

# Specialist drug and alcohol services for young people – a cost benefit analysis

Frontier Economics

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department for Education.

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## Executive Summary

This report looks at the costs and benefits associated with young people's drug and alcohol treatment.

There were approximately 24,000 young people who received specialist drug and alcohol treatment in the UK in 2008-09. This is defined as "a care planned medical, psychosocial or specialist harm reduction intervention". As set out in the Drug Strategy 2010 such treatment is aimed at preventing escalation of use or harm and should "respond incrementally to the risks in terms of drug use, vulnerability and, particularly, age." Most of these young people were treated primarily for alcohol (37%) or cannabis (53%) misuse, with the remaining 10% misusing Class A drugs, including heroin and crack. Apart from using drugs and alcohol, these young people had experienced a range of other problems, including involvement in crime (shoplifting, theft, assault); being NEET (not in education, employment or training); or housing problems.

The National Treatment Agency (NTA) has oversight of young people's specialist substance misuse services and systematically collects information on those young people accessing them. This information includes data on young people's characteristics and, for most 16 and 17 year olds, a range of outcomes comparing treatment start and exit (such as crime, health, housing and education). We have drawn upon this data and the evidence from a range of academic studies and policy reports to assess the cost-effectiveness of young people's specialist drug and alcohol treatment in the UK.

Throughout the report the term 'young people' is taken to refer to those aged under 18 unless stated otherwise. However, as noted much of the evidence base from the UK and abroad applies to those aged 16 or 17. The impact of this is discussed in the methodology section.

### *Our approach*

There are two main elements of our study:

- **Costs:** Understanding the amount that is spent in total and per person on specialist drug and alcohol services for young people in 2008-09.
- **Benefits:** Estimating and valuing the benefits of young people's drug and alcohol treatment – measured as a reduction in the economic and social costs of drug and alcohol misuse.

While measuring the costs of treatment is relatively straightforward, assessing the benefits associated with treatment is more complicated. First, we need to establish a counterfactual, i.e. what would have happened to these young people in the absence of treatment. There is significant evidence that many of these

young people would, in the absence of treatment, impose significant economic and social costs on society. These costs can be split into:

- **Immediate costs** – the cost of crime committed by young people misusing drugs, the NHS costs associated with treatment of drug and alcohol-related conditions affecting young people, and the cost of drug and alcohol related deaths for young people<sup>1</sup>; and
- **Long-term costs** – the costs incurred if young substance misusers become problematic drug users (PDUs) or problematic alcohol users as adults. If this happens, the costs imposed on society are likely to increase further as adult PDUs and problematic alcohol users tend to commit more frequent and serious crimes, impose higher costs on the NHS, are more likely to die prematurely and have high unemployment rates. Finally, those young people who do not become PDUs or problematic alcohol users as adults might still incur long term costs. Indeed, young substance misusers are more likely to be NEET (not in education, employment or training) and leave school without qualifications. This too has a cost, in terms of lower wages and poorer employment prospects.

We rely on NTA data from the National Drug Treatment Monitoring System (“NDTMS”) and the associated Treatment Outcomes Profile data (“TOP”) and a range of academic studies and policy reports to estimate these counterfactual costs.

We estimate that the immediate counterfactual cost of **crime** committed by young people misusing drugs and alcohol is just under £100m per year. This equates to an annual cost of crime per young drug and alcohol user of around £4,000 per person per year in the absence of treatment. These costs appear to be driven by a relatively small number of the young people misusing drugs or alcohol, with the majority reporting no offending. The annual counterfactual **health care** cost of young people’s drug and alcohol misuse is around £4.3m per year, or £179 per person per year. Within this, the counterfactual cost of drug and alcohol related death accounts for £4.2m per year; the remainder is the cost of drug and alcohol related illness.

In order to estimate the long term counterfactual costs of adult substance misuse for young people in treatment, we look at three types of adult substance misuse:

- adult alcohol misuse;
- adult problematic drug use (PDU); and

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<sup>1</sup> There may be other type of immediate costs (e.g. teenage pregnancies) which we do not quantify in this study.

- adult non-problematic drug use (non-PDU).<sup>2</sup>

It is likely that young people's substance misuse contributes to further costs, including those associated with children's services, and particularly the costs of being taken into care. However, it was not possible to isolate the proportion of these costs attributable to substance misuse and so these were not factored into the overall cost figures. Throughout the report we have taken a cautious approach to constructing cost and benefit figures to ensure that the final calculations provide a robust lower estimate of any projected savings.

In **Table 1** below, we summarise the costs associated with adult substance misuse – these are the costs of crime, poor health, premature death and lost output due to absenteeism and low employment levels. These costs are high and vary between £21,300 - £45,100 per year for non-problematic adult drug users, £173,090 - £238,397 per year for adult alcohol abusers, and £550,388 - £958,848 per year for problematic adult drug users.<sup>3</sup>

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<sup>2</sup> Throughout this report, the term problematic drug user ("PDU") refers to clients citing opiates, crack cocaine, or both as any of their presenting substances. Non-problematic drug users ("non-PDUs") are clients using illegal drugs other than opiates or crack when presenting for treatment. It should be noted here that even non-problematic drug use can impose considerable economic and social costs to society. Alcohol misuse in this report includes not just dependent drinking, but also harmful alcohol use (defined as drinking over the recommended weekly amount and experiencing health problems directly related to alcohol) and is consistent with our estimates of the costs of adult alcohol misuse.

<sup>3</sup> The cost estimates reported for adult problematic drug users are broadly consistent with previous estimates made by NICE, and subsequently adopted by the NTA in their recent analysis of the value for money of adult drug treatment. In particular, these studies estimate a lifetime crime cost of £445,000 for an injecting drug user, and a lifetime health cost of £35,000. Although at the lower end of our estimates of the lifetime cost of an adult PDU, these studies do not include costs such as lower productivity or other lost output and are therefore broadly in line with the estimates shown here.

**Table 1.** Lifetime costs of adult substance misuse

Type of adult substance misuse	Study	Annual cost	Discounted lifetime cost	Range of discounted costs
	The Societal Cost of Alcohol Misuse in Scotland for 2007	£16,207	£238,397	
Adult alcohol abuse	Alcohol misuse: How much does it cost? (First estimate)	£11,767	£173,090	£173,090 to £238,397
	Alcohol misuse: How much does it cost? (Second estimate)	£12,737	£187,363	
Adult problematic drug use	The economic and social costs of Class A drug use in England and Wales, 2000 (High estimate)	£61,109	£898,909	£550,388 to £958,848
	The economic and social costs of Class A drug use in England and Wales, 2000 (Medium estimate)	£52,224	£768,214	
	The economic and social costs of Class A drug use in England and Wales, 2000 (Low estimate)	£37,416	£550,388	
	Assessing the scale and impact of illicit drug markets in Scotland	£65,184	£958,848	
Adult non-problematic drug use	RAND prevention cost effectiveness study			£21,300 to £45,100

Source: Frontier calculations based on the Home Office and RAND publications

However, not all young substance misusers will become problematic adult substance users, or experience other wider problems, even if not treated. Existing academic studies suggest that between 30% and 40% of moderate/heavy teenage alcohol and cannabis users would develop drug/ alcohol misuse problems as adults while the remaining 60%-70% would experience natural remission (even if not treated). The proportion is however higher for teenage Class A drug users (up to 95% of teenage Class A drug users continue to use drugs in adulthood).

We combine the lifetime costs of adult substance misuse with the probabilities that young people currently in treatment would have become adult problematic and non-problematic drug users in the absence of treatment. The results of the counterfactual cost calculations are presented in **Table 2** below.

**Table 2.** Total lifetime counterfactual costs attributable to young substance misusers who access treatment

	Long-term counterfactual costs
<b>Total counterfactual costs</b>	£1.1 billion - £2.2 billion
<b>Total counterfactual costs (per person)</b>	£46,145 - £91,964

Source: Frontier analysis based on the NDTMS/TOP, Hser et al. (2008), Filmore (1975) and Patton et al. (2006)

It is worth noting that these average costs are lower than the unit costs of being a PDU or a problematic alcohol user. This is because some young people (between 56% and 64% of the sample) are expected to experience natural remission (i.e. reduce or halt their drug or alcohol use as they move out of adolescence) and, therefore, not incur these costs in the future. In addition, 17.5% of the sample are expected to become non-PDUs (if not treated), with the costs of non-PDU being somewhat lower – between £21,300 and £45,100 over a 20 year period.

The final element of long term counterfactual costs that we have considered is the cost associated with being NEET. This leads to poorer educational attainment and labour market outcomes in later life. Recent academic literature has valued the lifetime cost of educational underachievement and poor employment prospects at between £92,000 and £356,000 per person (expressed as a net present value<sup>4</sup>).

After the counterfactual costs are established, we can estimate the benefits of treatment. As a result of treatment, most young people reduce their drug and alcohol consumption, commit fewer crimes and report improved wellbeing. The likelihood of their becoming PDUs or problematic alcohol users as adults also decreases. Therefore, some of the costs that these young people would have imposed on society if not treated are now averted. We estimate these reductions in the counterfactual costs (i.e. the benefits of treatment) and compare them against the cost of treatment. Throughout this report, all of the immediate and long term counterfactual costs and future benefits have been appropriately discounted, and are reported in terms of their net present value. Our findings are discussed in detail below.

<sup>4</sup> The net present value (“NPV”) is the total value now of a stream of future costs and benefits. The value of each future cost or benefit is discounted, as the value of a payment made in a future period is lower than if the same nominal amount had been paid in the current period.

### *Costs of treatment*

The total amount spent on local services for young substance misusers in 2008-09 was £62.2m. Around 40% of this funding came from the Young Person's Pooled Treatment Budget. The remainder was provided through Area Based Grants, Home Office funding for Youth Offending Teams or Youth Justice Board spending via the secure estate.

It is not possible to entirely distinguish between funding that is allocated for drug and alcohol treatment and funding that is allocated to provide drug information and preventative advice. However, despite these limitations, we believe that the figure of £62.2m is a good estimate of the total cost of providing treatment services for young people in 2008-09.

### *Benefits of treatment*

Both the immediate and long term benefits of treatment describe the economic and social costs that are avoided as a result of getting people into specialist drug and alcohol treatment. The immediate benefits of treatment are lower levels of drug and alcohol related crime, and fewer drug and alcohol related inpatient admissions and deaths. The long term benefits of treatment are a lower likelihood (and therefore lower expected cost) of young people developing substance misuse problems as adults, and improved educational attainment and labour market outcomes.

#### **Immediate benefits**

Data provided by the NTA indicates that the potential immediate benefit of drug and alcohol treatment could be up to a 55-65% reduction in offending by young people receiving treatment. This equates to a £59.3m net annual saving as a result of treatment.

Our analysis also shows around a 40% drop in the estimated number of drug and alcohol related deaths and hospital admissions post-treatment. This equates to a benefit of around £1.8m per year in terms of the NHS and wider social costs that can be avoided.

The immediate benefit from reduced crime alone appears to be sufficiently large to suggest a positive net benefit of drug and alcohol treatment for young people. Even assuming no long term benefits or immediate health benefits, we calculate that in order for young people's treatment to be cost effective, the required reduction in the immediate amount of crime committed by young people is just 32%.

It should be noted that the proportion of young people in treatment who are offending appears to be low. However, these rates should be expected to under-report levels of offending as young people may be reluctant to admit to offending behaviour. In addition, those who do offend appear to be fairly prolific, contributing to the costs identified within this report. By treatment exit,

## **Executive Summary**

the amount of self-reported offending committed by young people has fallen on average by 55-65%.

### Long term benefits

Unlike the immediate benefits of treatment, the long-term benefits are very difficult to assess. The NDTMS/TOP data includes information on a range of outcomes immediately after treatment, such as substance use, education, employment, crime and health. These immediate impacts, however, cannot be easily 'translated' into long-term effects.

To assess the long term benefits of fewer adult substance misuse problems, we look at the re-presentation rates for young people four years after treatment. These are:

- 40% for Class A drug users (comparable to adult PDUs);
- 16% for alcohol users;
- 17% for cannabis users.

Compared to long-term substance misuse rates expected without treatment (37%-44%), treatment is effective for many young people. That is to say that many young people who would otherwise be expected to escalate their drug or alcohol use and develop further problems appear to have effectively reduced or halted their misuse for up to four years after treatment (judged by NTA re-presentation data).

However, we need to exercise caution when using these re-presentation rates as a proxy for the treatment's effectiveness. This is because some young people may relapse after the period covered by the re-presentation data. Others may have developed problematic drug or alcohol use again, but without re-accessing treatment. Therefore, in our hypothetical scenarios below, we adopt a conservative approach and use slightly lower effectiveness rates - 7% and 10% - than the 4 year re-presentation rates of 20% reported by the NTA.

In the absence of concrete evidence on long-term effectiveness of young people's treatment, we adopt a scenario-based approach. We find that if the number of those who are likely to develop substance misuse problems as adults is reduced by 2.8% - 5.6%, the long-term benefits of treatment would offset the cost of treatment (assuming that the immediate benefits are excluded from this analysis). Moreover, with a slightly higher reduction in the number of those who would have long-term drug related problems – 7%-10% reduction – the long-term benefits of treatment would exceed the cost of treatment. More specifically:

- a 7% reduction in the number of young people who are likely to become adult substance misusers in their lifetime would generate £15.5 million - £92.6 million *net* benefits; and

- a 10% reduction in the number of young people who are likely to become adult substance misusers in their lifetime would generate £48.8 million – £159.0 million *net* benefits.

If these reductions (7%-10%) are achieved, the long-term net benefits of treatment would be high – up to £159 million.

To estimate the long-term benefits of improved educational outcomes, we have modelled the effect of treatment on the proportion of young people who are not in education, employment in training. When entering treatment, 45% of young people in our sample are NEET, compared to 9% of the wider population. Data from the NTA however indicates that treatment could potentially reduce the proportion of young people that are NEET by 6.5%.

Using estimates of the lifetime cost of being NEET, a 6.5% reduction in the proportion that are NEET leads to a total lifetime benefit for young people in our sample of £159m, equivalent to £6,590 per person. If the reduction in the NEET percentage was just 5%, this would still lead to significant benefits totalling £121m. On the other hand, a 10% reduction in the NEET percentage would generate £242m of benefits, more than £10,080 per person. This only takes into account changes in NEET status by the time of treatment exit. It does not include any impact of treatment in supporting young people to be ready for employment or education and may therefore underestimate the benefits of treatment in this area.

We sought to assess the costs faced by wider children's services, including costs of children being taken into care. However, it is difficult to identify the proportion of such costs that could be directly attributed to young people's substance misuse. As such, and in the interests of robust estimates we have not included such costs within this analysis.

### *Net benefits of treatment*

**Table 3** summarises our results and brings together both estimates of immediate and long-term benefits. All of the immediate and long term benefits in this report have been appropriately discounted and are expressed in NPV terms.

**Table 3.** Summary of costs and benefits

Benefits	Per person	Per year for all young people in treatment in 2008-09	Across a lifetime of substance misuse for all young people in treatment in 2008-09	Ratio of benefits to costs
<b>Total costs per year</b>			<b>£62.2m</b>	
<b>Immediate benefits</b>	<b>£2,539</b>	<b>£61.1m</b>	<b>£120.1m</b>	<b>£1.93</b>
<i>Crime</i>	<i>£2,464</i>	<i>£59.3m</i>	<i>£116.5m</i>	<i>£1.87</i>
<i>Health</i>	<i>£74</i>	<i>£1.8m</i>	<i>£3.5m</i>	<i>£0.06</i>
<b>Long-term benefits</b>	-	-	<b>£170.0m - £401.5m</b>	<b>£2.73 – £6.45</b>
<i>Education and employment</i>	-	-	<i>£121.2 - £242.5m</i>	<i>£1.95 - £3.90</i>
<i>Adult problematic substance misuse</i>	-	-	<i>£48.8m – £159.0m</i>	<i>£0.78 – £2.56</i>
<b>Total benefits</b>	-	-	<b>£290.1m - £521.6m</b>	<b>£4.66 – £8.38</b>

Source: Frontier analysis

Throughout this report, we highlight several key limitations of our analysis, particularly relating to the practical or conceptual difficulties in identifying and quantifying the benefits associated with young people’s drug treatment. However, despite these limitations, our results provide a robust yet conservative estimate of the benefit of young people’s drug treatment.

In particular, the results shown in **Table 3** are robust to changes in the assumptions surrounding both the immediate and long-term benefits of treatment. When compiling figures we have tended to use the upper estimate of costs associated with treatment and the lower estimate of any benefits. Finally, to the extent we have been unable to capture certain benefits in our analysis, our results again represent a conservative estimate of total benefits.

Overall, the study has shown that the immediate and long-term benefits of specialist substance misuse treatment for young people are likely to significantly outweigh the cost of providing this treatment. In particular, we have estimated a benefit of £4.66-£8.38 for every £1 spent on young people’s drug and alcohol treatment. Furthermore, our central case estimates are based on a conservative set of assumptions. Therefore, the benefit of specialist drug and alcohol treatment for young people may be larger than we report here.



# 1 Introduction

The Department for Education (“DfE”) appointed Frontier Economics to undertake a cost benefit analysis of drug policy relating to young people. This project is an element of a broader piece of work being carried out by the Centre for Analysis of Youth Transitions.

There are two types of policy relating to drug and alcohol misuse by young people: prevention and communication policies; and treatment policies. Following initial discussions with the Department for Education, we have narrowed the focus of our work to cover young people’s drug and alcohol treatment. This has allowed us to focus on a specific group of young people in need of treatment.

The central question posed by the Department for Education was therefore: what are the costs and benefits of drug and alcohol treatment for young people?

The remainder of this report presents the main findings of our work. The report is structured as follows:

- Section 2 describes the background to young people’s drug and alcohol treatment and previous studies in this area;
- Section 3 sets out in more detail the approach we have taken and the data we have used;
- Section 4 sets out the treatment costs relating to drug and alcohol misuse by young people;
- Section 5 discusses the likely outcomes for young people who do not receive treatment and the cost of these outcomes – the counterfactual;
- Section 6 describes the impact of treatment on these outcomes, quantifies the resulting benefits, and discusses the key drivers of the results; and
- Section 7 discusses the implications of these results and concludes.



## 2 Background

In this section, we first describe the scope of our work and the particular aspects of young people's drug policy that we have focussed on in this report. We then briefly explain the development of drug and alcohol treatment in the UK and summarise some of the key existing literature on the effectiveness of drug and alcohol treatment. Much of the available literature relates to adult misuse. Given the divergent patterns of substance misuse and treatment responses between adults and young people we need to use this literature cautiously. We therefore identify in this section where research specifically relates to adolescent drug or alcohol treatment.

### 2.1 Scope of the study

Young people's drug policy covers many areas, encompassing education initiatives in schools, the criminal justice system, specialist treatment services, social care, and other elements of children's services. These policy areas tend to overlap as young people who misuse drugs and alcohol typically face a number of other problems such as exclusion from school, family breakdown etc. It is therefore extremely difficult to identify the relative contribution of each individual programme or policy initiative to improvements in outcomes for young people. Similarly, identifying the relative contribution of prevention initiatives and treatment policies to lower drug and alcohol misuse by young people is likely to be difficult.

This report therefore focuses specifically on the costs and benefits of one element of young people's drug policy in isolation. We do not comment on the relative cost effectiveness of treatment policies versus prevention policies or on the relative cost-effectiveness of one programme versus another.

#### 2.1.1 Treatment or prevention

The Department of Health group treatment into four tiers according to the scale of the intervention that is required<sup>5</sup>, as shown in **Table 4**.

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<sup>5</sup> Department of Health (2002) "Models of Care for Treatment of Adult Drug Misusers"

**Table 4.** Tiers of treatment

Tier	Description
<b>Tier 1</b>	Interventions from general healthcare and other services that are not specialist drugs services, for example hospital A&E departments, pharmacies, GPs, antenatal wards and social care agencies. Tier 1 services offer facilities such as information and advice, screening for drug misuse and referral to specialist drugs services.
<b>Tier 2</b>	Open-access drug treatment (such as drop-in services) that does not always need a care plan. Tier 2 covers things like triage assessment, advice and information and harm reduction given by specialist drug treatment services.
<b>Tier 3</b>	Drug treatment in the community with regular sessions to attend, undertaken as part of a care plan. Prescribing, structured day programmes and structured psychosocial interventions (counselling, therapy etc) are always Tier 3. Advice, information and harm reduction can be Tier 3 if they are part of a care plan.
<b>Tier 4</b>	Residential drug treatment – inpatient treatment and residential rehabilitation. Treatment should include arrangements for further treatment or aftercare for clients finishing treatment and returning to the community.

Source: NTA

However, young people's patterns of substance misuse and the treatment approaches required vary considerably from those associated with adults. Substance misuse interventions for young people tend to be categorised as *universal* (typically education and communication programmes), *targeted* (including early intervention for at-risk groups such as young offenders or looked after children), and *specialist* (for those who have already developed drug or alcohol misuse and who require a care-planned structured package of support). We have restricted our study to those young people receiving specialist support in 2008 -09.

The vast majority of young people accessing specialist treatment need and receive counselling, sometimes alongside their families to address the underlying causes and consequences of substance misuse. Such psychosocial interventions are the most common form of support accessed by under-18s. A small number of young people may need more intensive support, including a package of care that combines support from a specialist children's home or foster care placement with substance misuse services. A very small number may need pharmacological interventions.

Many young people benefit from general interventions and open-access drug and alcohol treatment or preventative advice (i.e. local prevention, education, or early

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intervention services). However, these individuals are not captured in the data we have used for this analysis as the treatment they receive does not form part of a structured care plan. Little is known about the circumstances and characteristics of those accessing targeted services. Because of this difficulty, the benefits of treatment for the group of young people receiving non-specialist interventions have not been captured in our study.

### 2.1.2 Limitations of our work

In this report, we have presented our best estimates of the likely costs and benefits associated with young people’s drug and alcohol treatment. The costs and benefits described are based on an extensive examination of the available evidence and provide reasonable estimates of the likely impact of young people’s drug and alcohol treatment.

However, as with any study that requires an assessment of what would have happened in the absence of an intervention (i.e. the counterfactual), there are some key limitations of our work. These include:

- **conceptual limitations** to what our work can and cannot demonstrate; and
- **data limitations** where evidence is missing, incomplete, or not sufficiently robust to provide a definite answer.

