

Drug prevention programmes in schools: What is the evidence?

Key messages:

- Universal drug education programmes in schools have been shown to have an impact on the most common substances used by young people: alcohol, tobacco and cannabis.
- The approaches which appear to be most effective are those based on social influences and life skills, for example Life Skills Training and Unplugged.
- Interventions which are not drug-specific but focus on children and young people's attachment to school can also be effective in reducing substance misuse. The Good Behaviour Game is one example of these.
- There has been limited work on cost-effectiveness in a UK context, but what there is suggests that programmes do not need to have dramatic impacts to be cost-effective.
- The research evidence has some limitations and in particular is largely from a US context so there may be a need for further testing and adaptation in bringing programmes to the UK.
- Another lesson from research is that partial implementation of programmes reduces their impact. This has implications for teacher training and the need for schools to set aside sufficient time, but also for designers to ensure programmes are not overambitious in terms of content.

Executive summary

Research has demonstrated that universal drug education programmes in schools can have an impact on the most common substances used by young people: alcohol, tobacco and cannabis. This is backed up by Cochrane systematic reviews (Foxcroft and Tsertsvadze, 2011).

There are clear messages from the research evidence about the approaches which are most successful. Evaluation has consistently shown that scare tactics and fear-based approaches are not effective. Simply providing information about drugs without addressing the social context is also generally ineffective, as are programmes which focus solely on boosting self-esteem.

Interactive learning seems to be necessary for success, with more didactic methods being less effective. The approaches which appear to be most effective are those based on understanding social influences and developing life skills. These include a normative education component: correcting misperceptions about how common and acceptable substance misuse is among the young people's peer group. They also teach interpersonal skills to help handle situations where alcohol or drugs are available. Examples with a strong evidence base include the Life Skills Training programme, developed in the United States and Unplugged, which was tested in a large-scale evaluation across several European countries.

Young people who are disengaged from school are at higher risk of substance misuse. Another type of intervention that has been successful focuses on the overall school ethos or on classroom management to reduce this risk. One of the most striking examples is the Good Behaviour Game. This intervention with primary school pupils has no overt link with drugs or alcohol. However, by keeping children engaged and improving behaviour in the classroom, it can significantly reduce later anti-social behaviour including problematic drug use amongst boys in particular.

Another lesson from research is that partial implementation of programmes reduces their impact. This has implications for teacher training, for schools to allow sufficient time, but also for designers to ensure programmes are not overambitious in terms of content.

There is still much we have to learn about exactly how these interventions function: currently we are not sure why the same programme may produce significant results in one evaluation and not in another. Context is clearly important, for example the extent to which underage drinking is seen as the norm. As the majority of the research evidence is from other countries, the United States in particular, this limits the extent to which conclusions can be drawn about the effectiveness of programmes in a UK context. The process of adapting and testing programmes in the UK is at a comparatively early stage. It will be important to build on existing knowledge, both in the design of interventions and in ensuring evaluation is sufficiently rigorous and detailed.

Considering both public health and wider social impact, initial studies on the potential cost-effectiveness of universal drug prevention programmes in schools are encouraging. It appears that interventions with only modest impacts may still be cost-effective. Further research will enable more certainty about the extent to which harmful substance use can be reduced and also about how this relates both to long term behaviour and immediate impact on a range of outcomes across both public health and crime and anti-social behaviour.

Context

Why attempt universal drug prevention programmes in schools?

The harm caused by the use of tobacco, alcohol and illicit drugs by young people can be divided into the immediate damage caused to developing minds and bodies, and the risk of developing addictions and behaviour which last long into adulthood.

There are particular health risks associated with alcohol misuse in adolescence, which is a sensitive time for brain development. Young people with alcohol use disorders may display structural and functional deficits in brain development compared with their non-alcohol-using peers, and heavy drinking during adolescence may affect normal brain functioning during adulthood. Adolescents who drink heavily may experience adverse effects on liver, bone, growth and endocrine development (Donaldson, 2009).

Under the influence of alcohol, impaired judgement can lead to high-risk behaviour such as accepting a lift from a drunk driver, or anti-social behaviour. In particular, alcohol consumption is associated with risky sexual behaviour such as not using a condom during a young person's first sexual encounter; an increased likelihood of having sex and at a younger age; unprotected sex; teenage pregnancy; and the likelihood of contracting sexually transmitted diseases (Donaldson, 2009).

