimates. The total social cost of each death is £1,144,890 in 2000 prices. This yields the following estimates:

Health service costs of ecstasy deaths in 2000: £13,000
Other social costs of ecstasy deaths in 2000: £22,884,400

These figures can also be expressed in terms of the cost per user. Given the estimate of 384,000 users, this would yield a health service cost of £0.03 per user and a total social cost (health resource and other social costs) of £59.59 per user. Obviously, because the consequences have been calculated from an observed figure, using the higher number of estimated ecstasy users of 781,000 yields a lower estimate of the cost per user of £0.017 and £29.30 respectively.

All recreational drug users may be at some risk from drug-related health problems, particularly toxicity and overdose. As reviewed in Culyer *et al.* (2002), there are no epidemiological studies giving risks for a range of medical conditions. The only available information is for recorded hospital episodes. There were 136 bed days from 26 episodes from any poisoning by narcotics and psychotics for individuals aged under 25 in England in the year 1999-2000 (Department of Health, 2001b). These admissions were all for LSD and have therefore been attributed to young recreational use rather than problem use. These figures seem low and may underestimate hospital use, especially Accident and Emergency Admissions. No data were available to check these estimates.

These episodes can be valued as follows. Each episode (26 were recorded) is likely to involve some ambulance costs and admission through Accident and Emergency Departments (A&E) as well as the cost per bed day for each of the 136 days recorded. The ambulance costs were taken at £179 per episode and an A&E admission of £65 per episode (figures taken from Netten and Curtis, 2000). The bed day costs are based on the average costs per day of inpatient episodes for poisoning, toxic effects and overdose of £226 (NHS Schedule of Reference Costs, 2000). The total cost for the 26 episodes and 136 bed days is therefore £37,080.

The only other hospital admissions directly related to young recreational users are for mental illness, see Table 3.1. Admissions were not available delineated by age. The drug-related mental illness admissions were therefore allocated 50 per cent to young recreational users and 50 per cent to older regular users.

Table 3.1: Mental health admissions related to young recreational drug use

Type of episode	No.	Bed days
Mental and behavioural disorders due to sedatives and hypnotics:		
Psychotic disorder	8	195
Residual and late-onset psychotic disorder	2	60
Mental and behavioural disorders due to multiple /psychoactive drugs		
Psychotic disorder	428	13,696
Amnesic syndrome	3	314
Residual and late-onset psychotic disorder	6	198
Total	447	14,463

Source: Department of Health, 2001b.

These bed days can be valued at £146 per day (Netten and Curtis, 2000). This gives a total cost of £2,111,598 for England.

Summing all the available health service costs for young recreational users gives an estimate of £2,161,678 (£13,000 + £37,080 + £2,111,598). Available data only cover hospital expenditure and there is no evidence about any excess use of primary care. Data are only available where drug use has been identified as a cause and the episode has been coded. This may be an underestimate of the total impact of recreational drug use. Also, data on hospital use were only available for England and exclude any impact in Wales.

The summary health effects for young recreational users per year are:

Health Service Costs (Reactive government expenditure): £2,161,678
Total Social Costs in the Health Domain: £25,046,078

Work

Part of the valuation of ecstasy-related deaths includes an element for lost productivity from that death. There are also likely to be some productivity effects from drug use by young recreational users. This may be short-term increasing sickness absence or affecting performance at work. There may also be longer-term impacts for the individual if drug use has impacted on education or employment history. There is no evidence that recreational use by under 25s is associated with unemployment. There is evidence of a causal association between productivity loss and drug use but no data are available to estimate these effects.

Driving

There are studies which suggest recreational drug users drive having recently consumed drugs. One recent study of use by clubbers suggests that 43 per cent had used ecstasy, 25 per cent cocaine and eight per cent LSD and also driven (Ingram *et al.*, 2001). Applying these percentages to all young recreational users would yield the following estimates:

Use of ecstasy prior to driving:
165,120 (lowest estimate)
335,830 (highest estimate)

Use of cocaine prior to driving:
67,200 (lowest estimate)
796,000 (highest estimate)

Use of LSD prior to driving:
10,960 (lowest estimate)
18,800 (highest estimate)

However, these figures are based on one survey of clubbers and it is unclear whether or not such proportions would translate to the whole recreational drug using group. The figures are therefore only given as an illustration of the potential size of the population with this risk.

While there is evidence of driver fatalities having tested positive for drugs (18% tested positive, Department of Environment, Transport and the Regions, 1999) this cannot assume that such tests are causally linked to the traffic accidents. Further research is required before any risk from the incidence of taking drugs recreationally and driving accidents can be calculated.

Crime

There are two major crime elements considered for this group: acquisitive crime; and crimes associated with possession of recreational drugs. There is no evidence of a causal relationship between acquisitive crime and younger recreational drug use. It may be part of the transition between young recreational users and problem users that use increases to a point where some acquisitive crime is conducted.

The numbers of drug possession offences depend on the level of police activity. Any changes in policy will impact on the criminal justice costs. What is currently impossible to determine is the impact of such enforcement expenditure on the level of drug use and other drug consequences. It is difficult to determine in the context of the model whether the drug possession criminal justice costs should be classed as proactive or reactive. They are included in this section as a reactive cost. Individual drug users may suffer other costs if they have a criminal conviction. Such costs have not been included in this report.

Data on those arrested for possession are broken down by substance but not by age. It is assumed that half the arrests for possession are among the under 25s. All such arrests for

ecstasy and LSD are assumed to be attributable to young recreational users. For the estimated cocaine arrests, one half are assumed to be young recreational users and one half to be young problem users. Using the latest available data from the Home Office (relating to 1998) this yields an estimate of:

- 1,560 arrests for ecstasy use
- 306 arrests for LSD
- 1,112 arrests for cocaine
- 2,798 total arrests

An estimate of the costs of a drug possession arrest can be derived from figures reported in Brand and Price (2000). An estimate of £3,551 per arrest was calculated based on the total police costs for drug-related offences from Brand and Price (2000) divided by the total number of drug offences (Corkery, 2001). However, these figures related to a mixture of possession and supply offences and it is likely that for young recreational and older regular users these arrests are generally for possession. Therefore, a more general cost of arrest of £1,346 was used. This figure is based on police expenditure and all arrests allowing for other police activities (see Godfrey *et al.*, 2002).

Estimated costs for drug possession arrests for young recreational users: £3,766,108

Other social consequences

No other social consequences were identified for young recreational users.