Because of these, we have not been able to provide a definitive figure for the financial benefits of young people’s drug and alcohol treatment. Instead, our results are presented in two ways: first as a range of potential benefits, depending on the particular assumptions used; and second in terms of the required impact that young people’s drug and alcohol treatment would need to have in order for the treatment to be cost effective.

#### *Conceptual limitations*

Cost benefit studies typically compare a group who are affected by a certain policy (i.e. those who receive treatment) with a control group who are unaffected by the policy (i.e. those who do not receive treatment). A key source of uncertainty in this project centres on how to define an appropriate counterfactual for young people who do not receive treatment.

A common problem highlighted in previous reviews of cost effectiveness and outcome studies of drug treatment services is that there is no control group which can be used to form this counterfactual<sup>6</sup>. Ideally, individuals should be randomly assigned to both the treatment group and the counterfactual in order to prevent ‘self-selection bias’ in the results. The most appropriate control group in

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<sup>6</sup> National Audit Office (2010) “Tackling problem drug use”

our study are drug users with an identified treatment need who do not receive treatment. However, there are obvious ethical issues which prevent such an approach in this case. Having established a treatment need, treatment providers have an obligation to treat these individuals, rather than monitor them as part of a control group.

As a result, no single data source can compare the outcomes for those receiving treatment with a control group that does not receive treatment. Developing an appropriate counterfactual must necessarily involve some assumptions. This in turn introduces some uncertainty over what would have happened to these people in the absence of treatment.

### *Data limitations*

This study has been further limited by the lack of detailed data and the absence of robust evidence that can be used to evaluate the likely effect of treatment.

Our approach was to compare the behaviour and characteristics of young people when entering treatment with the characteristics and behaviour of the same group of young people after they left treatment. The observed change in outcomes could then be one potential proxy measure for the immediate or short-term effect of treatment.

In practice, the available data on young people before and after treatment only covers a limited sample of those in treatment, and a specific age range (16 and 17 year olds). We have used this data to assess some of the impacts of treatment, and the resulting analysis has some important caveats surrounding how representative the data is of the population of young people in treatment.

Furthermore, the data comparing outcomes before and after treatment does not control for other changes in the lives of young people which may have affected their health or their involvement in criminal activities over the time they are in treatment. We are therefore unable to distinguish from the data the impact that treatment has on outcomes compared to the impact of other factors on changes in outcomes before and after treatment.

We began our study with the intention of using a measure of young people's re-presentation into the adult treatment system as a measure of treatment effectiveness. However, this information provides only a partial picture of treatment effectiveness. It is only available for a limited time period and it does not, by definition, capture details of young people who go to develop further problematic substance misuse but do not re-enter the treatment system. We have therefore sought alternative sources of information on the long-term impact of drug and alcohol treatment for young people to develop a more robust picture of costs and benefits.

## **Background**

## 2.2 Background to young people's treatment

Before reviewing previous studies on the cost effectiveness of treatment, it is worth outlining how drug policy has developed in the UK over the past 15 years, and the role that treatment plays. We begin by describing young people's treatment, looking at some of the differences between adult and young people's treatment. Next we summarise how drug and alcohol treatment has developed since the NTA was set up in 2001. Finally we discuss some of the evidence on the number of young people using drugs.

### 2.2.1 Description of young people's treatment

The priority for adult drug treatment has largely been to reduce the number of problematic drug users (defined as users of opiates and/or crack cocaine). These drug users cause the most harm to society and according to a report by Godfrey et al. (2002)<sup>7</sup> account for 99% of the costs to society of Class A drug use. The same report by Godfrey identified the estimated annual cost to society of Class A drug use as £15.3bn (in 2001 prices). There are an estimated 330,000 adult problem drug users in total, but only 166,000 problem drug users are engaged in effective treatment in the community<sup>8</sup>. There are potentially large savings to be made by getting more adult problem drug users into effective treatment or by preventing young people from becoming problem drug users as adults.

Young people's drug and alcohol treatment is very different to adult drug treatment. Few young people would fall into the category of problem drug users. Just 2% of young people who enter treatment do so with problems with opiates or crack<sup>9</sup>. Young drug and alcohol users also differ from adults in that they will typically not have used drugs for sufficiently long so as to develop dependencies. This then affects the type of treatment typically provided to young people. As shown in **Table 5**, the types of specialist intervention required to treat young people are more likely to involve psychosocial interventions<sup>10</sup> and harm reduction measures<sup>11</sup>, rather than specialist pharmacological interventions (such as methadone prescribing) which are more appropriate for treating dependent adults.

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<sup>7</sup> Godfrey et al. (2002) "The economic and social costs of Class A drug use in England and Wales, 2000" Home Office Research Study 249

<sup>8</sup> NAO estimate

<sup>9</sup> See **Table 10**.

<sup>10</sup> Psychosocial interventions are non-pharmacological interventions typically involving structured counselling, motivational enhancement, case management, care-coordination, psychotherapy, and relapse prevention. The intention is to encourage behavioural and emotional change, the support of lifestyle adjustments and the enhancement of coping skills.

<sup>11</sup> Harm reduction includes services to manage injecting behaviour (e.g. needle exchange, advice on injecting, access to appropriate testing), advice to prevent overdose, and reducing substance misuse related injury.

**Table 5.** Interventions received by young people in 2008-09

Type of intervention	Proportion of total interventions
Psychosocial only	51%
Harm reduction only	12%
Family work only	1%
Specialist pharmacological only	0%
Access to residential treatment only	0%
Psychosocial & family work	1%
Psychosocial & pharmacological	0%
Psychosocial & family work & pharmacological	0%
Psychosocial & family work & harm reduction	2%
Psychosocial & harm reduction	19%
Psychosocial & harm reduction & pharmacological	0%
Other interventions or combinations	9%
No named interventions	4%

Source: NTA "Substance misuse among young people: The data for 2008-09"

Since 2003, the NTA began collecting quantitative information on young people in treatment via the National Drug Treatment Monitoring System ("NDTMS"). This records the drugs used by people in treatment, and a number of other characteristics of those receiving treatment. In 2007, a further element to the NDTMS was introduced to help monitor the outcomes of treatment, known as the Treatment Outcomes Profile ("TOP"). The TOP asks about the characteristics and behaviour of young people when they enter treatment, when they leave treatment and at selected intervals during their treatment. The NDTMS and TOP data are useful in exploring both the characteristics of young people entering treatment and the effectiveness of treatment for these young people.

## Background

### 2.2.2 The extent of drug and alcohol use among young people

The British Crime Survey provides a measure of the extent of drug use by young people. In 2008-09, 22% of 16-19 year olds reported that they had used illicit drugs in the past year, and 7% of 16-19 year olds had used a Class A drug in the past year. Cannabis was the most commonly used drug, with 18% of 16-19 year olds reporting use in the past year. The next most commonly used was cocaine powder, used by 5% of 16-19 year olds in the past year.

The proportion of people aged 16-19 who used illicit drugs in the past year declined steadily from 1998 to 2007-08, before increasing again slightly in 2008-09. A similar pattern can be seen for Class A drug use. This pattern may have emerged for a number of reasons, with increased effectiveness or availability of drug treatment just one of many potential explanations for the observed trend.

The NHS Information Centre produces an annual report on drug and alcohol use by 11-15 year olds<sup>12</sup>. The proportion of 11-15 year olds who have taken drugs in the last year has decreased from over 20% in 2001, to 14.8% in 2009. A large part of this decrease has come through a reduction in the proportion of young people using cannabis, which fell from 13.4% in 2001 to 8.9% in 2009.

As shown in **Table 6**, 3.6% of young people aged 11-15 have used any Class A drug in the last year. However, this proportion is much higher for 15 year olds alone, where 8.9% used a Class A drug last year. Cocaine, crack and heroin use similarly becomes more widespread at age 15.

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<sup>12</sup> NHS Information Centre “Smoking, drinking and drug use among young people in England in 2009” Table 2.7c

**Table 6.** Percentage of pupils aged 11-15 who have taken individual drugs in the last year, by age

Age	Any drug	Any Class A drug	Cannabis	Cocaine	Crack	Heroin
11	4.5%	0.8%	0.5%	0.2%	0.3%	0.1%
12	6.6%	0.8%	1.7%	0.2%	0.3%	0.2%
13	9.8%	2.3%	4.0%	0.4%	0.4%	0.3%
14	18.6%	3.6%	12.0%	1.5%	0.7%	0.3%
15	29.7%	8.9%	22.8%	3.4%	1.4%	1.1%
<b>Total</b>	<b>14.8%</b>	<b>3.6%</b>	<b>8.9%</b>	<b>1.2%</b>	<b>0.6%</b>	<b>0.4%</b>

Source: NHS Information Centre "Smoking, drinking and drug use among young people in England in 2009" Table 2.7c

We are unable to combine these two data sources to establish a typical profile of drug use by young people. The evidence does suggest however that drug use by young people is already established by the time they are 15. Aged 16-19, the proportion of people using drugs in the last year then appears to stabilise or even decline. We cannot be sure whether this is due to changes in the way the data on drug use is collected or reported across the available data sources or whether this represents a real decline in use by 16-19 year olds.

The NHS Information Centre reports in 2008 that 52% of pupils aged 11-15 had ever had an alcoholic drink, and that 18% had drunk alcohol in the past week. This varies widely by age: 16% of 11 year olds had ever had an alcoholic drink (3% in the last week); compared to 81% of 15 year olds (38% in the last week). Of those pupils that drank alcohol in the past week, the mean number of units consumed was 14.6 units and the median number of units consumed was 8.5 units.

## 2.3 Previous studies

There is good evidence in the UK of the cost-effectiveness of adult drug treatment. However, there has been little or no quantitative evaluation of the cost-effectiveness of treatment for young people. The available evidence on the effectiveness of drug and alcohol treatment for young people focuses primarily on the US. In the UK, policy evaluations have either focused on adult drug treatment alone or have not looked at the benefits of treatment directly.

## Background

There have been several attempts in the past to measure the annual cost of drug and alcohol misuse to society. We discuss some of these attempts at length when estimating the cost of adult problem substance misuse. The aim of this report however is not to quantify the economic and social cost of drug and alcohol use by young people, rather to evaluate the cost-effectiveness of treatment policies designed to reduce this economic and social cost. This section therefore focuses on studies that measure cost-effectiveness of treatment only.

Below, we describe some of the previous attempts to measure the cost-effectiveness of treatment. This includes reviews of NTORS and DTORS, two major studies of adult treatment in the UK. We also discuss some of the international evidence on the effectiveness of treatment programmes. As noted above, we have broadened our literature review to include evaluations of adult treatment programmes, although we acknowledge that the differences between adult and adolescent substance misuse mean that findings from these evaluations need to be applied to the current project cautiously.

### 2.3.1 Evidence from the UK

#### NTORS

Following the 1995 White Paper on drugs<sup>13</sup>, a government taskforce was appointed to help measure the effectiveness of treatment services. As part of this, the taskforce commissioned the National Treatment Outcome Research Study (“NTORS”) – the first national prospective study of treatment outcomes for drug misusers in the UK. The NTORS study was a longitudinal cohort study of 1,075 adults starting a new drug-related treatment episode at one of 54 participating residential and community treatment agencies from March-July 1995. This was primarily an adult study – the average age of the cohort studied was 29.3 years, with a range of 16-58 years<sup>14</sup>.

The NTORS study looked at a subset of four treatment types, selected because they were representative of the main types of treatment programme in the UK. These treatments included inpatient drug dependence units; residential rehabilitation agencies (both in residential settings); methadone maintenance programmes; and methadone reduction programmes (in a community setting). The study focussed on a limited number of drugs: heroin; non-prescribed methadone; crack cocaine; powder cocaine; amphetamines; and benzodiazepines. The study also asked about alcohol use before and after treatment. No questions were asked about the level of cannabis use. The study concentrates more on treatment for Class A drug users, and is therefore less applicable to young people,

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<sup>13</sup> Government White Paper (1995) “Tackling Drugs Together”

<sup>14</sup> Gossop et al. (1998) “Substance use, health and social problems of service users at 54 drug treatment agencies”

a large proportion of whom receive treatment for cannabis or alcohol misuse problems.

Participants in the NTORS study were interviewed three times: first when they entered treatment (when they were asked about the two years prior to entering treatment); and then one year and two years later (when they were asked about the three months prior to the interview). At each point, they were asked about:

- use of addiction services (other than the current treatment episode);
- health care events (i.e. inpatient episodes); and
- offences committed.

The cost of addiction services in the two years prior to treatment for the cohort was £2.9m. The cost of treatment itself in the next two years was £2.0m. In addition, the cohort accessed other treatment services outside this primary treatment, which added a further £2.4m over the two years post-treatment.

Total health costs for the cohort increased from £98,000 in the three months before entering treatment, to £137,000 after 1 year and £140,000 after 2 years. This increase in health care costs came from increased medical inpatient costs, and more A&E and GP visits. The increase in health costs post-treatment is explained as treatment may lead to more health conditions being discovered or provide an opportunity for existing medical problems to be addressed.

Crime costs were considerably larger, totalling £5.8m in the three months prior to entering treatment. Types of crime included in the study were shoplifting, burglary, robbery, fraud, and drug offences. A year after entering treatment, crime costs had fallen to £1.8m, but after two years they had increased again to £3.0m.

These costs were then aggregated to compare the total cost in the two years prior to treatment with total costs in the two years after treatment. A summary of these costs is shown in **Table 7**.

**Table 7. NTORS - Summary of costs**

Cost	2 years prior to treatment	2 years following treatment	Net cost / benefit
Main treatment	-	£2.0m	
Other addiction treatment	£2.9m	£2.4m	
<b>Total cost of treatment</b>	£2.9m	£4.4m	£1.5m
Health care costs	£0.8m	£1.1m	-£0.3m
Crime costs	£46.6m	£19.3m	£27.4m
<b>Total of health care and crime costs</b>	£47.4m	£20.4m	£27.0m

Source: Godfrey et al. (2004) "Economic analysis of costs and consequences of the treatment of drug misuse: 2-year outcome data from the National Treatment Outcome Research Study (NTORS)"

The NTORS study concluded that the ratio of benefits to costs over the two year period following treatment was a saving of approximately £18 for every additional £1 spent on treatment<sup>15</sup>. If fraud offences are excluded from the costs of crime, then the net benefit of reduced crime falls from £27m to £14m, and the saving reduces to £9.50 for every additional £1 spent on treatment.

The NTORS study gives some idea of the potential cost savings that result from adult treatment. However, its applicability to young people is limited in two main areas. First, it is a short-term study looking only at the immediate impact of treatment in the two years after treatment is received. Second, it considers a limited range of treatments targeted predominantly at the use of Class A drugs.

### DTORS

The NTORS study was recently updated in a new UK study, the Drug Treatment Outcomes Research Study ("DTORS"). Like NTORS, DTORS was a national longitudinal study looking at the effectiveness of treatment in England.

The sample contained 1,796 adults seeking treatment for a drug problem, recruited from 94 Drug Action Teams across the country. Participants were again restricted to those aged 16 or over when entering treatment. 20% of participants were aged 16-24, with the majority of participants aged 25-34. The study was not restricted to certain types of treatment, with all patients receiving

<sup>15</sup> Godfrey, Stewart and Gossop (2004) "Economic analysis of costs and consequences of the treatment of drug misuse: 2-year outcome data from the National Treatment Outcome Research Study (NTORS)"

Tier 3 and Tier 4 treatment eligible for the study. The DTORS study differed from the previous NTORS work in that it covered all types of drug use including cannabis use. However, patients receiving alcohol treatment were not included in the study. This again makes the results less applicable to the types of treatment typically received by young people.

Participants were interviewed when entering treatment, and then again 3-5 months later (first follow-up), and 11-13 months later (second follow-up). At each point, they were asked about their drug use, health risk behaviour, offending, and mental and physical health; and about the type of treatment they had received. Like NTORS, the approach adopted by the DTORS study is to take behaviour when entering treatment as a proxy for what would have happened in the absence of treatment (i.e. there is no control group). The difference between this and the observed behaviour post-treatment is then taken as a measure of the impact of treatment.

Some of the changes in outcomes observed between the initial interview and the first and second follow-ups are summarised in **Table 8**.

**Table 8.** DTORS - Summary of the effects of treatment

Measure	Initial level	First follow up	Second follow up
Proportion in paid employment	9%	11%	16%
Proportion in stable accommodation	60%	67%	77%
Mean weekly income	£95	£107	£147
Proportion who had committed an acquisitive offence in the last four weeks	40%	21%	16%
Proportion who had committed a high cost offence in the last four weeks	8%	3%	4%
Proportion rating their general health as 'excellent' or 'very good'	20%	27%	25%

Source: Jones et al. (2009) "The Drug Treatment Outcomes Research Study (DTORS: Final outcomes report"

The final element of the DTORS study was an analysis of cost-effectiveness. This looked at the costs of treatment and the net benefit of treatment (in terms of the savings in economic and social costs) in the 12 months after treatment. This only valued short-term benefits and did not consider the long-term benefits of effective treatment, such as increased employment and improved productive capacity.

The cost-effectiveness analysis of the DTORS sample showed that structured treatment was cost-effective. The estimated cost-benefit ratio was a saving of £2.50 in the first year of treatment for every £1 spent on structured treatment. The source of this benefit is shown in **Table 9**. As with the NTORS study, a large proportion of the net benefits of treatment come from a reduction in offending.

**Table 9.** DTORS – Net costs and benefits

Costs / benefits	Without treatment	With treatment	Net benefit
Cost of structured treatment	-	£4,914	
Cost of health and social care	£4,543	£3,120	£1,423
Cost of reported offences	£50,585	£39,967	£10,618
<b>Total</b>	<b>£55,127</b>	<b>£43,087</b>	<b>£12,041</b>
QALYs	0.63	0.68	0.05

Source: Davies et al. (2009) "The Drug Treatment Outcomes Research study (DTORS): Cost-effectiveness analysis"

### *Other evaluations*

In Scotland, the Drug Outcome Research in Scotland study ("DORIS") sampled 1,033 drug users entering treatment in 2001. The treatments they received included substitute methadone prescribing (27% of participants), non-substitute prescribing (28%), counselling (20%), residential rehabilitation (12%), and detoxification (12%). The study covered adults with a median age of 27 and a range of 16-53.

Participants were interviewed upon entry, and then again after 8, 16 and 33 months. After 33 months, 67% of the original cohort was successfully re-interviewed (694 people). The measure of effectiveness used by DORIS was of strict abstinence (i.e. being completely drug free for at least 90 days prior to being interviewed). 33 months after treatment, just 8% of drug users reported being abstinent. Those who received residential rehabilitation treatments were most likely to be abstinent, with 25% of that group drug free, compared to just 5% of people recruited from prison-based drug treatment agencies, and 6% of people recruited from community-based drug treatment agencies<sup>16</sup>. This difference was despite there being no real difference in the level of dependence for these groups when entering treatment.

After 33 months, 59% of people who were abstinent were in education or employment, compared to 29% of those who were not abstinent. 79% of

<sup>16</sup> McKeganey et al. (2006) "Abstinence and drug abuse treatment: Results from the Drug Outcome Research in Scotland Study"

## Background

abstinent patients said that their health was much better or somewhat better, compared to 47% of not abstinent patients. 13% of abstinent patients had committed a crime in the past 17 months, compared to 91% of the non-abstinent group. The study showed that whilst there are clear benefits of drug treatment for those who become abstinent, the proportion of those receiving treatment that become abstinent is small. Using total abstinence as a measure of the effectiveness of treatment may not be the best way of capturing treatment benefits.

Also in 2007, PricewaterhouseCoopers produced a report for the Ministry of Justice reviewing prison-based drug treatment funding<sup>17</sup>. This included an economic model considering the expected costs and benefits to society of prison-based drug treatment. The model estimated the potential lifetime cost savings in several areas, discounted over a period of 100 years at a rate of 3.5%:

- excess mortality costs;
- excess morbidity costs;
- direct health costs;
- lost economic output;
- costs to the criminal justice system;
- social costs; and
- intergenerational costs.

The model calculates the cost savings following immediately effective treatment – i.e. it assumes that post-treatment, problem drug users will be able to adopt a lifestyle aligned with the aggregate population average in terms of economic, health and social activity, adjusted for the characteristics of the population in treatment. This immediate and effective transition to the behaviour of a non drug user is an extreme scenario, which may overstate the potential benefits of effective drug treatment.

PWC concluded that the discounted lifetime cost saved following immediately effective prison-based drug treatment for a 21 year old male was £736,000. Cost estimates are largely based on the costs of Class A drug use by Godfrey (2002), discussed later in this report. The majority of these cost savings come from reductions in the mortality rate, fewer lost earnings, and lower levels of acquisitive crime and costs to the criminal justice system.

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<sup>17</sup> “Report to the Department of Health and Ministry of Justice Review of Prison-Based Drug Treatment Funding Final Report” December 2007 (Published March 2008)

To summarise, the UK evidence on effectiveness of adult treatment is generally positive, but the evaluations tend to be short-term and it is not clear whether it can be ‘read across’ to young people’s treatment.

### 2.3.2 International evidence

#### *Evidence relating to young people*

In the US, current research on the effectiveness of young people’s drug treatment typically uses longitudinal data from large-scale observational studies, such as the Drug Abuse Treatment Outcome Studies (“DATOS”) programme. The DATOS programme includes a sample of 3,382 adolescent patients (known as “DATOS-A”) receiving short term, longer term and residential drug treatment.

Hser et al. (2001)<sup>18</sup> analyse DATOS-A data on 1,167 adolescents aged 11-18 from four US cities: Pittsburgh; Minneapolis; Chicago; and Portland. They do not measure the cost effectiveness of treatment – instead they compare the characteristics and behaviour of young people entering treatment with the same set of characteristics a year later. They find that there are significant reductions in drug use and criminal activity, and improvements in mental health and school performance in the year after treatment. The proportion of young people using marijuana weekly or more frequently dropped from 80% before treatment to 44% after treatment. Heavy drinking similarly fell from 34% pre-treatment to 20% one year later. Reductions in any hard drug use were smaller, falling from 48% to 42%. They observed improvements in school attendance and reduced criminal activity, with the proportion of adolescents committing any illegal act falling from 76% to 53% in the year after treatment.

