



Home Office

Predictive factors for illicit drug use among young people: a literature review

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Home Office Online Report 05/07

The views expressed in this report are those of the authors, not necessarily those of the Home Office (nor do they reflect Government policy).

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Contents

Acknowledgements	i
Executive summary	iii
1 Introduction	1
Background	1
Levels of drug use among young people in the UK	2
Definitions of risk, protection and resilience	3
Research aims	4
Structure of the report	4
2 Methodology	5
Literature searches	5
Study categorisation	5
Selection of papers	6
Review process	6
Categorisation of risk factors	7
3 Results	8
Risk factors 1: Personal factors – biological, psychological and demographic	8
Risk factors 2: Personal factors – behavioural or attitudinal	10
Risk factors 3: Interpersonal relationships	11
Risk factors 4: Structural – environmental and economic	12
Qualitative papers	12
Survey of selected issues	14
4 Discussion	18
Review limitations	18
Assessment of risk factors	18
Conclusions	19
References	22

Executive summary

Introduction

There is a substantial epidemiological literature on factors associated with increased risk of illicit drug use among young people. Past reviews of this evidence have generally been unsystematic and thus prone to bias. The methodological quality of this evidence, and the validity of any conclusions that can be drawn from it, have often not been explicitly considered. The most recent substantive British review (Lloyd, 1998) highlighted the complex nature of the evidence but concluded that there are a number of high risk groups. These groups include the homeless, those looked after by local authorities, prostitutes, truants, those excluded from school, young offenders, children from families with substance abusing parents or siblings and young people with conduct or depressive disorder. However, the review was not systematic and few studies were cited that did not support the hypothesised links between risk factors and problem drug use.

Methods

The literature review described in this report was undertaken between January and June 2005. A systematic search of electronic databases identified 251 relevant papers of adequate quality. Of these 78 were randomly selected for further analysis. For the 62 quantitative studies, factors were classified into four main categories (A: Personal [biological, psychological]; B: Personal [behavioural, attitudinal]; C: Interpersonal relationships and D: Structural [environmental, economic]). Papers were reviewed in terms of methodology, type and level of drug use, type of data analysis and magnitude of relationships between predictive factors and drug use. The review process was modified for the 16 qualitative studies, taking account of these studies' descriptive and theoretical nature.

Results

The most extensive and consistent evidence relates to young people's interaction with their families. The key predictors of drug use are parental discipline, family cohesion and parental monitoring. Some aspects of family structure such as large family size and low parental age are linked to adolescent drug use. There is also consistent evidence linking peer drug use and drug availability to adolescent drug use. There is extensive evidence on parental substance use, although some studies report no association while others indicate that the association is attenuated by strong family cohesion. Age is strongly associated with prevalence of drug use among young people reflecting a range of factors including drug availability, peer relationships and reduced parental monitoring. There is limited evidence suggesting that genetic factors account for a significant proportion of the variance in liability to use cannabis, however this interpretation has been criticised by other writers. There is a similar level of evidence linking self-esteem and hedonism to drug use. The available evidence indicates that higher levels of drug use are strongly associated with young people's reasons for using drugs after controlling for risk factors.

Categories where evidence linking specific factors is mixed include: mental health, Attention Deficit Hyperactivity Disorder (ADHD), stimulant therapy, religious involvement, sport, health educator interventions, school performance, early onset of substance use and socio-economic status. For some of these categories there is evidence of indirect effects; for example, socio-economic status may influence parental monitoring which in turn influences drug use. The review did not consider any studies relating to previously identified risk and protective factors such as ethnicity or impulsivity.

For young drug users in treatment, psychosocial risk predicts drug abuse at treatment entry but not follow up. In contrast, protective factors are of increased importance during recovery.

The overall ratio of risk to protection may be more important than any individual factor. These results, although supported by a relatively small body of research, support the concept of resilience to drug use. According to this view resilience to drug use is enhanced by increasing social skills, social attachments and material resources despite constant exposure to known risk factors.

Whereas risk and resilience are, to a large extent, independent of individuals' motives, there is evidence that the latter are just as important as the former in determining drug use. Young drug users consistently report getting intoxicated and relief from negative mood states as reasons for their drug use. Qualitative research shows that the context in which young people experience drugs is crucial for understanding how risk and protective factors operate in relation to experimental and sustained drug use.

Risk factors have differential predictive values throughout adolescence. Some factors may occur at birth (or before) while others occur at varying times throughout adolescence. Some factors may persist for long periods of time while others are transitory. The distinction between early and late onset risk factors is important as preventive measures need to focus on particular age groups.

Conclusion

This review was pragmatic because it was time constrained and not all the studies identified could be reviewed in detail. From the studies reviewed, the evidence relating to factors associated with increased (or decreased) risk of drug use is described. Further analysis would require a detailed assessment of individual studies, with clear specification of exposures (risk and protective factors), outcomes (type and level of drug use) and study design (i.e. did exposure precede the outcome).

Much of the current knowledge about risk and protective factors is not yet available in a form that would permit the calculation of the effect of reducing exposure to risk (or enhancing protective factors), even if was possible to modify the exposure. The evidence indicates that risk and protective factors are context dependent and operate on people taking drugs for disparate reasons. With these caveats, improving the general social environment of children and supporting parents will probably be the most effective strategies for primary prevention of drug use. Studies indicating that risk and resilience can be successfully altered include interventions for parental monitoring and enhancement of social attachments and skills. These interventions show promise but have rarely been implemented or evaluated in the UK.

Keywords: Adolescence, Development, Drug Use, Risk Factors, Protective Factors, Resilience, Epidemiology, Review, Systematic Evidence

1 Introduction

Background

This report presents the results of a literature review on predictive factors for drug use among young people. Both policy makers and practitioners are aware of the importance of risk factors but the evidence requires careful evaluation. The last substantive review by a British researcher highlighted the complex nature of the evidence (Lloyd, 1998 [4.361]) but concluded that there was evidence of a number of high-risk groups. These groups include the homeless, those looked after by local authorities, prostitutes, truants, those excluded from school, young offenders, children from families with substance abusing parents or siblings, and young people with conduct or depressive disorder. The review does not quantify the level of risk associated with being a member of these groups. Lloyd's review cites very few studies that do not support the hypothesised links between risk factors and problem drug use.

An Australian study provides the most comprehensive review and analysis to date (Spooner, 1999). Her review notes that it is important to distinguish between the aetiology of drug use and the aetiology of drug abuse. She quotes Gorusch (1980), who states that there is strong evidence that those who use drugs do not necessarily become continual users, and they in turn do not necessarily become addicts. Thus the causes for each stage of drug use may be different. Spooner suggests that causal factors for drug use are more social, while those for problematic use are more likely to be psychological. The evidence indicates that "alienation needs to be countered before positive behavioural changes can be initiated" (Calabrese, 1990), and that conventionality predicts health-related behaviour (Donovan, 1991).

Spooner's review found that parental modelling factors (e.g. parental drug use, parental attitude to drugs) appear to have less influence than the quality of the parent-child relationship and parental management techniques. Being in a single parent family seems to be significant, but the effect disappears after adjustment for other factors. Once adolescents begin to use, parental attempts to control can be ineffective. Associating with peers is one of the strongest predictors, but the influence is not simple. Spooner interprets the literature as saying that drug use is often preceded by the individual being rejected by prosocial peers. The influence of peers increases as the influence of the family decreases. Timing of academic problems is also important.

Conduct disorder and drug use could possibly be part of the same underlying syndrome. Mental illness has tended not to be a strong or reliable indicator of drug abuse. This is also the case for socio-economic status.

With regard to interventions, Spooner states that knowledge-based interventions have had "no effect" or have actually increased drug use. However, she recommends provision of accurate information.

Spooner attaches considerable importance to a "detailed and complex study" by Kaplan and Johnson (1992). They found that the strongest predictor of increased drug use was the effect of specific labelling. In other words drug use increased as a result of getting into trouble about drug use. Negative social sanctions lead to increased use by a variety of pathways. First, the drug user interprets the label in a positive way. Second, the drug user loses motivation to conform. Third, having become alienated, the drug user has less opportunity to socialise with non-drug users.