High-risk groups

Among the high-risk group within young recreational users the consumption of Class A drugs may well be higher than among the rest of this group. There are no estimated additional costs, either in reactive government expenditure or wider social costs for this group.

Older regular users

Categories of costs for older regular Class A drug users are very similar to those already described for younger recreational users.

Health

There is no evidence of ecstasy death amongst older users. Without evidence to the contrary, cocaine deaths are assumed to be associated with problem use.

Reported hospital episodes due to poisoning and intoxication are, however, higher for older users than among young people. As with younger recreational users, data are only available for England. The number of episodes and bed days taken from Department of Health (2001b) are shown in Table 3.2.

Table 3.2: Hospital episodes for those aged over 25 years

Hospital episode data for 1999-2000 shows the following FCE for over 25 year olds:		
Type of episode	No.	Bed days
Poisoning by LSD	17	10
Poisoning by cocaine	221	1,017
Total	238	1,027

Using the same estimates of costs this yields: 238 times £179 for ambulance costs; 238 times £65 for A&E costs; and 1027 times £226 for the cost of bed days. The total is £290,174.

The data for drug-related, mental illness admissions were not available by age. These admissions were therefore divided between the older regular and younger recreational users. The number of episodes and bed days for this group is therefore assumed to be the same as in Table 3.1.

Using a unit cost of £146 per bed day (Netten and Curtis, 2000) as before, the health care costs can be calculated as £2,111,598.

Total health service use among older regular users is costed as £2,401,800 per year. This figure excludes any primary care costs for this group. The summary health-care costs identified can therefore be summarised as:

Total health care costs for older regular users: £2,401,800

Work

There is no evidence that recreational use of Class A drugs by older users is associated with unemployment. There is some evidence of a causal link between recreational drug use and productivity losses but no data are available in the UK to estimate these impacts.

Driving

Based on the same study as used for younger recreational users (Ingram *et al.*, 2001), the following estimates can be made of the numbers of older regular users who drive after taking drugs. Given the limited nature of this survey as previously mentioned, these figures are given as an illustration of the potential size of the risk population.

Use of ecstasy prior to driving:
93,740 (lowest estimate) (43% of 218,000)
403,304 (highest estimate) (43% of 938,000)

Use of cocaine prior to driving:
37,000 (lowest estimate) (25% of 148,000)
136,250 (highest estimate) (25% of 545,000)

Use of LSD prior to driving:
56,640 (lowest estimate) (8% of 708,000)
101,680 (highest estimate) (8% of 1,271,000)

There are currently no data to translate the incidence of drug-driving into adverse consequences.

Crime

There is no evidence of a causal relationship between acquisitive crime and Class A regular use. There are data on drug possession arrests and, as with younger users, the size of this consequence depends on policing policies. As with younger users, this expenditure is classified for this project as a reactive expenditure.

The number of offences was assumed to be split equally between the younger recreational and older regular users group. The number of offences is therefore estimated at the same level as for younger recreational users, yielding a cost estimate of £3,776,108.

Other social costs

No other social costs were identified for older regular users.

Problem drug users and treatment related consequences

It is known that problem drug users have a range of problems that impact on a range of people in society. It is also clear from research evidence that the level of these consequences is lower on average for those drug users in treatment than for those out of treatment. This division is also important to make as the active scenario arrest referral is assumed to act on consequences through attracting more people into treatment. However, research on those in treatment suggest that most drug users in the UK have a number of periods in and out of treatment (Gossop *et al.*, 2001; Coid *et al.*, 2000). Therefore treatment cannot be treated simply as a one-off event with a clear pattern of before and after the event costs. There will also be those who have never been in a treatment programme. Given that they may have a shorter drug-using career, these users may be expected to have accumulated fewer adverse effects. On the other hand, these users may be more chaotic and therefore have very high levels of problems.

Research is limited, but it could be assumed that a third of problem users are in treatment, a third have previously been in treatment and a third have never been in treatment (Frischer *et al.*, 2001). However, these are broad assumptions based mainly on observational data and expert opinion. These proportions were used in this simulation as a starting point, but this is a major area for further research. Further divisions could be made. For example, assuming that two-thirds of those never in treatment are relatively young and may suffer fewer consequences than others as a result of their drug use. Of this sub-group one half may become drug-free without help, but the other half may need some help from an agency. The remaining third of those never in treatment may well be chaotic. These illustrative proportions are illustrated in Table 3.3.

Table 3.3: Assumed treatment status of current problem drug users

In treatment (a third)	Not in treatment (two thirds)		
	Previously in treatment (a third)	Never in treatment (a third)	
		Less consequences (2 in 9)	Chaotic (1 in 9)
	May require treatment (1 in 9)	Recover without help (1 in 9)	

Ideally, health, work, driving, crime and other social consequences could be attributed to users in these different treatment states. In reality data are not available which are related in such detail to the user's treatment history. It was therefore not possible to use this detailed type of division in this project.

The main source of data for the consequences of problem drug users used in this research has been taken from the National Treatment Outcome Research Study (NTORS), Gossop *et al.* (1996). This study, funded by the Department of Health, consists of a cohort study of 1,075 drug users entering treatment in 1995. The study used a large number of providers spread throughout England, but there was no sampling basis to ensure those attenders were representative of the total population of those attending treatment in that year. Also, there may have been changes in the population coming forward for treatment in the subsequent periods and changes in the treatment received. However, the findings of NTORS have been found to be similar to comparable US and UK studies (Coid *et al.*, 2000; Gossop *et al.*, 2001). These NTORS patients were asked about a number of consequences before entering treatment and one year and two years after treatment. A further longer-term follow-up has just been completed, which confirms the treatment outcome data, but no economic analysis has been undertaken on the five-year follow-up data.

Data from special analysis of this study and based on the methodology used in economic analysis of the baseline, one-year and two-year follow-up data from the survey (Godfrey *et al.*, 2002) are used in this report. For the analysis, the groups from Table 3.3 were collapsed into two groups: those currently in treatment (one-third) and those not currently in treatment (two-thirds), taken from Frischer *et al.*, 2001. It was assumed that those not in treatment had experiences closely related to the consequences of NTORS participants in the twelve months before entering treatment. Those in treatment were assumed to have the level of consequences experienced from the community treatment programmes (methadone

programmes). New treatment attenders are assumed to have the levels of consequences recorded at the one-year follow-up point. Those who are assumed to be treatment attenders for longer than one year are assumed to have the levels of consequences recorded at the two-year follow-up point. It should be noted at the follow-up period that not all the individuals are assumed to have remained in the same treatment programme for that period. Also, the two-thirds majority classified as “not in treatment” would have experienced some addiction-related treatment in the previous two years. Clearly, further research is needed to relate costs to different treatment status to improve the accuracy of this model. The figures for the numbers of problem users in these three groups based on the medium estimate of problem drug users of 337,350 are shown in Table 3.4.