Morrall et al. (2004)<sup>19</sup> criticise these sorts of analyses of treatment effectiveness because of their inability to distinguish changes in outcomes due to treatment, with other changes that would have taken place anyway as the cohort matures. They note that this could potentially be addressed by comparing the relative effectiveness of two different programmes. Morrall et al (2006)<sup>20</sup> does this, comparing the relative effectiveness of 10 adolescent substance abuse treatment programmes in the US. For each of the 10 treatment programmes, they measure the effect of the treatment on six outcome measures: recovery; substance problems; substance use frequency; illegal activities; emotional problems; and days in a controlled environment. They found limited evidence of treatment effectiveness, with a positive and significant improvement in outcomes post-

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<sup>18</sup> Hser et al. (2001) “An Evaluation of Drug Treatments for Adolescents in 4 US Cities”

<sup>19</sup> Morrall et al. (2004) “Effectiveness of Community-Based Treatment for Substance-Abusing Adolescents: 12-Month Outcomes of Youths Entering Phoenix Academy or Alternative Probation Dispositions”

<sup>20</sup> Morrall et al. (2006) “The Relative Effectiveness of 10 Adolescent Substance Abuse Treatment Programs in the United States”

treatment in just 11 of the 60 programme and outcome pairs, and negative and significant effects in 6 of 60 programme and outcome pairs.

Dennis et al. (2004)<sup>21</sup> examined the clinical and cost-effectiveness of five short-term outpatient treatments for adolescents with cannabis use disorders and found significant and stable post-treatment improvements across all programmes, as measured by the number of days of abstinence or the proportion of young people in recovery. Specifically, the proportion of adolescents in recovery (defined as no drug or alcohol use in the last month) increased from 3% at intake to around 24% a year later. The improvement in clinical outcomes post-treatment did not differ according to which of the five treatment programmes was received. The cost per day of abstinence achieved did vary across treatment types, with motivational enhancement and cognitive behaviour therapy treatment alone being the most cost-effective, and programmes which also included parent education sessions, home visits and other services being the least cost effective. As with most studies of this type, the authors acknowledge that their results are limited by the absence of an appropriate control group with which to compare outcomes.

Other studies of the effectiveness of treatment for adolescents in the US include Ruiz (2005)<sup>22</sup>, who compares treatment outcomes for rural and non-rural adolescents. For both groups, there is a steep decrease in substance use three months after entering treatment, followed by a gradual increase in the frequency of substance misuse over the next 2-3 years.

The studies mentioned in the previous section tend to focus only on the effectiveness of drug treatment, without placing a value on the cost of treatment, or the potential value of the benefits of young people's treatment. Although Dennis et al. consider cost-effectiveness to some extent, this does not go so far as to place a value on the saving in economic and social costs as a result of treatment.

### *Evidence relating to adults*

Cost-effectiveness studies of treatment tend to relate to adult drug treatment only. Cartwright (2000)<sup>23</sup> provides a review of 18 such cost-benefit analyses. The review points out the fact that none of the cost benefit studies that were reviewed at that time related to adolescent drug treatment, described by Cartwright as a "striking area of omission". Cartwright identifies the short-term

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<sup>21</sup> Dennis et al. (2004) "The Cannabis Youth Treatment (CYT) Study: Main findings from two randomized trials"

<sup>22</sup> Ruiz et al. (2005) "Treatment issues and outcomes for juvenile-justice-involved youth from rural and non-rural areas"

<sup>23</sup> Cartwright (2000) "Cost-Benefit Analysis of Drug Treatment Services: Review of the Literature" *Journal of Mental Health Policy and Economics* 3, 11-26

nature of most of these studies, saying that the long-term nature of addiction is not adequately addressed. He also highlights the range of approaches that are taken in these studies, both in measuring the costs of treatment, and when calculating the potential net benefits of treatment. The review shows that despite these problems, even short-run benefits are sufficiently large that the studies consistently find a benefit-cost ratio greater than one.

A subsequent review of 11 studies by McCollister and French (2003) confirmed that the net benefit of treatment was almost always positive, with the ratio of treatment benefits to treatment costs ranging from 1.33 to 23.33. This review was less relevant to young people's substance misuse as it considered both treatment and prevention programmes and looked only at studies of chronic substance abusers or problematic users (including problem alcohol users).

One more recent study by Ettner et al. (2006)<sup>24</sup> uses data from the California Treatment Outcome Project ("CalTOP"), which interviewed over 2,500 participants at intake, and then 3 and 9 months later, to measure the cost-effectiveness of treatment. Questions were asked about use of health services, employment, crime, and benefits received. The study found that benefits in the 9 months post-treatment outweighed the cost of treatment, giving a benefit-cost ratio of \$7:\$1. The majority of the benefit came from reduced crime and from higher earnings. Cost-effectiveness varied according to the type of treatment that was provided, with higher benefit-cost ratios for out-patient treatment (\$11:\$1) than for residential treatment (\$6:\$1), and no significant benefits for methadone maintenance treatments.

The cost-effectiveness reviews and studies mentioned above are based on US data. Godfrey and Parrott (2000)<sup>25</sup> warn that US research may not be applicable to the UK. They note that the treatment structures and costs vary considerably between the UK and the US. They also point out that the quality of some of the US research is again hampered by the absence of a control group.

To summarise, it appears that there are few, if any, previous studies which conducted good CBA evaluation of young people's treatment. Existing evidence tend to be short term. There is some evidence that adult treatments are cost-effective, but cost-benefit ratios vary by program and country. Overall, it is difficult to generalise these studies and to make any inferences about potential cost-effectiveness of young people's treatment in the UK.

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<sup>24</sup> Susan L Ettner, David Huang, Elizabeth Evans, Danielle Rose Ash, Mary Hardy, Mickel Jourabchi, and Yih-Ing Hser (2006) "Benefit-Cost in the California Treatment Outcome Project: Does Substance Abuse Treatment "Pay for Itself"?", *Health Serv Res.* 2006 February; 41(1): 192-213.

<sup>25</sup> Godfrey and Parrott (2000) "How can Policy Makers use Available Evidence on the Cost Benefits of Drug Treatment" *Journal of Mental Health Policy and Economics* 3, 55

## 3 Approach

This section sets out the approach we haven taken to assess the costs and benefits of young people’s drug and alcohol treatment.

### 3.1 Conceptual framework

There are two main elements of our study:

- **Costs:** Understanding the amount that is spent in total and per person on specialist drug and alcohol treatment for young people in 2008-09.
- **Benefits:** Estimating and valuing the benefits of young people’s drug and alcohol treatment – measured as a reduction in the economic and social costs of drug and alcohol misuse.

The approach we follow in this analysis captures both the immediate and long-term benefits of specialist drug treatment for young people, and compares these benefits with the cost of providing specialist treatment. In the following sections, we set out the approach used by other similar studies in the past, and provide a rationale for the approach we have followed.

#### 3.1.1 Modelling lifetime costs and benefits

There are two possible ways to assess the costs and benefits of substance misuse treatment.

- comparing *in-year* costs and benefits of treatment; and
- comparing *lifetime* costs and benefits of treatment.

The in-year approach compares the cost of drug and alcohol treatment provided in any one year, with the cost savings realised in that year from current and past spending on drug and alcohol treatment. The advantage of looking at in-year costs and benefits of treatment is that it provides a measure of the financial benefits in any one year from current and previous investment in treatment. This is the approach that the NTA have adopted in their ongoing assessment of the value for money of adult drug treatment.

The question being considered by the NTA is what the cumulative effect is of the amount spent on drug treatment from 2001-02 to 2008-09. In any one year, cost savings up to that point are compared with the amount spent on drug treatment in that year and a ratio of benefits to costs is calculated. This includes benefits in the current year from money previously spent on drug treatment. For example, drug treatment in 2001-02 may turn a person from being a problem drug user to a drug user in recovery with a much lower cost to society. The savings from this change are counted not just in the year of treatment, but also in

subsequent years. This approach can therefore be used to assess the current financial impact of a previous policy initiative.

The Department of Health have similarly developed a model to assess the costs and benefits of adult substance misuse treatment, using broadly the same information as the NTA. The DH model differs from the NTA model as it considers the lifetime costs and benefits of treatment for problematic drug users. This is a forward looking approach which compares future outcomes for drug users who receive treatment with outcomes for those who do not receive treatment. The DH model estimates the lifetime cost of crime, health care, and the cost of looked after children, both for young people who receive treatment (the intervention scenario) and for young people who do not (the counterfactual). The model also includes a measure of the increase in Quality Adjusted Life Years (“QALYs”) for adults receiving treatment compared to those who do not receive treatment.

The way we have calculated the benefits of drug and alcohol treatment is more closely aligned with the approach adopted by the Department of Health. We compare the lifetime cost imposed on society by a sample of young people receiving treatment (the intervention scenario) with the lifetime cost to society if the same group of young people had not received treatment (the counterfactual). The benefit of treatment is the difference between these two figures. If this is then bigger than the cost of providing the treatment itself, then there is an overall net benefit of providing treatment.

Some of the benefits of treatment that we capture in our model are immediate benefits, but other treatment benefits (i.e. reduced likelihood of becoming an adult drug user) have a much longer-lasting impact. These long-term benefits are more important for young people (e.g. as they may develop substance dependency or become problematic drug or alcohol users if not treated) than for adults, where the goal of treatment is primarily to reduce the immediate harm done by adult problem drug use than on improving long-term outcomes. A forward looking lifetime model which takes into account these potential long-term benefits is therefore more appropriate for this project.

### 3.1.2 Long-term and immediate benefits

In this study, we have categorised the potential benefits of drug and alcohol treatment into two broad groups:

- immediate benefits; and
- long-term benefits.

#### *Immediate benefits*

Substance misuse treatment can have an immediate impact on the behaviour of young people. Young people leaving treatment may stop using drugs completely,

## Approach

or significantly reduce their levels of substance misuse. In turn, this may result in an immediate change in the harmful behaviour that was previously associated with their substance misuse.

The two principal immediate impacts of drug and alcohol treatment for young people that we have included in our model are improved health or reduced criminal activity.

To quantify these benefits, we first need to establish a counterfactual, i.e. the economic and social cost to the criminal justice system and to the health care system of young people who do not receive treatment. This is done in section 5. Section 6 then estimates the potential reduction in crime or health service costs that can be attributed to specialist substance misuse treatment.

### *Long-term benefits*

Substance misuse treatment for young people may also have longer-term impacts. We have included two potential sources of long-term benefits of young people's treatment in our model.

- reduced likelihood of developing adult substance misuse problems; and
- improved engagement in education and employment, resulting in greater productive capacity and future earnings potential.

We have drawn upon published sources to assess the probability that young people who do not receive treatment will develop substance misuse problems as adults. Specifically, we estimate the probability that they will become:

- problematic drug users (“PDUs”);
- non-problematic drug users (“non-PDUs”); or
- problematic alcohol users.<sup>26</sup>

We have then used estimates of the lifetime cost to society of each of these three types of adult substance misuse to calculate the economic and social cost to society in the counterfactual. Further detail on how we have calculated the counterfactual cost of adult substance misuse is provided in section 5.2.

The economic and social costs associated with adult substance misuse are potentially very large, particularly for young people who then go on to become problem drug users. We recognise that receiving treatment as a young person does not *remove* the possibility that an individual will develop substance misuse

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<sup>26</sup> A problematic drug user (“PDU”) refers to clients citing opiates, crack cocaine, or both as any of their presenting substances. Non-problematic drug users (“non-PDUs”) are clients using illegal drugs other than opiates or crack cocaine when presenting for treatment. Problematic alcohol users include both dependent and harmful users (i.e. those drinking over the recommended weekly amount and experiencing health problems directly related to alcohol).

problems in later life. However, young people's substance misuse treatment may *reduce* the probability of developing problems as adults. One long-term benefit of treatment is therefore the lower expected cost to society of adult substance misuse. We explore the potential effect that treatment has on this cost in section 6.2.

Estimates of the cost to society of adult substance misuse typically include crime and health costs. They also measure lost output, either through premature death, increased absenteeism or lower productivity when at work. However, even for young people who do not develop substance misuse problems as adults, there may still be long-term education and employment costs relating to their drug use.

The mechanism for this is as follows. Young people's substance misuse can affect attendance at school, and increase the proportion of young people who are not in education, employment or training ("NEET"). This then can have an effect on educational attainment and on the qualification levels that are achieved. Drug use which leads to lower educational attainment then affects future earnings and lowers the productive potential of young people. Substance misuse therefore has a further economic and social cost to society, in addition to the lost output associated with adult substance misuse.

### 3.1.3 Discounting and the career of substance misuse

The costs of young people's drug and alcohol treatment tend to be incurred immediately<sup>27</sup>. The benefits on the other hand may persist for a number of years. To compare the costs with the benefits, we discount the value of future benefits and calculate the net present value of these benefits. This approach has been followed consistently throughout the report, and both the immediate and long term counterfactual costs and benefits are reported in terms of their net present value.

To discount these future benefits, we then need to establish:

- the times at which these future benefits will occur; and
- the rate at which future benefits are discounted.

Choosing a discount rate is relatively straightforward. Throughout this report we have used the recommended Treasury discount rate of 3.5% to discount future benefits<sup>28</sup>.

Estimating the length of time that the benefits of treatment will persist in the future is more difficult. We have assumed that the immediate benefits of drug

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<sup>27</sup> This approach does not ignore the possibility of incurring further direct costs of treatment for adult substance abuse. These expenses are included as a long-term cost associated with adult substance misuse and are discounted accordingly in the model.

<sup>28</sup> HM Treasury "The Green Book: Appraisal and Evaluation in Central Government"

and alcohol treatment will last from the point at which young people enter specialist treatment, until they turn 18. On average, this is a period of 2 years<sup>29</sup>. After this, the costs of any ongoing substance misuse will be captured by the estimates of the cost of adult substance misuse.

For the subset of young people who develop problems with substance misuse as adults, we assume the “career” of adult substance misuse will last for 20 years. This is based upon recent detailed work by the NTA on the value for money of adult drug treatment<sup>30</sup>.

It is possible that the average length of time that an adult uses drugs will differ depending on whether they are a PDU, a non-PDU or a problematic alcohol user. However, to be consistent with the NTA’s work on adult substance misuse, we have assumed a 20-year career of all types of adult substance misuse throughout this report.

## 3.2 Sample description

### 3.2.1 Young people included in the study

The total number of young people who entered specialist drug and alcohol treatment in 2008-09 was 24,053. This is the size of the sample cohort that we have modelled.

Our study looks at the costs and benefits of specialist treatment for all types of substance misuse, including treatment for alcohol misuse by young people. Previous studies of substance misuse have tended to focus on either drug misuse or alcohol misuse, rarely both.

**Table 10** shows that cannabis was listed as the primary drug for 53% of young people entering treatment, and that alcohol was listed as the primary drug for a further 37% of young people entering specialist treatment. Alcohol misuse is therefore an important part of young people’s substance misuse. Focussing only on drug misuse would mean that we would capture only a subset of young people who benefit from specialist substance misuse treatment.

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<sup>29</sup> See **Table 12**.

<sup>30</sup> NTA (2006) “Addiction careers and the natural history of change”

**Table 10.** Number of young people in specialist treatment - by primary drug – 2008-09

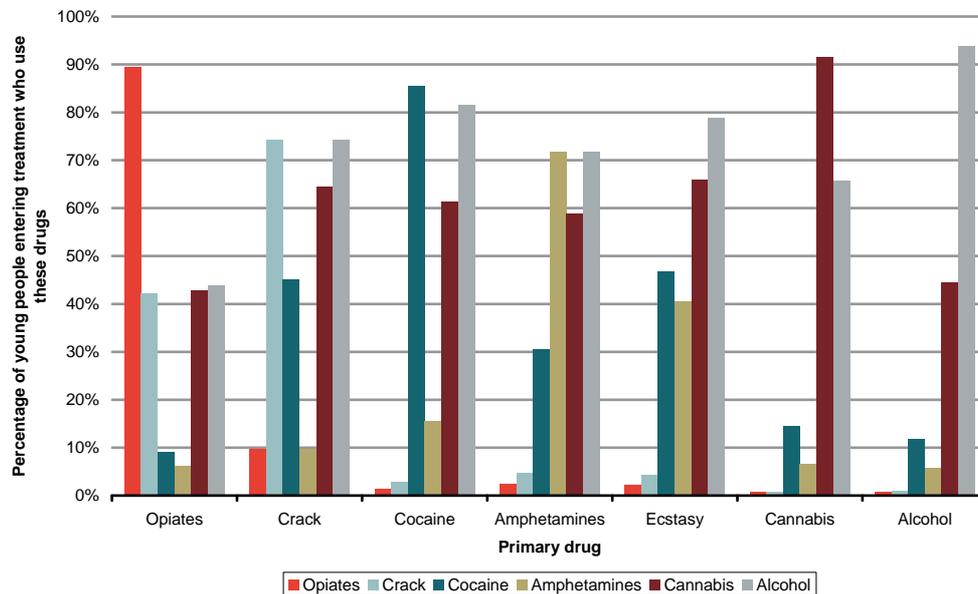
Primary drug	Number of young people	Percentage of young people
Heroin and other opiates	547	2%
Crack	110	0%
Cocaine	745	3%
Amphetamines	230	1%
Ecstasy	210	1%
Cannabis	12,642	53%
Alcohol	8,799	37%
Solvents	284	1%
Other	270	1%
<b>Sub-total</b>	<b>23,836</b>	<b>100%</b>
Missing or inconsistent data	217	
<b>Total</b>	<b>24,053</b>	

Source: NTA "Substance misuse among young people: The data for 2008-09"

### 3.2.2 Drug use

Young people often require treatment for misuse of multiple drugs. For example, young people whose primary drug is crack also tend to be frequent users of cannabis and alcohol. NDTMS Treatment Outcomes Profile data records the number of days in the past month that a young person has used each type of drug.

## Approach

**Figure 1.** Primary and additional drug use

Source: Frontier analysis of TOP data

**Figure 1** shows that young people entering treatment tend to be poly-substance users. For example, 40% of mainly opiate users also use crack, alcohol or cannabis. Most crack users also use cannabis and alcohol. And there is significant overlap in alcohol and cannabis use.

### 3.2.3 Age

**Table 11** shows that 75% of young people in treatment are aged 15-17, and 10% are less than 14 years old.

**Table 11.** Young people in treatment - by age

Age	Proportion of young people in treatment in 2008-09
<12	1%
12-13	2%
13-14	6%
14-15	15%
15-16	23%
16-17	26%
17-18	28%

Source: NTA "Substance misuse among young people: The data for 2008-09"

The average age of young people in treatment did differ depending on the drug they were receiving treatment for. Solvent misusers were the youngest group in treatment, followed by those with cannabis and alcohol misuse problems where the average age of those in treatment was approximately 16. Heroin and crack users in treatment were typically older, with an average age of nearly 17.

It is worth noting that the TOP data allows us to compare outcomes before and after treatment for 16-18 year olds only. We have used this TOP data to estimate the level of crime committed in the counterfactual. As 16-18 year olds represent 54% of the young people in treatment, one concern with using this data is that crime committed by this group might not be representative of young people as a whole.

Evidence from the 2006 Offending, Crime and Justice Survey suggests that offending by 16-17 year olds is broadly similar to the pattern of offending across all 10-17 year olds<sup>31</sup>. For example, 16% of 16-17 year olds in the survey report committing an assault in the last 12 months, compared to 17% of all 10-17 year olds. 3% of 16-17 year olds committed vehicle theft, and 12% committed other thefts; compared to 2% and 11% of all 10-17 year olds. Based on this evidence, looking only at crime committed by 16-17 year olds entering treatment provides a reasonable indication of the overall level of crime committed by all young people entering treatment.

<sup>31</sup> Home Office Statistical Bulletin (2008) "Young people and crime: findings from the 2006 Offending, Crime and Justice Survey"

**Table 12.** Average age of young people in treatment - by primary drug

Primary drug	Average age of young people in treatment
Heroin and other opiates	16.9
Amphetamines	16.5
Cocaine	16.6
Crack	17.0
Ecstasy	16.2
Cannabis	15.8
Solvents	14.8
Alcohol	16.0
Other	16.4
<b>Total</b>	<b>16.0</b>

Source: Frontier analysis of data from NTA "Substance misuse among young people: The data for 2008-09

### 3.2.4 Other demographic characteristics

We understand from our discussions with stakeholders that young people in drug and alcohol treatment face a number of other problems, in addition to their substance misuse. Before considering the effect of treatment on substance misuse and behaviour relating to substance misuse, we first set out the demographic characteristics of young people who receive treatment. This begins to identify the range of problems and adverse social circumstances which may contribute to substance misuse. It also helps explain why treatment alone may not lead to improvements in behaviour, if other problems exist which are not directly tackled by substance misuse treatment.

In our sample, 62% of young people entering treatment are male. This proportion does not vary significantly by age group. 85% of young people treated in 2008-09 were white British.

TOP data (recorded for a subset of young drug users in our sample) shows that 12% of young people entering treatment in 2008-09 had an acute housing problem. A further 5% were said to have a housing risk. Young opiate, crack, cocaine and amphetamines users were particularly likely to face housing problems.

We do not have any further information on the socio-economic characteristics of our sample directly, or on other factors such as family breakdown or the nature of other problems faced by young drug users in our sample. We know from other studies that young people who are serious drug users have multiple problems. A report by the Advisory Council on the Misuse of Drugs (2006) describes some of the characteristics of young people who are most at risk of substance misuse problems<sup>32</sup>. The report says that drug use by teenagers is more common among individuals for whom one or more of the following factors are present.

- Drug use by parents or older siblings
- Family conflict or poor and inconsistent parenting
- Truancy and other forms of delinquency
- Pre-existing behavioural problems
- Low parental supervision
- Living with a single or step-parent.

A survey of 23,000 13-15 year olds in Scotland looked at the relationship between family affluence and drug use. It showed that 13-15 year girls in less affluent families were more likely to be regular alcohol or regular cannabis users than girls in more affluent families. There was no relationship between family affluence and alcohol or cannabis use for 13-15 year old boys.

The Advisory Council on the Misuse of Drugs also references the results of a European school student survey on the relationships between young drug and alcohol use and a number of other personal characteristics<sup>33</sup>. Whether teenagers live with a single parent or a step-parent was significantly associated with alcohol and cannabis use in the UK. The level of parental supervision (measured by whether parents knew where their children spent their Saturday nights) was also significantly associated with alcohol and cannabis use. Other similar relationships were found between older sibling drug use, truancy, and alcohol and cannabis use in the UK.