The review states that Rhodes and Jason's (1988) social stress model may help when planning treatment intervention. The model proposes the calculation of a risk/protective index:

$$\frac{\text{Risk factors (stress+ drug normalization + drug experience)}}{\text{Protective factors (attachments +skills + resources)}}$$

Finally, Spooner is careful to note the limitations of her review. She acknowledges that there is much that is not known or not clear and that the literature contains much "supposition, inconsistency and error".

Another review of relevance to our study is by Canning *et al.*, (2004), and is entitled *Drug use prevention among young people: a review of reviews*. For current purposes, two of the reviewed papers are of interest.

The White and Pitts (1998) systematic review showed that the effects of interventions on illicit drug use were small and declined with time. Both meta-analyses of the one- and two-year follow up periods showed weighted mean effect sizes of 0.037 and 0.018, respectively, for the shorter and longer duration (these effect sizes are considered to be very small). Of 11 evaluations carried out to one year, ten showed that the direction of effect favoured drugs education. Their impact was small but they were associated with a decrease in substance use.

Canning concluded that the literature says little about the actual effects of interventions on drug-using behaviour. The absence of evidence of effective outcomes, such as prevention, delay, or reduction of drug use, makes it hard to determine 'what works' in drug prevention initiatives with vulnerable young people. Long-term, comparative longitudinal studies should be made of groups which have experienced particular types of interventions.

The final review of relevance to this report is entitled "*Systematic review of general population longitudinal studies reporting associations between illicit drug use by young people and psychosocial harm*" (Macleod *et al.*, 2004). Although this review looked at consequences rather than causes of drug use, it is important for its methodological insights. The authors note that past reviews of the relevant evidence have often been non-systematic and have used restricted search strategies. Much evidence is cross-sectional and derives from highly selected samples. Such evidence is limited as a basis for inferring true causal relations and their possible relevance to public health. The review found that cannabis use was inconsistently associated with psychological problems. Some studies found no association, although others reported associations between increased use and increased problems. Within these latter studies, patterns of association with specific psychological problems were inconsistent. Cannabis use was inconsistently associated with antisocial or otherwise problematic behaviour. The review confirmed the existence of evidence of associations between cannabis use and psychosocial harm; however, the extent and strength of this evidence seemed less than is perhaps sometimes assumed. Furthermore, the causal nature of these associations is far from clear.

This review aims to build on the findings of previous reviews, drawing on the extensive new research that has been conducted since the late 1990s.

Levels of drug use among young people in the UK

In order to provide context for the current review, information on the prevalence of drug use among young people is summarised in this section.

Levels of illicit drug use among young people in the UK are among the highest in the European Union (Hibbell *et al.*, 2004). The rates of 'ever cannabis use' among respondents, aged 16 at time of interview in 2003, were 41 per cent for boys and 35 per cent for girls. The rates for use in the last 30 days were 23 per cent for boys and 16 per cent for girls.

National surveys conducted among school pupils aged 11 to 15 in England found that the prevalence of taking any drugs was stable between 2001 and 2003 (Boreham and Blenkinsop, 2004). Prevalence of taking drugs in the last month was 12 per cent in 2003,

while prevalence of taking drugs in the last year was 21 per cent, and the prevalence of having ever taken drugs was 30 per cent. Forty-two per cent of pupils had been offered drugs. The most commonly offered drug was cannabis (27%), followed by volatile substances (19%), poppers (12%), magic mushrooms (10%), crack (9%), cocaine (9%) and heroin (7%). Prevalence rates are strongly associated with age. At age 11, four per cent had taken drugs in the last month and eight per cent in the last year, compared with 23 per cent and 38 per cent of 15-year-olds respectively.

In another series of school surveys from 1987-2005, Balding (2005) notes that over this time period young people (aged 11 to 15) are more likely to have been offered drugs (up to 53% of 14- to 15-year-olds in 2002) and have taken drugs (up to 33% of 14- to 15-year-olds in 1996). The surveys have also found that, as pupils get older, fewer think that cannabis is 'always unsafe'. On the other hand, in recent years young people have been less likely to know a drug user personally, or worry about drugs.

Among the 16- to 24-year-old age group, the 2003/2004 British Crime Survey (Chivite-Matthews *et al.*, 2005) indicates that around 2.8 million people in England and Wales have ever used any illicit drug and 0.5 million used a Class A drug in the last year.

Definitions of risk, protection and resilience

Although each of these concepts has been defined in numerous ways in different studies, they contain core characteristics. For the purposes of this report the definitions used are those given by Clayton (1992) and Werner (1989). A risk factor is "an individual attribute, individual characteristic, situational condition, or environmental context that increases the probability of drug use or abuse or a transition in level of involvement in drugs" (Clayton, 1992). Conversely, a protective factor is "an individual attribute, individual characteristic, situational condition, or environmental context that inhibits, reduces, or buffers the probability of drug use or abuse or a transition in level of involvement in drugs" (Clayton, 1992). Resilience is a process "whereby young people exhibit positive behaviours although they have been exposed to risk factors" (Werner, 1989).

In order to plan interventions or treatment it is necessary to apply a more rigorous definition of risk. The Absolute Risk Difference is the difference in the risk for disease or death between an exposed population and an unexposed population. Relative risk is defined as "the ratio of the probability of developing, in a specified period of time, an outcome among those receiving the treatment of interest or exposed to a risk factor, compared with the probability of developing the outcome if the risk factor or intervention is not present" (<http://www.med.ualberta.ca/ebm/define.htm>; accessed 08/02/07). The literature on drug abuse contains many general statements about risk factors without specifying what the potential impact of removing exposure to that factor might be. Conversely, a person or group may be stigmatised by being labelled as having a risk factor, when the risk may not be very large. Furthermore, few studies determine the prevalence of exposure to risk factors in the population. The relationship between risk and causality has been extensively analysed and refined in the literature. By examining the available evidence in relation to Hill's postulates (Hill, 1965) it may be possible to assess whether there is a causal connection between hypothesised risk factors and outcomes. Hill's modified postulates are: 1) Consideration of explanations other than an underlying cause-and-effect relationship for the observed association; 2) Strength of the association; 3) Data collection free from bias; 4) Consistency of results in various studies (that is, similar observations in different populations at different times in different places); 5) Plausible biologic mechanism and 6) Positive dose-response or exposure-risk relationship refers to whether the frequency or severity of illness increases with increasing dose or exposure.

Parker (2003) argues "we need to revise the way we define risk and protective factors in relation to youthful heavy drinking and now extensive 'recreational' drug use certainly in respect of the UK and Western Europe". Parker notes that, in his experience, most young drug users do not produce high-risk scores on traditional measures. This has encouraged some to situate psychosocial factor analyses in a more sociological framework to try and explain why 'risk' needs to be re-cast to better explain macro changes in substance

consumption. He argues that there has been a closure of gender difference and that a substantial proportion of these young substance consumers are well educated, employed, conforming citizens from professional classes. Parker argues that “rational consumption theory” is a more convincing explanation of drug use than attempts to explain it in terms of vulnerability.

Parker’s approach draws from survey research and therefore may not take account of young people who are under-represented in surveys, such as those for whom drug use is problematic. Parker’s use of normalization theory has also been critically examined by Shildrick (1992).

Some of the issues raised by previous reviews are that:

- Results from different populations tend to be grouped together in terms of age-band, type and levels of drug use.
- Risk factors which seem similar are considered under the same general heading (e.g. behaviour problems, family relations).
- Lists of so-called risk and protective factors are given without noting that there are many contradictory findings.
- Only positive findings are reported.
- There is a lack of systematic analysis of specified risk factors in relation to specified outcomes.
- The impact of confounding or differentiating causal from non-causal associations is not considered.

Perhaps because of these limitations, risk is sometimes described in the form of simple statements which may or may not be appropriate for different forms of drug use and different populations. The Health Promotion Agency for Northern Ireland (<http://www.drugsalcohol.info>; accessed 08/02/07) states that correlates of drug use include impulsive behaviour, excessive personal stress, boredom, anti-social tendencies, scepticism about school drug education and media prevention efforts, peer pro-drug attitudes, lack of parental concern and intention to use. Negative correlates include self-esteem, liking school, achievement, religious beliefs, optimism about the future, parental intolerance of deviance, and the presence of controls and regulations in the home.