Table 3.4: Number of problem users by group, medium estimate

	Not in treatment	In treatment	
		<1 year	> 1 year
Number	224,900	56,225	56,225

Consequences of problem drug users related to treatment are dealt with under the headings: health; criminal justice costs; work (benefit income) and other social consequences arising from crime. There were no data on drug use and driving collected as part of this study. Further costs of problem drug use relating to deaths; neonatal care; children in care; deaths and other effects of methadone poisoning in children in drug-using families are considered separately. Figures are presented on the additional costs related to injecting drug users although these are not, because of potential double counting, added to the total cost estimates.

Health service use consequences of problem users in and out of drug treatment

The NTORS study asked individual drug users for their use of a range of health services including visits to the GP (other than to collect scripts); A&E attendances; inpatient stays for physical health problems (excluding addiction treatment); outpatient mental health-care and inpatient mental health-care stays. The responses related to the total NHS resource use of the drug user (excluding addiction treatment) and no attempt was made to ask individuals the proportion of this use which was related to drug use rather than other health issues. The figures for health service consequences could therefore be seen as an overestimate of health service costs relating to drug use. However, the estimates only relate to current health service use and do not make any adjustment for the impact of current drug use on future health-care demands. An alternative method would be to attempt to identify specific drug-related illness from treatment samples or routine data sources. However, no suitable sources

of data were found. All figures are presented in detail using the medium estimates of problem drug users for clarity, with the high and low estimates being presented as totals to illustrate the sensitivity of figures to the estimate of the size of the problem drug-using group.

The data from the NTORS study for different types of health service use are considered in turn. Of those in treatment, 50 per cent are presumed to have started the treatment within the year and therefore data from the one-year follow-up point is used for this group of problem drug users. The other 50 per cent are presumed to have experienced a number of treatments over a longer period and therefore the two-year follow-up data is used for this group. No data (or literature) were found to support this split and some limited sensitivity analysis is undertaken to test the importance of this division. An alternative would be to make no distinction and use some average outcome figure. However, differences year to year in treatment outcomes could have a significant impact on different elements of the public sector. It was felt this refinement did add a useful dimension to the model, especially for the planned simulations of arrest referral and other policies where the impact was to alter the numbers of new entrants into treatment. A further assumption is that the results at the two-year point continue beyond the two-year period. However, this assumption has more empirical support in that the initial analysis of the five-year NTORS study outcomes suggest most outcomes have remained relatively stable between the two-and five-year follow-up points (Gossop *et al.*, 2001).

The *primary care* visits are taken as follows:

- 3.6 GP visits per user not in treatment
- 5.6 GP visits per user starting treatment within the year
- 6.8 GP visits per user in treatment system over one year

Using these figures, this translates into the following numbers of GP visits per year: 809,640 visits among the group not in treatment; 314,860 among those in treatment for less than one year; and 383,330 for those in treatment for more than one year. It should be noted these are estimated visits over and above any visits associated with their treatment for drug misuse.

These estimates of numbers of visits were combined with the estimate of cost per visit to the GP of £18 (Netten and Curtis, 2000). This yields the calculation of costs per year of: £14,573,520 for those not in treatment; £5,667,480 for those in treatment less than one year; and £6,881,940 for those in treatment over one year. This yields a total of £27.1 million using the medium estimate of problem drug users. The range of estimates for GP use by drug users is between £23.0 million (low estimate) and £40.7 million (high estimate).

For A&E use, the following data were used:

- 0.7 episodes per user not in treatment. This figure is similar to the estimate of 23 per cent reporting they had an accidental overdose in the year prior to treatment (Coid *et al.*, 2000)
- 0.8 episodes per user in treatment for less than one year
- 0.8 episodes per user in treatment for more than one year

Applying these figures to the numbers in the different groups yields the number of A&E visits each year as: 157,430 for those not in treatment; 44,980 for those in treatment for less than one year; and 44,980 for those in treatment for more than one year.

It was assumed that many of these visits would be of a serious kind, often involving an overdose incident and therefore a cost of £282 per visit was used (Netten and Curtis (2000)). This value assumes an overnight stay. No questions were asked in the survey about emergency ambulance use and therefore this value is likely to be a reasonable estimate of overall NHS costs, even if some visits were shorter than overnight. The estimated costs are: £44,395,260 for those not in treatment; £12,684,360 for those in treatment less than one year; and £12,684,360 for those in treatment more than one year. The total cost is therefore estimated at £69.8 million using the medium estimate of the number of problem drug users, varying between £58 million and £105 million using the lower and higher estimates.

The *inpatient hospital* stays were assumed as follows:

- 1.75 days per user not in treatment
- 2.8 days per user in treatment less than one year
- 2.4 days per user in treatment more than one year

These figures translate to the numbers of bed days being: 393,575 for those not in treatment; 157,430 for those in treatment less than one year and 134,940 for those in treatment for more than one year.

The costs were taken at £223 per day (Netten and Curtis, 2000). This yields an estimate of £87,767,225 for those not in treatment; £35,106,890 for those in treatment less than one year and £30,091,620 for those in treatment for more than one year. The total figure is estimated at £153.0 million, varying between £127 million and £229 million.

Participants in the NTORS study were also asked about their use of mental health services. The analysis from that study using the intake, one-year and two-year follow-up data, yielded the following figures for community mental health service use:

- 1.3 outpatient mental health visits per user not in treatment
- 0.8 outpatient mental health visits per user in treatment less than one year
- 1.6 outpatient mental health visits per user in treatment more than one year

This yields the total estimated number of community mental health visits of: 292,370 for those not in treatment; 44,980 for those in treatment less than one year and 89,980 for those in treatment of more than one year.