Although we cannot observe these risk factors directly in our sample of young drug users, we can assume that there are a number of other problems faced by these young people that may have contributed to their drug use.

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<sup>32</sup> Advisory Council on the Misuse of Drugs (2006) "Pathways to Problems: Hazardous use of tobacco, alcohol and other drugs by young people in the UK and its implications for policy"

<sup>33</sup> Swedish Council for Information on Alcohol and Other Drugs (2004) "The ESPAD Report 2003: alcohol and other drug use among students in 35 European countries"

## 4 Cost of young people's treatment

This chapter describes the cost of providing specialist treatment for young people in 2008-09. First, we set out the different sources of funding in place at the time for young people's drug and alcohol treatment and report the total amount of funding available through each stream. Second, we discuss any potential local variations in the amount that is spent on young people's treatment or the way the treatment is delivered.

### 4.1 Sources of funding

In 2008-09, there were three principal sources of drug and alcohol treatment funding for young people:

- the Young People's Pooled Treatment Budget;
- Local Authority Area Based Grants; and
- funding from Youth Offending Teams.

The total funding from each of these three streams in 2008-09 is shown in **Table 13**.

**Table 13.** Funding for young people's treatment in 2008-09

Funding stream	Amount in 2008-09
Young Persons Pooled Treatment Budget	£24.7m
Area Based Grant (Home Office)	£15.4m
Area Based Grant (Department for Education)	£7.0m
Youth Justice Board contribution to YOTs	£8.5m
Youth Justice Board spending on treatment via secure estate	£6.5m
<b>Total</b>	<b>£62.2m</b>

Below, we describe each funding stream in more detail.

#### 4.1.1 Young peoples Pooled Treatment Budget

The Young People's Pooled Treatment Budget ("YPPTB") combines funding previously provided by the Department of Health and the Home Office into one

single stream of revenue funding. The total amount of funding allocated via the Young People's Pooled Treatment Budget in 2008-09 was £24.7m.

Funding from the YPPTB is allocated directly to one of 149 local Drug Action Teams in England on the basis of local need and key deprivation factors. The local DAT then commissions services for young people from NHS or private providers.

Funding for young people's treatment is ring-fenced for treatment services relating specifically to young people. The adult pooled treatment budget, which in 2008-09 was £383m, is similarly ring-fenced for treatment. In some cases, adults (typically aged 18-19) may also access some of the services commissioned for young people as part of transitional arrangements between youth and adult services. Where this is the case, some of the adult PTB funding may be allocated to young people's commissioners who are better placed to provide services for these individuals.

#### 4.1.2 Area Based Grants

The Area Based Grant was a revenue funding stream allocated directly to local authorities. This was not ring-fenced for treatment services and local authorities were free to use this allocation as they chose.

In 2008-09, there were two elements of Area Based Grant funding that were earmarked for young people's treatment<sup>34</sup>.

- The Home Office contributed £15.4m each year in 2008-09 towards the Young People Substance Misuse Partnership.
- The Department for Education contributed £7.0m in 2008-09 through the Area Based Grant for young people's substance misuse.

As described below, we have explored with several local commissioners the proportion of this Area Based Grant funding that was spent in practice on providing specialist treatment for young people.

#### 4.1.3 Youth Offending Teams

The Home Office have previously made funding available so that all Youth Offending Teams ("YOTs") in England and Wales have a named drug worker as part of their team. The Youth Justice Board reports that there are now 202 specialist drugs workers and services working with YOTs in England and Wales. Drugs workers can be located within the YOT itself, or may be based in drug treatment agencies.

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<sup>34</sup> Memo from Marcus Bell, DCSF, "Confirmation of funding for local areas to reduce young people's substance misuse in England", 19 March 2008

## Cost of young people's treatment

The Home Office contributed £8m in 2008-09 directly to local Youth Offending Teams (“YOTs”) via a grant by the Youth Justice Board<sup>35</sup>. This funding is intended to support substance misuse workers within the YOT and to provide them with a budget to buy services for treatment.

#### 4.1.4 Youth Justice Board spending via secure estate

Finally, in 2008-09 the Youth Justice Board spent £6.5m on treatment via its secure estate. The secure estate includes three types of secure accommodation in which young people are placed as part of a custodial sentence (secure training centres, secure children’s homes, or young offender institutions).

Substance misuse treatment is then delivered for example in dedicated substance misuse facilities in Young Offenders Institutes. These facilities include group and one-to-one interview rooms, facilities for voluntary testing, and offices for substance misuse staff.

## 4.2 Local case studies

To supplement our understanding of expenditure on specialist substance misuse treatment for young people, we have spoken to three local commissioners of young people’s substance misuse services. The aim of these local case studies was:

- to understand the proportion of the non ring-fenced funding that was spent on specialist treatment;
- to investigate whether there were any other funding streams that could be used to pay for specialist substance misuse services; and
- to gain a greater understanding of the ways young people come into contact with treatment services and how these services are organised at a local level.

These local case studies were selected to cover a range of treatment models. The local areas differed in the amount of funding allocated for young people’s treatment, the way this money was spent and how the service as a whole was structured.

### 4.2.1 Funding streams

The sources of funding for young people’s treatment identified by commissioners were broadly similar and matched our understanding of the way young people’s treatment services are funded. All received money from the YPPTB, from Area Based Grants and from Youth Offending Teams. The

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<sup>35</sup> <http://www.yjb.gov.uk/en-gb/practitioners/Health/SubstanceMisuse/>

proportion of funding accounted for by each of these sources is also broadly similar, with around 40% of funding coming via the YPPTB, as shown in **Table 14**.

**Table 14.** Funding split for young people's substance misuse treatment - Local case studies

Funding source	Local area 1	Local area 2	Local area 3
YPPTB	39%	45%	40%
Area Based Grant (Department for Education)	50%	29%	5%
Area Based Grant (Home Office)			23%
YOTs	10%	12%	8%
Additional funding from adult treatment services		13%	5%
Additional funding from local authorities			11%
Additional Area Based Grant Funding			8%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: Frontier analysis of proportion of total funding for young people's treatment provided by each funding source – based on interviews with local commissioners

In one local area, there were no additional sources of funding for young people's treatment other than the major funding streams. Two local commissioners said that they received a small amount of funding from adult treatment services. In one case, this was for work done in treating some 18-19 year olds more suited to the treatment provided by young people's services<sup>36</sup>. In the other, this was a contribution to support work on parental substance abuse being carried out within the Children's Services division.

One local area also received an additional allocation from the Area Based Grant to support a short-term project to provide two additional substance misuse education workers based in schools. The same local area also received additional funding from the local authority.

<sup>36</sup> The commissioner told us that this was because the adult services tended to be more focused more on treating Class A drug use (such as heroin use) and were less appropriate for these individuals.

## Cost of young people's treatment

A common theme across the three commissioners we interviewed was that all funding provided for young people's treatment was spent – no funds were carried over to the following year. Young people's treatment services tended to be commissioned in large blocks, with one principal provider, and other smaller providers contracted to provide specific specialist services<sup>37</sup>. Most of this appeared to be spent on commissioning specialist treatment services, with only a small proportion of funding in one local area left over to spend on prevention and targeting work.

In this report, we have taken the total amount of funding allocated for young people's treatment via the YPPTB, the Area Based Grants, and the YOT/YJB funding as the total amount that is spent on specialist treatment for young people. There may be some other additional funding streams allocated to certain local areas which are then spent on drug and alcohol treatment, in which case we may understate the total amount that is spent on specialist treatment. Alternatively, a proportion of this funding may be spent on providing preventative advice and drug information rather than treatment directly. In this case, we would overstate the amount spent on specialist treatment.

On the whole, we believe that the figure of £62.2m is a reasonable estimate of the total amount that was spent on specialist treatment services for young people in 2008-09.

#### 4.2.2 Referral routes and service structure

Young people tend not to self-refer into treatment, with just 11% of young people entering treatment nationally in 2008-09 referred by themselves, their family or their friends. Self-referrals are more common for adults, but for young people the majority of those entering treatment are picked up by other routes. The commissioners we spoke to emphasised the need for treatment services to work closely with other services better placed to identify those young people with a treatment need.

Approximately 40% of referrals nationally in 2008-09 into young people's substance misuse treatment services came through the criminal justice system. When Youth Offending Teams assess young offenders as part of a formal criminal justice system response, they conduct a holistic assessment of the problems which may have contributed to their offending behaviour. If this assessment highlights alcohol or drug misuse they should receive appropriate support, including referral into specialist treatment.

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<sup>37</sup> For example, one provider helped to finance a Tier 3 Child and Adolescent Mental Health Service in addition to their primary treatment service. Another mentioned the need to commission expensive Tier 4 residential treatment for some patients, but that there were currently no young people who received Tier 4 treatment.

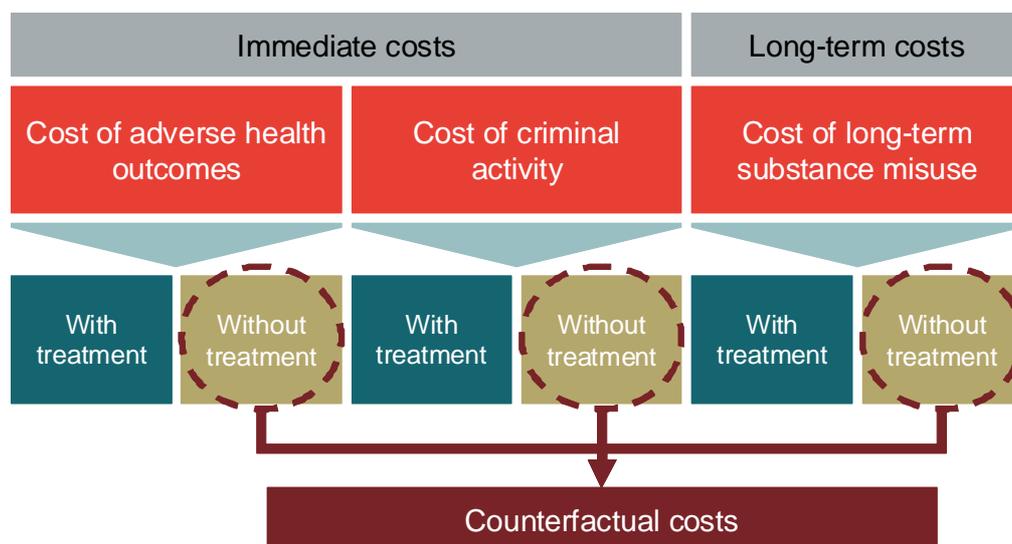
There is also a strong link between education and treatment services, with 19% entering treatment in 2008-09 via the education system. One commissioner stressed the need to train teachers to increase the number of people who are referred into specialist treatment services. One local commissioner provided a comparison of those entering treatment via the YOTs, and those entering treatment via Education Link. In this one local area, the evidence suggested that whilst types of drug use were similar across referral routes, young people entering treatment via Education Link tended to be younger than young people entering treatment via YOTs. Furthermore, there were fewer unplanned exits and a far lower proportion of re-referrals into treatment for those entering through Education Link rather than through YOTs.

The conclusion that can be drawn in this particular local area is that young people entering treatment through the criminal justice system tend to be older drug users, who are more likely to drop out or return for further treatment. However, it is not clear how this description of referral routes compares to the national picture and we should be cautious when interpreting this result.

## 5 The counterfactual

Drug and alcohol misuse imposes economic and social costs both on substance users, their families and on society as a whole. These costs include the costs of crime, poor health, premature deaths, poor educational and employment outcomes and so on. Specialist treatment is expected to reduce young people's substance misuse and therefore to avert some of these costs. Our objective is to estimate this reduction in the economic and social costs due to the YP specialist treatment. However, before we can do that we need to understand what would have happened in the absence of treatment, i.e. to assess the total costs that the young people who are currently in treatment would have imposed on society if not treated. These costs are called the counterfactual costs and are highlighted in **Figure 2**.

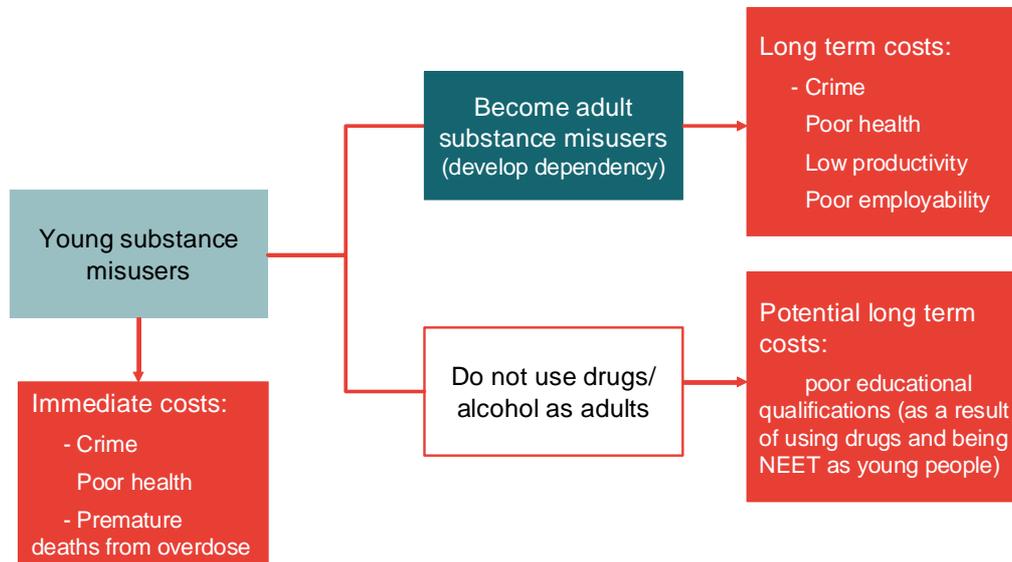
**Figure 2.** The counterfactual cost of young people's drug and alcohol misuse



To establish an appropriate counterfactual for young people in the absence of treatment, we have drawn upon a combination of previously published literature and reports, survey evidence, and evidence from the NDTMS/TOP data.

We split the counterfactual costs into (i) immediate costs and (ii) long-term costs, as illustrated by **Figure 3** below.

**Figure 3.** Counterfactual costs: immediate and long term



Source: Frontier Economics

**Immediate costs** include:

- the costs of crime committed by young substance misusers in any given year; and
- the NHS costs associated with treatment of drug and alcohol-related conditions affecting young people (such as alcohol poisoning and drug overdose).

**Long-term costs** are incurred if young substance misusers become problematic drug users (PDUs) or problematic alcohol users as adults. If this happens, the costs imposed on society are likely to increase further as adult PDUs and problematic alcohol users tend to commit more frequent and serious crimes, impose higher costs on the NHS, have high unemployment rates and poor educational attainment.

There exist several studies estimating the long-term costs associated with adult substance misuse. However, one needs to be careful when applying these estimates in the context of young people's CBA as not all young people who abuse drugs as teenagers would necessarily become adult PDUs or problematic alcohol users.

In order to understand what proportion of young people are likely to develop adult substance misuse problems, we look at the literature exploring patterns of drug and alcohol misuse over time. This is discussed in detail in Section 5.2.3. The general conclusion seems to be that between 30% and 40% of

## The counterfactual

moderate/heavy teenage alcohol and cannabis users would develop adult substance misuse problems while the remaining 60%-70% would experience natural remission (even if not treated). The proportion is however higher for teenage Class A drug users (up to 95% of teenage Class A drug users continue to use drugs in adulthood).

We combine these proportions (probabilities) with the unit costs of adult substance misuse to estimate the expected long-term counterfactual costs that are likely to be incurred in the absence of treatment.

Finally, those young people who do not become PDUs or problematic alcohol users as adults might still incur long term costs. Indeed, young substance misusers are more likely to be NEET (not in education, employment or training) and leave school without qualifications (discussed in detail below). This may affect their whole working life, resulting in lower wages and poorer employment prospects.

Below we explain how we calculate immediate counterfactual costs and the long term counterfactual costs in more detail.

## 5.1 Immediate costs

We identify two types of immediate counterfactual costs associated with young people's substance misuse. These are the cost of crime committed by young substance misusers and the NHS costs associated with treatment of drug and alcohol-related conditions affecting young people (such as alcohol poisoning and drug overdose). Clearly, there are various other problems associated with drug-taking, e.g. truancy and broken families. These problems also impose economic and social costs on young people, their families and society. However, some of these costs are difficult to quantify (e.g. strained family relationships), while others are better classified as long-term costs (e.g. truancy, which is likely to lead to poor educational outcomes and low employability, which means lost output and earnings over individuals' working life). These latter costs are likely to be significant and are taken into account in our estimates of the long-term counterfactual costs.

It is likely that young people's substance misuse contributes to further costs, including those associated with children's services, and particularly the costs of being taken into care. However, it was not possible to isolate the proportion of these costs attributable to substance misuse and so these were not factored into the overall cost figures. Throughout the report we have taken a cautious approach to constructing cost and benefit figures to ensure that the final calculations provide a robust lower estimate of any projected savings.

### 5.1.1 Crime

To estimate the cost to the criminal justice system in the counterfactual, we have used data from the NDTMS Treatment Outcomes Profile. TOP data records the number of crimes committed by young people when they enter and when they leave treatment. In this report, we have used the amount of crime committed by young people *entering* treatment as a proxy for the level of criminal activity by young people *in the absence* of treatment (i.e. the counterfactual).

There are two points to note in relation to the TOP crime data. First, offending behaviour in the TOP is self-reported. As a result, we may underestimate both the frequency and the prevalence of offending by young people. Our estimates of the cost of crime presented below can therefore be thought of as a conservative estimate. Second, the TOP data only covers 16 and 17 year olds in treatment. However, as outlined in section 3.2.3, the pattern of offending amongst 16-17 year olds is broadly similar to the pattern of offending across all 10-17 year olds. Offending in the TOP data can therefore be considered broadly representative of offending by all young people receiving specialist treatment.

A summary of the immediate counterfactual cost to the criminal justice system of crime committed by young people in the absence of treatment is given in **Table 15**.

**Table 15.** Immediate costs of crime in the counterfactual

Type of crime	Year 1	Year 2 (discounted)	Total
Shoplifting	£18.4m	£17.8m	£36.1m
Assault	£57.6m	£55.7m	£113.3m
Theft	£22.2m	£21.4m	£43.6m
<b>Total</b>	<b>£98.2m</b>	<b>£94.9m</b>	<b>£193.0m</b>

Source: Frontier analysis

The following sections explain how the immediate cost of crime in the counterfactual has been calculated.

## The counterfactual

### *Number of crimes committed by young people in the counterfactual*

Certain types of crime are more closely linked to substance misuse than others<sup>38</sup>. The TOP data we have received records information on three types of drug-related crime committed by young people<sup>39</sup>.

- The number of days in the past 28 days that they had committed a **shoplifting** offence.
- Whether or not they had committed an **assault** in the past 28 days.
- Whether or not they had committed a **theft** in the past 28 days.

Using this, we can estimate the annual number of crimes committed per person in the counterfactual for each of these three types of crime.<sup>40</sup> Since young people on average enter treatment aged 16<sup>41</sup>, we have modelled the number of crimes they would have committed in the absence of treatment over a period of two years until they turn 18. After this point, any crimes they commit will be captured in our estimates of the cost of adult drug misuse.

#### *Shoplifting*

Responses to the question on the frequency of shoplifting and drug selling are recorded as either: 0 days; 1-9 days; or 10+ days; or not answered. Around 7% of young people did not answer the question on their shoplifting behaviour. 1.5% of young people said that they had shoplifted on 10 or more days in the last month. A further 4.3% admitted shoplifting on 1-9 days. The level of shoplifting did vary according to the primary drug that young people were receiving treatment for, as shown in **Figure 4**.

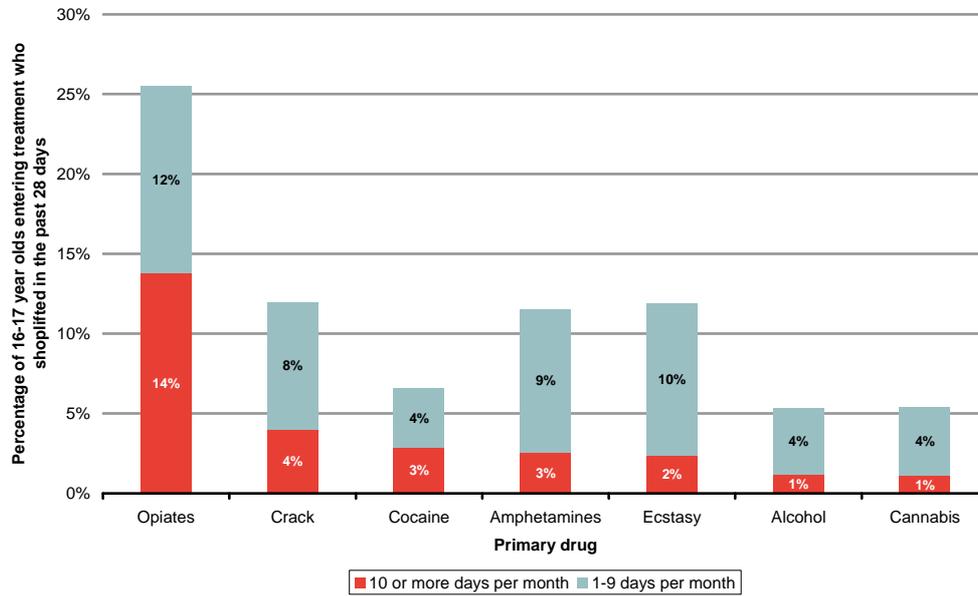
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<sup>38</sup> For example, see UK Drug Policy Commission (2007) “An Analysis of UK Drug Policy: A Monograph Prepared for the UK Drug Policy Commission”

<sup>39</sup> TOP data also records information on the amount of drug selling carried out by young people in the past 28 days. The Home Office however describes selling drugs as a “victimless crime”, and does not measure the economic and social costs associated with it. We have therefore not assigned a cost to drug selling, and have not included drug selling crimes in our analysis.

<sup>40</sup> The questions in the TOP data ask about criminal behaviour in the past 28 days. To convert this to an annual figure, we have multiplied the total crime committed by 12 months. This assumes that the extent of offending reported by young people immediately prior to entering treatment would remain constant throughout the year, in the absence of specialist treatment.

<sup>41</sup> See **Table 12**.