Research aims

The aim of this review is to appraise the evidence on risk, protection and resilience from studies on illicit drug use among young people. From this appraisal, the aim is to determine the strength of the evidence associated with four categories of predictive factors. These categories are: A: Personal [biological, psychological]; B: Personal [behavioural, attitudinal]; C: Interpersonal relationships; and D: Structural [environmental, economic]. Whereas previous reviews have been descriptive, the aim of this review is to quantify the evidence in as unbiased a manner as possible. At the same time, the review also aims to analyse qualitative research and consider how findings from this literature complement the quantitative literature.

Structure of the report

Chapter 2 of the report describes the study methodology and how the papers were analysed. In Chapter 3 the main findings are presented and Chapter 4 contains the discussion and conclusions. There are four appendices available in a separate document. Appendix 1 details the review’s search strategy; Appendix 2 contains the forms used to code studies; Appendix 3 gives previous classifications of risk, protection and resilience; Appendix 4 lists the risk factors described in this review; and Appendix 5 contains detailed tables of study results. These tables include details of studies reviewed together with associations identified, their values and significance levels.

2 Methodology

Literature searches

The terms used in the search strategy are shown in Appendix 1.

The following sources were scanned.

- Journal articles describing quantitative studies identified by a search of electronic databases.
- Drugscope library.
- UK government publications (<http://www.drugs.gov.uk/publication-search>; accessed 08/02/2007).
- Qualitative European drug research network <http://qed.emcdda.eu.int>; accessed 08/02/2007).

The study was conducted between January and June 2005. The data searches took place in January 2005 and the data were entered into Reference Manager in January 2005. The papers were reviewed between February and March 2005 and the analysis was conducted from April to June 2005.

Study categorisation

Existing classification schemes were reviewed, but were not considered appropriate for this study because they tend to relate to the quality of experimental evidence. From our current knowledge we know that most studies in this field do not have a high-grade experimental design and we have therefore developed the alternative scheme shown below as a more appropriate categorisation. This is a categorical rather than an ordered scale.

Categories of evidence for this review

1. Systematic reviews which include at least one Randomised Control Trial (RCT).
2. Other systematic and high quality reviews which synthesise references.
3. Individual Randomised Controlled Trials (RCTs).
4. Individual non-randomised, experimental/intervention studies.
5. Individual non-experimental studies – Longitudinal, cohort.
6. Individual non-experimental studies – Cross-sectional.
7. Qualitative studies.
8. Summary review articles and discussions of relevant literature.

Four hundred and three papers were identified from the searches. The number of papers in each of the categories was as follows:

Description	Number of papers
1) Systematic reviews which include at least one Randomised Control Trial (RCT) (e.g. from Cochrane)	0
2) Systematic and high quality reviews which synthesise references	6
3) Individual RCTs	4
4) Individual non-randomised, experimental/intervention studies	6
5) Individual non-experimental studies – Longitudinal, cohort	62
6) Individual non-experimental studies – Cross-sectional	92
7) Qualitative studies	24
8) Summary review articles and discussions of relevant literature	57
9) Not appropriate for this study	152

Based on a review of the abstracts 152 papers were excluded because:

- substance use /abuse was not measured as a study outcome;

- drugs were considered as risk factors for other later outcomes;
- childhood predictors of adult drug use were examined.

After exclusion of these categories, there were 251 potential papers. The results of the searches were input into Reference Manager. The coding proformas are shown in Appendix 2.

Selection of papers

Given the study timeframe it was not possible to review all 251 papers. Using the figures shown in the previous section, it was decided to review all systematic and high quality reviews, individual RCTs, individual non-randomised experimental/intervention studies, and qualitative studies. However, after preliminary review of the 24 qualitative studies, eight were rejected because they failed to give sufficient information on drug use among young people or the qualitative methods were only a minor part of the study.

A random subset of papers were selected for categories 5, 6 and 8 (individual non-experimental studies - longitudinal; individual non-experimental studies - cross-sectional and review articles and discussions). Following the selection of papers for review, it transpired that a small number could not be obtained, and were therefore not considered for review. In category 4, one paper was not obtainable. Where papers in categories 5, 6 and 8 were not obtainable, another paper was randomly selected as a replacement.

There were eight reviewers for the project, split into four teams, of two. Each team reviewed papers as follows:

Reviewers	Categories	Number of papers in category	Number allocated for review
Martin Frisher and John Macleod	2 Systematic and high quality reviews (no RCTS)	6	6
	3 Individual RCTs	4	4
	4 Individual non-randomised, experimental/intervention studies	6	5
	8 Review articles and discussions	57	5
Matthew Hickman and Katherine Keetley	7 Qualitative studies	24	16
Roger Bloor and Dennis Okolo	5 Longitudinal, cohort	62	20
Ilana Crome and Manoj Kumar	6 Cross-sectional	92	22
	Total	251	78

Review process

Given that most systematic reviews examine fewer papers and are conducted over a much longer timeframe, it was necessary to develop a strategy for analysing the 78 selected papers. This involved the development and piloting of a coding form.

For the 62 quantitative studies the following variables were coded:

1. Type of study.
2. Study setting (country).
3. Participants (in-treatment, community etc.).

4. Respondents' age range.
5. Risk and protective factors
6. Main outcome measure (type of drug).
7. Main outcome measure (level of drug use).
8. Type of analysis.
9. Specify comparison made (e.g. risk factor: left school vs. stayed at school; outcome: weekly drug use).
10. Type of association between risk factor and outcome.
11. Strength of association between risk factor and outcome.

For each study, details of up to ten risk factors and associations were included. The review process was modified for the 16 qualitative studies, taking account of their descriptive and theoretical nature. Details of the coding for qualitative studies are given in Appendix 2.

Categorisation of risk factors

There are many potential classifications of risk, protection and resilience. Some of the previous classifications are shown in Appendix 3. The scheme adopted in this study is based on previous Home Office work (Dillon, 2006).

A: Personal: Biological or psychological including demographics (that are given, i.e. can not really be changed)

- Genetic predisposition
- Gender
- Age
- Ethnicity
- Life events
- Self-esteem
- Hedonism (sensation seeking)
- Mental disorder or depression

B Personal: Behavioural or attitudinal (personal factors that are easier to change by policy or life changes than are the ones above)

- Law breaking (delinquency)
- Anti-social behaviour (conduct disorder)
- Educational disturbance
- Early onset of smoking
- Early onset of alcohol use
- Attitude towards drug use
- Alienation (rebellion)
- Low religiosity
- Dealing with drugs

C Personal: Interpersonal relationships (these include all of the relationships with family and friends)

- Lack of family bonding (poor relationships)
- Parental management (parental control)
- Family disturbance (conflict)
- Peers in trouble or using drugs
- Low social support network

D Structural: Environmental and economic (these include issues outside of the individual and most of the time outside of the individual's control).

- Socio-economic status (poverty)
- School management
- Neighbourhood disorder
- Things to do in the area
- Drugs availability

The full list of risk factors identified in the study is shown in Appendix 4.

3 Results

This chapter presents the results of the quantitative studies, followed by those of the qualitative studies.

Three hundred and seventeen relationships between factors and specific outcomes were identified in the 62 quantitative studies. For these, the outcome drugs were cannabis (39%), Class A drugs (10%), and amphetamines/ecstasy (1%). In the remaining analyses (50%), the outcome was a general measure of drug use, with higher scores indicating higher levels of drug use. The risk factor categories for the 317 relationships were:

- A. Personal factors – Biological, psychological and demographic (27%).
- B. Personal factors – Behavioural or attitudinal (24%).
- C. Interpersonal relationships (33%).
- D. Structural –environmental and economic (16%).

Seventy-two per cent of papers were published in 2000–2004. Ten per cent of studies were primarily British. The full results of the quantitative literature review are shown in Appendix 5.

Risk factors 1: Personal factors – biological, psychological and demographic

These are factors that are either difficult or impossible to change (Dillon *et al.*, 2006).