Costs of community treatment for psychological or emotional problems are estimated at £50 per visit (Netten and Curtis, 2000). This may be an underestimate of the value as some of these visits may be more expensive outpatient visits to a psychiatrist. With no additional information however, the lower estimate of visits within the community were taken. The costs are estimated as: £14,618,500 for those not in treatment, £2,249,000 for those in treatment less than one year and £4,498,000 for those in treatment more than one year. The total across all groups is estimated at £21.4 million, varying between £17.8 million and £32.0 million.

Extrapolating from NTORS estimates of the number of drug users receiving inpatient mental health treatment (excluding addiction treatments) are:

- 1.5 days per user not in treatment
- 0.4 days per user in treatment less than one year
- 2 days per user in treatment more than one year

Using these figures, the estimate of the number of mental health bed days used by problem drug users each year is 337,350 for those not in treatment, 22,490 for those in treatment less than one year and 112,450 for those in treatment for more than one year.

Costs are estimated at £144 per day (Netten and Curtis, 2000). Applying this unit cost figure to the estimated numbers of mental health inpatient bed days yields estimates of costs of: £48,578,400 for those not in treatment, £3,238,560 for those in treatment less than one year and £16,192,800 for those in treatment more than one year.

Table 3.5: Health service costs (£) for problem drug users 2000

Type of health cost	Not in treatment	In treatment	
		<1 year	>1 year
Primary care	£14,573,520	£5,667,480	£6,881,940
A&E	£44,395,260	£12,684,360	£12,684,360
Inpatient care	£87,767,225	£35,106,890	£30,091,620
Community mental health	£14,618,500	£2,249,000	£4,498,000
Inpatient mental health	£48,578,400	£3,238,560	£16,192,800
TOTAL	£209,932,905	£58,946,290	£70,348,720

These different elements of health service cost are summarised in Table 3.5. Problem drug users are estimated to cost the health service between £283 million and £509 million per year, in addition to the specific addiction treatment they may be receiving. This addiction treatment is treated as proactive government spending within the costing model. This figure also excludes additional costs from infectious disease risks among injecting drug users.

Table 3.6: Summary health care expenditure per year £ million, 2000

	Not in treatment	In treatment		TOTAL
		< 1 year	> 1 year	
Low	175.4	49.1	58.6	283
Medium	209.9	58.0	70.3	339
High	314.9	88.4	105.5	509

The total sum can also be expressed as a cost per user, approximately £1,000. The average is similar whether high, low or medium estimates are used, given the methods used to calculate these figures which use the same estimate of effect per user. There are differences, however, in the costs per user across treatment status, £933 for those not in treatment, £1,048 for those in treatment under one year and £1,251 for those in treatment more than one year. It may seem surprising that health expenditure per user seems higher for those engaged in treatment than those not in treatment. This may reflect the poor health state of problem drug users and escalating health problems or, indeed, some deficit of health-care needs which are picked up and dealt with while the user is engaged in treatment. Further five-year data from the NTORS study are needed to examine whether health-care utilisation falls in future years. These findings do imply that increasing the number of problem drug users into treatment may increase reactive health-care expenditure at least in the short-term.

Work

It is known that problem drug users have problems with maintaining employment in the legitimate economy. The data from the NTORS study suggested that, among the cohort prior to intake, 81 per cent were mostly unemployed. As with crime, the link between drug use and employment is likely to be complex with, for some, unemployment being a causal factor for drug use rather than drug use being a causal factor for unemployment. There are no data to separate these impacts. Among those entering community-based treatments, the numbers unemployed fell slightly to 79 per cent and the same number were mostly unemployed at the two-year follow-up point. That is the change in employment is small. Estimates are again taken from the NTORS study with data prior to intake figures being taken for problem users not in treatment, the one year follow up figures for the community treatment being taken for those engaging in treatment in the year in question, and the two year follow-up being used for those problem drug users engaged in treatment for more than a year. The estimated numbers receiving state benefits are given in Table 3.7.

Unemployment clearly has implications for government reactive expenditure. Full benefit entitlement will depend upon the family circumstances and the take-up of benefits among the problem drug users. As a minimum estimate, unemployment costs are based upon Job Seekers allowance for those over 25 at £52.20 per week; £2,714 per year (Emmersen and Lancaster, 2000). Applied to the estimates of number of problem drug users yields the estimate of government reactive benefit expenditure as shown in Table 3.7. As suggested above, however, this expenditure cannot be taken in isolation as being totally attributable to drug use.

Table 3.7: Estimate of numbers in receipt of state benefit and expenditure

	Not in treatment	In treatment	
		<1 year	> 1 year
Numbers	182,169	44,418	44,418
Estimated cost, £, 2000	£494,406,666	£120,550,452	£120,550,452

The resource (social cost) implications of these high levels of unemployment are harder to estimate. It could be argued that spells of long-term unemployment have life-time implications for the individual problem drug users and there is a loss of labour resource for the economy. Others suggest that the value in terms of economic loss will depend on the economic circumstances. No attempt was made in this study to estimate the wider resource consequences of the level of unemployment among problem drug users.

Crime

The relationship between crime and problem drug use is complex. However, one of the main outcomes of individuals taking up drug treatment is a fall in offending. There are two elements to the economic impact of crime. The first element is the expenditure by the criminal justice system dealing with the crimes committed (including drug offences). For some crimes and some criminal justice expenditure, e.g., prison costs, the government reactive spend may occur some time after the offence was committed. Also, the level of expenditure will depend not only on the offending rate but also the success of the CJS in apprehending and detaining offenders.

The second element of the economic costs of crime is the impact on the victims of crime. These costs can take the form of expenditures taken in anticipation of crime, for example, shop security measures or burglar alarms for homes. There are also more direct victim costs of crime in terms of material or physical damage and loss, and the wider fear of crime elements (Brand and Price, 2000).

The NTORS study has data both on direct contacts of problem drug users with the criminal justice system and self-reports of the numbers of offences committed. The two elements of the cost of drug-related crime are estimated from these data. As one purpose of this study is to estimate actual government reactive spending flow changes, CJS expenditure is based on the reported contacts. For drug users in treatment, some CJS expenditure may relate to offences committed before the user was in treatment.

The data available for directly estimating CJS expenditures are drug arrests, arrests for acquisitive crimes, stays in police custody, appearances in court and stays in prison. NTORS data suggests the following pattern of *drug arrests*:

- 0.3 arrests per user not in treatment;
- 0.8 arrests per user in treatment less than one year; and
- 0.4 arrests per user in treatment more than one year.