Habits from adolescence can influence behaviour over a lifetime, especially when addiction is triggered. For example, the first symptoms of nicotine dependence can appear within weeks or even days of starting to smoke occasionally, often before the onset of daily smoking. Early uptake of smoking is associated with subsequent heavier smoking, higher levels of dependency, a lower chance of quitting, and higher mortality (ASH 2011; Jit et al., 2009). Similarly, studies in the US have estimated that the probability of alcohol dependence can be reduced by 10% for each year drinking onset is delayed in adolescence (Grant, Stinson and Harford, 2001).

Outcomes from drug education in schools

What outcomes should a drug education programme in schools be measured on? Unlike other education programmes, the ultimate aim is not just to increase knowledge and understanding of the issue but to change behaviour through enhancing some of the factors which protect against substance misuse. The intended messages may vary according to the substance and age of the recipients.

Even the modest aim of delaying the onset of drinking or smoking may be a valuable outcome since, as described above, there are specific harms associated with early use of alcohol and tobacco. This is recognised in UK legislation making it illegal to sell alcohol and tobacco to young people under the age of 18.

Possible desired outcomes:

- complete abstinence
- short-term abstinence (i.e. delayed uptake)
- reduced use in the short term
- reduced use over a lifetime

Longer-term outcomes are more difficult to measure. Evaluations often therefore focus on short-term use and (particularly where few young people are users) intermediate measures such as knowledge, and attitudes.

The prevention paradox in public health is that the benefits of an intervention or behaviour change are seen at the population level: many individuals do not benefit at all, and those who have benefited cannot tell 'what would have happened otherwise'.

Evidence base

This paper draws on a wide base of research studies testing the effectiveness of different drug prevention programmes. Studies have been designed with the following questions in mind:

- Can changes before and after be attributed to the programme or some other factor? This question requires a control group of young people to measure changes against.
- Were results just due to chance? The larger the study, the lower the probability that random effects will skew the results.
- Was there any bias that could affect the results? For example, are the schools trying out the programme in more affluent areas than control schools? An important tool to reduce bias is random allocation to experimental and control groups. For educational studies such as these, it tends to be whole schools or classes which are allocated to groups rather than individual students ('clustering').

Randomised controlled trials (RCTs) with a sample size sufficient to reduce the impact of random variation are the best way of testing drug prevention programmes. However, problems may still remain, for example more pupils at high risk of substance misuse may drop out of the study. Since individual studies may show apparently contradictory results, or show positive results which are not statistically significant (ie have a higher probability of arising from chance alone), systematic reviews are important in assessing the strength of the evidence from the literature as a whole.

Systematic reviews assess not just studies' results but the quality of their methodology. Meta-analysis is a statistical analysis technique for pooling and drawing conclusions about effects across several studies. Cochrane reviews, conducted through the international Cochrane collaboration, are considered the 'gold standard' of healthcare systematic reviews.

Three main Cochrane reviews have been conducted recently in this field:

- Evaluation of universal school-based interventions aiming to prevent misuse of illicit substances (Faggiano et al., 2005)
- A review of all randomised controlled trials of behavioural interventions in schools to prevent children and young people from starting smoking (Thomas and Perera, 2006)

- A review of evidence on the effectiveness of universal school-based prevention programs in preventing alcohol misuse in school-aged children and young people. (Foxcroft and Tsertsvadze, 2011)

The strengths and weaknesses of the research evidence are discussed further below, but there is one factor which is common to most of the studies: unless otherwise stated, they were carried out in the United States. There are therefore questions about whether programmes will be as effective in a different cultural context and further evaluation is needed within the UK.

Theory and models of drug prevention in schools

Different theories about the most significant factors determining drug use have led to a range of different models for prevention education. These may focus on providing factual information about the effects of drugs and alcohol; improving skills to resist 'peer pressure'; general life skills such as problem-solving; increasing self esteem; or changing perception of peer group norms of substance use.

Life skills and social influences approaches

Many programmes aim to work across more than one area and there is no universally agreed categorisation of programmes, either by theory, content or process. However, in general, drug education programmes adopting life skills, social influences, resistance skills or normative approaches have been found to be more effective than others. For example Foxcroft and Tsertsvadze (2011) conclude in their Cochrane review of alcohol education that these types of approaches are the most effective. Similarly Faggiano et al. (2005) in a Cochrane review of school-based prevention for illicit drugs find that programmes based on life skills are the most effective in reducing drug use.