Gender

Gender was a significant predictor of drug use in four studies (Hofler *et al.*, 1999 [63.397]; Johnson *et al.*, 1995 [19.119]; von Sydow *et al.*, 2002 [45.248]; Young *et al.*, 2002 [83.387]). Ilomaki *et al.*, 2004 [11.59]) did not find a significant association between gender and level of drug use.

Age

Four studies found that age was a predictor of cannabis use or overall level of drug use (Young *et al.*, 2002 [83.37]; Beckett *et al.*, 2004 [77.363]; Ljubotina *et al.*, 2004 [46.206]; Howard and Jenson, 1999 [22.142]).

Ethnicity/language/place of birth

An Australian study (Olsson *et al.*, 2003 [90.399]) reported that non-English speakers and those with parents born outside Australia had higher levels of drug use, although these differences were non-significant after controlling for other factors.

Life events

A study by Turner (2003 [7.53]) found that lifetime cumulative exposure to distant, as well as to more recent, adversity predicts risk of subsequent drug dependence. However, the study also reported that some types of trauma were not significant after controlling for other factors. The authors note that studies of the impact of lifetime cumulative adversity on substance abuse problems are very rare. Lynskey *et al.* (2002 [44.241]) reported that childhood sexual trauma was a risk factor for ecstasy but not for crack cocaine. Turner and Lloyd (2003 [55.266]) reported significant associations with emotional abuse by caretakers and physical abuse by partner or spouse.

Self-esteem

Four studies (Howard and Jenson, 1999 [22.142]; Hoffman and Cerbone, 2002 [43.240]; Vega *et al.*, 1993 [62.304]; Newcomb *et al.*, 1986 [53.286]) reported that low self-esteem was associated with drug use. In the latter study ten risk factors were studied and, of these, self-

esteem had the lowest correlation with drug use (0.07 compared with 0.16 for 'poor relationship with parents' and 0.41 for 'peer drug use').

Hedonism

One study (Ljubotina *et al.*, 2004 [46.206]) reported that hedonism was associated with level of cannabis use.

Depression/anxiety

In relation to depression and anxiety, Hoffman and Cerbone (2002 [43.240]) and Hofler *et al.* (1999 [63.397]) reported associations, while Ilomaki *et al.* (2004 [11.59]) did not. Turner (2003 [7.53]) reported significant associations, but these became non-significant after controlling for other factors.

Other psychological and mental health factors

A range of psychological factors was associated with drug use, including suicidality (Howard and Jenson, 1999 [22.142]; Vega *et al.*, 1993 [62.304]) and mental health problems (Hofler *et al.*, 1999 [63.397]). For phobias, Ilomaki *et al.* (2004 [11.59]) found that "over one-half of the adolescents with phobic disorders had developed substance dependence within three years after the onset of phobia". However, other studies did not report significant psychological associations (for example with regards to mental health problems and sensation seeking (Newcomb *et al.*, 1986 [53.286]). Tarter *et al.* (2003, 49.269) report that neurobehavioural disorder score differentiates boys at "high average risk" at ages 10 to 12 from those at "low average risk". Neurobehavioural disinhibition at age 16, in conjunction with substance use frequency and risk status group, predicted substance use disorder at age 19 with 85 per cent accuracy.

Attention Deficit Hyperactivity Disorder (ADHD)/stimulant therapy/learning disability/conduct disorder

The issue of stimulant therapy featured in many studies. Wilens *et al.* (2003 [1.84]) reported significant associations with drug use while Mannuzza *et al.* (2003 [4.281]) did not. Some studies reported both significant and non-significant associations, depending on what precise relationship was being studied (Biederman *et al.*, 1997 [60.392]; Fischer and Barkley, 2003 [4.23]). Beitchman *et al.*, 2001 [56.354]) reported associations with learning disability (LD). The children in this study underwent a three-stage screening, in which the criteria involved being below the 25th percentile for at least one of the following subjects – reading, writing or maths. Note that this definition excludes those who would be diagnosed as having a learning disability in the UK, as the children all had IQ levels of greater than 70.¹ The screening resulted in a sample of 284 who were then followed up at ages 12 and 19. They were screened at follow up for both a learning difficulty and substance use disorder (SUD). The study showed that there was an increased risk for SUD if there was a learning difficulty present at age 19, or at both ages 12 and 19. There was no increased risk for SUD from the presence of a learning difficulty at age 12 only. The risk for SUD is both a general risk for a number of adverse outcomes and a specific independent risk for SUD. Lynskey *et al.* (2002 [44.241]) reported a significant association with childhood conduct disorder.

Genetic

Lynskey *et al.* (2002 [44.241]) reported that 45 per cent of the variance in liability to cannabis dependence could be accounted for by genetic factors, 20 per cent by shared environmental

¹ A diagnosis of learning disability in the UK assumes an IQ below 70 - the American definition of learning disability assumes an IQ below 80. The only US studies that can be equated to a UK LD population are ones which look at the USA "mental retardation" population which have IQ below 80. The USA LD population in this study consists of people with specific disorders of reading, writing, arithmetic etc but only a mild IQ deficit and they would mostly need some form of remedial education within a normal school setting.

factors and 35 per cent by non-shared environmental factors.² Merikangas and Avenevoli (2000 [40.226]) state that "...familial factors are more strongly associated with substance dependence than abuse, with an attributable risk of 55 per cent". These findings, however, do not apply to the changes in patterns of drug use over recent decades. The substantial change in prevalence over such a short timescale cannot be due to genetic factors, which operate over a much longer period.

Risk factors 2: Personal factors – behavioural or attitudinal

These are personal factors that are easier to change by policy or life changes than those in the previous section (Dillon *et al.*, 2006).

Early onset of substance use

Four studies reported significant associations (Hofler *et al.*, 1999 [63.397]; von Sydow *et al.*, 2002 [45.248]; Howard and Jenson, 1999 [22.142]; Johnson *et al.*, 1995 [19.119]) while two did not (Beckett *et al.*, 2004 [77.363]; Newcomb *et al.*, 1986 [53.286]). Von Sydow *et al.* (2002 [45.248]) studied predictors of cannabis use vs. abuse and concluded that as well as "factors such as peer group pressure, drug availability, and low self-esteem, findings suggest that family history (e.g. parental mental disorders, early parental death), and prior experiences with legal drugs play a significant role in the initiation of cannabis consumption and the transition to cannabis use disorders in adolescents and young adults".

Other substance use

Many studies reported a particular form of drug use as being a risk factor for another form of drug use (examples include Hofler *et al.*, 1999 [63.397]; von Sydow *et al.*, 2002 [45.248]). With regard to inhalant use, Johnson *et al.*, (1999 [19.119]) reported that "youths with a history of inhalant use by age 16 were over nine times more likely to begin heroin use by age 32, even when other plausible risk factors for the development of heroin use were held constant (RR = 9.3; 95% C.I. = 1.3-51.3)".

Perceptions of substance use

Several studies reported that, where drug use is perceived as being low-risk in relation to health, levels of drug use are higher (von Sydow *et al.*, 2002 [45.248]; Morgan *et al.*, 1999 [3.357]). High satisfaction with drug use was associated with higher levels of cannabis use (McCambridge and Strang, 2004 [71.348]).

Religion

Religious involvement was significant in one study (Yang *et al.*, 1998 [31.139]) but not in two others (Bachman *et al.* 1990 [20.100]; Newcomb *et al.*, 1986 [53.286]).

Sport

Participation in sport was significant in one study (Stronski *et al.*, 2000 [36.161]) but not in another (Morgan *et al.*, 1999 [3.357]).

Predictors of treatment outcome

The overall level of risk and protection (as measured by indices of several factors) and treatment duration were significant in relation to level of drug use during and after participation in treatment (Latimer *et al.*, 2000 [14.86]). The precise relationship depends on the user's participation in drug treatment.

² The effects of nurture can be divided into shared and non-shared. Shared environmental factors are those experienced by siblings raised together. Non-shared environmental factors are not shared by siblings, i.e. unique experiences. In many cases non-shared environmental effects have been found to outweigh shared environmental effects. That is, environmental effects that are typically thought to be life-shaping (such as family life) have less of an impact than non-shared effects, which are harder to identify. One possible source of non-shared effects is the pre-natal environment. Random variations in the genetic program of development may be a substantial source of non-shared environment. (source: http://en.wikipedia.org/wiki/Nature_versus_nurture accessed 15/10/05.)