**Figure 4.** Shoplifting by young people entering treatment - by primary drug

Source: TOP data on 16-17 year olds entering treatment in 2008-09

Note: The percentages reported above exclude those who did not answer the question on their shoplifting behaviour

Young opiate users were far more likely to shoplift than users of other drugs, and did so more frequently, with 14% shoplifting on 10 or more days in the last month. On the other hand, only 1% of alcohol and cannabis users shoplifted more than 10 times in the month before they entered treatment.

To calculate the number of shoplifting offences in the counterfactual, we first calculate the weighted average number of shoplifting days in the past 28 days. Then, combining this with the total number of young people in treatment in 2008-09, we can calculate the expected total number of shoplifting offences that would have been committed by our sample over the next two years in the absence of treatment. This is shown in **Table 16**.

## The counterfactual

**Table 16.** Shoplifting by young people entering treatment

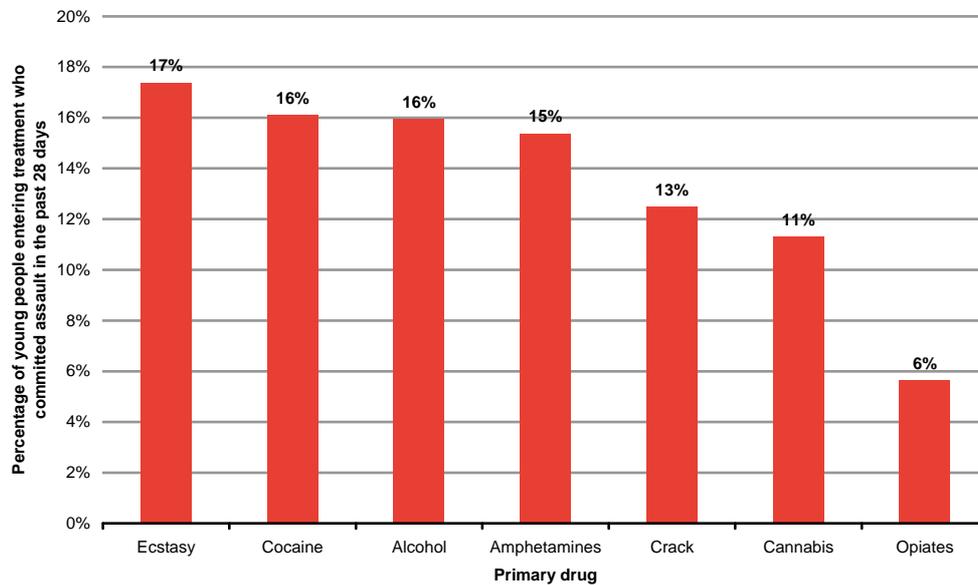
Primary drug	Average number of shoplifting offences per person per month	Number of people treated in 2008-09*	Number of shoplifting offences per month	Number of shoplifting offences per year
Opiates	3.21	552	1,770	21,242
Crack	1.16	111	129	1,545
Cocaine	0.73	752	548	6,581
Amphetamines	0.94	231	216	2,595
Ecstasy	0.93	212	197	2,361
Cannabis	0.42	12,757	5,377	64,522
Alcohol	0.43	8,879	3,844	46,126
<b>Total</b>	<b>0.51</b>	<b>23,494</b>	<b>12,081</b>	<b>144,973</b>

Source: Frontier analysis of NTA data

Note: \* The figures for the number of people treated given here do not match the figures given in **Table 10**. This is because we have scaled up the number of young people treated proportionally to include young people in treatment where a primary drug was not recorded.

### *Assault*

7% of those asked whether they had committed an assault in the past 28 days refused to answer. 12% said that they had committed an assault, and the remaining 81% said that they had not done so in the past month. The level of crime again varied depending on the primary drug, with a larger proportion of alcohol users reporting that they had committed an assault than cannabis or opiates users, as shown in **Figure 5**.

**Figure 5.** Assault by young people entering treatment - by primary drug

Source: TOP data on 16-17 year olds entering treatment in 2008-09

Note: The percentages reported above exclude those who did not answer the question on assaults

The data on theft and assault only reports whether or not a young person has committed the crime in the past month – it does not set out whether this has happened more than once. To be conservative, we have assumed that if a young person committed an assault in the past month, they did so only once. Our estimates of the number of assaults and theft may therefore understate the true amount of crime committed by these young people.

The estimated number of assaults committed by young people in the counterfactual over a period of two years is shown in **Table 17**

## The counterfactual

**Table 17.** Assault by young people entering treatment

Primary drug	Percentage who committed assault in the past 28 days	Number of people treated in 2008-09*	Number of assaults per month	Number of assaults per year
Opiates	5%	552	29	351
Crack	12%	111	13	160
Cocaine	15%	752	112	1,343
Amphetamines	15%	231	34	411
Ecstasy	17%	212	35	424
Cannabis	10%	12,757	1,333	15,996
Alcohol	15%	8,879	1,331	15,977
<b>Total</b>	<b>12%</b>	<b>23,494</b>	<b>2,888</b>	<b>34,662</b>

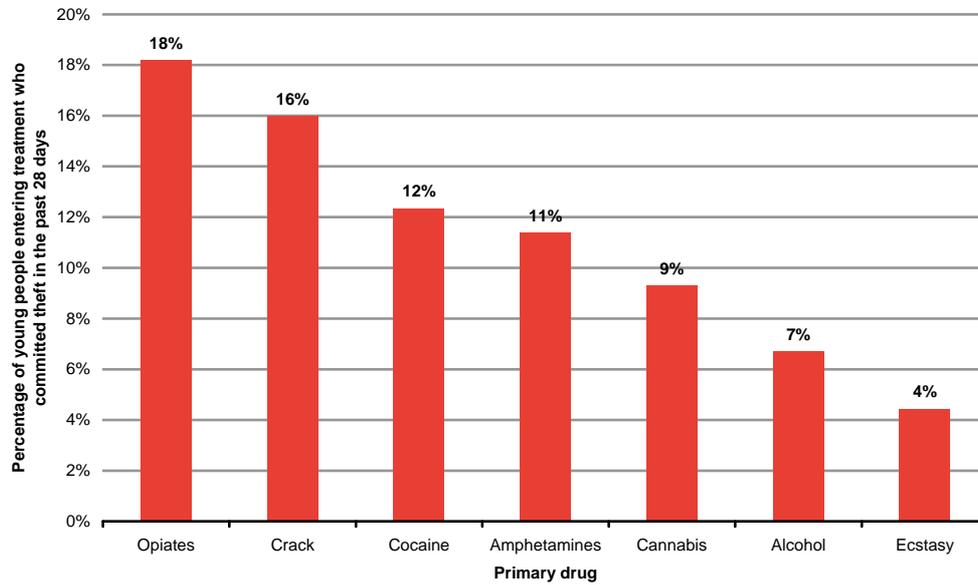
Source: Frontier analysis of NTA data

Note: \* The figures for the number of people treated given here do not match the figures given in **Table 10**. This is because we have scaled up the number of young people treated proportionally to include young people in treatment where a primary drug was not recorded.

### *Theft*

8% of those asked said that they had committed a theft in the past 28 days. 85% said that they had not, and 6% refused to answer. Young people treated primarily for opiate or crack use typically committed more theft than young people treated for cannabis, alcohol, or ecstasy misuse, as shown in **Figure 6**.

**Figure 6.** Assault by young people entering treatment - by primary drug



Source: TOP data on 16-17 year olds entering treatment in 2008-09

Note: The percentages reported above exclude those who did not answer the question on theft

The estimated number of thefts committed in the counterfactual is shown in **Table 17**.

The counterfactual

**Table 18.** Theft by young people entering treatment

Primary drug	Percentage who committed theft in the past 28 days	Number of people treated in 2008-09*	Number of thefts per month	Number of thefts per year
Opiates	17%	552	95	1,141
Crack	16%	111	18	213
Cocaine	11%	752	86	1,033
Amphetamines	11%	231	26	308
Ecstasy	4%	212	9	106
Cannabis	9%	12,757	1,101	13,212
Alcohol	6%	8,879	561	6,730
<b>Total</b>	<b>8%</b>	<b>23,494</b>	<b>1,895</b>	<b>22,743</b>

Source: Frontier analysis of NTA data

Note: \* The figures for the number of people treated given here do not match the figures given in **Table 10**. This is because we have scaled up the number of young people treated proportionally to include young people in treatment where a primary drug was not recorded.

### *Unit costs of crime*

Estimates of the economic and social cost of different types of crime are set out in two reports by the Home Office. These cost estimates all include three elements:

- costs *in anticipation* of crime (defensive expenditure, insurance administration);
- costs *as a consequence* of crime (including the physical and emotional impact on victims, value of property stolen/damaged, lost output and health services); and
- costs *in response* to crime (criminal justice system costs).

These estimates are widely referenced in other cost benefit studies. The estimates are therefore a good and broadly accepted measure of both the economic and social cost to society as a result of these crimes.

We have used these estimates (updated to reflect current prices) in our analysis to place a value on the cost to society of drug-related crimes committed by young

people in the counterfactual. The specific unit cost estimates that we have used in this report are shown in **Table 19**.

**Table 19.** Unit costs of crime

Type of crime	In 1999 prices	In 2003 prices	In 2009 prices
Theft	£600	£844	<b>£974</b>
Common assault	£540	£1,440	<b>£1,663</b>
Theft from a shop	£100	-	<b>£127</b>

Source: Home Office: The economic and social costs of crime against individuals and households 2003/04; The economic and social costs of crime, 2000

Note: Figures in bold reflect the unit cost of crime used in our analysis, updated to reflect 2009 prices using the GDP deflator. Other figures in the table set out the raw data in the Home Office reports used to calculate these unit costs. Where the unit cost of crime is estimated in both the 2000 and 2003/04 reports, unit costs in 2009 are based on the more recent estimate, and the previous estimate is shown in grey.

### *Total cost of crime*

**Table 20** combines the counterfactual number of crimes and the unit cost of these crimes to show the counterfactual cost per year. We estimate the total cost of crime to be £193.0 million over a two year period - £98.2m in the first year and £94.9m in the second year (discounted).

**Table 20.** Immediate annual cost of crime in the counterfactual – by primary drug and type of crime

Primary drug	Number of shoplifting offences	Cost of shoplifting offences	Number of assaults	Cost of assaults	Number of thefts	Cost of thefts	Total cost of offences
Opiates	21,242	£2.7m	351	£0.6m	1,141	£1.1m	£4.4m
Crack	1,545	£0.2m	160	£0.3m	213	£0.2m	£0.7m
Cocaine	6,581	£0.8m	1,343	£2.2m	1,033	£1.0m	£4.1m
Amphetamines	2,595	£0.3m	411	£0.7m	308	£0.3m	£1.3m
Ecstasy	2,361	£0.3m	424	£0.7m	106	£0.1m	£1.1m
Cannabis	64,522	£8.2m	15,996	£26.6m	13,212	£12.9m	£47.7m
Alcohol	46,126	£5.8m	15,977	£26.6m	6,730	£6.6m	£39.0m
<b>Total</b>	<b>144,973</b>	<b>£18.4m</b>	<b>34,662</b>	<b>£57.6m</b>	<b>22,743</b>	<b>£22.2m</b>	<b>£98.2m</b>

Source: Frontier analysis

The estimates of the number of offences in the previous sections are based on the amount of crime committed by young people entering treatment aged 16 and 17. Our approach takes this as a proxy for the level of crime committed by all young people when they enter treatment.

We cannot assess directly using the NDTMS/TOP data how the level of crime committed by young people entering treatment varies by age. However, evidence from the Offending Crime and Justice Survey suggests that the amount of crime committed by young people peaks at age 14-15, after which it declines<sup>42</sup>. The survey also shows that crime committed by 16-17 year olds (the typical age that a young person would enter treatment) is broadly representative of crime committed by all young people. We therefore believe that these estimates provide a reasonable picture of the level of crime committed by young people entering treatment for misuse of drugs or alcohol.

<sup>42</sup> Home Office Statistical Bulletin (2008) “Young people and crime: findings from the 2006 Offending, Crime and Justice Survey”

## 5.1.2 Health

Our estimate of the counterfactual health care costs of young people's drug and alcohol misuse fall into two broad categories:

- the **hospital costs** of young people's drug and alcohol misuse; and
- the cost of **drug related deaths** by young drug and alcohol users.

A summary of the immediate total cost to the health care in the absence of treatment is given in **Table 21**.

**Table 21.** Immediate health care costs

Type of health care cost	Year 1	Year 2	Total
Hospital costs	£0.1m	£0.1m	£0.2m
Drug and alcohol related deaths	£4.2m	£4.1m	£8.2m
<b>Total</b>	<b>£4.3m</b>	<b>£4.2m</b>	<b>£8.4m</b>

Source: Frontier analysis

A large proportion of the immediate health care costs associated with young people's drug and alcohol misuse come from the cost of drug and alcohol related deaths, rather than from hospital costs. Below, we describe in more detail how these estimates have been calculated.

### *Hospital costs*

To estimate the immediate cost of hospital care for young drug and alcohol users in the counterfactual, we have drawn upon data from the NHS Information Centre for Health and Social Care ("IC") and from the DH reference cost database. The IC produces information on the number of drug and alcohol related hospital episodes for young people, and the reference cost database allows us to estimate the associated costs.

### *Number of drug and alcohol related inpatient episodes*

The IC records two types of drug related episodes

- episodes where the primary or secondary diagnosis was of drug related mental health and behavioural disorders; and
- episodes where there was a primary diagnosis of poisoning by drugs.

The number of these episodes for young people in 2008-09 is shown below.

## The counterfactual

**Table 22.** Number of drug related inpatient episodes for young people in 2008-09

Episode type	Number of episodes by people aged 0-16	Number of episodes by people aged 16-24	Estimated number of episodes by young people aged 0-17
Drug related mental health and behavioural disorders (primary or secondary diagnosis)	318	6,721	1,812
Poisoning by drugs (primary diagnosis)	711	2,741	1,320

Source: NHS Information Centre for Health and Social Care

Notes: The estimated number of episodes for young people aged 0-17 is calculated by adding all of the episodes for those aged 0-16 to two ninths of the number of episodes for those aged 16-24.

The total number of drug related inpatient episodes shown above covers all drug and alcohol misusers, not just those who receive treatment. We must therefore estimate the proportion of these hospital admissions accounted for by young people in our sample.

One proxy for this is the proportion of young people with serious drug or alcohol use that are engaged in effective treatment over the course of a year. A potential drawback with this approach is that our sample may be made up of particularly problematic drug and alcohol users who account for more episodes per person than an average drug and alcohol user. If this were true, we would understate the proportion of admissions that are accounted for by our sample. We have therefore only included the most frequent drug and alcohol users in our measure of the total population, so our sample should be broadly representative of these users.

To estimate the proportion of serious young drug users, we have again used information from the NHS IC. We estimate that the number of young people using illicit drugs regularly is approximately 320,000. Regular use for 11-15 year olds is defined as taking drugs at least once a month in the past year. Regular use for 16-17 year olds is defined as taking drugs in the past month. Just 15,000 young people were treated for drug use in 2008-09. Our sample therefore represents approximately 4.7% of all young people regularly using illegal drugs.

Taking this estimate of the proportion of drug related hospital episodes accounted for by our sample, we calculate that there are 85 mental health and behavioural episodes for our sample per year, and 62 drug poisoning episodes for our sample each year.

As we have done when estimating the counterfactual cost of crime, we have assumed that any immediate benefits (such as lower healthcare or crime costs) will last only from the point at which a young person enters treatment (typically age 16), to the point when they turn 18. After this point, any further health care costs will be captured by our estimates of the cost of adult drug use.

Taking this into account, over a two year period our sample will therefore experience:

- 171 drug related mental health and behavioural disorder episodes; and
- 124 drug poisoning episodes.

The IC similarly report alcohol related inpatient episodes by age, although this data is only available for 2007-08. Alcohol related inpatient episodes are grouped according to whether they can be wholly or partly attributed to alcohol misuse. We have taken the conservative approach of only including hospital episodes that can be wholly attributed to alcohol misuse in our study.

**Table 23.** Number of alcohol related inpatient episodes for young people in 2007-08

Episode type	Number of episodes by people aged 0-16	Number of episodes by people aged 16-24	Estimated number of episodes by young people aged 0-17
Alcohol related NHS hospital admissions (wholly attributable to alcohol)	4,700	20,600	9,278

Source: NHS Information Centre for Health and Social Care

Notes: The estimated number of episodes for young people aged 0-17 is calculated by adding all of the episodes for those aged 0-16 to two ninths of the number of episodes for those aged 16-24.

We have carried out a similar exercise to estimate the proportion of alcohol related hospital admissions accounted for by our sample. Again, we first estimate the number of moderate or heavy alcohol users. For young people aged 11-15, we have interpreted this as the number of 11-15 year olds that drank 14 or more units of alcohol in the past week. For those aged 16-17, we have taken the number of 16-17 year olds defined as hazardous or harmful alcohol users (i.e. those with an Alcohol Use Disorders Identification Test “AUDIT” score of more than 8). Using this approach, we estimate that there are around 660,000 young people drinking alcohol in sufficient quantities such that it may result in health problems. The number of young people in our sample treated for alcohol misuse is just 8,799. Our sample therefore represents approximately 1.3% of harmful young alcohol users.

## The counterfactual

Using this estimate, we calculate that our sample accounts for 123 alcohol related NHS hospital admissions that are wholly attributable to alcohol per year, and 246 over a two year period.

### ***Cost per inpatient episode***

The NHS reference cost database in 2008-09<sup>43</sup> presents the national average unit cost for different types of inpatient and outpatient episodes. Young people who misuse drugs and alcohol will typically be admitted for short stay non-elective inpatient procedures. Our cost estimates have therefore been drawn from the “Non-elective Inpatient (Short Stay)” schedule of reference costs.

The drug and alcohol related inpatient episodes described in the previous section are defined according to their disease classifications<sup>44</sup>. However, reference costs contain cost information on the procedures that are carried out. We have therefore tried to match the procedure to the diagnosis to estimate the cost of a typical inpatient episode, as shown in **Table 24**.

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<sup>43</sup>

[http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_111591](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_111591)

<sup>44</sup> More specifically, inpatient episodes are classified according to the International Classification of Diseases (ICD-10) codes.

**Table 24.** Unit cost of drug related inpatient episodes for young people

Type of episode	Matched procedure	Average cost per episode (# of episodes in brackets)
Drug related mental health and behavioural disorders (primary or secondary diagnosis)	Behavioural Disorders with length of stay 1 day or less	<b>£431</b>
Poisoning by drugs (primary diagnosis)	Poisoning, toxic, environmental and unspecified effects with major CC	£389 (2,193)
	Poisoning, toxic, environmental and unspecified effects with intermediate CC	£338 (38,637)
	Poisoning, toxic, environmental and unspecified effects without CC	£329 (44,626)
	<b>Weighted average cost of poisoning</b>	<b>£334</b>

Source: NHS Reference Cost Database 2008-09

Notes: CC in the above definitions stands for "complications and co-morbidities"

Wholly attributable alcohol inpatient episodes cover a range of diagnoses. Across all patients, mental and behavioural disorders due to alcohol account for 65% of NHS hospital admissions. Alcoholic liver disease accounts for 17% of admissions, and the toxic effect of alcohol accounts for 14%. The remaining 4% are for other wholly attributable conditions.

For young people, we assume that they will not be admitted to hospital for liver disease, or for other long-term wholly attributable conditions as they have not typically had the time to become dependent on alcohol. Alcohol related admissions for young people we therefore assume are split between mental and behavioural disorder episodes and toxic effects (i.e. poisoning episodes). Applying the same unit cost estimates as above, we can calculate a weighted average cost per wholly attributable hospital episode for young people.

## The counterfactual

**Table 25.** Unit cost of alcohol related inpatient episodes for young people

Type of episode	Estimated proportion of episodes for young people	Average cost per episode
Mental and behavioural disorders due to use of alcohol	83%	£431
Toxic effect of alcohol	17%	£334
<b>Weighted average cost per episode</b>		<b>£415</b>

Source: NHS Reference Cost Database 2008-09 and NHS Information Centre for Health and Social Care

### *Total cost of drug and alcohol related hospital episodes*

Combining our estimates of the number of drug and alcohol related hospital admissions in the counterfactual with the unit cost of these episodes, we can estimate the immediate annual counterfactual cost of hospital care. This is summarised in **Table 26**.

**Table 26.** Immediate annual cost of drug and alcohol related hospital admissions in the counterfactual

Type of episode	Number of episodes	Total cost
Drug related mental health and behavioural disorders (primary or secondary diagnosis)	85	£36,768
Poisoning by drugs (primary diagnosis)	62	£20,780
Alcohol-related NHS hospital admissions (wholly attributable to alcohol)	123	£50,976
<b>Total</b>		<b>£108,524</b>

Source: Frontier analysis

It is worth noting that these estimates are likely represent a lower bound of the true counterfactual costs as we only include hospital episodes which are wholly attributable to alcohol and drug misuse and because we do not include costs of GP visits (due to a lack of data).

### *Drug and alcohol related deaths*

The Office for National Statistics reported that there were 51 deaths related to drug misuse by those aged less than 20 in 2008. This included deaths from

mental or behavioural disorders due to drug use, accidental and intentional poisoning. There were 4 deaths related to alcohol misuse by those aged under 20 in 2008.

There are a number of important caveats surrounding these estimates on the number of drug and alcohol related deaths by young people. First, this covers deaths by young adults 18 and 19, not just by young people aged less than 18. We may therefore overstate the number of drug and alcohol related deaths for young people. However, it is also reasonable to assume that drug misuse by young people aged less than 18 may have contributed significantly to the death of 18-19 year olds.

Second, it is possible that whilst the use of drugs or alcohol was not directly responsible for the death of an individual, it may have been an important contributory factor. We have taken the conservative approach of not including deaths which could be partly attributed to drug or alcohol misuse in this study.

The estimate of the value of a human life saved used in the Department for Transport's project appraisals in 2007 was £1.64m. In 2009 prices, this becomes £1.71m. This is the value we have assigned to a life saved in our model. The elements of the value of a life are shown below.

