



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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Acknowledgements

Thanks to Corrina Knight for all her work on this project. Thanks also to Natalia Chivite-Matthews and Geraldine Brown for helpful comments on the draft manuscript.

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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.

- Lysnkey *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" (Locatenet, 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.

2.268

Hallfors, D., Vevea, J. L., Iritani, B. et al. (2002) Truancy, grade point average, and sexual activity: A meta-analysis of risk indicators for youth substance use. *Journal of School Health*, **72**, 205-211.

3.357

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

4.361

Lloyd, C. (1998) Risk factors for problem drug use: Identifying vulnerable groups. *Drugs: Education, Prevention and Policy*, **5**, 217-232.

5.402

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

6.403

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

1.11

Sussman, S., Sun, P., McCuller, W. J. et al. (2003) Project towards no drug abuse: Two-year outcomes of a trial that compares health educator delivery to self-instruction. *Preventive Medicine*, **37**, 155-162.

2.61

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.

3.62

Tolan, P., Gorman-Smith, D. and Henry, D. (2004) Supporting families in a high-risk setting: Proximal effects of the SAFEChildren preventive intervention. *Journal of Consulting and Clinical Psychology*, **72**, 855-869.

4.103

Ellickson, P. L., Bell, R. M. and McGuigan, K. (1993) Preventing adolescent drug use: Long-term results of a junior high program. *American Journal of Public Health*, **83**, 856-861.

Category 4: Individual non-randomised, experimental/intervention studies

1.37

Schinke, S. P., Di Noia, J. and Glassman, J. R. (2004) Computer-mediated intervention to prevent drug abuse and violence among high-risk youth. *Addictive Behaviors*, **29**, 225-229.

2.63

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.

4.281

Mannuzza, S., Klein, R. and Moulton, J. (2003) Does stimulant treatment place children at risk for adult substance abuse? A controlled, prospective follow-up study. *Journal of Child and Adolescent Psychopharmacology*, **13**, 273-282.

5.331

Case, S. and Haines, K. (2003) Promoting prevention: Preventing youth drug use in Swansea, UK, by targeting risk and protective factors. *Journal of Substance Use*, **8**, 243-251.

6.362

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

4.23

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

11.59

Iloimaki, R., Hakko, H., Timonen, M. et al. (2004) Temporal relationship between the age of onset of phobic disorders and development of substance dependence in adolescent psychiatric patients. *Drug and Alcohol Dependence*, **75**, 327-330.

12.72

Reinherz, H. Z., Giacconia, R. M., Carmola Hauf, A. M. et al. (2000) General and specific childhood risk factors for depression and drug disorders by early adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, **39**, 223-231.

13.77

Poulton, R., Caspi, A., Milne, B. J. et al. (2002) Association between children's experience of socio-economic disadvantage and adult health: A life-course study. *Lancet*, **360**, 1640-1645.

16.87

Rashad, I. and Kaestner, R. (2004) Teenage sex, drugs and alcohol use: Problems identifying the cause of risky behaviors. *Journal of Health Economics*, **23**, 493-503.

19.119

Johnson, E. O., Schntz, C. G., Anthony, J. C. et al. (1995) Inhalants to heroin: A prospective analysis from adolescence to adulthood. *Drug and Alcohol Dependence*, **40**, 159-164.

22.142

Howard, M. O. and Jenson, J. M. (1999) Inhalant use among antisocial youth: Prevalence and correlates. *Addictive Behaviors*, **24**, 59-74.

33.191

Brook, D., Brook, J., Rosen, Z. et al. (2002) Correlates of marijuana use in Colombian adolescents: A focus on the impact of the ecological/cultural domain. *Journal of Adolescent Health*, **31**, 286-298.

40.226

Merikangas, K. and Avenevoli, S. (2000) Implications of genetic epidemiology for the prevention of substance use disorders. *Addictive Behaviors*, **25**, 807-820.

43.240

Hoffmann, J. and Cerbone, F. (2002) Parental substance use disorder and the risk of adolescent drug abuse: An event history analysis. *Drug and Alcohol Dependence*, **66**, 255-264.