The social influences approach assumes that drug use behaviour is determined by the interaction between personal factors (such as knowledge, skills, self-efficacy, outcome expectations and personal goals) and environmental influences. These include direct peer pressure and wider perception about the norms of drug use in society.

Two tools in particular have been used within this approach: resistance skills, focusing on resisting direct peer pressure, and normative education, focusing on young people's understanding of prevalence and attitudes to substance use in their peer group. Life skills approaches focus mainly on generic skills such as decision-making and problem-solving but also include aspects of the social influences approach. There is often overlap between the above approaches.

Donaldson et al (1994) compared the effectiveness of two strategies, resistance skills training and normative education, finding that normative beliefs predicted future drug use while resistance skills alone did not. Similarly, in a review of all evaluations of the Life Skills Training programme, Coggans et al (2003) concluded that the programme has generally been found to be less effective in influencing factors such as assertiveness, self-esteem and decision-making than it has in changing knowledge, attitudes and normative expectations. They conclude that the 'life skills' elements may actually be less important than changing knowledge, attitudes and norms by high quality interactive learning.

Fear-based approaches

Research has consistently found that attempting to frighten young people away from using drugs through fear-based approaches is ineffective (Prevention First, 2008). In general, people often have a defensive response to messages arousing fear and unpleasant emotions. Warnings that do not match young people's personal experiences or what they perceive amongst their friends will not be believed and can undermine the credibility of the messenger. Cragg (1994) argues that emphasising the dangers of drugs may in fact enhance the status of drug-taking as part of youth culture and a rite of passage.

Factual information provision

Stead and Angus (2004) found eight reviews concluding that factual information provision alone appears not to change behaviour. This does not mean that information provision is not an important component of drug prevention programmes, just that it is insufficient alone to have an impact on behaviour.

Affective approaches

Similarly, programmes whose sole focus is building personal skills and self-esteem have been found to be less effective than other approaches (Stead and Angus, 2004). This may be because of the lack of drug-specific content and skills, including interactive content, or dependence on mechanisms which do not exist, for example a strong link between self-esteem and drug use, or both.

Delivery process

How to deliver drug education:

There is evidence that interactive drug education programmes are nearly always more effective than non-interactive ones (Stead and Angus, 2004). Interactive programmes have been defined by Tobler et al. (reviews discussed in Stead and Angus (2004)) as those with a higher degree of active participation by all students, through discussion, brainstorming or skills practice, as opposed to those focusing largely on teacher presentations and teacher-led discussion. Tobler attributes this to development of 'interpersonal competence' (the ability to negotiate drug offer situations skilfully and without losing face in the peer group) and better understanding of actual levels of drug use and views of drug use in the peer group.

Who should deliver drug education:

Most drug education is delivered by teachers. Ofsted (2010) reported better quality teaching from teachers trained in PSHE or non-specialist teachers, often tutors. External speakers are also commonly used. A national mapping survey found that around a third of primary schools and just over half of secondary schools used an external speaker to deliver some of their drug education, while 17% of both used school nurses (Formby et al., 2011).

Some drug prevention programmes are delivered to young people by their peers. The evidence shows that peers can be effective delivery agents of drug education. However, the evidence is mixed on whether they tend to be more effective than adults. The use of peers may ensure interactive learning, but lessons led by teachers can also be interactive. Some reviewers have concluded that other factors are more important in determining a programme's success (McDonald, 2004; Stead and Angus, 2004). These may be the credibility of the individuals leading the programme, whether peers or teachers, the content, the level of interaction, age group and the number of sessions. An additional benefit from peer-led education can be the positive impact on the peer educators themselves (Mentor UK, 2011).

Police officers may be seen as having particular credibility with pupils, but O'Connor et al. (1999) found this was not generally supported by

the research, and that there was no evidence that delivery of drug education by police officers in uniform offered any particular advantage over delivery by teachers. It is likely that teachers will better be able to manage the interactive model of learning which has been shown to be more effective.

O'Connor et al. conclude that police may have the most impact and credibility by contributing input on drugs and the law to a school-led programme. While programmes that aim to build relationships between pupils and police can be valuable, these should be described and evaluated according to these outcomes, and not in terms of drug-related knowledge gained or attitude change.

Age

Drug education should be age-appropriate and timely, so children are armed with basic information before they first encounter drugs. Early experimentation can shape future substance use, for example one study found that children who had tried cigarettes just once by age 11 were more likely to smoke at age 14 even after adjusting for other factors (Fidler et al, 2006), and smokers who start early are less likely to quit (Jit et al., 2009). Designing appropriate education is complicated by the fact that individuals in a class may have very different levels of knowledge and experience.