Other behavioural characteristics

Several studies reported that behavioural problems are significantly associated with drug use (e.g. contextual violence (Brook *et al.*, 2002 [33.191]); resolving conflict through physical aggression (Unger *et al.*, 2003 [45.203]); and early sexual involvement (Hallfors *et al.*, 2002 [2.268]). Other studies did not find evidence of association (e.g. resolving conflict through non-physical aggression or non-aggression (Unger *et al.*, 2003 [45.203]), deviance (Newcomb *et al.*, 1986 [53.286]). Unger *et al.* (2003) found that “adolescents who respond to interpersonal conflicts in an aggressive manner, whether physical or verbal/psychological, may be at increased risk for substance use, while non-aggressive conflict management skills may be protective”.

Risk factors 3: Interpersonal relationships

These include relationships with, and characteristics of, family, friends and peers.

Family structure

There were associations with young parents (Reinherz *et al.*, 2000 [12.72]), larger families (Reinherz *et al.*, 2000 [12.72]) and parental divorce (Lynskey *et al.*, 2002 [44.241]). One study (Boyle *et al.*, 2001 [53.253]) reported that the dominant influence appears to be from older to younger siblings rather than from parents to offspring.

Family interaction

Several studies reported family interactions to be associated with drug use. Examples include low parental discipline (King and Chassin, 2004 [2.63]), family cohesion (Hoffman and Cerbone, 2002 [43.240]) and parental monitoring (Case and Haines, 2003 [5.331]). In a randomized longitudinal trial, Stanton *et al.*, (2004 [2.61]) found that a parent monitoring intervention can “sustain protection beyond that conferred through an adolescent risk reduction intervention”.

Family substance abuse/psychiatric conditions

There were a large number of studies in this category, with the vast majority reporting significant associations with parental substance use (e.g. parental substance misuse (Merikangas and Avenevoli, 2000 [40.226]); parental cannabis use (Li *et al.*, 2002 [16.91]); older sibling substance use (Boyle *et al.*, 2001 [53.253]); father’s SUD (Reinherz *et al.*, 2000 [12.72]). Hoffman and Cerbone (2002 [43.240]) noted “parental SUD is positively associated with adolescent drug abuse, yet this association is attenuated by strong family cohesion”. Some studies reported associations with parental psychopathology (Brook *et al.*, 2002 [33.191]; Newcomb *et al.*, 1986 [53.286]). However, some did not find significant associations (e.g. parental smoking (Denton and Kampfe, 1994 [5.402]); parental substance abuse (Hoffmann and Su, 1998 [18.93]).

Peer behaviour and use

Several studies reported significant associations with friends’ use of licit and illicit substances (e.g. Hofler *et al.*, 1999 [ref 63.397]; von Sydow *et al.*, 2002 [45.248], Li *et al.*, 2002 [16.91]; Beckett *et al.*, 2004 [77.363]) and being offered drugs by friends (von Sydow *et al.*, 2002 [45.248]).

Risk factors 4: Structural – environmental and economic

These issues are either totally or largely outside of the individual's control (Dillon *et al.*, 2006).

Socio-economic

Some studies reported associations between lower socio-economic status (SES) and level of drug use [Reinherz *et al.*, 2000 [12.72]; Poulton *et al.*, 2002 [13.77]; Hofler *et al.*, 1999 [ref 63.397]). However, other studies did not find associations (Poulton *et al.*, 2002 [13.77]; Olsson *et al.*, 2003 [90.399]). Turner and Lloyd (2003 [55.266]) reported that “lifetime rates of drug dependence disorder did not vary significantly by socio-economic group”.

Poulton *et al.*, (2002 [13.77]) found that substance abuse resulting in clinical dependence was related to childhood socioeconomic status. The authors noted that “upward mobility did not mitigate or reverse the adverse effects of low childhood socioeconomic status on adult health”. Beckett *et al.* (2004 [77.363]) reported that indicators of local amenities had an indirect association with parental attitudes to drugs, which in turn were a strong predictor of young people's problematic drug use.

Education, school performance and school management

Several studies reported significant relationships (e.g. Hallfors *et al.*, 2002 [2.268]; Johnson *et al.*, 1995 [19.119]; Stronski *et al.*, 2000 [36.161]; Ljubotina *et al.*, 2004 [46.206]) while one did not (Morgan *et al.*, 1999 [3.357]). The latter study was unusual in that it examined country-level associations between school performance and levels of drug use. Case and Haines (2003, [5.331]) found that “exposure to risk factors within the main domains of the young person's life (family, school, neighbourhood, psychological) significantly increases the likelihood that they will ever become involved in drug use (‘ever takers’)”. They also reported that bullying, poor school performance and low school commitment were all associated with level of drug use. Study 36.161 (Stronski *et al.*, 2000) reported that school performance was associated with last month cannabis use, while study 2.268 (Hallfors *et al.*, 2002) reported that school performance was associated with ever cannabis use. This study, which used meta-analytic techniques, concluded that truancy had a higher predictive value for drug use. Reinherz *et al.* (2000 [12.72]) found that teacher-rated attention problems or ADHD at age nine were predictive of later drug use.

Drug availability

Several studies reported that access to drugs (von Sydow *et al.*, 2002 [45.248]; Hofler *et al.*, 1999 [63.397]) or perceived access to drugs (Morgan *et al.*, 1999 [3.357]; Manning *et al.*, 2001 [85.385]) or being offered drugs (Manning *et al.*, 2001 [85.385]) were associated with drug use (see also section on peer behaviour and use).

Effect of interventions

In a complex study, health educator led intervention showed both significant and non-significant associations depending on the precise nature of the intervention and the measure of drug use (Ellickson *et al.*, 1993 [4.103]). The study concluded that “when lessons stopped the program's effects on drug use stopped”. Effects on cognitive risk factors persisted for a longer time but were not sufficient to produce corresponding reductions in drug use. Sussman *et al.* (2003, [1.11]) reported that health educator led intervention was not associated with level of cannabis use, although there was an effect on “hard drug use” at two-year follow up.

Qualitative papers

The results from the 16 qualitative studies are considered separately because of their methodological approach. Many of the studies used a range of qualitative methods, with about half based on cross-sectional depth interviews, often with focus groups. Three studies were longitudinal, three involved non-participant observation, and one used only focus

groups. Ten of the studies were conducted in the UK, three in the US, two in Europe, and one among young people in Mexico. Seven of the studies recruited a purposive sample of young people from the general population or local community, three recruited subjects from schools, and the remainder recruited specific populations of young people including the homeless, young offenders, gang members, American Indians, and young people living in rural Mexico.

The studies focused on different drugs (heroin, any illicit drugs, alcohol, cocaine and cannabis) but, in contrast to the quantitative studies, did not explore specific risk or protective factors associated with drug use. Rather these studies examined different attitudes, behaviours and theories attached to drug use among young people. Three important and common themes (in the UK studies) were normalisation of drug taking and availability, the social context of drug taking, and implications for drug education and prevention.

Galt (1997 [1.67]) reported that illicit drugs were readily available and accessible and an accepted part of youth culture, and concluded that for drug education to be successful it has to take account of different motives and patterns of drug use. In contrast Burr (1987 [6.338]) considered the social profile of heroin users, which included factors such as family breakdowns and high rates of truancy and delinquency prior to heroin use. The researchers argued that the "local criminal subculture in South London provided the means for rapid expansion of heroin use" and that heroin use was an extension rather than the cause of delinquent behaviour among working class youth in the study. Boys *et al.* (1999 [5.337]) sought to explore decision making with regards to drug taking and observed multiple influences, which the researchers categorised into five individual-level influences (functions of substance use, substance-related expectancies, physical/psychological state, role commitments, and boundaries) and five social/contextual-level influences (environment, availability, finance, friends, peers, and the media). Bell *et al.* (1998 [4.336]) also argued that a crucial step in becoming a regular user lies in matching the effects of the drug to the social context in which it is used.