44.241

Lynskey, M., Heath, A. C., Nelson, A. C. et al. (2002) Genetic and environmental contributions to cannabis dependence in a national young adult twin sample. *Psychological Medicine*, **32**, 195-207.

45.248

von Sydow, K., Lieb, R., Pfister, H. et al. (2002) What predicts incident use of cannabis and progression to abuse and dependence? A 4-year prospective examination of risk factors in a community sample of adolescents and young adults. *Drug and Alcohol Dependence*, **68**, 49-64.

49.269

Tarter, R., Kirisci, L., Mezzich, A. et al. (2003) Neurobehavioral disinhibition in childhood predicts early age at onset of substance use disorder. *American Journal of Psychiatry*, **160**, 1078-1085

53.286

Newcomb, M. D., Maddahian, E. and Bentler, P. M. (1986) Risk factors for drug use among adolescents: Concurrent and longitudinal analyses. *American Journal of Public Health*, **76**, 525-531.

54.314

Gibbons, F. X., Gerrard, M., Lune, L. S. V., et al. (2004) Context and cognitions: Environmental risk, social influence, and adolescent substance use. *Personality and Social Psychology Bulletin*, **30**, 1048-1061.

55.351

Pudney, S. (2003) The road to ruin? Sequences of initiation to drugs and crime in Britain. *Economic Journal*, **113**, C182-C198.

56.354

Beitchman, J. H., Wilson, B., Douglas, L., et al. (2001) Substance use disorders in young adults with and without LD: Predictive and concurrent relationships. *Journal of Learning Disabilities*, **34**, 317-332.

58.372

Denham Wright, J. and Pearl, L. (2000) Experience and knowledge of young people regarding illicit drug use 1969-99. *Addiction*, **95**, 1225-1235.

60.392

Biederman, J., Wilens, T., Mick, E. et al. (1997) Is ADHD a risk factor for psychoactive substance use disorders? Findings from a four-year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry*, **36**, 21-30.

63.397

Hofler, M., Lieb, R., Perkonig, A. et al. (1999) Covariates of cannabis use progression in a representative population sample of adolescents: A prospective examination of vulnerability and risk factors. *Addiction*, **94**, 1679-1694.

Category 6: Individual non-experimental studies – cross-sectional

5.25

Aytaclar, S., Erkiran, M., Kirisci, L. et al. (2003) Substance abuse and associated psychosocial risk factors among Turkish male adolescents. *Addictive Behaviors*, **28**, 1419-1429.

7.29

Vanyukov, M. M., Kirisci, L., Tarter, R. E. et al. (2003) Liability to substance use disorders: 2. A measurement approach. *Neuroscience and Biobehavioral Reviews*, **27**, 517-526.

8.31

Adams, C. D., Perkins, K. C., Lumley, V., et al (2003) Validation of the Perkins Adolescent Risk Screen (PARS). *Journal of Adolescent Health*, **33**, 462-470.

14.86

Latimer, W. W., Newcomb, M., Winters, K. C. et al. (2000) Adolescent substance abuse treatment outcome: The role of substance abuse problem severity. *Journal of Consulting and Clinical Psychology*, **68**, 684-696.

16.91

Li, C., Pentz, M. A. and Chou, C-P. (2002) Parental substance use as a modifier of adolescent substance use risk. *Addiction*, **97**, 1537-1550.

18.93

Hoffmann, J. P. and Su, S. S. (1998) Parental substance use disorder, mediating variables and adolescent drug use: A non-recursive model. *Addiction*, **93**, 1351-1364.

20.100

Bachman, J. G., Johnston, L. D. and Malley, P. M. (1990) Explaining the recent decline in cocaine use among young adults: Further evidence that perceived risks and disapproval lead to reduced drug use. *Journal of Health and Social Behavior*, **31**, 173-184.

31.139

Yang, M. S., Yang, M. J., Lin, Y. H. et al. (1998) Prevalence and related risk factors of licit and illicit substance use by adolescent students in southern Taiwan. *Public Health*, **112**, 347-352.