Stead and Angus (2004) conclude that it does not seem that drug education is more effective at particular ages. It is, however, harder to measure the effectiveness of interventions for younger age groups, since the real impact will be felt years later.

Non-drug education strategies

A significant protective factor against later misuse of drugs is attachment to school. Whole-school approaches that focus on the school's ethos can significantly enhance this protective factor for pupils. For example the programme PATHE (Positive action through holistic education) in South Carolina implemented a range of activities including changes to school discipline, community involvement, pupil participation, new activities and academic and counselling services.

After two years the programme was associated with an overall reduction of 16% in youth crime, 17% alcohol and other drug use, and an 8% reduction in anti-social behaviour measures. (Gottfredson et al., 1986, cited in Ross et al., 2011)

A meta-review by Wilson et al (2001) concluded that strategies focused on altering classroom or instruction management were associated overall with a 10% reduction in delinquency and a five percent reduction in alcohol or drug use. (See also information on the Good Behaviour Game, below).

Evidence for specific programmes

The recent Cochrane review of alcohol interventions in schools (Foxcroft and Tsertsvadze, 2011) concluded that certain generic psychosocial and developmental prevention programmes can be effective, in particular Botvin's Life Skills Training, Unplugged, and the Good Behaviour Game. These programmes have also shown positive results in reducing smoking and cannabis use (Coggans et al., 2003).

Life Skills Training

The Life Skills Training programme is delivered in 30 sessions over three years. It aims to improve young people's knowledge about drugs, equip them with the skills to resist social pressure to use drugs and enhance their self-esteem, interpersonal skills and self-confidence. It has been extensively evaluated in a series of studies.

The Cochrane review by Foxcroft and Tsertsvadze (2011) found all six trials included in the study that evaluated Life Skills Training demonstrated positive results for alcohol use. Thomas and Perera (2006) in a Cochrane review of anti-smoking interventions cite Botvin et al. (1995) as an example of a study showing long-term impact.

In one trial involving 56 schools, Botvin et al. (1995) followed up students six years after the baseline test, i.e. three years after they finished the programme. There were two intervention groups – one with teacher training provided in person, one by video. Cigarette smoking was significantly reduced in the intervention groups, as was drunkenness in the past month, but other measures were not significant. When only students who had received 60% or more of the programme (the high fidelity group) were included in the analysis, significant reductions were found across all measures of cigarette, alcohol and marijuana use (see Figure 1)

Coggans et al (2003) have questioned the programme's theoretical basis, arguing that research has shown it to be less effective in influencing factors such as assertiveness, self-esteem and decision-making than in changing knowledge, attitudes and normative expectations. They conclude that the 'life skills' elements may actually be less important than changing knowledge, attitudes and norms by high quality interactive learning.

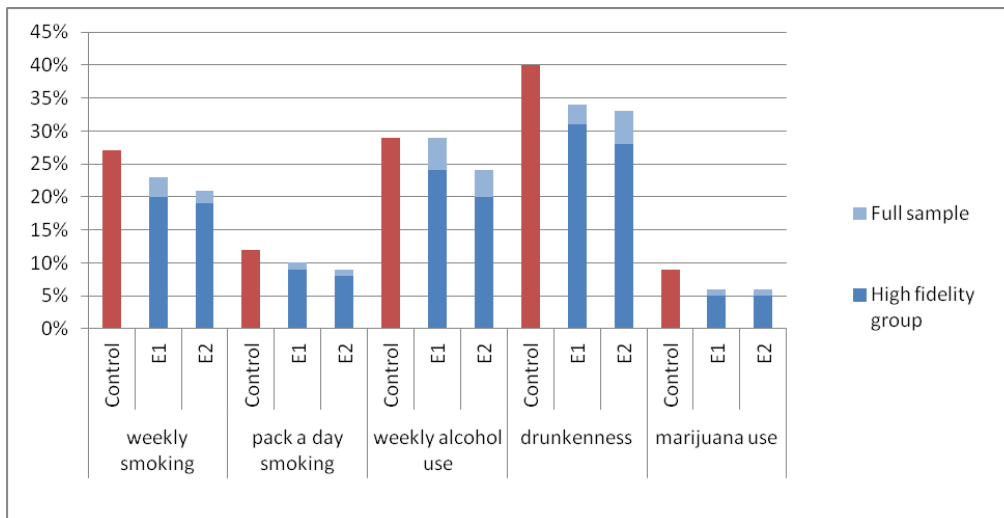


Figure 1: Prevalence of selected measures of substance use at six year follow-up:

Unplugged

The EU-Dap study of the Unplugged programme (Faggiano et al., 2008; 2010) was conducted across seven European countries: Austria, Belgium, Germany, Greece, Italy, Spain and Sweden. The curriculum consists of 12 one-hour units covering information, normative belief and intrapersonal skills. Peer or parental components were also included for some of the schools but encountered problems of low implementation and low attendance by parents respectively.