Maycock (2002 [11.345]) focused on initiation, reporting that it was frequently an informal, if not haphazard event, strongly dependent on availability and social context. The researchers emphasised that often drug decisions were not about whether or not to take drugs, but were based on "acceptable" and "unacceptable" drugs and "appropriate" vs. "inappropriate" patterns of use which, in common with Galt (1997 [1.67]), they interpreted implied that "social and cultural contexts of young people's lives need to be acknowledged within strategies aimed at reducing harm". Melrose (2000 [10.342]) also assessed initiation, but among young people excluded from school or in local authority care, reporting that motivations divided between "oblivion seekers", "acceptance seekers", and "thrill seekers".

A study by Pearson (2001 [20.381]) involved non-participant observation in local pubs in South London (once a week for seven years). He reported that use of drugs (cannabis and cocaine) was "normalised" within adult networks in that it was seen as an acceptable aspect of everyday life. In contrast, Shildrick (2002 [22.383]) argued that the concept of normalisation made too sharp a distinction between recreational and problematic drug use, which might obscure how traditional patterns of inequality may impact on youth drug use.

Klee and Reid (1998 [9.341]) examined drug use among homeless people, reporting that self-medication was common and that "damaging childhood experiences and problems [are] perpetuated and increased by illicit drug use". The study concluded that, as the period of homelessness lengthens, "the potential for rehabilitation and re-housing seem to diminish with more established patterns of drug use".

Cope (2000 [14.375]) interviewed young offenders and reported that "drugs played a role in the management of time and was one of a number of strategies inmates developed to cope with their sentences". Anderson (1994 [13.374]) found that young female offenders reported accounts of trajectories of drug use that typically began with problems the young women were unable to solve leading to escape through substance use, then escalation of trouble and problems and detention, with the participants repeatedly asking for "someone to listen" to problems early on.

The qualitative studies yield a range of insights which are not evident from the quantitative literature.

Survey of selected issues

Before summarising the findings of the review, it is worth while to compare and contrast some of the findings of the review. This section also draws on other research known to the authors.

Example 1. How do risk factors and protective factors impact on treatment of substance abuse among young people?

Latimer *et al.* (2000 [14.86]) examined risk and protection among a group of young people receiving treatment. Their study evaluated the hypothesis that combined indices of risk and protection are more important than individual factors.

Risk was defined by an index including parental substance abuse, sibling substance use, deviant attitudes, deviant behaviour, and impulsivity. Protection was defined by an index including no psychological disturbance, social connectedness, goal directedness, peer abstinence, and school connectedness. The study was longitudinal with six- and 12-month follow up. The sample comprised 225 youths in substance abuse treatment aged 14 to 17.

The key findings were as follows.

- Elevated pre-treatment substance abuse problem severity does NOT predict treatment outcome.
- Pre-treatment psychosocial risk *does* predict six-month post-treatment abuse severity.
- Six-month post-treatment risk does *not* predict 12-month post-treatment abuse severity.
- Pre-treatment protection does *not* predict six-month post-treatment abuse severity.
- Elevated psychosocial protection at six-month follow-up *does* predict reduced 12-month post-treatment abuse severity.

These findings suggest that protective factors become more important during recovery. This may be due in part to the influence of aftercare participation. Protective factors may take time to develop if they were previously blocked, whereas risk factors may be harder to modify. The model suggests that a lack of post-treatment psychosocial protection, rather the presence of psychosocial risk, may be an important relapse predictor.

In an earlier study of 994 adolescents in the USA (Newcomb *et al.*, 1986 [53.286]), ten risk factors for substance use were considered in a concurrent and longitudinal study over a five-year period. The number of risk factors was linearly associated with an increased percentage of drug users and abusers, as well as with frequency of use. The authors concluded that there is not one particular or specific reason that accounts for all types of drug use or all types of drug users. An implication of the study is that drug prevention programs should focus on reducing exposure to known risk factors and attempting to reduce the impact of those risk factors identified as being present.

Example 2. Does participation in sporting activity create resilience?

Countries reporting higher levels of participation in sports or reading books for enjoyment among young people were associated with higher levels of drug use (Morgan *et al.*, 1999 [3.357]). This type of ecological study can be interpreted in various ways. For example, the young people engaging in sport may not be the same young people who are using drugs. At an individual level, one study reported a positive association between sports and lower levels of drug use (Stronski *et al.*, 2000 [36.161]). From the available evidence it is not possible to draw any firm conclusions on this issue.

Example 3. Which parental factors relate to drug use?

Denton and Kampfe, 1994 [5.402] cite Pandina and Scuele (1983) who reported that adolescents who abuse drugs frequently report their parents to be controlling. They also cite

Tec (1973), who found that drug using adolescents typically come from homes where there is much parental pressure. Studies from the 1970s and 1980s found that parental disapproval did not have a significant influence on drug abusing adolescents. The review concludes that “although most studies find significant relationships between discipline and adolescent substance abuse, the findings are contradictory”. In a study of young problematic drug users in England in 2000, perception of parental control was found to be the best predictor of young people’s level of problematic drug use (Beckett *et al.*, 2004 [77.363]). The quality of parent-child relationships is related to cannabis use (Olsson *et al.*, 2003 [90.399]). These studies show that parental factors are sensitive to time and place. The American studies from the 1980s showed that drug abuse was associated with “controlling” parents. The UK studies from more recent times appear to reach the opposite conclusion.

Example 4. Is there an optimal age for drug prevention?

Among 101 adolescent drug users attending designated services in Stoke and Newcastle, the average age at interview was 16.8 years and the average age of first drug use was 13.2 years (Beckett *et al.*, 2004 [77.363]). Although the study was cross-sectional, the data indicate a gradual progression towards higher Levels of Problematic Drug Use (LPDU). These data could be used to argue that prevention activities should be directed and initiated in early adolescence because, among this sample, a high proportion of 16-year-olds with problematic drug use involving heroin and cocaine began experimenting with drugs at age 13. However, only a very small proportion of 13-year-olds who experiment with drugs will become problematic users (Balding, 2000). Shedler and Block (1990) found that adolescents who reported experimenting with psychoactive drugs at age 18 had healthier psychological outcomes at that age compared to frequent users or abstainers. Assessments of personality at ages 7 and 11 indicated that these differences could be traced to the early childhood and the quality of parenting received. The key findings of the Shedler and Block study regarding differences at age 18 were not replicated in a later study by Milich *et al* (2000).

The Balding study could be interpreted as saying that that early intervention would potentially only affect a small number of cases. Another possible argument against early intervention is that the age of onset only has a small impact on later levels of problematic drug use, after controlling for other factors (Beckett *et al.*, 2004 [77.363]). As higher levels of problematic drug use seem to develop (at least currently in the UK) around the age of 15 to 16, attempts to modify behaviour at this age may be more productive. The development of problematic drug use within a social context means that the differential impact of familial, parental models and peer pressures as the young person develops needs also to be considered. Previous American research, for example, has indicated that the effect of peers' antisocial activities on drug use begins to increase after the age of 15 (Guo *et al.*, 2002).

Although many commentators support the idea of drug prevention initiatives at an early age it is not clear if research has established whether there is an optimal age. The 2001 UK report to the EMCDDA notes the “importance of drugs education starting before the age of onset” (Jeffery *et al.*, 2002). This conclusion is based on the Positive Futures projects that have been established to engage vulnerable young people in high crime areas in sporting activities and also Project Charlie, which is a drug education programme aimed at children in primary schools.

Example 5. Is early drug use a risk factor for later problematic use?

- Analysis of the 1998/1999 Youth Lifestyles Survey (YLS) survey suggests that “early soft drug use and later hard drug use may be joint expressions of the same underlying personal problem rather than a consequence of a causal influence of soft drug use on the subsequent desire for harder drugs.” (Pudney, 2003 [55.351]).
- An American study found that, from the population of cannabis users, 17 per cent had used cocaine whereas from the population of non-cannabis users only 0.2 per cent had used cocaine (Center on Addiction and Substance Abuse, 1994) This study shows that cannabis users do have a much higher rate of cocaine use but also that, for the vast majority of cannabis users (83%), the drug is “clearly a ‘terminus’ rather than a ‘gateway’” (<http://www.ukcia.org/culture/effects/gateway01.php>, accessed 08/02/2007). In

epidemiological terms, it is clear that earlier cannabis use is a risk factor for later cocaine use. However, the study was not able to examine the hypothesis that both forms of drug use are the expression of some underlying characteristic.