**Table 27.** Cost of a life saved

	Lost output	Human costs	Medical and ambulance	Total
In 2007 prices	£556,660	£1,080,760	£970	<b>£1,638,390</b>
In 2009 prices	£581,022	£1,128,060	£1,012	<b>£1,710,094</b>

Source: Department for Transport WebTAG guidance documents; Updated using the GDP deflator

Based on the number of lives lost due to drugs and alcohol in the counterfactual, and the value of a life saved, we can calculate the immediate counterfactual cost of drug and alcohol related deaths for young people. We have again assumed, as we did for hospital health care costs, our sample accounts for just 4.7% of drug-related deaths, and 1.3% of alcohol related deaths by young people. We have also assumed that the number of drug and alcohol deaths is constant per year over the two years. Taken together, the number of drug related deaths we have modelled in the counterfactual is 4.8 (2.4 per year) and the number of alcohol related deaths over the two year period is 0.1 (0.05 per year).

The annual cost of drug related deaths is summarised in **Table 28**

## The counterfactual

**Table 28.** Immediate annual cost of drug and alcohol related deaths

Drug and alcohol related deaths	Number of deaths in the counterfactual	Economic and social cost of deaths
Drug related deaths	2.40	£4.1m
Alcohol related deaths	0.05	£0.1m
<b>Total</b>	<b>2.45</b>	<b>£4.2m</b>

Source: Frontier analysis

## 5.2 Long term costs

### 5.2.1 Costs associated with poor educational qualifications

Young substance misusers are more likely to be NEET (not in education, employment or training) than young people on average. DfE statistics show that only 9% of 16-18 year olds were NEET in 2009<sup>45</sup>. On the other hand, the NDTMS data shows that 45% of the young people in treatment were NEET, suggesting that the problem is more widespread among substance misusers.

The proportion of young people that are NEET varies according to the primary substance for which treatment is being provided. The proportion of young drug users in treatment for opiate and crack use that are NEET is 62% and 55% respectively. The proportion of young drug users in treatment for cannabis and alcohol use that are NEET is similar to the average of 45% across all young people entering treatment in 2008-09.

Being NEET between 16 and 18 years of age leads to poorer educational outcomes and poorer employment prospects later in life. A study by the University of York<sup>46</sup> assesses the long-term costs of being NEET. It estimates that the cost of educational underachievement and poor employment prospects is between £92,000 and £356,000 per person (in NPV terms).

Adjusting for the probability of being NEET among young substance misusers, we find that average incremental long-term counterfactual cost per young person in treatment is between £33,100 and £128,300, with the central estimate of £80,700 (the average between the low and the high estimate). This suggests that

<sup>45</sup> <http://www.education.gov.uk/16to19/participation/neet/a0064101/strategies-for-16-to-18-year-olds-not-in-education-employment-or-training-neet>

<sup>46</sup> “Estimating the life-time cost of NEET; 16-18 year olds not in Education, Employment or Training”, research undertaken for the Audit Commission, University of York, 2010

those young substance misusers who do not develop long-term substance misuse problems may still incur significant long-term costs throughout their working life. This is due to their poorer educational qualifications and poorer resulting employment prospects.

### 5.2.2 Costs associated with developing substance misuse problems

In addition to poor educational outcomes and lower employability, young substance misusers also run the risk of developing substance misuse problems and suffering its long-term consequences as adults. To estimate whether young people who do not receive treatment will develop adult substance misuse problems, we have gone through three steps:

1. Use academic studies and published reports to determine the likelihood that moderate or heavy use as a young person will result in adult substance misuse problems.
2. Use academic studies and published reports to establish the economic and social costs associated with adult substance misuse. More specifically, we look at three types of outcomes – problematic drug use (PDU), non-problematic drug use (non-PDU) and problematic alcohol use – and assess the costs of crime, poor health, premature deaths and low productivity/lost output associated with each of these outcomes.
3. Estimate the number of young people who received treatment in 2008-09 who would have become adult PDUs, non-PDUs or problematic alcohol users in the absence of treatment and the costs associated with these future outcomes.

### 5.2.3 Evidence on long term consequences of young people's substance abuse

#### *Cannabis and alcohol*

There is evidence showing that alcohol and drug misuse by teenagers may lead to adult problematic substance misuse, with frequency of use and age of initiation being among the main factors.

In a longitudinal study conducted by Filmore (1975), 206 respondents were followed up from a large previous study of drinking patterns of 17,000 American college students. The study found that 40% of those, who were identified as problem alcohol users during the college years, also met this criterion in middle age. Filmore concluded that in terms of alcohol misuse, young people experienced an erratic pattern of non-chronic problems with a 50-60 per cent chance of natural remission in men and 70 per cent in women.

### The counterfactual

Bonomo et al. (2004)<sup>47</sup> focus on alcohol dependency only and find that frequent drinking and binge drinking are associated with alcohol dependence in young adulthood. Frequent use increased odds for later dependence at least six fold. The relationship between the frequency of use in adolescence and dependence in adulthood remains significant even if other factors are taken into account. The authors conclude: “*our study demonstrates that the clearest predictor of alcohol dependence in young adults was regular recreational alcohol use in the teens.*”

Patton et al. (2006) surveyed a random sample of young people in the state of Victoria, Australia. The first interview (wave 1) took place when the respondents were 14-15 years old; the last interview (wave 8) took place ten years later. Young people were asked about their consumption of cannabis, alcohol and Class A drugs (both frequency and quantity consumed).

Alcohol and/or cannabis were used by close to 90% of the sample. But only a third progressed to the heavy-usage stage as young adults. The study finds that moderate<sup>48</sup> consumption of cannabis and alcohol in teenage years was positively associated with heavy substance misuse in adulthood. For example:

- 23% of persistent moderate-risk teenage cannabis users were daily cannabis users at wave 8 (age 24-25) and 14% were high-risk alcohol users.
- Similarly, 10% of moderate teenage alcohol users were daily cannabis users and 20% were high-risk alcohol users at wave 8.<sup>49</sup>

*“High-risk cannabis use was also associated with failure in education and training, not being in a relationship and high rates of parenthood. It was also associated with over seven times higher risks of amphetamine and cocaine usage, and higher rates of consultation with drug and alcohol counselling services.”*

These statistics suggests that, in aggregate, 30-37% of moderate teenage substance misusers are likely to become heavy users by the time they reach adulthood. This gives us an estimate for the proportion of young people who might experience drug-related problems later in life if not treated. We expect this to be the lower bound estimate because the teenagers described in this study are moderate users, while those treated by the NTA tend to be heavy users. Therefore, the probability of having drug-related problems later in life for them is likely to be significantly higher.

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<sup>47</sup> “Teenage drinking and the onset of alcohol dependence: a cohort study over seven years”

<sup>48</sup> In this study, moderate alcohol users are defined as males drinking more than 28 units in the last week or females drinking more than 14 units in the last week. Moderate cannabis use is defined as at least weekly use.

<sup>49</sup> In this paper, high risk alcohol use is defined as men (women) drinking in excess of 43 (28) standard drinks

### Class A drugs

There exists a strand of literature developing a so called ‘gateway theory’, which suggests that cannabis is a ‘gateway’ drug whose usage encourages other forms of more serious illicit drug use (Kandel et al., 1986; Kandel, Yamagushi and Chen, 1992; Stenbacka et al., 1993). It appears that while the use of cannabis indeed precedes other drug use, the *causal* relationship is not very strong if other factors are taken into account. Fergusson and Horwood (2000) tested the theory taking into account several other factors, such as parental criminality and drug use, peer group effects, etc. When these characteristics are taken into account, the effect of cannabis use becomes less significant. However, for those who use cannabis 50+ times for at least one year, the effect remains strong, i.e. these young people are more likely to start using other illicit substances (including heroin and crack) than those who do not use cannabis or use it only occasionally.

Unfortunately, this analysis does not go as far as predicting what proportion of teenage cannabis users will become adult PDUs (as oppose to using Class A drugs occasionally). Therefore, it is of limited use for our purposes. Instead, we rely on the literature that focuses specifically on Class A drug users, their drug career progression and the probability of natural remission.

- Hser et al. (2008) analysed the trajectories of heroin, cocaine and methamphetamine use. All people in their sample were persistent users over a ten year period. In the beginning of their drugs career, frequency of use was 8 days per month (for cocaine users), 12 days for meth users and 13 days for heroin users. These figures have increased significantly for heroin users over time (to up to 18 days per month). Primary drug type was strongly associated with future trajectory, with heroin users most likely to be in the High Use group and cocaine and meth users most likely to be in the Moderate Use group. Only 5% stopped using drugs after 3-5 years. For 95% average consumption either increased or remained stable over the ten year period. This is despite the fact that some of these drug users received treatment.

This statistics confirms that Class A drug users exhibit very persistent consumption patterns and that few users experience natural remission.

#### 5.2.4 Implications for our counterfactual analysis

The young people treated by the NTA can be split into three main categories based on primary substance:

- heroin and crack users – 2.4% of the sample;
- mainly alcohol users – 36.6% of the sample. These young people may also use other substances, including heroin and crack (1.7%);

### The counterfactual

- mainly cannabis users, but also other drugs, such as cocaine, ecstasy and amphetamines – 60.3% of the sample. Some of these young people use multiple substances, including heroin and crack (1.7%).

For each of these groups, we combine the statistics on primary substance with the probabilities from the literature that these young people would become PDUs (problematic users of heroin and crack), problematic alcohol users or heavy users of cannabis (non-PDUs) as adults. This is presented in **Table 29** below.

**Table 29.** Probabilities of future adverse outcomes in the absence of treatment

Main substance	% of the sample	Probability of becoming ...		
		PDUs	Non PDUs	Problematic alcohol users
<b>Heroin and crack users</b>	2.4%	95%		
<b>Alcohol users</b>	36.6%	1%	10%	20%-40%
<b>Cannabis and other drug users</b>	60.3%	1%	23%	14%

Source: Frontier analysis based on the NDTMS/TOP, Hser et al. (2008), Filmore (1975) and Patton et al. (2006)

The interpretation of this table is as follows:

- 2.4% of the young people in our sample are treated for heroin and crack misuse. According to Hser et al. (2008), almost all these young people (95%) are expected to become adult PDUs if not treated. It is possible that the remaining 5% would have problems with alcohol or other drugs. However, in the absence of strong evidence on this, we do not take this possibility into account in our quantitative analysis (hence, our estimates of the counterfactual costs are conservative).
- 37% of the sample misuse alcohol. According to Filmore (1975) and Patton (2006), between 20% and 40% of these young people are likely to become problematic alcohol users as adults, if not treated. Moreover, 10% may also become heavy cannabis users (non-PDUs).

Modelling progression from teenage alcohol use to adult problematic drug use is difficult. It requires significantly more information than is currently available in the NDTMS/TOP, i.e. age of initiation into drugs and alcohol, family characteristics, parental criminality and drug use, etc. Our estimate

(1%) is based purely on current use of heroin and crack by this group and may potentially understate the true probability that a teenage alcohol user may become an adult PDU if not treated.

- 60% of the sample misuse cannabis or other drugs (cocaine, ecstasy, amphetamines). According to Patton et al. (2006), 23% of them are likely to continue their career of heavy cannabis use, while 14% are likely to become problematic alcohol users as adults. Transition to PDUs (1%) is based on current consumption of heroin and crack and may potentially understate the risk (i.e. our estimate is conservative).<sup>50</sup>

Overall, we find that between 37% and 44% of the sample are expected to have persistent problems with drug and alcohol if not treated. Below, we establish the costs associated with adult substance misuse.

### 5.2.5 Costs associated with adult substance misuse

There are three types of adult substance misuse that we assign costs to in our model:

- adult alcohol misuse;
- adult problematic drug use; and
- adult non-problematic drug use.

In this report, we do not attempt to calculate bottom-up estimates of the cost of adult substance misuse. Instead, we have drawn upon previously published sources to estimate the lifetime cost of different types of adult substance misuse. This produces a range of potential estimates of the lifetime economic and social cost of problematic drug use (PDU), non-problematic drug use (non-PDU), and problematic alcohol use. As shown in section 6.2, the choice of value within this range can have a significant impact on our results.

Most previous studies estimate the annual cost to society of adult drug and alcohol misuse. This cost can also be expressed as annual cost per substance misuser. Cost estimates are typically broken down into the following categories:

- health and social care costs;
- crime (and criminal justice system) costs;

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<sup>50</sup> Although our model groups cannabis users in the same category as other drug users (including cocaine, ecstasy and amphetamine users), we recognise that there may be differences in the likelihood of developing adult substance misuse problems across these groups. For example, Hser et al. (2008), indicate that young cocaine use will often persist into adulthood. To the extent that cocaine users are more likely than cannabis users to develop adult substance misuse problems, our analysis provides a conservative estimate of the likelihood of escalation. However, this effect is likely to be small given that relatively few young people receive treatment for cocaine use compared to cannabis use.

## The counterfactual

- the cost of lost output; and
- the cost of drug related deaths.

We assume that the substance abuse “career” lasts 20 years (to be consistent with the NTA and DH modelling). We then discount these costs over time using an annual discount rate of 3.5%.

A summary of the lifetime costs of different types of adult substance misuse is given in **Table 30**. To ensure that our estimates are consistent, we report all costs in 2009 prices.

**Table 30.** Lifetime costs of adult substance misuse

Type of adult substance misuse	Study	Annual cost	Discounted lifetime cost	Range of discounted costs
	The Societal Cost of Alcohol Misuse in Scotland for 2007	£16,207	£238,397	
Adult alcohol abuse	Alcohol misuse: How much does it cost? (First estimate)	£11,767	£173,090	£173,090 to £238,397
	Alcohol misuse: How much does it cost? (Second estimate)	£12,737	£187,363	
Adult problematic drug use	The economic and social costs of Class A drug use in England and Wales, 2000 (High estimate)	£61,109	£898,909	£550,388 to £958,848
	The economic and social costs of Class A drug use in England and Wales, 2000 (Medium estimate)	£52,224	£768,214	
	The economic and social costs of Class A drug use in England and Wales, 2000 (Low estimate)	£37,416	£550,388	
	Assessing the scale and impact of illicit drug markets in Scotland	£65,184	£958,848	
Adult non-problematic drug use	RAND prevention costs effectiveness study			£21,300 to £45,100

Source: Frontier calculations based on the Home Office and RAND publications

Below, we expand on the evidence and detailed descriptions of the estimated costs of adult problematic and non-problematic drug and alcohol misuse.

### *Adult alcohol abuse*

In this study, we employ a consistent definition of adult alcohol misuse that includes not only dependent alcohol use, but also a broader group of people who

consume alcohol at harmful levels. Harmful drinking is defined as when a person drinks over the recommended weekly amount and has experienced health problems directly related to alcohol.<sup>51</sup> We do not include adults whose alcohol use may be defined as hazardous, as there is little evidence of the harm caused by this type of alcohol use.<sup>52</sup> The definition used in this report therefore encompasses the majority of alcohol use that leads to physical, social or psychosocial harm. Furthermore, this approach mirrors the definition of problematic alcohol use discussed in section 5.2.3

A Cabinet Office study<sup>53</sup> in 2003 put the annual cost of alcohol misuse in England at £23bn-£26bn (in 2009 prices), which is equivalent to £11,767 - £12,737 per heavy adult alcohol user<sup>54</sup> per year. As shown in **Table 30**, this equates to a discounted lifetime cost over a 20-year period of alcohol abuse of £173,090 (using the low estimate) to £187,363 (using the high estimate).

**Table 31** breaks down the two estimates of the cost of alcohol misuse in England into individual cost categories. The table shows that around two thirds of these costs are associated with crime, including criminal justice costs, prison costs, victim costs, etc. This is to be expected given a strong association between problematic alcohol use and violent crime. The remaining costs (c. 30%) are health care costs (inpatient, outpatient, A&E, GP consultations, etc.) and lost output (due to absenteeism). Adjusting for inflation, the total cost per heavy adult alcohol user in 2009 prices ranges from £11,767 (the low estimate) to £12,737 (the high estimate), leading to the annual costs reported in **Table 30**

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<sup>51</sup> The number of people drinking alcohol at harmful levels is difficult to measure exactly, and the two studies described in this section use the number of men (women) who drink in excess of 43-50 (28-36) units of alcohol per week. as a proxy for the number of harmful adult alcohol users.

<sup>52</sup> See for example “The Societal Cost of Alcohol Misuse in Scotland for 2007”, York Health Economics Consortium, University of York, page 8

<sup>53</sup> Cabinet Office: Alcohol misuse: How much does it cost? September 2003

<sup>54</sup> In this study, heavy adult alcohol use covers men (women) drinking more than 50 (36) units per week. This totalled 1,930,705 in 2000-01.

## The counterfactual

**Table 31.** The economic and social cost of adult alcohol abuse in England

Cost category	First estimate	Second estimate	Total cost per heavy alcohol user (First estimate)	Total cost per heavy alcohol user (Second estimate)
<b>Health care costs</b> (inpatient, outpatient, A&E, ambulatory services, GP consultations, practice nurses, other primary care, dependency drugs and treatment services)	£1,383m	£1,683m	£717	£872
<b>Workplace and wider economy costs</b> (lost productive output due to absenteeism, reduced employment and premature mortality)	£5,194m	£6,421m	£2,690	£3,326
<b>Crime costs</b> (Criminal Justice System costs, property/health and victim services costs, costs in anticipation of crime, crime costs of lost productive output, emotional impact costs, drink-driving costs)	£11,940m	£11,940m	£6,184	£6,184
<b>Total (in 2001 prices)</b>	<b>£18,517m</b>	<b>£20,044m</b>	<b>£9,591</b>	<b>£10,382</b>
<b>Total (in 2009 prices)</b>	<b>£22,719m</b>	<b>£24,592m</b>	<b>£11,767</b>	<b>£12,737</b>

Source: Cabinet Office: Alcohol misuse: How much does it cost? September 2003

A Scottish study<sup>55</sup> in 2007 provided an alternative estimate of the cost of adult alcohol misuse. The contribution of each cost category to this estimate is shown in detail in **Table 32**. Lost output, alcohol-related death and crime account for the majority of the total cost of adult alcohol abuse in Scotland. After adjusting for inflation, this study estimated the cost of alcohol misuse at £3.7bn per year (in 2009 prices). This is equivalent to £16,207 per harmful adult alcohol user<sup>56</sup> per year, which is the annual figure for this study reported in **Table 30**. The total discounted economic and social cost of alcohol misuse per person over a typical 20-year ‘career’ implied by this study is then £238,397.

<sup>55</sup> The Societal Cost of Alcohol Misuse in Scotland for 2007, York Health Economics Consortium, University of York

<sup>56</sup> This report uses the number of men (women) drinking more than 50 (35) units per week as a proxy for the number of harmful adult alcohol users.

**Table 32.** The economic and social cost of adult alcohol misuse in Scotland

Cost category	Annual cost (mid point)	Annual cost per harmful adult alcohol user
<b>Health</b> (GP and practice nurse, Community Psychiatric Team, community prescribed drugs, laboratory tests, inpatients, A&E, outpatients, day cases, ambulance journeys, alcohol services)	£268m	£1,169
<b>Social care</b> (children and families, criminal justice, care homes, Children's Hearing System)	£231m	£1,007
<b>Crime</b> (costs in anticipation of crime, costs as a consequence of crime, costs in response to crime)	£727m	£3,175
<b>Lost productive capacity</b> (presenteeism, absenteeism, lost productive capacity due to unemployment, premature mortality)	£866m	£3,780
<b>Wider social costs</b> (wider costs of premature mortality, i.e. non-paid work, intangible human costs of alcohol-related death)	£1,465m	£6,396
<b>Total (in 2007 prices)</b>	<b>£3,556m</b>	<b>£15,527</b>
<b>Total (in 2009 prices)</b>	<b>£3,711m</b>	<b>£16,207</b>

Source: The Societal Cost of Alcohol Misuse in Scotland for 2007, York Health Economics Consortium, University of York

These two studies provide a range of estimates for the discounted cost per person of a career of adult alcohol abuse. As summarised in **Table 30**, these annual cost estimates range from £173,090 - £238,397 per adult alcohol misuser over a 20 year 'career'.

### *Problematic drug use*

A Home Office commissioned study<sup>57</sup> put the cost of problematic Class A drug use at £29,616-£53,309 per user per year (in 2009 prices). As shown in **Table 33**, two thirds of these costs are the costs of crime, including criminal justice costs, prison costs, victim costs, etc. These estimates also include health care costs and costs associated with caring for children of PDUs.

<sup>57</sup> The economic and social costs of Class A drug use in England and Wales, 2000

## The counterfactual

**Table 33.** The economic and social cost of adult problematic Class A drug use

	Annual cost per problem Class A drug user		
	Low estimate	Medium estimate	High estimate
Health costs (primary care, A&E, inpatients, mental health, drug-related deaths, neonatal services)	£2,651	£3,977	£4,772
Crime costs (arrest costs, custody costs, criminal justice costs, prison costs, victim costs)	£20,861	£31,291	£37,550
Other social costs (caring for children in need)	£125	£187	£224
<b>Total (in 2000 prices)</b>	<b>£23,637</b>	<b>£35,455</b>	<b>£42,546</b>
<b>Total (in 2009 prices)</b>	<b>£29,616</b>	<b>£44,424</b>	<b>£53,309</b>

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

The Home Office study does not estimate lost output due to problematic drug use. However, the study does report that 81% of PDUs were unemployed prior to being admitted for treatment (vs. 5.5% for the population as a whole in 2000). Based on these statistics, we estimate lost output to be £7,800 per person per year (under a conservative assumption that if employed, PDUs would earn the minimum wage). Adding this to the health, crime and other social cost of problematic drug use in **Table 33**, the total annual economic and social cost of PDUs increases to £37,416 - £61,109 per person, depending on whether the high, medium, or low cost estimate is used.

A 2009 Scottish study also estimated the annual cost to society per problem drug user. This study did include the cost of lost output, as well as health, crime and other social costs. This resulting cost per problem drug user was estimated at £65,184 per year (in 2009 prices), higher than the England and Wales study and therefore representing the upper bound in the lifetime cost of adult problematic drug use.

These annual costs are equivalent to £550,388 - £958,848 over a 20 year drug career, depending on the study and estimate used. These figures are broadly consistent with NICE estimates of the lifetime crime cost (£445,000) and healthcare cost (£35,000) for injecting drug users, which in turn have been used in recent work carried out by the NTA in their analysis of the costs of adult problematic drug use<sup>58</sup>. Whilst the estimates used by the NTA are at the lower end of our range of lifetime costs, there are other costs included **Table 33** not

<sup>58</sup> NICE (2009) "Costing statement: Needle and syringe programmes"

captured by the NTA work, which would tend to bring these cost estimates more in line with each other.