36.161

Stronski, S. M., Ireland, M., Michaud, P. et al. (2000) Protective correlates of stages in adolescent substance use: A Swiss national study. *Journal of Adolescent Health*, **26**, 420-427.

37.162

Farrell, A. D., Kung, E. M., White, K. S. et al. (2000) The structure of self-reported aggression, drug use, and delinquent behaviors during early adolescence. *Journal of Clinical Child Psychology*, **29**, 282-292.

41.174

Brook, J. S., Brook, D. W., de la Rosa, M. et al. (2001) Adolescent illegal drug use: The impact of personality, family, and environmental factors. *Journal of Behavioral Medicine*, **24**, 183-203.

45.203

Unger, J., Sussman, S. and Dent, C. (2003) Interpersonal conflict tactics and substance use among high-risk adolescents. *Addictive Behaviors*, **28**, 979-987.

46.206

Ljubotina, D., Galic, J. and Jukic, V. (2004) Prevalence and risk factors of substance use among urban adolescents: Questionnaire study. *Croatian Medical Journal*, **45**, 88-98.

53.253

Boyle, M. H., Sanford, M., Szatmari, P. et al. (2001) Familial influences on substance misuse by adolescents and young adults. *Canadian Journal of Public Health*, **92**, 206-209.

55.266

Turner, R. and Lloyd, D. (2003) Cumulative adversity and drug dependence in young adults: Racial/ethnic contrasts. *Addiction*, **98**, 305-315.

62.304

Vega, W. A., Zimmerman, R. S., Warheit, G. J. et al. (1993) Risk factors for early adolescent drug use in four ethnic and racial groups. *American Journal of Public Health*, **83**, 185-189.

67.325

Friedman, A. S. and Glassman, K. (2000) Family risk factors versus peer risk factors for drug abuse: A longitudinal study of an African American urban community sample. *Journal of Substance Abuse Treatment*, **18**, 267-275.

71.348

McCambridge, J. and Strang, J. (2004) Drug problems – what problems? Concurrent predictors of selected types of drug problems in a London community sample of young people who use drugs. *Addiction Research and Theory*, **12**, 55-66.

77.363

Beckett, H., Heap, J., McArdle, P. et al. (2004) Understanding problem drug use among young people accessing drug services: A multivariate approach using statistical modelling techniques (Home Office Online Report 15/04). At <http://www.homeoffice.gov.uk/rds/pdfs04/rdsolr1504.pdf>; accessed 08/02/2007,

83.370

Young, S. E., Corley, R. P., Stallings, M. C. et al. (2002) Substance use, abuse and dependence in adolescence: Prevalence, symptom profiles and correlates. *Drug and Alcohol Dependence*, **68**, 309-322.

85.385

Manning, V., Best, D., Rawaf, S. et al. (2001) Drug use in adolescence: The relationship between opportunity, initial use, and continuation of use of four illicit drugs in cohort of 14- to 16-year-olds in South London. *Drugs: Education, Prevention and Policy*, **8**, 397-405.

90.399

Olsson, C. A., Coffey, C., Toumbourou, J. W., et al. (2003) Family risk factors for cannabis use: A population-based survey of Australian secondary school students. *Drug and Alcohol Review*, **22**, 143-152.

Category 7: Qualitative studies

1.67

Galt, M. (1997) Illicit drug availability in rural areas and attitudes toward their use: Young people talking. *Health Education Journal*, **56**, 17-34.

4.336

Bell, R., Paris, S., Cunningham-Burley, S. et al. (1998) Young men's use of cannabis: Exploring changes in meaning and context over time. *Drugs: Education, Prevention and Policy*, **5**.

5.337

Boys, A., Marsden, J., Fountain, J. et al. (1999) What influences young people's use of drugs? A qualitative study of decision-making. *Drugs: Education, Prevention and Policy*, **6**, 373-387.

8.340

Burr, A. (1987) Chasing the dragon. *British Journal of Criminology*, **27**, 333-355.