Three months after completion of the programme, there was an estimated reduction of 30% in daily smoking compared to the control group, 28% in drunkenness at least once over past 30 days, and 31% in frequent drunkenness (at least three episodes in past 30 days). Reductions in less frequent smoking and in cannabis use were not statistically significant (Faggiano et al., 2008). Fifteen months after programme completion, the reduction in tobacco use was no longer statistically significant, but there were significant reductions of around 20% for any drunkenness in past 30 days; 38% for frequent drunkenness; and 26% for frequent cannabis use (at least three times in past 30 days) (Faggiano et al., 2010). (See Figure 2).

Another way of looking at the size of the impact is the 'number needed to treat' (NNT). On average, for every 40 students going through the programme, one would avoid 'frequent drunkenness' at the follow-up

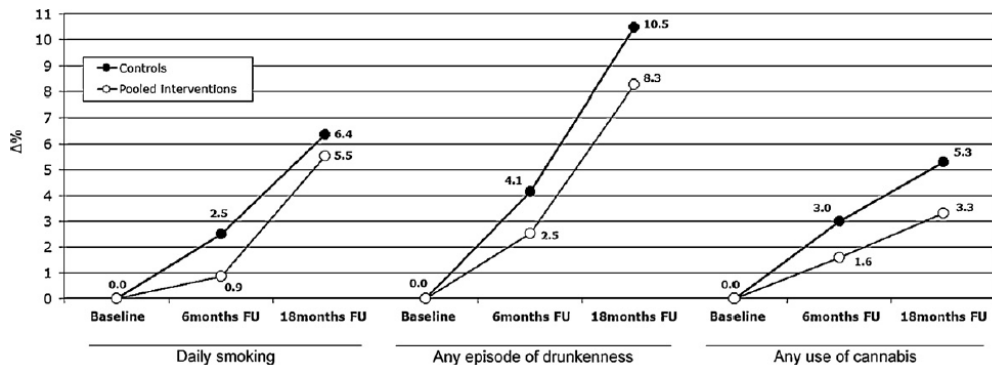


Figure 2: Changes in prevalence of past 30 days substance use between EU-Dap participants at baseline, at the 6-month and at the 18-month follow-up

15 months after completion. The NNT for frequent cannabis use is similar (46). The NNT for ‘any drunkenness’ is lower, because this level of drinking was more prevalent among the young people: for every 26 students going through the programme, one would avoid ‘any drunkenness’ in the past month.

Good Behaviour Game

The Good Behaviour Game (GBG) is significantly different from the other interventions in this section, and may be seen to have more in common with general school-based interventions reviewed above. The game is a way of managing class behaviour during lessons by dividing pupils into teams which could earn prizes and praise for good behaviour. It aims to socialise children and reduce aggression or disruptive behaviour.

In the first long-term randomised trial (Kellam et al., 2008), the Good Behaviour Game was tested in first- and second-grade (ages 6–8) classes in Baltimore primary schools, in two consecutive years. The young people were followed up when 19-21 years old, and significant impacts were demonstrated on problematic substance use. These were greater among boys. Effects were also greater and more consistent in the first year group who took part in the GBG when their teachers were freshly trained and subject to continued monitoring and mentoring.

In the first year group, regular smoking was significantly reduced among young men previously exposed to the game (6% compared to

20%), but not among young women. In the second year group, 30–40% fewer boys and girls went on to smoke regularly after being exposed to the game, but these differences were not statistically significant.

Around 38% of boys not exposed to the game in the first year group had met criteria for diagnoses of drug abuse or dependence at some time by follow-up in adulthood; among those from GBG classes, this was halved to 19%, a statistically significant effect. The figures for girls were much lower (8% vs. 7%) and not significant. Similar effects were found for the second year group.