### *Non-problematic adult drug use*

We are unaware of any research into the costs of non-problematic drug use conducted in the UK. In our work we rely on a study of cost-effectiveness of school-based prevention programs in the US.<sup>59</sup> This study focuses on cocaine users and estimates that total costs associated with cocaine consumption in 1999 were \$27 billion, including the costs of crime, health and reduced productivity.<sup>60</sup>

It is assumed that these costs are broadly proportional to cocaine consumption. Life-long consumption per person is estimated to be between 225 gm and 475 gm. This corresponds to \$32,000 - \$67,600<sup>61</sup> or £21,300 - £45,100 (in 2009 prices).

Costs of non-problematic drug use appear to be significantly lower than the costs associated with problematic drug use and problematic alcohol use. This makes intuitive sense given that PDUs and problematic alcohol users are more likely to be involved in violent crimes and are more likely to have serious health problems (including dying prematurely).

To summarise, our estimates of the lifetime costs of adult substance misuse are as follows:

- £173,090 - £238,397 for adult problematic alcohol users;
- £550,388 - £958,848 for PDUs; and
- £21,300 - £45,100 for non-PDUs.

### 5.2.6 Estimates of long-term costs associated with young people's substance misuse

We now combine the lifetime costs of adult substance misuse (discussed above) with the probabilities that young people currently in treatment would have become adult problematic and non-problematic drug users in the absence of treatment (presented in Section 5.2.4). The results of the counterfactual cost calculations are presented in **Table 34** below.

Total counterfactual costs are estimated to be between £1.1 billion and £2.2 billion. These are estimated as:

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<sup>59</sup> "An ounce of prevention: a pound of uncertainty", RAND, 1999

<sup>60</sup> We do not include any additional costs of being NEET in this case, as lower productivity and earnings potential has already been taken into account in these estimates of the cost of non-problematic drug use.

<sup>61</sup> Economic and social costs associated with consumption of one ton of cocaine are estimated to be \$93 million (in 1992 prices).

## The counterfactual

$$N * \sum_{i,j} (\alpha_i * \beta_{ij} * Cost_j),$$

where N=24,053 (the number of young people in treatment),

$\alpha_i$  - shares of the sample according to the primary substance  $i$  (heroin & crack, alcohol, cannabis),

$\beta_{ij}$  - probability of a future outcome  $j$  (PDU, non-PDU, problematic alcohol use) based on primary substance  $i$ ;

$Cost_j$  - lifetime cost of being PDU, non-PDU, problematic alcohol user.

**Table 34.** Total counterfactual costs

Main substance	% of the sample	Probability of becoming ...		
		PDU	Non PDU	Problematic alcohol user
<b>Class A drug users</b>	2%	95%		
<b>Alcohol users</b>	37%	1%	10%	20%-40%
<b>Cannabis and other drugs</b>	60%	1%	23%	14%
<b>Unit life-time costs</b>		£550,388 – £958,848	£21,300 – £45,100	£173,090 – £238,397
<b>Total counterfactual costs</b>		£1.1 billion - £2.2 billion		
<b>Total counterfactual costs (per person)</b>		£46,145 - £91,964		

Source: Frontier analysis based on the NDTMS/TOP, Hser et al. (2008), Filmore (1975) and Patton et al. (2006)

These costs are equivalent to £46,145 - £91,964 per person. It is worth noting that these average costs are lower than the unit costs of being a PDU or a problematic alcohol user. This is because some young people (between 56% and 64% of the sample) are expected to experience natural remission ('grow out' of their habit) and, therefore, not incur these costs in the future. In addition, 17.5% of the sample are expected to become non-PDUs (if not treated), with the costs of non-PDU being somewhat lower – between £21,300 and £45,100 over a 20 year period.

In section 6 below, we estimate the extent to which these costs can be reduced as an outcome of the young people's specialist treatment.



## 6 Estimating the benefits of young people's specialist treatment

In this section, we explain how we have measured the impact of treatment on the immediate and long-term costs of young people's drug and alcohol misuse. We then complete the CBA by comparing the costs and benefits of treatment under a range of different assumptions.

### 6.1 Immediate benefits

First, we describe the data we have used to estimate the immediate impact of treatment, and present some important caveats surrounding this data and how it can be used. Second, we summarise what the data shows on the potential impact of treatment on crime and health costs. Finally, we describe the potential uncertainty surrounding these estimates, and discuss the required impact that treatment needs to have on immediate outcomes for it to be cost effective.

#### 6.1.1 Data used to estimate immediate benefits

In 2007, the NTA developed a tool which would help monitor and assess the effectiveness of the national drug and alcohol treatment system, known as the Treatment Outcome Profile ("TOP"). The TOP replaced proxy measures of treatment effectiveness (such as waiting times and treatment retention) with a more focused, outcome-based set of measures on the effectiveness of drug and alcohol treatment. The TOP was initially developed for adult drug treatment, but has subsequently been introduced for 16 and 17 year olds.

TOP data is recorded at key points within an individual's treatment path:

- at the start of treatment;
- every six months from then on; and
- when young people exit treatment.<sup>62</sup>

At each stage, young people are asked a number of questions by treatment workers about their substance use, and other aspects of their behaviour such as crime, health, housing, employment and education. The questions asked in the TOP are presented in detail in Annexe 1. The results are then submitted to the NTA where they are validated and analysed before being fed back to local commissioners and providers.

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<sup>62</sup> For most young people's treatment, the length of time spent in treatment is relatively short. We are therefore only able to compare TOP data when entering treatment, with TOP data when leaving treatment in this study.

To estimate the immediate benefits of treatment in this study, we compare the behaviour of young people before treatment with the behaviour of the same group of young people when they leave treatment. Then, taking behaviour prior to treatment as a proxy for what would have happened in the absence of treatment, we can assess the effectiveness of treatment in changing behaviour.

We have considered the TOP data on young people aged 16-17 who left treatment in the first quarter of 2010/11. There are some important caveats to note before using this data.

- **The data only covers 16-17 year olds in treatment.** TOP data is not collected for young people under 16. A comparison of outcomes before and after treatment should therefore only be applied to 16-17 year olds in our sample. However, although the level of crime may vary by age, we have found no evidence to suggest that the impact of treatment on crime committed by 16-17 year olds will be proportionally different from impact on crime committed by young people under 16. We have therefore chosen to apply the observed reductions in crime to all young people in our sample.
- **The data only covers planned treatment exits.** It is also important to consider unplanned exits by young people from treatment, which accounted for 32% of planned and unplanned exits in 2008-09. There are several assumptions we can make on the benefit for those with unplanned exits from treatment. At the most conservative, we can assume that young people with unplanned exits from treatment will receive no immediate benefit of treatment. However, young people who do not complete treatment may benefit considerably as a result of the treatment they had received up to that point. The least conservative estimate would attribute the same benefits to young people regardless of whether their treatment exit was planned or unplanned. We will model a number of scenarios within this range of impacts.
- **TOP data is not available for everyone.** There were 1,359 16-17 year olds who left treatment over this period. However, before and after TOP data was only recorded in 1,055 cases, or for 78% of treatment exits over the period. Whilst we note that this is not full coverage of those leaving treatment, the sample size remains sufficiently large to give us confidence in the results. We have seen no evidence to suggest that impact of treatment for young people where TOP data before and after was not recorded would be any different.

Despite these limitations, TOP data has a significant advantage over other data sources in that it concentrates solely on a subset of young people who receive treatment. This group is the focus of our study. It is also a direct measure of outcomes, particularly for crime, as it records the level of problematic behaviour

## Estimating the benefits of young people's specialist treatment

directly, rather than by inferring the change in problematic behaviour from other measures of effectiveness. We therefore believe that it is appropriate to use this TOP data to give us an idea of the potential impact of treatment on outcomes for young people.

### 6.1.2 Immediate impact of treatment from TOP data

**Table 35** shows percentage change in crime and drug/ alcohol related health episodes before and after treatment. We use these as a proxy for the treatment's short-term effectiveness.

**Table 35.** Impact of treatment on immediate crime and health costs

Adverse outcome	Percentage reduction for young people in treatment
Level of assaults*	61%
Level of theft*	55%
Amount of shoplifting*	64%
Alcohol related episodes and deaths	39%
Drug related health episodes and deaths	42%

Source: Frontier analysis

Notes: \* Assumes half the reduction in crime for those with unplanned exits compared to those with planned exits.

The way in which these estimates have been calculated is described in more detail below.

#### *Crime*

As we have noted previously, the TOP data on crime reports the following three measures.

- Whether or not the young person had committed an **assault** in the past 28 days.
- Whether or not the young person had committed a **theft** in the past 28 days.
- The number of days in the past 28 days that young people have committed a **shoplifting** offence.

As shown in **Table 36**, 9.2% of 16-17 year olds with a planned treatment exit reported that they had committed an assault in the 28 days prior to entering

treatment. When leaving treatment, just 2.5% of the same group of young people had committed an assault in the past 28 days. For those with a planned treatment exit, this therefore equates to a 73% reduction in the number of assaults over the treatment period. However, planned treatment exits account for 68% of planned and unplanned treatment exits. For the remainder of young people with *unplanned* exits, we have assumed that the reduction in the number of assaults is half the reduction for young people with planned exits (i.e. a 37% reduction)<sup>63</sup>. Estimating a weighted average reduction in the number of assaults across both planned and unplanned treatment exits, the number of assaults for all young people fell by 61% during treatment.<sup>64</sup>

A similar change post-treatment can be observed for the proportion of young people who committed thefts. 6.8% of young people in treatment reported committing theft (not including shoplifting) in the month before entering treatment, compared to 2.4% of young people leaving treatment. For those with a planned treatment exit, this equates to a reduction of 65% when in treatment. Again, assuming that the reduction in the amount of theft committed by young people with unplanned treatment exits is half the reduction seen for those with planned exits; this equates to a 55% reduction in theft across all those in treatment, as shown in **Table 36**.

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<sup>63</sup> Below we consider alternative scenarios – no impact for unplanned exits and the same impact as for planned exits.

<sup>64</sup> Calculated as follows: (68% planned exits x 73% reduction) + (32% unplanned exits x ½ x 73% reduction) = 61% reduction

**Table 36.** TOP data on assaults and thefts pre and post-treatment

	Prior to entering treatment	When leaving treatment	Percentage reduction
<b>Assault</b>	9.2% (143)	3.5% (55)	61%
<i>Planned exits</i>	9.2% (97)	2.5% (26)	73%
<i>Unplanned exits</i>	9.2% (46)	5.8% (29)	37%
<b>Theft</b>	6.8% (106)	3.1% (48)	55%
<i>Planned exits</i>	6.8% (72)	2.4% (25)	65%
<i>Unplanned exits</i>	6.8% (34)	4.6% (23)	33%

Source: Frontier analysis of TOP data

Note: Figures in parenthesis denote the number of people in each group in the TOP data

The TOP data on the level of shoplifting before and after treatment is recorded slightly differently. 5.5% (58 people) aged 16-17 reported engaging in shoplifting in the month before entering treatment. On average, those who did report shoplifting at the start of treatment did so on 5.1 days over the past 28. When leaving treatment, the average number of days of shoplifting for this group had fallen to 1.2. The amount of shoplifting therefore falls by 76% for this group.<sup>65</sup> Assuming for unplanned exits that the reduction in the amount of shoplifting is half this (i.e. 38%), the overall reduction in the number of days shoplifting by young people when in treatment is 64%.

It should be noted at this point that not all reductions in crime can be attributed solely to drug and alcohol treatment. Many young people referred from the criminal justice system will continue to be under Youth Offending Team supervision or receive other interventions aimed specifically at tackling their offending. We may therefore overestimate the contribution of treatment to reductions in offending behaviour. However, this should be considered in light

<sup>65</sup> 0.7% of 16-17 year olds (7 people) who were not engaging in shoplifting at the start of treatment did report that they had shoplifted at the end of treatment. This would suggest that treatment has led to an increase in their shoplifting behaviour. However, we would argue that shoplifting by these individuals is likely to be infrequent, and not a direct consequence of the treatment they receive. We have therefore not included these individuals in our analysis of the effectiveness of treatment on criminal behaviour.

of the conservative approach we have taken when estimating the overall levels of offending by young people in treatment.

### *Health*

The TOP records a measure of the health of young people based on a self-reported score from 1-20 covering (i) physical health; and (ii) psychological health. The TOP data before and after treatment shows that for young people with planned exits, the mean self-reported physical health score improved from 13.7 prior to treatment, to 15.4 when leaving treatment, an improvement of 13%. The mean psychological health score increased from 12.5 to 15.3, an improvement of 22%.

The evidence from TOP therefore shows that there is some improvement in health outcomes following treatment. However, it is not possible to translate these improvements in self-reported health scores into a measurable reduction in health care costs.

When we calculate health care costs in the counterfactual, we only include costs which can be wholly attributed to drug or alcohol misuse. It could be argued that the health care costs directly associated with drug and alcohol use fall to zero if a young person leaves treatment free of drug or alcohol use<sup>66</sup>. More generally, it is reasonable to think that the level of these costs relates directly to the extent and frequency of drug and alcohol use.

The TOP data contains two pieces of information on the level of drug use by young people when entering and when leaving treatment. First, the TOP records the proportion of young people using a drug when entering treatment who are abstinent from that drug when they leave treatment. Abstinence is defined as not using the drug in any of the 28 days prior to the interview. Second, the TOP data compares the mean number of days that a drug is used at the start of treatment, with the mean number of days of drug use when leaving treatment.

To measure the proportion of health care costs directly related to drug and alcohol misuse that can be avoided through treatment, our preferred approach is to compare the number of days of use before and after treatment. This will not only capture a change in outcomes for young people who become abstinent, but also captures improvements in outcomes for young people whose substance misuse is significantly reduced.

Alcohol users on average drank on 8 days per month prior to entering treatment. When the same group left treatment, they drank on 4.2 days, a 47% reduction. The extent of the reduction in drug use post-treatment varied widely across drugs, with a greater than 90% reduction in the number of days of opiates or

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<sup>66</sup> This would be true only if there were no persistent effects on the health of an individual from young drug and alcohol use.

amphetamines use, but only a 46% reduction in the number of days of cannabis use. Given that cannabis use was far more common amongst those in treatment, the weighted average reduction in the mean number of days of drug use during treatment was 50%.

Again, we have assumed that reductions in drug use for young people with unplanned exits from treatment were half the size of the reductions for young people with planned exits. Across both planned and unplanned exits, the reduction in days of alcohol use was therefore 39%, and the reduction in days of all other drug use was 42%. If we assume that the number of days of drug and alcohol use is directly proportional to the number of drug and alcohol related illnesses and deaths, then we can model the reduction in health care costs during treatment using these figures.

### 6.1.3 Quantifying the benefit of treatment

If we apply the estimated reductions in crime and health costs summarised in **Table 35**, to the cost of these problems in the counterfactual, this gives an estimate of the potential economic and social cost savings from treatment.

**Table 37.** Central case estimates of the immediate annual net benefit of treatment

Cost area	Counterfactual cost per year	Reduction in cost post-treatment	Net benefit of treatment
Shoplifting	£18.4m	64%	£11.7m
Theft	£22.2m	55%	£12.1m
Assault	£57.6m	61%	£35.4m
<b>Crime total</b>	<b>£98.2m</b>		<b>£59.3m</b>
Drug related mental health and behavioural disorders	£36,768	42%	£15,330
Poisoning by drugs	£20,780	42%	£8,664
Alcohol-related NHS hospital admissions	£50,976	39%	£19,930
<b>Inpatient subtotal</b>	<b>£108,524</b>		<b>£43,923</b>
Drug related deaths	£4.1m	42%	£1.7m
Alcohol related deaths	£0.1m	39%	£0.04m
<b>Drug and alcohol deaths subtotal</b>	<b>£4.2m</b>		<b>£1.7m</b>
<b>Health care total</b>	<b>£4.3m</b>		<b>£1.8m</b>
<b>All immediate benefits (crime plus healthcare)</b>	<b>£102.5m</b>		<b>£61.1m</b>

Source: Frontier analysis

#### 6.1.4 Sensitivities

One assumption we have made that could potentially affect the size of the net benefit of treatment is the level of benefits that we attribute to young people with unplanned exits from treatment. In the previous table, we present our central case estimates based on a reduction in crime and drug use which is half of the reduction observed for young people with planned treatment exits.

The table below shows how the calculated immediate net benefits of treatment change under two extreme scenarios:

### Estimating the benefits of young people's specialist treatment

- first, if we attribute *no improvement* in outcomes to young people with unplanned treatment exits; and
- second, if we attribute *the same improvement* in outcomes to young people with an unplanned treatment exit.

**Table 38.** Immediate annual net benefit of treatment – unplanned treatment exit scenarios

Cost area	No improvement for unplanned exits	Half of the improvement for unplanned exits	The same improvement for unplanned exits
Shoplifting	£9.5m	£11.7m	£14.0m
Theft	£9.8m	£12.1m	£14.5m
Assault	£28.6m	£35.4m	£42.2m
<b>Crime total</b>	<b>£47.9m</b>	<b>£59.3m</b>	<b>£70.6m</b>
Drug related mental health and behavioural disorders	£12,396	£15,330	£18,264
Poisoning by drugs	£7,006	£8,664	£10,332
Alcohol-related NHS hospital admissions	£16,116	£19,930	£23,744
<b>Inpatient subtotal</b>	<b>£35,517</b>	<b>£43,923</b>	<b>£52,329</b>
Drug related deaths	£1.4m	£1.7m	£2.0m
Alcohol related deaths	£0.03m	£0.04m	£0.04m
<b>Drug and alcohol deaths subtotal</b>	<b>£1.4m</b>	<b>£1.7m</b>	<b>£2.1m</b>
<b>Health care total</b>	<b>£1.4m</b>	<b>£1.8m</b>	<b>£2.1m</b>
<b>All immediate benefits (crime plus healthcare)</b>	<b>£49.4m</b>	<b>£61.1m</b>	<b>£72.8m</b>

Source: Frontier analysis

The range of annual net benefits from changing this assumption is therefore relatively large, ranging from £49.4m to £72.8m, with a central case estimate of £61.1m. However, even under the most conservative assumption, the immediate

net benefit of treatment is roughly equal to the annual amount spent on drug and alcohol treatment for young people.

### 6.1.5 Required reductions for treatment to be cost effective

As shown in **Table 37**, our central case estimate of the immediate benefits of treatment is an annual cost saving of £61.1m. Over the two year period for which we estimate immediate benefits, the discounted net present value of these savings is £120.1m. In comparison, the amount spent on young people's treatment in 2008-09 was £62.2m. Overall, the immediate benefits of young people's treatment, even without taking into account the potential long-term benefits of treatment, is almost double the total annual treatment costs.

The majority of these immediate benefits come from reductions in the amount of crime committed by young people following treatment. £59.3m of the £61.1m of savings, or 97% of savings come from reductions in the amount of theft, shoplifting and assault committed by young people who misuse drugs and alcohol.

One question which may be of interest to policy makers and treatment providers is "what is the minimum reduction in the amount crime committed by young people in treatment in order for the treatment to be cost effective?" This question does not include the potential immediate benefits from lower health care costs, or the long term benefits of treatment.

The table below shows that a 32% reduction in all types of crime committed by young people in treatment is required in order for the treatment provided to be cost effective over a two year period, even without taking into account the size of any long term benefits. As described earlier in this chapter, TOP data indicates a 50-65% reduction in the amount of crime committed compared to pre-treatment levels. Given this observed reduction, a 32% reduction in the amount of crime committed post-treatment appears achievable.

**Table 39.** Immediate net benefit of treatment with a 32% reduction in all types of crime

Cost area	Net benefit in year 1	Net benefit in year 2	Total net benefit
Shoplifting	£5.9m	£5.7m	£11.6m
Theft	£7.1m	£6.9m	£14.0m
Assault	£18.6m	£17.9m	£36.5m
<b>Crime total</b>	<b>£31.6m</b>	<b>£30.6m</b>	<b>£62.2m</b>

Source: Frontier analysis

## 6.2 Long term benefits

Unlike the immediate benefits of treatment, the long-term benefits are very difficult to assess. The NDTMS/TOP data includes information on a range of outcomes immediately after treatment, such as substance use, education and employment, crime and health (discussed in detail above). These immediate impacts, however, cannot be easily ‘translated’ into long-term effects, as some of those who stop using drugs immediately after treatment may relapse in a few months (or a few years), and incur the long-term costs associated with adult substance misuse.

The same generally applies to most existing studies on treatment effectiveness, i.e. they focus on the immediate impacts (up to 12 months after treatment). Some prevention studies<sup>67</sup> looked at the long-term effects of prevention. These studies, however, are fundamentally different as they assess the impact of a delay in drug initiation rather than the impact of young people’s treatment on the likelihood of persistent drug-related problems in adulthood.

### 6.2.1 Re-presentation rates

One potential way of assessing the long-term effectiveness of treatment is to use ‘re-presentation’ rates, i.e. to look at the number of people who require a repeated treatment some time after their first treatment. This is the approach used by the NTA in the cost-benefits analysis of adult drug treatment. It is assumed that those who do not re-present (either voluntarily or through the Criminal Justice System) have recovered.

<sup>67</sup> See for example “An ounce of prevention: a pound of uncertainty: the cost-effectiveness of school-based drug prevention programs”, RAND, 1999

The re-presentation rates for adults is around 50% (41% for those who exit treatment in a planned way compared to 53% for those who leave before treatment is completed). In comparison, the re-presentation rates for young people four years after treatment are:

- 40% for heroin or crack users<sup>68</sup>;
- 16% for alcohol users;
- 17% for cannabis users.

The re-presentation rates for young Class A drug users are comparable to adult PDU re-presentation rates, while the rates for young alcohol and cannabis users are significantly lower – 16%-17%. This is to be expected given that these young people, in most cases, have not yet developed substance dependency.

We can use these re-presentation rates to assess treatment's effectiveness, i.e. we can compare them against long-term substance misuse rates expected without treatment - 37%-44% (discussed in Section 5.2.4). Clearly, the re-presentation rates compare favourably, indicating that the treatment is effective for many young people.