9.341

Klee, H. and Reid, P. (1998) Drugs and youth homelessness. *Drugs: Education, Prevention and Policy*, **5**, 269-280.

10.342

Melrose, M. (2000) *Fixing It? Young People, Drugs and Disadvantage*. Dorset: Russet House Publishing.

11.345

Maycock, P. (2002) Drug pathways, transitions and decisions: The experiences of young people in an inner-city Dublin community. *Contemporary Drug Problems*, **29**, 117-156.

12.368

Wagner, F., Diaz, D. B. et al. (2002) Social cohesion, cultural identity, and drug use in Mexican rural communities. *Substance Use and Misuse*, **37**, 715-717.

13.374

Anderson, N. L. (1994) Resolutions and risk-taking in juvenile detention. *Clinical Nursing Research*, **3**, 297-315.

14.375

Cope, N. (2000) Drug use in prison: The experience of young offenders. *Drugs: Education, Prevention and Policy*, **7**, 355.

18.379

McKeganey, N., McIntosh, J. and MacDonald, F. (2003) Young people's experience of illegal drug use in the family. *Drugs: Education, Prevention and Policy*, **10**, 169-184.

19.380

Okamoto, S. K., Hurdle, D. E. and Marsiglia, F. F. (2001) Exploring culturally-based drug resistance strategies used by American Indian adolescents of the southwest. *Journal of Alcohol and Drug Education*, **47**, 45-59.

20.381

Pearson, G. (2001) Normal drug use: Ethnographic fieldwork among an adult network of recreational drug users in inner London. *Substance Use and Misuse*, **36**, 167-200.

22.383

Shildrick, T. (2002) Young people, illicit drug use and the question of normalization. *Journal of Youth Studies*, **5**, 35-48.

23.384

Valdez, A. and Sifaneck, S. J. (2004) Getting high and getting by: Dimensions of drug selling behaviors among American Mexican gang members in south Texas. *Journal of Research in Crime and Delinquency*, **41**, 82-105.

Category 8: Commentaries

2.16

Bailey, S. (2003) Young offenders and mental health. *Current Opinion in Psychiatry*, **16**, 581-591.

7.53

Turner, R. J. (2003) The pursuit of socially modifiable contingencies in mental health. *Journal of Health and Social Behavior*, **44**, 1-17.

19.126

Blum, R. W. (1997) Adolescent substance use and abuse. *Archives of Pediatrics and Adolescent Medicine*, **151**, 805-808.

38.249

Hawkins, J., Catalano, R. and Arthur, M. (2002) Promoting science-based prevention in communities. *Addictive Behaviors*, **27**, 951-976.

52.373

Spooner, C. (1999) Causes and correlates of adolescent drug abuse and implications for treatment. *Drug and Alcohol Review*, **18**, 453-475.

Section 2. References not reviewed

Category 4: Individual non-randomised, experimental/intervention studies (not reviewed)

Sussman, S., Dent, C. W. and Stacy, A. W. (2002) Project towards no drug abuse: A review of the findings and future directions. *American Journal of Health Behavior*, **26**, 354-365.

Category 5: Individual non-experimental studies - Longitudinal, cohort (not reviewed)

Aas, H. and Pedersen, W. (1993) Stages in adolescents' drug use – A longitudinal study. *Nordisk Alkoholtidsskrift*, **10**, 145-154.

Biederman, J. (2003) Pharmacotherapy for attention-deficit/hyperactivity disorder (ADHD) decreases the risk for substance abuse: Findings from a longitudinal follow-up of youths with and without ADHD. *Journal of Clinical Psychiatry*, **64**, 3-8.

Biederman, J., Faraone, S. V., Monuteaux, M. C. et al. (2000) Patterns of alcohol and drug use in adolescents can be predicted by parental substance use disorders. *Pediatrics*, **106**, 792-797.

Blore, L. G., Schulze, S. and Lessing, A. (2004) The relationship between adolescent depressive symptomatology and substance abuse. *Curationis*, **27**, 12-22.