These figures yield estimates of the number of arrests for the problem user group as 67,470 for those not in treatment, 44,980 for those in treatment less than one year and 22,492 for those in treatment more than one year when using the medium estimate of problem users. The pattern of an increase in arrests in the first year of treatment is puzzling. The data are as supplied for the project from the NTORS data and further analyses of the results obtained was not possible within this project.

These figures are used with the estimate for the cost of a drug possession or supply arrest of £3,551 to estimate the police costs, discussed above. It should be noted that it is assumed, following Brand and Price (2000), that there are no victim costs associated with drug-related offences. This yields a cost of £239,585,970 for those problem users not in treatment, £159,723,980 for those in treatment less than one year and £79,869,092 for those in treatment more than one year.

The NTORS data are used to suggest the following pattern of arrests for acquisitive *crimes* among problem drug users:

- 1.35 arrests per drug user not in treatment in a year;
- 1.6 arrests for users in treatment for less than one year; and
- 0.4 arrest for users in treatment for more than one year.

Extrapolating from these figures gives the estimates for the number of arrests of 303,615 for those not in treatment, 89,960 for those in treatment less than one year and 22,492 arrest for those in treatment more than one year.

Arrest costs for these offences are estimated at £1,346, taking the lower more general arrest costs discussed above. This yields costs of £408,665,790 for those problem drug users not in treatment, £121,086,160 for those in treatment less than one year and £30,274,232 for those in treatment more than one year.

Based on NTORS, we estimate problem drug users are held in *police custody*, on average:

- prior to treatment, 2 nights;
- at one year, 1.2 nights; and
- at two years, 0.8 nights.

These figures translate to estimates of the number of nights in police custody as 449,800 for those not in treatment, 67,470 for those in treatment less than one year and 44,980 for those in treatment for more than one year.

Costs of overnight stays are estimated at £69 per stay (Godfrey *et al.*, 2002) and the estimated costs are £31,036,200 for those not in treatment, £4,655,430 for those in treatment less than one year and £3,103,620 for those in treatment more than one year.

The NTORS data are used to provide the following estimates of *court appearances*:

- 2.2 occasions per year for those not in treatment;
- 1.4 occasions per year for those in treatment less than one year; and
- 1.2 occasion per year for those in treatment more than one year.

This provides the estimate of the court appearances for the medium estimate of problem users as 494,780 for those not in treatment, 78,715 for those in treatment less than one year and 64,470 for those in treatment more than one year.

The costs of court appearances are estimated at £699 per appearance based on Harries (1999), yielding the estimates of criminal justice costs of £345,851,220 for those not in treatment, £55,021,785 for those in treatment less than one year and £47,161,530 for those in treatment more than one year.

Using NTORS data, it is estimated that problem drug users spend:

- 36 days in prison per year out of treatment;
- 34 days in prison per year in the first year of treatment; and
- 39 days in prison per year for those in treatment more than one year.

This yields the estimate of the number of days in *prison* of 8,096,400 for those out of treatment, 1,911,650 for those in treatment less than one year and 2,192,775 for those in treatment more than one year.

Costs per day in prison are estimated at £68.86 (Godfrey *et al.*, 2002) and this yields the estimates of prison costs for the medium estimate of the problem drug-using population of £557,518,104 for those out of treatment, £131,636,219 for those in treatment less than one year and £150,994,486 for those in treatment more than one year.

Table 3.8: Summary of criminal justice costs (£), medium estimate of problem drug users, 2000

	Not in treatment	In treatment	
		<1 year	> 1 year
Arrests for drug offences	239,585,970	158,723,980	79,869,092
Arrests for acquisitive crime	408,665,790	121,086,160	30,274,232
Police detention	31,036,200	4,655,430	3,103,620
Court appearances	345,851,220	55,021,785	47,161,530
Prison stays	557,518,104	131,636,219	150,994,486
TOTAL	1,582,657,284	472,123,576	311,402,960

The costs of police in terms of arrests and stays in the police cells, court appearances and prison stays give an estimate of the criminal justice costs of problem drug users by treatment status. The figures for the medium estimate of problem drug users are given by category and treatment status in Table 3.8. The total estimates by treatment status and for the different estimates of the number of problem drug users are given in Table 3.9. These costs vary from £1,972 million to £3,549 million depending on the estimates of the number of problem users. The cost per user is £701 based on the medium estimate.

Table 3.9: Summary estimates of criminal justice costs, £ million

	Not in treatment	In treatment		TOTAL for all problem users
		< 1 year	> 1 year	
Lowest estimate	1,319.0	393.4	259.5	1,972
Medium estimate	1,582.7	472.1	311.4	2,366
Highest estimate	2,374.0	707.4	467.1	3,549

Other social costs – victim costs of crime

There are likely to be a number of other social impacts of drug use related to treatment status, including driving, for which no data are available. However, as described above there are the victim costs of crime. Using the Brand and Price (2000) estimates, and the pattern of offences self reported by NTORS clients, yields the following estimates of the wider social costs of crime:

- £30,827 per year for problem drug user not in treatment;
- £8,893 per year for problem drug user in treatment less than one year; and
- £13,464 per year for problem drug user in treatment more than one year.

These figures reflect the fall in the offences committed by NTORS clients after they had entered the treatment under study (Gossop *et al.*, 2001). Using these figures and the medium estimate of problem users, yields a total cost of £8190 million, and an estimate of £24,277 victim cost per user.

Table 3.10: Estimates of the victim costs of crime, £ million, 2000

	Not in treatment	In Treatment		TOTAL for all problem users
		< 1 year	> 1 year	
Lowest estimate	5,778	417	630	6,825
Medium estimate	6,933	500	757	8,190
Highest estimate	10,400	751	1,135	12,286

Other costs of problem drug users not covered in the estimates related to treatment

There are various impacts of problem drug users which are not available from the NTORS study or other treatment data. There is a high rate of premature deaths among problem drug users, and additional health and social care resources required from impacts on children and the unborn. Information on deaths is based on six-monthly figures provided by the National Programme on Substance Abuse Deaths (Ghodse *et al.*, 2001) for January to June. The full year report was not available when this research was conducted. Figures are doubled to provide estimates for the year.

Estimated deaths from opiates: 846
 Estimated deaths from cocaine: 26
 Total 872

Health service costs of death are estimated as £670; a total of £584,240.

Health service costs of death: £584,240
 Total social costs of death: £998 million

The wider social costs of these deaths using the DETR estimate of £1,144,220 are estimated at £998 million.