In the first year group, both girls and boys had a significantly lower probability of developing any symptoms of alcohol abuse or dependence, calculated as a 50% reduction in the likelihood of these problems. However these effects were not found in the second year group.

Similarly, smoking was reduced from 20% to 6% in boys. Alcohol abuse was lower in the GBG group but this was not always statistically significant. There were other impacts, for example the most initially aggressive and disruptive boys were more likely to complete their education with the GBG.

The GBG has now been received by around 4000 children in the United States (SAMHSA, 2010). More recent research in the Netherlands found a significant impact on tobacco use for 10-13 year olds, but not alcohol (van Lier et al, 2009). The programme is currently being trialled in the UK by the Children and Families Research Group at Oxford Brookes University.

Limitations

One of the most obvious limitations is that the majority of research evidence is US-based, and so there are question marks over whether programmes will transfer successfully to a UK context and what factors will affect whether they are successful here.

There is also significant variability in results: for example Thomas and Perera (2006) highlight the case of the Hutchinson Smoking Prevention Project. This particularly long and rigorous study found no long-term effect of an intensive eight-year 'social influences' programme on smoking behaviour, in contrast to other research with a similar basis. Some of this variability in research findings could be attributed to methodological issues (below). We also do not know exactly how context and implementation factors affect programme success.

Relevant Cochrane reviews (Faggiano et al., 2005; Thomas and Perera, 2006; Foxcroft and Tsertsvadze, 2011) identify several common methodological problems reducing the confidence with which conclusions can be drawn from the studies available. These include:

- High drop-out rates in follow-up. This is more serious if some young people are more likely to drop out than others.
- Poor design where studies treat data as if students were randomly allocated to control or experimental groups, whereas in fact it was the classes or schools which were allocated
- Failure to report important statistical and methodological information which make it harder to carry out meta-analyses.

Their general recommendations for future research include ensuring that studies are large enough to give sufficient statistical power (ie ensuring that results are unlikely to be due to chance alone). Larger studies also allow the impact on different subgroups to be analysed, such as whether a programme is more effective with girls than boys. Detailed and systematic reporting of programme content and context is also important. This allows different studies to be compared to increase understanding of which elements of drug education have an impact, and how context affects results (an important consideration if programmes are to be implemented more widely).

Cost effectiveness

The costs of drug prevention programmes in schools are usually measured as the cost of teachers' (or other staff) time plus consumables such as workbooks (Jones et al., 2007a). They could also be considered not as monetary costs but as the opportunity cost of time spent on other PSHE issues or on other curriculum subjects.

A study on cost-effectiveness by the US Department of Health and Human Services concluded that national implementation of an effective programme which cost \$220 per pupil could in the long term save \$18 for every \$1 invested (Miller and Hendrie, 2009). This calculation is based on the proportion of all those receiving a programme who delay or avoid substance use as a direct result, drawing on the findings from two meta-analyses. Their medium estimate is that 4.7% of pupils will delay using alcohol, 4.1% marijuana, 2.7% cocaine and 4.6% smoking.

There is a lack of data for the expected impacts in a UK context, so economic research has either drawn on US research or used a modelling approach, calculating how effective a programme would have to be to be cost-effective for a given cost.

Jones et al. (2007a) compared the cost-effectiveness of three existing programmes: the School Health and Harm Reduction Programme (Australia), Lion's Quest 'Skills for Adolescence' (USA) and STARS for Families (USA). The 'cost per case of hazardous/harmful drinking averted' for each of the programmes (measured after 2 years or 20 months) were around £540 for the STARS for Families programme, £285 for SHARHRP and £34,255 for Lion's Quest SFA.

Jit et al. (2009) found school-based smoking prevention programmes delivered at age 11 could be cost-effective even if they merely delayed uptake rather than having a long-lasting effect on smoking prevalence. This is because there is a significant association between the age at which someone starts smoking regularly and the probability of being able to quit smoking later. Using data on effectiveness from randomised controlled trials and cost of £38.50 per student, drawn as an average from a literature review, a hypothetical intervention would be cost-effective at a willingness-to-pay threshold of £20,000 per quality-adjusted life year (QALY) gained, standard in NICE evaluation.