Boys, A., Farrell, M., Taylor, C. et al. (2003) Psychiatric morbidity and substance use in young people aged 13 to 15 years: Results from the child and adolescent survey of mental health. *British Journal of Psychology*, **182**, 509-517.

Brook, J. S., Brook, D. W., Aencibia, M. et al. (2001) Risk factors for adolescent marijuana use across cultures and across time. *Journal of Genetic Psychology*, **162**, 357-374.

Brook, J. S., Kessler, R. C. and Cohen, P. (1999) The onset of marijuana use from preadolescence and early adolescence to young adulthood. *Development and Psychopathology*, **11**, 901-914.

- Brook, J. S., Whiteman, M., Finch, S. et al.** (2000) Longitudinally foretelling drug use in the late twenties: Adolescent personality and social-environment antecedents. *Journal of Genetic Psychology*, **161**, 37-51.
- Bry, B. H.** (1996) Psychological approaches to prevention. in *Drug Policy and Human Nature: Psychological Perspectives on the Prevention, Management, and Treatment of Illicit Drug Abuse* (eds W. K. Bickel and R. J. DeGrandpre), pp. 55-76. New York: Plenum.
- Duncan, S. C., Duncan, T. E. and Strycker, L. A.** (2000) Risk and protective factors influencing adolescent problem behavior: A multivariate latent growth curve analysis. *Annals of Behavioral Medicine*, **22**, 103-109.
- Ellickson, P. L. and Morton, S. C.** (1999) Identifying adolescents at risk for hard drug use: Racial/ethnic variations. *Journal of Adolescent Health*, **25**, 382-395.
- Farrell, A. D.** (1993) Risk factors for drug use in urban adolescents: A three-wave longitudinal study. *Journal of Drug Issues*, **23**, 443-462.
- Fergusson, D. M., Lynskey, M. T. and Horwood, L. J.** (1993) Conduct problems and attention deficit behaviour in middle childhood and cannabis use by age 15. *Australian and New Zealand Journal of Psychiatry*, **27**, 673-682.
- Gil, A., Vega, W. and Turner, R.** (2002) Early and mid-adolescence risk factors for later substance abuse by African Americans and European Americans. *Public Health Reports*, **117** (Suppl. 1), S15-S29.
- Gil, A., Wagner, E. and Tubman, J.** (2004) Associations between early-adolescent substance use and subsequent young-adult substance use disorders and psychiatric disorders among a multiethnic male sample in South Florida. *American Journal of Public Health*, **9**, 1603-1609.
- Graber, J. A., Seeley, J. R., Brooks-Gunn, J. et al.** (2004) Is pubertal timing associated with psychopathology in young adulthood? *Journal of the American Academy of Child and Adolescent Psychiatry*, **43**, 718-726.
- Granic, I. and Dishion, T.** (2003) Deviant talk in adolescent friendships: A step toward measuring a pathogenic attractor process. *Social Development*, **12**, 314-334.
- Hsieh, S. and Hollister, C. D.** (2004) Explaining gender differences in adolescent substance abuse behavior: Comparisons and implications for treatment. *Journal of Child and Adolescent Substance Abuse*, **13**, 53-70.
- Kendler, K., Jacobson, K., Prescott, C. et al.** (2003) Specificity of genetic and environmental risk factors for use and abuse/dependence of cannabis, cocaine, hallucinogens, sedatives, stimulants, and opiates in male twins. *American Journal of Psychiatry*, **160**, 687-696.
- Langbehn, D., Cadoret, R., Caspers, K. et al.** (2003) Genetic and environmental risk factors for the onset of drug use and problems in adoptees. *Drug and Alcohol Dependence*, **69**, 151-167.
- Latimer, W. W., Winters, K. C., Stinchfield, R. et al.** (2000) Demographic, individual and interpersonal predictors of adolescent alcohol and marijuana use following treatment. *Psychology of Addictive Behaviors*, **14**, 162-173.
- Lewinsohn, P. M., Gotlib, I. H. and Seeley, J. R.** (1995) Adolescent psychopathology: IV. Specificity of psychosocial risk factors for depression and substance abuse in older adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, **34**, 1221-1229.