In England, statistics of hospital episodes for 1999 to 2000 (Department of Health, 2001b) are shown in Table 3.11.

Table 3.11: Neonatal effects of drug misuse 1999-00 England

	Code	FSE	Admissions	Emergency admissions	Average length of stay
Newborn babies were affected by maternal use of drugs of addiction.	P04.4	161	120	3	13
Neonatal withdrawal syndrome from maternal use of drugs of addiction.	P96.1	914	702	71	18.1

Source: Department of Health (2001b)

Following NERA (2001), costs are based on HRG N04: Neonatal Treatment with Multiple Major Diagnoses (National Schedule of Reference Costs, 2000). This gives an average cost of £4,023 per episode and the estimated cost of neonatal effects of £4,324,755. This estimate is likely to be an under-estimate as it does not include the costs of specialist clinics for pregnant drug users, midwives and health visitors.

Neonatal health service costs: £4,324,755

Amongst NTORS clients, 47 per cent had responsibility for children under 18. Some of these children may be in need of social care. In Coid *et al's* sample, nine per cent of those who had children had, at some point, had their children taken into care or in need (at risk) (Coid *et al.*, 2000). Evidence of drug users who have children in need, but who are not looked after by local authorities, is harder to find, but one research project reported ten per cent of drug users in the care of GPs to have children on the at risk register, (Eaton, 1998). Costs of care are different for those in care from those not in care but at risk. Costs for 'looked after' children are estimated at £435 per week, or £22,650 per year (National Statistics/Department of Health, 2001). Costs of care for children in need are estimated at £85 per week, or £4,420 per year. Without better numbers of children in care, it would seem reasonable to take the figure of nine per cent of drug users with children had at least one child at risk. The minimum sum would be that this number of children is costed at £4,420 per year.

Estimates of the cost to social services of caring for children in need:

£52,560,814 (lowest estimate)

£63,072,980 (medium estimate)

£75,687,576 (highest estimate)

Statistics of hospital episodes for 1999 to 2000 (Department of Health, 2001a) show 16 cases of toxicity due to opioid use amongst children less than 15 years of age. There is no indication of whether these were the result of accidental use of parents, methadone; nor whether the parents was in treatment or not in treatment.

There is evidence that 16 young people under 15 were admitted to hospital following opiate poisoning, though there is no information as to whether this was following accidental use of parents, methadone.

In England and Wales in 2000, one child under 4 years was reported as dying following methadone poisoning.

Injecting drug users

Injecting drug users are a sub-set of problem drug users. The NTORS sample on which many of the costs of problem users were based included injecting users. It is important to avoid double counting of the same costs. Health-care costs may well therefore include health costs relating to injecting problems and even infectious diseases. What is not included is the future impacts of the spread of drug-related infections, such as HIV and Hepatitis B and C. In this section, some of the sources of data to estimate specific impacts related to injecting drug users are reviewed, but these estimates are not included in the summary figures presented in the next section.

There is an assumption that injecting drug users are at higher risk of accidental overdose and death than non-injecting drug users, though we assume a majority of episodes are accounted for by injecting drug users. With available evidence, estimates should be made on the basis of current injectors.

There is no literature evidence on the extra risk of overdose through injecting use, though we assume a majority of episodes are accounted for by injecting drug users.

Injecting of drugs is associated with a number of health problems. Coid *et al.* (2000), notes that most respondents had experienced pruritis and a quarter had sores and skin ulcers due to intravenous drug use. Fifteen per cent of clients in the NTORS study were reported to have injection-related abscesses and infections.

Based on these figures we assume (the mean of 15% and 25%) 20 per cent of injecting drug users with injecting site abscess and infections. Estimates are based on current injectors, as estimated in Chapter 2, and shown in Table 3.12.

Table 3.12: Estimate of the number of injecting users with injecting site abscesses and infections

	Not in Treatment	In treatment
Lowest estimate	37,483	No data
Medium estimate	44,980	
Highest estimate	67,470	

Other physical problems were chest pains. Other health issues associated with injecting are infective endocarditic, vein damage, lymphatic drainage, thrombosis, blood clots, and gangrene (BMA, 1997).

There is a lack of adequate information on these problems in the literature to enable assumptions to be made as to prevalence of the range of physical health problems associated with problem drug use.

All current injecting drug users risk HIV through sharing injecting paraphernalia, though the risk is reduced, in England and Wales, with low prevalence of HIV amongst the injecting community. Past injectors may already be infected with the disease; they also risk returning to injecting.

Estimates of prevalence are based on treatment samples and therefore we cannot extrapolate to problem users not in treatment. It is estimated that prevalence of HIV amongst injecting drug users is approximately two per cent in England and Wales (and Northern Ireland) (PHLS, 2001). Estimates based on both past and current injectors would yield 5,938 numbers of injecting users infected with HIV using the medium estimate of problem users.

A number of injecting drug users will be unaware that they are infected with HIV. PHLS suggests that a third of injecting drug users with HIV are unaware of their status. There are

stages of HIV/AIDS; asymptomatic, symptomatic and AIDS. Information from PHLS suggests that of known HIV cases in the year 2000, 25.9 per cent were asymptomatic, 48.8 per cent were symptomatic, 28 per cent had AIDS and 1.8 per cent had died.

It is assumed, therefore, that amongst injecting users, 33 per cent are unaware (and probably asymptomatic, though not necessarily) leaving 66 per cent aware. This would yield an estimate of 1,799 HIV positive injectors being unaware of their status based on the medium estimate of problem users, 1,363 using the low estimate and 2,453 using the high estimate. This would therefore yield estimates of those with HIV being aware of their status as 2726, 3598 and 4907 using the low, medium or high estimate of the numbers in the problem drug using group respectively. The HIV status of those aware of their condition are shown in Table 3.13.

Table 3.13: HIV positive injectors HIV status

	Asymptomatic	Symptomatic	AIDS
Lowest estimate	706	1,330	736
Medium estimate	931	1,756	1,007
Highest estimate	1,270	2,395	1,373

Health-care costs vary at different stages of infection, and these have changed rapidly with changes in treatment and in particular the introduction of combination therapies. New treatments mean average annual costs of treating people with HIV are decreasing but lifetime costs are increasing. Previously the main costs associated with HIV/AIDS were following AIDS diagnosis and in particular inpatient care. It is now advised that treatment be offered soon after diagnosis (British HIV Association, 2001).