However, we need to exercise caution when using these re-presentation rates as a proxy for the treatment's effectiveness. Indeed, they are likely to represent an upper bound on treatment effectiveness, with the actual effectiveness being potentially somewhat lower. This is because some young people may relapse after the period covered by the re-presentation data. Others may have developed problematic drug or alcohol use again, but without re-accessing treatment. Therefore, in our hypothetical scenarios below, we use slightly lower effectiveness rates - 7% and 10% - than those suggested by the 4 year re-presentation rates (20%).

### 6.2.2 Long-term benefits: break-even scenario

In the absence of concrete evidence on long-term effectiveness of young people's treatment, we adopt a scenario-based approach. First, we estimate a reduction in the long-term counterfactual costs needed in order for the benefits to counteract the costs. This scenario is presented in **Table 40** below.

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<sup>68</sup> If we were instead to consider a broader group of drugs including heroin, crack, cocaine, amphetamines and ecstasy, the re-presentation rate for young people falls to 28%. This indicates that re-presentation amongst those using cocaine, amphetamines or ecstasy is lower than for heroin or crack. users.

**Table 40.** Cost-benefit analysis: break even scenario

	Lower bound	Upper bound
<b>Long term counterfactual costs</b>	£1,100m	£2,200m
<b>Cost of treatment</b>	£62.2m	£62.2m
<b>Reduction in counterfactual costs required to break even</b>	5.6%	2.8%

Source: Frontier Economics

We find that the long-term counterfactual costs need to be reduced by 2.8% (using the upper bound cost estimate) or by 5.6% (using the lower bound cost estimate) in order to generate the £62.2m of savings required to break even. It should be noted that this is the required reduction assuming no immediate benefit of treatment, which in practice will not be the case.

The long-term counterfactual costs were estimated in Section 5.2. There we discussed that only a proportion of young people (37%-44%) are expected to incur these costs<sup>69</sup>. Therefore, when we estimate the number of people whose long-term drug taking careers are averted as a result of treatment, we need to keep in mind that 56%-63% of these young people are expected to have remission even without treatment.

If the number of young people who are expected to become problematic adult drug or alcohol users reduced by 298 (using the high counterfactual cost estimate) or by 499 (using the low counterfactual cost estimate), this would deliver sufficient benefits to counteract the costs of treatment.<sup>70</sup> This is in addition to 56%-63% of those who are expected to experience natural remission. Therefore, even if the young people's specialist treatment delivers relatively modest long-term results, the benefits associated with treatment are likely to meet or even exceed the costs of treatment.

### 6.2.3 Long-term benefits: positive net benefits

In addition to the 'break even' scenario, we consider two other hypothetical scenarios:

<sup>69</sup> The remaining 56% - 63% are expected to experience natural remission. However, when young people are referred to treatment, it may be difficult (or even impossible) to tell who will experience natural remission later and who won't. Therefore, all young people who are referred need to be treated.

<sup>70</sup> Overall, the number of young people in treatment expected to become problematic adult drug or alcohol users ranges from 8,900 when only 37% of young people develop problems; to 10,583 if 44% of young people go on to develop problems as adults.

- 7% reduction in the number of those who are expected to have long-term drug/alcohol related problems in adulthood; and
- 10% reduction in the number of those who are expected to have long-term drug/alcohol related problems in adulthood.

These are summarised in **Table 41**.

**Table 41.** Hypothetical scenarios of long-term cost effectiveness

	Scenarios
<b>Number of people in treatment</b>	24,036
<b>Number of those who are expected to have long-term drug related problems</b>	8,900 – 10,583 (37%-44% of those in treatment)
<b>Long-term counterfactual costs</b>	£1.1 billion – £2.2 billion
<b>Scenario 1: Break-even</b>	Reduction in the number of long term users: between 298 and 499 Net benefits = 0
<b>Scenario 2: 7% reduction in the number of those who are expected to have long-term drug related problems</b>	Reduction in the number of long term users: between 622 and 740 Net benefit = £15.5 million – £92.6 million
<b>Scenario 3: 10% reduction in the number of those who are expected to have long-term drug related problems</b>	Reduction in the number of long term users: between 889 and 1,058 Net benefit = £48.8 million – £159.0 million

Source: Frontier Economics

If these reductions (7%-10%) are achieved, the long-term net benefits of treatment would be high – up to £159.0 million.

Obviously, it is difficult to measure the long-term effectiveness accurately (as it requires long-term follow up). However, these 7-10% reductions appear to be achievable given that the upper bound on treatment's effectiveness is 20% (based on the 4 year re-presentation rates discussed above).

#### 6.2.4 .Long-term educational benefits

In addition to the long-term treatment benefits associated with preventing adult problematic drug and alcohol abuse, there are further long-term benefits of

### Estimating the benefits of young people's specialist treatment

treatment for young people through improvements in educational and subsequent employment outcomes.

There is some support in the academic literature for the positive impact that drug treatment can potentially have on educational attainment and hence wages. A US study by Register et al (2001) estimated that adolescent drug use has a significant negative impact on educational attainment<sup>71</sup>. In particular, they find that adolescent drug use reduces educational attainment by around one year, all else equal.

As discussed in section 5.2.1, the lifetime cost of being NEET (expressed as a net present value of future costs) is between £92,000 and £356,000 per person. Evidence from the NDTMS suggests that 45% of young people entering drug treatment were NEET, compared to 9% of young people in the population as a whole.

The information in the Treatment Outcomes Profile compares the number of young people in education and in paid work at the start of treatment and at the end of treatment. **Table 42** summarises the information recorded in the TOP.

**Table 42.** Treatment Outcomes Profile – Education and employment

	Number at start of treatment	% of sample at start of treatment	Number at end of treatment	% of sample at end of treatment
<b>Paid work</b>	166	16%	220	21%
<b>Education</b>	558	53%	526	50%
<b>NEET *</b>	331	31%	309	29%
<b>Total</b>	1,055	100%	1,055	100%

Source: Frontier analysis of National Treatment Agency Treatment Outcomes Profile data

Note: \* The total figure assumes that young people are either in education, or in employment, and that it is not possible for a young person to be in both education and paid employment. As discussed below, the table may therefore understate the proportion of the sample that is neither in education nor employment.

Compared to when they enter treatment, more young people are in paid work, but fewer young people are in education when they leave treatment. This pattern is to be expected as the sample in the TOP data only covers 16-17 year olds entering treatment. Between entering and completing treatment, at this age young people may have completed their education and sought to find employment. This

<sup>71</sup> Register, Williams and Grimes (2001) “Adolescent Drug Use and Educational Attainment”, Education Economics, Vol. 9, No. 1

can explain the decrease in the proportion of young people in education post-treatment. This finding also says little about young people's level of engagement in education. It may be that they attend rarely or are temporarily suspended from school. However, in our data they would still appear to be in education at treatment start. Again, as we are unable to distinguish this within the data, we adopt a cautious approach that may underestimate rather than overstate the benefits of treatment.

The TOP data before and after treatment does not directly record the number of young people that are NEET. In the table above, we have assumed that young people are either in paid work, in education, or are NEET. The data does not allow us to determine the number of young people who are in both education *and* employment. Young people in both employment and education are therefore counted twice in the above data. The resulting estimate that 31% of young people are NEET when entering treatment will therefore understate the true proportion of the sample that is NEET.

Despite this limitation, the overall effect of treatment appears to be to reduce the proportion of people who are NEET from 31% of the sample, to 29% when leaving treatment. This is a reduction of 6.5% from the levels when entering treatment.

To calculate the long-term educational and employment benefits of treatment, we have again adopted a scenario based approach. In particular, we have modelled the effect of reducing the proportion of young people who are NEET when entering treatment by 5%, 7.5% and 10%. As a central case, we have however taken the estimates reduction of 6.5% implied by the TOP data. Using the estimates of the lifetime cost of being NEET described above, the benefit per person and in total of treatment can then be calculated for our sample of young people entering treatment in 2008-09.

**Table 43.** Net present value of the long-term educational and employment benefits of treatment

Reduction in the proportion of young people that are NEET	Average benefit per person			Total benefit		
	Low	High	Average	Low	High	Average
5%	£2,070	£8,010	£5,040	£49.8m	£192.7m	£121.2m
<b>6.5%</b>	£2,707	£10,473	<b>£6,590</b>	£65.1m	£251.9m	<b>£158.5m</b>
7.5%	£3,105	£12,015	£7,560	£74.7m	£289.0m	£181.8m
10%	£4,140	£16,020	£10,080	£99.6m	£385.3m	£242.5m

Source: Frontier analysis

The long-term educational and employment benefits of treatment are significant, adding a further £158.5 million (in NPV terms) to the long-term benefits of treatment in the central case. This central case takes an average of the low and high costs associated with being NEET, and applies a reduction in the proportion of young people that are NEET of 6.5%. Even in this central case, the benefits associated with reducing the proportion of young people that are NEET are sufficient on their own (i.e. without considering immediate or other long-term benefits) to outweigh the annual cost of providing specialist treatment services to young people.



## 7 Conclusions

In this study, we have focussed on the costs and benefits of providing specialist drug and alcohol treatment services for young people. The study has shown that the benefit to society of providing such treatment is likely to significantly outweigh the cost of its provision. Furthermore, the results in the previous chapter indicate that the immediate benefits of treatment (i.e. until young people reach the age of 18) are sufficiently large alone to offset the cost of providing the treatment. Added to this, the long term benefits of treatment (in terms of improved employment prospects and reduced likelihood or become an adult problematic drug or alcohol user) further increase the ratio of benefits to costs.

This chapter is divided into two sections.

- First, we discuss our findings on the cost of treatment and the likely level of immediate and long-term benefits.
- Second, we recap some of the key sensitivities in our quantitative evaluation, and describe how our work can be thought of as a conservative estimate of the likely benefits of treatment.

### 7.1.1 The costs and benefits of treatment

#### *The cost of treatment*

In total, £62.2m was spent on specialist drug and alcohol services for young people in 2008-09. Approximately 40% of funding came from the Young People's Pooled Treatment Budget. The remainder of the funding was provided in the form of Area Based Grants or Youth Justice Board funding streams.

#### *Immediate benefits of treatment*

This report has considered two sources of immediate benefits of drug and alcohol treatment for young people: reductions in criminal activity; and reductions in drug related deaths and health care costs directly associated with their substance use. Observed reductions in the level of drug-related crime post-treatment could potentially save £59.3m per year across the 24,000 young people receiving treatment. Reductions in inpatient costs were minimal, but reductions in drug-related deaths led to further savings of £1.8m per year. The total immediate annual benefit of treatment across both crime and healthcare was therefore £61.1m.

Given that young people on average enter treatment aged 16, and that the immediate benefits of treatment for young people persist for a further two years until the individual turns 18 (after which point the economic and social costs of their substance misuse are captured in our estimates of the cost of adult

substance misuse), our estimate of the immediate benefit of treatment includes two years worth of savings. This is nearly double the £62m cost of providing treatment for these individuals.

### *Long-term benefits of treatment*

The long term benefits of treatment are more difficult to estimate than the immediate benefits. This is because calculating long term benefits necessarily involves a hypothetical assessment of the likely outcomes for individuals in the event that they did not receive treatment.

If treatment leads to a 10% reduction in the number of young people who become problematic drug and alcohol users as adults, the potential lifetime net annual benefit of treatment ranges from £49 million-£159 million. For treatment to be cost effective, long-term counterfactual costs alone must fall by 2.8%-5.6% (depending on whether the high or low counterfactual cost scenario is adopted), equivalent to a reduction of 298-499 people who develop adult drug or alcohol problems.

If treatment also successfully reduces the number of young people who are not in education, employment or training, we estimate that there may be further long-term benefits. These benefits are significant and range from £121m-£242m depending on the reduction in the percentage of young people who are NEET. We have chosen a central case estimate based on our analysis of the TOP data which at £160m is at the conservative end of this range.

**Table 44** summarises our results and brings together both estimates of immediate and long-term benefits.

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**Table 44.** Summary of costs and benefits

Benefits	Per person	Per year for all young people in treatment in 2008-08	Across a lifetime of substance misuse for all young people in treatment in 2008-09	Ratio of benefits to costs
<b>Total costs per year</b>			<b>£62.2m</b>	
<b>Immediate benefits</b>	<b>£2,539</b>	<b>£61.1m</b>	<b>£120.1m</b>	<b>£1.93</b>
<i>Crime</i>	<i>£2,464</i>	<i>£59.3m</i>	<i>£116.5m</i>	<i>£1.87</i>
<i>Health</i>	<i>£74</i>	<i>£1.8m</i>	<i>£3.5m</i>	<i>£0.06</i>
<b>Long-term benefits</b>	-	-	<b>£170.0m - £401.5m</b>	<b>£2.73 – £6.45</b>
<i>Education and employment</i>	-	-	<i>£121.2 - £242.5m</i>	<i>£1.95 - £3.90</i>
<i>Adult problematic substance misuse</i>	-	-	<i>£48.8m – £159.0m</i>	<i>£0.78 – £2.56</i>
<b>Total benefits</b>	-	-	<b>£290.1m - £521.6m</b>	<b>£4.66 – £8.38</b>

Source: Frontier analysis

The table above implies a benefit of £4.66-£8.38 for every £1 spent on young people's drug and alcohol treatment. Although this estimate is presented as a wide range of values, the magnitude of the estimated benefits is consistent with previous evaluations of the cost effectiveness of adult drug treatment.

The above results clearly show that treatment results in a net benefit, both in the short and long-term. In the short term, the benefits can be largely attributed to the immediate impact of reductions in offending, which are sufficiently large on their own to offset the cost of providing treatment for these young people.

However, even if we were to assume that there is no immediate benefit of treatment, the long-term benefits of treatment alone remain sufficiently large to generate positive a net benefit in excess of treatment costs. This is true even using the most conservative set of assumptions. In the longer-term, this benefit comes from two sources. First, treatment halts the escalation of young people's substance misuse and prevents subsequent problems as adults. Second, treatment has a significant impact in reducing the lifetime 'scar' on earnings associated with poor education and employment outcomes during adolescence.

### 7.1.2 Sensitivities

We have based our quantitative analysis on a sample of approximately 24,000 young people who received specialist treatment in the UK in 2008-09. These young people were assessed when entering and leaving treatment, and information on these individuals is recorded by the NTA via the National Drug Treatment Monitoring System. In addition to the NDTMS data, we have also drawn on information from published statistics and from academic research when calculating the immediate and long term benefits of treatment.

Although our quantitative estimates take the best and most up-to-date evidence on the costs and benefits of young people's substance misuse treatment, there are certain areas where evidence was unavailable, unreliable, or where there were a range of potential estimates for a particular input. This meant that there were several areas of our model where we needed to make evidence based assumptions.

In Chapter 6, we explored the implication of changing two key assumptions in our quantitative evaluation. In particular, we have looked at sensitivities surrounding:

- how the **immediate benefit** for young people with *unplanned* treatment exits compares to the observed reduction for those with *planned* treatment exits; and
- how the **long term benefit** of reducing the number of young people who develop substance problems as adults varies depending on the choice of cost estimate.

For the immediate benefits, we have taken the view that it would not be reasonable to attribute the same treatment benefit to young people who did not complete treatment as we observe for those who did complete treatment. However, it is also not reasonable to attribute no benefit of treatment to those with unplanned exits. Our central case estimate (which attributes half of the reduction achieved by young people with planned exits to those with unplanned exits), is therefore neither a conservative nor an optimistic assumption.

There is more uncertainty surrounding long term benefits and as such we have presented our estimates as a range of values rather than point estimates. Estimates of the cost of adult problematic substance misuse have been sourced from several independent studies. Although the magnitude of the estimated cost implied by these studies is similar, there is no single accepted figure for the cost of an adult problematic drug or alcohol user.

Although we have only directly tested the sensitivity of our results to these two assumptions, there are other areas of our quantitative evaluation where we have made evidence based assumptions that may affect our estimates. When we have needed to make an assumption, we have preferred to take a conservative

## Conclusions

approach. **Table 45** provides a list of these conservative assumptions, and the benefits to which they relate. The benefits we calculate can therefore be thought of as a conservative estimate of total benefits.

**Table 45.** Description of conservative assumptions

Description of benefit	Assumptions leading to lower benefits
<b>Counterfactual number of assaults</b>	If a young person has committed a theft or an assault, they did so only once per month
<b>Counterfactual number of thefts</b>	
<b>Number of drug and alcohol related illnesses</b>	Only illness or death that can be wholly attributed to drug or alcohol misuse is included in our estimates of the immediate health benefits
<b>Number of drug and alcohol related deaths</b>	
<b>Number of adult problematic Class A drug users</b>	5% of young people using Class A drugs will not become adult problematic drug users if not treated
	1% of young cannabis users will become problematic Class A drug users as adults
<b>Cost of adult problematic drug use</b>	If in employment, drug users would earn the minimum wage

Source: Frontier analysis

Other assumptions we have made will neither over nor understate the size of our benefits estimates. For example, we assume that the level of crime committed by young people when they enter treatment is a good proxy for the level of crime they will commit up until the point that they turn 18. Crime rates vary by age. However, since young people typically enter treatment at age 16-17 and the crime rate at this age broadly reflects the level of crime committed by all young people, this should not bias upwards or downwards our estimates of the counterfactual cost of crime.



## **Annexe 1:**

The National Drug Treatment Monitoring System (“NDTMS”) records demographic information and other characteristics of young people entering treatment. In addition, young people are asked about their drug use, health, education, criminal behaviour and housing need at a series of points during their treatment. This data is then combined to create a treatment outcomes profile (TOP) for an individual during their progression through treatment,

*Selected demographic information recorded in the NDTMS*

**Table 46.** Selected data recorded by the NDTMS

Item	Description
Sex of client	The sex that the client was at birth
Ethnicity	The ethnicity that the client states as defined in the OPCS census categories. If a client declines to answer then 'not stated' should be used, if a client is not asked then the field should be left blank.
DAT of residence	The Drug Action Team (or partnership area) in which the client normally resides (as defined by their postcode of their normal residence).
PCT of residence	The Primary Care Trust in which the client normally resides (as defined by their postcode of their normal residence). Due to DATs in some instances spanning many PCTs.
Problem Substance No. 1	The substance that brought the client into treatment at the point of triage/initial assessment, even if they are no longer actively using this substance. If a client presents with more than one substance the agency is responsible for clinically deciding which substance is primary.
Age of first use of Problem Substance No. 1	The Age (in years) that the client recalls first using the Problem Substance No. 1
Problem Substance No. 2	An additional substance that brought the client into treatment at the point of triage/initial assessment, even if they are no longer actively using this substance. 'Poly drug' should no longer be used in this field; instead the specific substances should be recorded in each of the problem substance fields.
Problem Substance No. 3	An additional substance that brought the client into treatment at the point of triage/initial assessment, even if they are no longer actively using this substance. 'Poly drug' should no longer be used in this field; instead the specific substances should be recorded in each of the problem substance fields.
Referral Source	The source or method by which a client was referred for this treatment episode. A valid referral source code should be used as defined in the NDTMS Data Set - Reference Data [3]. From April 2008, all referral source codes are specifically for young people's services and codes have been reviewed and refined. Services reporting to the NDTMS Young People's Data Set should select the code which best reflects the referral source from the entire list of

**Annexe 1:**

	codes available for this item. See APPENDIX D APPENDIX D.
Injecting Status	Is the client currently injecting, have they ever previously injected or never injected?
Housing need	The accommodation need refers to the current situation (28 days prior to treatment start) of the client with respect to housing need.
Children	How many children live with the client at least part of the time? A child is a person who is under the age of 18. Young people who are under the age of 18 years can also have parental status and should be asked about parental status.
Pregnant	Is the client pregnant? All sexually active young women who are under the age of 16 years should also be asked about pregnancy.
Drinking days	Number of days in the 28 days prior to initial assessment that the client consumed alcohol.
Units of alcohol	Typical number of units consumed on a drinking day in the 28 days prior to initial assessment
Discharge date	The date that the client was discharged ending the current structured (Tier 3/Tier 4) treatment episode. If a client has had a planned discharge then the date agreed within this plan should be used. If a client's discharge was unplanned then the date of last face to face contact with the treatment provider should be used.
Discharge reason	The reason why the client's episode of structured (Tier 3/Tier 4) treatment was ended.
Discharge destination	The lead agency that the treatment provider has referred a young person back or onto once the treatment episode has been completed.

Source: NTA: "NDTMS Data Set: Business Definition for Young People's Treatment Providers", March 1999



### *Data collected as part of the Treatment Outcomes Profile*

**Table 47.** Data collected by the NTA in the Treatment Outcomes Profile dataset

Item	Description
Treatment Outcomes Profile (TOP) date	Date of most recent care plan review. All outcome status submitted in this section of the data - set will be associated and stored as being the status as of this date. Note: TOP data should only be collected for young people aged 16 and over.
TOP ID	A technical identifier representing the TOP, as held on the clinical system used at the treatment provider. (NB: this should be a technical item, and should not hold or be composed of attributers which might identify the individual – this data is merely to assist in synchronising the data held in NDTMS with that on the clinical system). A possible implementation of this might be the row number of the TOP in the TOP table.
Treatment Stage	Stage of treatment that the TOP data relates to
Alcohol use	Number of days in previous 28 days that client has consumed alcohol
Opiate use	Number of days in previous 28 days that client has used opiates
Crack use	Number of days in previous 28 days that client has used crack
Cocaine use	Number of days in previous 28 days that client has used powder cocaine
Amphetamine use	Number of days in previous 28 days that client has used amphetamines
Cannabis use	Number of days in previous 28 days that client has used cannabis
Other drug use	Number of days in previous 28 days that client has used other problem drug
IV drug use	Number of days in previous 28 days that client has injected non prescribed drugs
Sharing	Has client shared needles or paraphernalia in last 28 days?
Shop theft	Number of days in previous 28 days that client has been involved in shop theft
Drug selling	Number of days in previous 28 days that client has been involved in selling drugs

Other theft	Has client has been involved in theft from or of vehicle, property or been involved in fraud in last 28 days
Assault/violence	Has client committed assault/violence in last 28 days
Psychological health status	Self reported score of 0 - 20
Paid work	Number of days in previous 28 days that client has had paid work
Education	Number of days in previous 28 days that client has attended college/education system
Acute housing problem	Has client had acute housing problem (been homeless) in last 28 days
Housing risk	Has client been at risk of eviction within past 28 days
Physical health status	Self reported score of 0 - 20.
Quality of Life	Self reported score of 0 - 20.

Source: NTA: "NDTMS Data Set: Business Definition for Young People's Treatment Providers", March 1999

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