Calculating the cost-effectiveness of alcohol prevention interventions is more complex. A programme which reduces harmful drinking will have an impact in terms of QALYs. The extent of this long-term health benefit will be dependent on how far the reduction is sustained into adulthood. There are also immediate costs to society from youth drinking. These include:

- Short-term alcohol poisoning and injury from drunken behaviour. Jones et al. (2007b) report that young people's drinking aged 15 to 16 results in 195,000 accidents and injuries a year and costs the NHS over £4 million a year through attendance at A&E alone.
- Crime and anti-social behaviour. Data from 2004 suggests around 80,000 violent offences and around 27,000 property-related offences were carried out by 10-17 year olds where the motivation was drunkenness, but other analyses suggests an even higher proportion of assaults may be carried out when drunk (Jones et al., 2007b).
- Regretted sex and failure to use contraception leading to increased risk of unplanned pregnancy and STDs. For example, Jones et al. (2007b) estimate 104,000 cases of unprotected sex among 15 and 16 year olds after drinking.
- Educational impact, for example truancy linked to alcohol.

A reduction in youth alcohol use therefore results in direct savings to the public sector. Nherera and Jacklin (2009) model cost-effectiveness of a hypothetical prevention programme including QALYs gained from avoiding adverse health outcomes, cost savings to the public sector, and also estimated 'willingness to pay' on behalf of the public to avoid certain outcomes. Their model suggests that a theoretical alcohol misuse prevention programme in schools could be a cost-effective use of public money if it cost £75 million and achieved at least a 1.4% reduction in alcohol consumption amongst young people.

One largely unknown factor is to what extent these programmes can reduce the number of young people who later develop into problem users of illicit drugs. While relatively few in number, these individuals represent high costs to themselves, their families and the public purse. PricewaterhouseCoopers (PwC) estimated the additional costs to society incurred by a problematic drug user over their lifetime, in

comparison with the average person, is £827,000 for a male and £859,000 for a female (PwC, 2008). Health England compared a wide range of public health interventions on cost-effectiveness and found that school-based drug prevention programmes to avoid illicit drug use were one of the most cost-effective in terms of short-term public sector costs saved (Health England, 2009).

Ultimately, decisions about which drug prevention programmes to invest in will be determined not just by long-term cost-effectiveness, but by other factors including the immediate costs of running them. These costs will determine how feasible it will be to roll out programmes from small-scale pilots to wider implementation.

Issues for implementation

Several studies demonstrate that programmes' effectiveness tends to be reduced if they are not implemented as the designers intended. Teachers may leave out elements because of lack of time, adapt exercises, insert additional material or make other changes which may not be consistent with the theory underlying the intervention. A major evaluation of Life Skills Training found that one in four students had teachers who implemented less than 60% of the important points and objectives in the programme (Botvin et al., 1990, cited in Dusenbury et al., 2003). Teachers may not be aware that they are adapting the programme (Dusenbury et al., 2005) and the extent of adaptation to the original programme is likely to increase over time (Ozer et al., 2010).

As previously described, Botvin et al. (1995) found the longer term impact of Life Skills Training on alcohol, tobacco and marijuana use was statistically significant on most measures of use only if the analysis was limited to students whom classroom observations had shown to have received a more complete version of the programme. Similarly, Dusenbury (2011) reported a study in which programme adaptations by teachers were significantly linked to students' cigarette and alcohol use.

There are steps which can be taken to reduce the erosion of important elements as programmes are rolled out. Firstly, the content of the programme needs to be matched to the time available in schools. For example, evaluation of delivery of the Blueprint Drug Prevention Programme in the UK found that the timings for some of the main activities were unrealistic. This resulted in teachers having to cut back on other parts of the lessons, such as review and reflection sessions (Stead et al., 2007). Similarly, Ringwalt et al. (2010) found that the All Stars drug prevention programme prescribed an overambitious amount of material for each lesson, with the result that teachers struggled to deliver it all and there was a trade-off between quality and quantity.

It is natural for teachers to want flexibility in a programme to meet their students' needs. For example, in evaluation of the Home Office Blueprint programme (Stead et al., 2007) several teachers expressed frustration at the prescriptive nature of the programme and their

perceived loss of control and autonomy, with the result that more flexibility was introduced in the second year.

Also, adaptation is also not necessarily harmful. Ozer et al. (2010) found that many adaptations suggested by teachers and students to two drug prevention programmes were either harmless or potentially beneficial. Examples included changes to language or teaching materials suggested by students to make the curriculum more realistic and engaging for their age and cultural backgrounds, or teachers wanting to add homework or make the curriculum more interactive. However, other suggestions were seen by the programmes' developers as potentially detrimental, for example students wanting to know more about the positive aspects of drug use or teachers wanting more focus on knowledge about drugs and their harmful effects.