Expenditure estimates under combination therapy per person per year are:

- Asymptomatic £13,381
- Symptomatic £14,222
- AIDS £24,314

Assuming all eligible patients are offered and take up treatment, the following costs are estimated, shown in Table 3.14. These costs do not include the costs of opportunistic infection associated with AIDS.

Table 3.14: Estimated annual costs of treatment for HIV infected drug users

	Asymptomatic	Symptomatic	AIDS	Total costs, £ million
Lowest estimate	£9,446,986	£18,915,260	£17,895,104	46.3
Medium estimate	£12,457,711	£24,973,832	£24,484,198	61.9
Highest estimate	£16,993,870	£34,061,690	£33,383,122	84.4

In addition some of these users will die each year. It is currently difficult to estimate how life expectancy may change with prolonged expectancy of asymptomatic and symptomatic HIV. The estimates in Table 4.14 are therefore shown as being indicative of the current order of magnitude of costs rather than being precise

The PHLS report prevalence of hepatitis B in injecting drug users, in 1999, as 25 per cent amongst those attending agencies in London and 17 per cent outside London. The combined estimate for England and Wales is approximately 21 per cent.

On the basis of these data the estimate of the numbers who are infected with Hepatitis are shown below.

Estimate of injecting drug users in England and Wales who have had or are currently infected with hepatitis B:
 44,980 (lowest estimate)
 53,975 (medium estimate)
 80,964 (highest estimate)

NERA (2001) estimates the lifetime costs of treating patients with hepatitis and related conditions to be £4,300 per person. This assumes an average life expectancy of 30 additional years; an annual cost per person year of £143 per person per year. Given the estimated numbers this would suggest an annual treatment cost for hepatitis B in the order of £7.8 million.

The report to EMCDDA suggests the prevalence of hepatitis C infection among injecting drug users to be approximately 38 per cent in 1999 (UKADCU, 2000). PHLS reports that one-third of injecting drug users attending specialist agencies had antibodies to hepatitis C. Twenty per cent will develop chronic illnesses, including cirrhosis of the liver and the possibility of liver failure, though this can take several years.

Estimate of injecting drug users in England and Wales who have had or are currently infected with hepatitis C:
68,152 (lowest estimate)
81,782 (medium estimate)
122,673 (highest estimate)

If similar annual treatment costs to hepatitis B were assumed this would yield an annual cost of £11.7 million.

Infectious diseases relating to injecting drug use are likely to have a major impact on the social costs of drug use. Data to estimate these costs are limited and further research is required to determine the lifetime costs of these diseases. From the available data it is estimated that infectious diseases may be costing the health service some £80 million each year. However, some of these costs would have already been taken into account in the estimates of health-care expenditure among problem users, see Table 4.5 and this estimate is not used further in the main estimates of the social costs of Class A drug users.

Conclusions

The consequences of Class A drug use have been estimated for young recreational users, older regular users and problem drug users. No additional costs were calculated for either higher risk groups within the young recreational users or injecting drug users within the problem user group. For both these subgroups their consequences were seen to be included in the main estimates and no means or data were available to separate the consequences for these sub-groups from the rest of their group. Injecting drug use and the related health-care consequences are significant. The costs of caring for those infected will continue whether or not the individual leaves the drug-using population and that clearly has longer-term cost consequences.

Only health and crime consequences could be identified for young recreational users, see summary Table 3.15. The difference between reactive government expenditure and total social costs is wholly accounted for by the estimates for ecstasy-related deaths. This monetary estimate is a present value element related to the estimated year of death, but unlike other elements, could be thought to be borne across future years. The reactive government expenditure per young recreational users is calculated to be between £7.50 and £15. Total social costs are estimated to be between £36 and £72 per user.

Table 3.15: Estimated cost of consequences of young recreational users per year, £ million, 2000

Domain	Reactive government spending	Total social costs
Health	2.2	25.0
Work	No data	No data
Driving	No data	No data
Crime	3.8	3.8
Other Social	None identified	None identified
TOTAL	6.0	28.8

There is some evidence that there could be an impact of drug use on the productivity of young recreational users but there is no evidence of an impact on unemployment rates. The impact on productivity at work or educational achievement could be both long lasting and significant for this group even if the average impact was modest. There is also evidence of driving shortly after drug taking but there is no current means of estimating the likely risk of accidents from these data. Other potentially excluded impacts include: the impact of criminal convictions for possession on the individual’s long-term career and employment; the concern about drug using among family members; impact of illicit markets for recreational users on the legitimate economy and the potential transmission risks to problem use.

For older regular users there was a similar pattern of government reactive costs. Crime costs, as for younger recreational users, are made up of criminal justice expenditure on drug arrests, see Table 3.16. With no deaths recorded for older regular users, government reactive costs and social costs are the same. The costs per user vary between £3 and £6. Driving impacts could be significant for the older regular user group as could productivity impacts. There are similar omitted consequences as for younger recreational users although some of the family concern about using could be assumed to lower.

Table 3.16: Estimated consequences for older regular users per year, £ million, 2000

	Reactive government expenditure	Total social cost
Health	2.4	2.4
Work	No data	No data
Driving	No data	No data
Crime	3.8	3.8
Other Social	None identified	None identified
TOTAL	6.2	6.2

The summary costs for problem drug users are shown in Table 3.17. Criminal justice costs are estimated to be the largest component of reactive government expenditure accounting for 67 per cent of the total, using the medium estimate. In terms of social consequences, victim costs of crime dominate at 88 per cent of the total, using the medium estimate. The reactive government expenditure per person is estimated at £10,402 and the total social cost at £35,455 per person using the medium estimate.

Table 3.17: Estimated consequences for problem drug users, £ million, 2000

Domain		Reactive government expenditure	Total social costs
Health	– low	288	1,286
	– medium	344	1,342
	– high	514	1,512
Work	– low	613	0
	– medium	736	0
	– high	1,094	0
Driving		No data	No data
Crime	– low	1,972	8,797
	– medium	2,366	10,556
	– high	3,549	15,834
Other Social			
	– low	53	53
	– medium	63	63
	– high	95	95
TOTAL	– low	2,926	10,136
	– medium	3,509	11,961
	– high	5,252	17,441

Sensitivity analysis

The costs from problem users are dependent on the values given to different consequences and the split of this group among those in and out of treatment. The unit costs used were taken from a number of previously published sources. While a range of sensitivity analyses on these values could be undertaken it was outside the scope of this project. Rather some limited sensitivity analysis was conducted varying the numbers of problem drug users who were in and out of treatment, and the split of those in treatment between those in treatment more than or less than one year.