- Lyskey *et al.* (2003 [44.241]) hypothesizes that, to the extent that twins share genes and environment, any variation in hard drug use must be attributable to some other factor or factors. The study population was 311 sets of same-sex twins in which only one twin had smoked marijuana before age 17. Early marijuana smokers were found to be up to five times more likely than their twins to move on to harder drugs. The study concluded that cannabis may change the brain (the classical gateway effect) but, as with the study by the Center on Addiction and Substance Abuse cited above, could not rule out other potential mechanisms including access to drugs, willingness to break the law, and likelihood of engaging in risk-taking behaviour.
- Qualitative research indicates that moving from experimentation with illicit drugs in the early teens to dance drugs and the Class As was seen as a sign of maturity both inherent in the image of the individual drugs themselves and also practically in the drugs' effects. (Measham *et al.*, 1998). Measham stated that "the continuation of drug use after an initial experience depended not only on the perceived positive and negative effects of the drug itself but also on how the drug trier learned to identify and interpret those effects".
- The evidence for the impact of early drug use on later problematic use is complex and often appears to be contradictory. Qualitative studies highlight the complex transitions involved in the natural history of drug use.

Example 6. How effective is drug education?

Melrose and Brodie (2001) reported that many young people felt that nothing would have prevented them from taking drugs when they did, as they wouldn't have listened to anyone at the time. Many young people also felt that they would not need the help of outside agencies to stop taking drugs if they should decide to do so. They stated that their drug taking wasn't a problem and that they could stop when and if they wanted to. This study appears to contradict the evidence cited above by Jeffery *et al.* (2002). The United Kingdom's Anti-drugs Coordinator's Annual Report 2000/2001 (2001) states that "educating children about the risks associated with drugs can delay or avoid the start of experimentation". However, a review notes that "evaluations that have attempted to demonstrate results in terms of reducing or preventing drug use have proved inconclusive" (Locatene, 2001). One researcher stated that "anti-drugs campaigns are more likely to encourage young people to experiment with drugs" (Plant, 2002). There does not appear to be a consensus on the value of drug prevention/education in the current literature.

Example 7. What is the association between deprivation and drug use?

In a study of 101 young people in English treatment agencies 60 per cent of respondents lived in areas of material deprivation (Townsend score above 3), compared with about 25 per cent of general population (Beckett *et al.*, 2004 [77.363]). However, in the same study there was no association between deprivation and level of problematic drug use (Beckett *et al.*, 2004 [77.363]). One common assumption, for example, is that more problematic forms of drug use are linked to socioeconomic deprivation (ACMD, 1998). Jeffery *et al.* (2002) state that there is a high correlation between social vulnerability including unemployment and offending, and chronic drug use. However, the 2000 British Crime Survey revealed a complex pattern of drug use. For example, rates of use by 16- to 29-year-olds in the last year for hallucinants and cocaine were highest in affluent urban areas, but use of heroin and crack was less prevalent in these areas than elsewhere.

Example 8. How do reasons for drug use related to risk factors?

Functions for substance use strongly predicted intensity of use in all five substances (alcohol, cannabis, amphetamines, ecstasy, and cocaine) when peer use, age of first use and demographics were controlled, explaining an additional 11 to 19 per cent of the variance in scores (Boys and Marsden, 2003). Functions also explained an average of 22 per cent of the

variance in problem scores over and above the effects of background variables and current intensity of use. In particular, functions concerned with relief from negative mood states were strong predictors of problem scores in alcohol, cannabis and cocaine. The potential implications of using a functional approach to explain and respond to substance use are considerable. This could help to enhance our understanding of how experimental substance use becomes regular and how regular use becomes problematic, and could thus inform prevention, education and intervention efforts. This is often overlooked from a risk/resilience perspective.

4 Discussion

Review limitations

Before summarizing the main results it should be noted that while the present review is systematic³ it is not comprehensive due to the large volume of literature available on the topic. Even with a relatively restricted set of studies, the review considered an extensive data set on risk factors for drug use. While the analyses conducted for this review enable some tentative conclusions to be drawn, these should be treated with caution since they do not meet the standards of objectivity associated with analyses of therapeutic interventions undertaken by, for example, the Cochrane Collaboration (www.cochrane.org). This would require a very detailed assessment of individual studies and would require clear specification of exposures (risk and protective factors), outcomes (type and level of drug use), and study design (i.e. did exposure procedure the outcome?). In comparison to many other areas where there is clear medical intervention and a clear outcome, study heterogeneity would make this a complex enterprise in relation to risk factors for drug use.

Four hundred and three papers were identified from initial searches. Based on the abstracts of these papers, 251 were considered to be relevant to the review. Due to time constraints, 78 papers (31%) were analysed. These papers were selected at random to avoid introduction of bias. Nevertheless it is likely that important information was reported in some of the papers that were not selected for further review.

Analysis of selected papers was limited by the process of data extraction. While many studies deal with relatively low levels of drug use, some focus on the more problematic end of the spectrum. Quantitative outcomes were assessed by a wide range of measures including odds ratios, relative risks, correlations, t-values, and percentage differences. Some analyses were univariate, while others were multivariate. Some studies considered complex interactions between different risk factors, which were not coded in the proforma. In a minority of studies, risks were measured prior to drug use, but in most cases measurement was concurrent. Ideally, all these factors would have been considered when selecting papers for detailed review. Assessment of quantitative papers involved extracting information predictive factors and the magnitude of relationships to drug outcome variables. This did not include detailed assessment of methodological quality of these studies.

Assessment of risk factors

Risk factors (1): Personal factors – biological, psychological and demographic

Male gender and older age are consistently associated with higher levels of drug use. Low self-esteem and hedonism are associated with higher levels of drug use. The evidence for depression, anxiety and life events is contradictory. While there is a considerable body of evidence linking poor mental health to drug use, some studies do not support this linkage. The evidence linking ADHD and stimulant therapy to drug use is extensive but mixed. Limited evidence links learning disability to drug use. There is very limited evidence to suggest that a substantial proportion of the variance in liability to cannabis use could be accounted for by genetic factors. There was no evidence from the review on ethnicity in relation to UK drug use.

Risk factors (2): Personal factors – behavioural or attitudinal

There is considerable evidence linking school pupils' behaviour (e.g. truancy, drop out, poor attendance) to drug use. The relationship between early onset of drug use and later

³ This review is systematic in the sense that explicit criteria were used to select papers so as to minimize the introduction of bias. It is not, however, systematic in the sense of reviews conducted by the Cochrane Collaboration where specific analytic techniques are applied to datasets. As explained in this review, this was not possible due to time constraints and the heterogeneous nature of the evidence.

problematic use is contradictory and depends on the drug and population being studied. There is evidence that licit substance use predicts later illicit drug use. Permissive attitudes to drug use are associated with higher levels of drug use. For participation in religious and sporting activities, the evidence was limited and mixed. Overall, levels of risk and protection are related to level of drug use during and after treatment.

Risk factors (3): Interpersonal relationships

Some aspects of family structure are associated with drug use (e.g. siblings of similar age, parental divorce, young parents). There is a considerable body of evidence linking dysfunctional family interaction and familial substance use to drug use. There is also considerable evidence for peer drug use.

Risk Factors (4): Structural – environmental and economic

There is limited evidence linking low socioeconomic status to drug use. There is considerable evidence relating aspects of schooling to drug use. Higher levels of drug availability are linked to higher levels of drug use. The evidence connecting specific interventions, such as health education, to drug use is limited and contradictory.

Clear evidence linking factors to drug use

The strongest and most consistent evidence links family interaction to drug use. The key elements of family interaction are parental discipline, family cohesion and parental monitoring. Modification of parental monitoring may be effective in reducing adolescent drug use. Some aspects of family structure are linked to adolescent drug use. There is also consistent evidence linking peer drug use and drug availability to adolescent drug use. These factors probably explain the consistent findings that age is strongly associated with prevalence of drug use. There is very limited evidence suggesting that genetic factors account for a significant proportion of the variance in liability to use cannabis. There is also limited evidence linking self-esteem and hedonism to drug use. The available evidence indicates that reasons for use explain as much of the variance in drug use as risk factors do. In relation to treatment for drug use, one study reported that the ratio of risk/protection is a consistent predictor of level of drug use during and after treatment.