It is important that teachers understand the key concepts behind programmes: which are the core elements and which parts could be safely altered. Ozer et al. suggest that programme developers should provide guidance to teachers on the parameters within which the programme can be safely adapted without undermining core components.

Better guidance and training in theory as well as practice may also improve teachers' ability to deliver programmes effectively. For example some teachers in the Blueprint programme found it difficult to deal with pupils challenging the survey data (believing the results only showed low prevalence of drug use because young people had lied when filling out the survey) (Stradling et al., 2007). This could be done through initial training, ongoing support (Dusenbury, 2011), or detailed instruction manuals (Dusenbury et al., 2003).

Conclusions

Rigorous evaluation of the research base through Cochrane reviews has shown that universal drug education programmes in schools can have a measurable impact, reducing harmful drinking, smoking, and cannabis use.

The programmes with the strongest evidence base tend to have a similar approach. They provide information about drugs and alcohol, in particular correcting misperceptions about how common and acceptable substance misuse is among the young people's peer group (normative education). They also teach interpersonal skills to help handle realistic situations where alcohol or drugs are available. Examples with a strong evidence base include the Life Skills Training programme, developed in the United States and Unplugged, tested in a large-scale evaluation across several European countries.

It is clear that young people who are disengaged from school are at higher risk of substance misuse. Another type of intervention focuses on the school's ethos or classroom management to reduce this risk. One of the most striking examples is the Good Behaviour Game, an intervention with primary school pupils which has no overt link with drugs or alcohol, but by engaging them in a positive way in the classroom can stop disruptive boys in particular dropping out of education and using drugs.

Evaluation has shown fear-based approaches not to be effective. Programmes depending only on information provision or only on boosting self-esteem also appear to be ineffective. Interactive teaching also seems to be necessary for success, with more didactic approaches generally unsuccessful.

Estimating the cost-effectiveness of programmes is complex because of the multiple uncertainties involved. Jit et al.'s (2009) work is striking since it demonstrates the cost-effectiveness of delaying young people's smoking uptake, even without assuming a very long-lasting impact. Alcohol use in particular has an impact on a wide range of outcomes in the short and long term, across both public health and crime and anti-social behaviour.

There is a need to develop the evidence base for drug prevention programmes within the UK. Randomised controlled trials of sufficient

size allow an assessment of overall impact. However, to understand how these programmes work and to increase their effectiveness in future, research can also look inside the 'black box' at how school context affects success, which elements of a programme are essential, and what factors predict drug use. For example, an intervention may affect both young people's normative beliefs and their social skills, but which of these predicts actual behaviour?

The process of adapting and testing programmes in the UK is at a comparatively early stage. It will be important to build on existing knowledge, both in the design of interventions and in ensuring evaluation is sufficiently rigorous and detailed. In adapting programmes for the UK, it is important to take account of the research that exists on 'usability', for example from the Blueprint programme: ensuring teachers have sufficient training and support to understand and deliver the core objectives; keeping programme content realistic for the time available; and allowing flexibility in delivery to meet the needs of different groups.

Despite some weaknesses in the existing research evidence and conflicting findings, the research points to some clear messages about which approaches are more effective, and also the size of the impacts which can be achieved in a successful programme. However, caution needs to be taken when extrapolating from these studies. A major limitation is that so much of the research is drawn from the United States, so there may be issues with transferability to a UK setting.

The effectiveness of programmes may depend on their context, for example they may be more successful at reducing underage drinking in environments where this behaviour is seen as relatively unusual, compared to when it is generally expected. Drug education is an important way to start shifting young people's norms about substance use. It will be most effective when combined with other measures, for example alcohol pricing, aimed not just at young people but at all parts of society.

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Mentor is the UK drug protection charity for children. Mentor believes that prevention is the best and most cost-effective way to protect our children from substance misuse.

The younger a person starts to drink alcohol, the more likely they are to become alcohol dependent by the age of 20. Children who drink before the age of 14 have an average of three lower GCSE grades. The earlier their initial exposure to cannabis, the greater the chances children will damage their health and well-being.

The DfE estimates the cost of young people misusing drugs and alcohol as just under £100million per year in crime, and £4.3 million per year in health care.

Tackling substance misuse requires a multi-faceted approach. Mentor is working with schools, parents, community groups, industry and partners in government and the third sector.

Our goal is that every young person in the UK can make the best possible informed choices about drug and alcohol use.

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