Increasing the assumed numbers in treatment from 33 per cent to 50 per cent would result in an estimated increase in reactive government expenditure of £5 million and decrease of social costs of £1,099 million. In contrast, assuming a lower proportion of problem drug users in treatment of 20 per cent, compared to the main estimate of 33 per cent, would result in an estimated decrease in government reactive expenditure of £4 million and an increase in social costs of £877 million. Changing the proportion of those in treatment for more than or less than one year from 50:50 to 80:20 or 20:80 would have the following results. If the proportion in treatment less than one year is 80 per cent, there would be an increase in reactive government expenditure of £90 million and a decrease in total social costs of £65 million compared to a 50:50 split. Reversing the proportion to 20 per cent in treatment less than one year would result in a decrease of government expenditure of £90 million and an increase in social costs of £65 million.

Combining the medium estimate of costs over all Class A drug users yields a total estimate annual reactive government expenditure of £3,251 million or £1,789 per user. Using the lowest estimates from the numbers of users and the sensitivity analysis would yield an estimate of £2,842 million. Using the highest estimates, including adding additional health costs for injecting drug users would yield an estimate of £5,439 million. The medium estimate of social costs is calculated as £11,996 million or £35,560 per user. The range of estimates is between £9,007 million and £18,523 million.

Assumption log

- Health costs and other social costs associated with ecstasy and other drug-related deaths are assumed to similar costs to those incurred by a road traffic accident death.
- Approximately half of those arrested for possession will be young people.
- Half of all cocaine use is recreational.
- Consequences for those in treatment differ from those not in treatment.
- Amongst problem users a third are currently in treatment, a third have previously been in treatment and a third have never been in treatment.
- Of those who have never been in treatment, two-thirds will be relatively young and may suffer fewer consequences as a result of drug use; though there is no literature evidence of how much less.
- A small but significant proportion of these may never enter treatment and will become drug-free without help; we assume a third. The remaining third of those who have never been in treatment we assume are extremely chaotic and suffer a disproportionately higher number of consequences.

- All our assumptions for those not in treatment are based on the same evidence; from drug users entering treatment, mainly drawn from the NTORS study.
- Of those assumed in treatment in any year, one half are assumed to have actively engaged or re-engaged in treatment in that year. Their consequences are assumed to be similar to those at one year after intake to the NTORS study.
- Of those assumed in treatment in any year, one half are assumed to have been actively engaged in treatment for over a year. Their consequences are assumed to be similar to those at two years after intake to the NTORS study.
- Actual criminal justice contacts from the NTORS study are taken to represent criminal justice costs, while victim costs of crime are based on self-reported offence data.

Research

The specific research needs are:

- The consequences of “recreational” use on productivity are not well understood.
- There is no evidence of the effect of drug use on driving.
- The nature of the causal relationship between problem drug use and mental health is not well researched.
- There are no data on the penalties imposed for possession of Class A recreational drugs.
- Little is understood about the consequences for problem drug users who have never been in treatment.
- More data are required linking consequences to treatment history
- Evidence of the treatment consequences for children, infectious disease and unemployment benefit is lacking.
- Further research is required to enable us to disentangle the consequences associated with injecting drug use and non-injecting drug use. There is strong evidence that non-injecting users are at risk of infections, such as hepatitis and even HIV though the extent of risk is not fully known.
- Generation of epidemiological evidence on health-related risks and how these risks vary with levels of use and across different types of use.
- To provide a more accurate public finance forecasting model in future work, additional research would be useful on the impact of changing activity on year-on-year health service and criminal justice systems. Other research is needed to determine a range of values for some of the major elements of such cross-government impacts and social issues such as the loss of drug users' lives.

Total economic costs or reactive expenditure is estimated to be £3.5 billion for Class A drug use in England and Wales, 2000 (medium estimate, range is £2.9bn to £5.3bn). This equates to some £1,927 averaged over all Class A drug users, and £10,402 averaged over problem drug users. The majority of the estimated costs are created by problem users.

Total social costs are substantially higher even though only limited data were available. The total estimate of consequences was £12 billion for 2000 (medium estimate, range is £10.1bn to £17.4bn). This equates to £6,564 per year averaged over all Class A drug users, £35,456 for problem drug users.

Discussion of key assumptions

In each chapter the many assumptions needed to make these calculations have been outlined. The main figures are the estimates of the different consequences by treatment status. These calculations are based upon available UK obtained data obtained from the NTORS study. This study has yielded comparable results to American treatment studies (Gossop *et al.*, 2001). The data from the period before the participants in NTORS entered the study were used to proxy for the costs of those problem users not in treatment. This is the key assumption for the estimates in the study. Any reduction in the costs of those not in treatment would imply there would be lower savings in either government reactive expenditure or total social costs for those in treatment from any estimates of the impact of changes in treatment numbers.

However, it could also be argued that using these estimates in any model underestimates the potential savings from treatment. First, some elements of the consequences of problem users were not available by treatment status, including impact on children and the unborn. Also, many of the longer-term impacts of treatment are not included, especially changes in infectious disease rates.

Estimates are also reliant on the impact of treatment and the time individuals are engaged with treatment services. The NTORS study shows problem drug users go in and out of addiction treatment. These effects are taken account of in the data used. However, at the time this study was undertaken, only two-year follow-up treatment data were available.

Differences in the estimates of the social costs impact were more substantial than those for reactive government expenditure. The estimates of those in treatment were just under a half of those out of treatment. It would be useful to have more empirical estimates to check the validity of the order of magnitude of these estimates.

Limitations of the proposed methodology and guidance for further research

The outline model provides a useful framework for estimation. The model's usefulness depends however on data availability. There is a lot of potential within the outline framework to undertake more specific modelling, particularly of longer-term impacts of drug use. This is an expanding field and a number of alternative mathematical and statistical approaches are available (Godfrey *et al.*, 2001). As such models are developed there is scope for introducing more sophisticated modelling. The current schema has the advantage of being relatively simple in construction and the calculations can be replicated. More sophisticated models may be more realistic in the assumptions taken, but the computer calculations required would make it much harder to follow how the estimates have been constructed.

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