Mixed evidence that links factors to drug use

Categories where evidence linking specific factors to drug use is mixed include gender, mental health, parental substance use, ADHD, stimulant therapy, religious involvement, sport, health educator led interventions, school performance, early onset of substance use, and socioeconomic status. No evidence was found linking adolescent drug use in the UK to ethnicity, language or place of birth. This does not mean that such a link does not exist, only that the review did not consider any relevant studies.

Conclusions

This systematic review was pragmatic because it was time constrained – it is therefore incomplete in that all the evidence identified could not be reviewed in detail. There is a large literature that is often of uncertain quality (mainly in relation to issues of measurement and sample bias). Subject to these caveats, the review has identified those factors that are associated with increased risk and those where the link is equivocal. Where the causal nature of these associations has been tested in intervention trials, effects have generally been small. This could be because the factors are not readily amenable to intervention, because the associations are not causal, because the influence of individual factors is small, because findings in one population do not generalise to others or for a combination of these reasons.

The evidence points to associations between a diverse group of risk factors for drug use. These factors include parental discipline, family cohesion, parental monitoring, peer drug use, drug availability, genetic profile, self-esteem, hedonistic attitudes, reasons for drug use, and the ratio of risk/protective factors. There is less consistent evidence linking drug use to mental health, parental substance use, ADHD/stimulant therapy, religious involvement, sport, health

educator led interventions, school performance, early onset of substance use, and socioeconomic status.

As has been noted in the context of youth violence, risk factors have differential predictive values throughout adolescence (Surgeon General, 1999). Some factors may occur at birth (or before) while others occur at varying times throughout adolescence. Some factors may persist for long periods of time while others are transitory. As already noted different factors are associated with the initiation and continuation of drug use, although this distinction is not always clear in the literature. Risk factors are not discrete entities and their complex interactions are difficult to conceptualise, let alone analyse. The studies reviewed here indicate additive effects of risk factors (although there may also be complex interactions). The distinction between early and late onset risk factors is important as preventive measures need to focus on particular age groups. Table 1 shows a possible framework for conceptualising the developmental nature of risk factors for drug use among young people.

Table 1. Potential Development Framework for Risk Factors for Drug Use among Young People (dark shading indicates a relatively strong factor, light shading indicates a relatively weaker factor)

	Categories of Risk and Protective Factors for Drug Use among Young People									
Age	Prenatal Environment ¹	Genetic	Family Experience ²	School ³	Friends ⁴	Psychological Traits ⁵	Reasons for drug use ⁶	Socio Economic ⁷	Early Licit Use ⁸	Protective Factors
Minus 9 months										
Birth										
Infancy (0-2)										
Early Childhood (3-8)										
Middle Childhood (9-11)										
Adolescence (12-18)										

Table notes: Possible factors associated with categories of risk: see text for more details

- 1 maternal smoking, maternal drug use
- 2 parental discipline, family cohesion, parental substance use, parental monitoring, sibling drug use, early life trauma
- 3 truancy, educational attainment, problems at school, school rules
- 4 friends' drug use, friends' anti-social behaviour
- 5 low self-esteem, hedonism, attention deficit hyperactivity disorder, phobias, depression, anxiety, aggressive behaviour to solve problems
- 6 get intoxicated, escape from negative moods
- 7 low household income, lack of neighbourhood amenities
- 8 early onset of smoking (age 11) and drinking (age 12)
- 9 As well as the inverse, there may be a range of additional protective factors such as negative consequences of drug taking, do not consider drugs as part of lifestyle, not being exposed to drugs, adherence to conventional values, involvement in religious or sporting activities, strategies for resisting pressures to use drugs, positive future plans

As mentioned in the introduction, the literature on drug abuse contains many general statements about risk and protective factors, without specifying what the potential benefits and harms of modifying exposure to these factors might be. In relation to human genetics, Merikangas and Avenevoli (2000 [40.226]) write that “progress in characterizing genes of relevance to the metabolism and response to specific drugs will ultimately enhance our ability to identify those at risk for the development of substance abuse and its sequelae”. However, there is also concern, given current knowledge, about the potential negative impact of identification of genetic risk factors in terms of stigma and labelling. It has also been argued that it would be counter to evolutionary theory to select genes for a harmful trait such as addiction (http://en.wikipedia.org/wiki/Drug_addiction; accessed 08/02/07). Much of the current knowledge about risk and protective factors is not yet available in a form that permits calculation of benefit were it possible to modify exposure to risk or protective factors.

Ideally, each study reviewed here would be further analysed in terms of relative risk so that it would be possible to determine the ratio of the probability of developing an outcome among those exposed to a risk factor, compared with the probability of developing the outcome if the risk factor is not present. For each specific category of risk factor and outcome (in terms of type and level of drug use) the evidence from various studies would be jointly considered to produce a weighted average. One of the difficulties with this approach is the diversity of risk factors, reflecting the complexity of the social environment in which drug use occurs. The qualitative studies reviewed here portray this complexity in descriptive terms and point to the situational determinants of drug use. It is widely accepted that the effects of drugs are dependent on “set and setting”, i.e. psychological and environmental factors (Zinburg, 1984). While risk and protective factors also operate within set and setting, Lloyd (1998) observed that there is a tendency to consider them as fixed entities which are unaffected by changing circumstances and environments. Perhaps the terms lend themselves to this interpretation because of their use in everyday language. This evidence reinforces the need to consider the rapidly changing environment in which predictive factors operate. It is within this context that the impact of risk, protection and resilience on drug use among young people should be analysed and interpreted.

References

This chapter is split into three sections. First, papers that were reviewed; second, papers that were eligible for review but could not be reviewed within the timeframe; third, papers that were not reviewed but are cited in the text.

Section 1. Reviewed papers

Categories used

- 1 Systematic reviews which include at least one RCT
- 2 Systematic and high quality reviews but no RCTs
- 3 Individual RCTs
- 4 Individual non-randomised, experimental/intervention studies
- 5 Individual non-experimental studies - Longitudinal, cohort
- 6 Individual non-experimental studies - Cross-sectional
- 7 Qualitative studies
- 8 Commentaries

Category 1: Systematic reviews which include at least one RCT

No papers

Category 2: Systematic and high quality reviews but no RCTs

1.84

Wilens, T. E., Faraone, S. V., Biederman, J. et al. (2003) Does stimulant therapy of attention-deficit/hyperactivity disorder beget later substance abuse? A meta-analytic review of the literature. *Pediatrics*, **111**, 179-185.

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Morgan, M., Hibell, B., Andersson, B. et al. (1999) The ESPAD study: Implications for prevention. *Drugs: Education, Prevention and Policy*, **6**, 243-256.

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Denton, R. E. and Kampfe, C. M. (1994) The relationship between family variables and adolescent substance abuse: A literature review. *Adolescence*, **29**, 475-495.

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Weinberg, N. Z., Rahdert, E., Colliver, J. D. et al. (1998) Adolescent substance abuse: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, **37**, 252-261.

Category 3: Individual RCTs

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Stanton, B., Cole, M., Galbraith, J. et al. (2004) Randomized trial of a parent intervention: Parents can make a difference in long-term adolescent risk behaviors, perceptions, and knowledge. *Archives of Pediatrics and Adolescent Medicine*, **158**, 947-955.

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King, K. M. and Chassin, L. (2004) Mediating and moderated effects of adolescent behavioural undercontrol and parenting in the prediction of drug use disorders in emerging adulthood. *Psychology of Addictive Behaviors*, **18**, 239-249.

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Ellickson, P. L., Bell, R. M. and Harrison, E. R. (1993) Changing adolescent propensities to use drugs: Results from project ALERT. *Health Education Quarterly*, **20**, 227-242.

Category 5: Individual non-experimental studies – longitudinal, cohort

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Fischer, M. and Barkley, R. A. (2003) Childhood stimulant treatment and risk for later substance abuse. *Journal of Clinical Psychiatry*, **64**, 19-23.

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Category 8: Commentaries

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