Maes, H. H., Woodard, C. E., Murrelle, L. et al. (1999) Tobacco, alcohol and drug use in eight- to sixteen-year-old twins. The Virginia twin study of adolescent behavioural development. *Journal of Studies on Alcohol*, **60**, 293-305.

Miller, L., Davies, M. and Greenwald, S. (2000) Religiosity and substance use and abuse among adolescents in the National Comorbidity Survey. *Journal of the American Academy of Child and Adolescent Psychiatry*, **39**, 1190-1197.

Miller, D. S. and Miller, T. Q. (1997) A test of socio-economic status as a predictor of initial marijuana use. *Addictive Behaviors*, **22**, 479-489.

Molina, B. and Pelham, W. E. J. (2003) Childhood predictors of adolescent substance use in a longitudinal study of children with ADHD. *Journal of Abnormal Psychology*, **112**, 497-507.

Moss, H. B., Lynch, K. G. and Hardie, T. L. (2003) Affiliation with deviant peers among children of substance dependent fathers from pre-adolescence into adolescence: Associations with problem behaviors. *Drug and Alcohol Dependence*, **71**, 117-125.

Pidcock, B., Fischer, J., Forthun, L. et al. (2000) Hispanic and Anglo college women's risk factors for substance abuse and eating disorders. *Addictive Behaviors*, **25**, 705-723.

Scheier, L. M., Newcomb, M. D. and Skager, R. (1994) Risk, protection, and vulnerability to adolescent drug use: Latent-variable models of three age groups. *Journal of Drug Education*, **24**, 49-82.

Schramm-Sapyta, N. L., Pratt, A. R. and Winder, D. G. (2004) Effects of periadolescent versus adult cocaine exposure on cocaine conditioned place preference and motor sensitisation in mice. *Psychopharmacology*, **173**, 41-48.

Shedler, J. and Block, J. (1990) Adolescent drug use and psychological health. *American Psychologist*, **45**, 612-630.

Silberg, J., Rutter, M., D'Onofrio, B. et al. (2003) Genetic and environmental risk factors in adolescent substance use. *Journal of Clinical Psychology and Psychiatry and Allied Disciplines*, **44**, 664-676.

Stenbacka, M. (2000) The role of competence factors in reducing the future risk of drug use among young Swedish men. *Addiction*, **95**, 1573-1581.

Stice, E., Burton, E. M. and Shaw, H. (2004) Prospective relations between bulimic pathology, depression, and substance abuse: Unpacking comorbidity in adolescent girls. *Journal of Consulting and Clinical Psychology*, **72**, 62-71.

Tarter, R. E., Blackson, T., Brigham, J. et al. (1995) The association between childhood irritability and liability to substance use in early adolescence: A 2-year follow up study of boys at risk for substance abuse. *Drug and Alcohol Dependence*, **39**, 253-261.

Tebes, J. K., Irish, J. T., Vasquez, M. J. P. et al. (2004) Cognitive transformation as a marker of resilience. *Substance Use and Misuse*, **39**, 769-788.

Urberg, K., Luo, Q., Pilgrim, C., et al. (2003) A two-stage model of peer influence in adolescent substance use: Individual and relationship-specific differences in susceptibility to influence. *Addictive Behaviors*, **28**, 1243-1256.

Vakalahi, H. F. (2002) Family-based predictors of adolescent substance use. *Journal of Child and Adolescent Substance Abuse*, **11**, 1-15.

Wills, T., Gibbons, F. X., Gerrard, M. et al. (2003) Family communication and religiosity related to substance use and sexual behavior in early adolescence: A test for pathways

through self-control and prototype perceptions. *Psychology of Addictive Behaviors*, **17**, 312-323.

Wills, T., Sandy, J., Yaeger, A. et al. (2001) Family risk factors and adolescent substance use: Moderation effects for temperament dimensions. *Developmental Psychology*, **37**, 283-297.

Windham, A. (2003) *Pathways to Problem Drug Use: The Role of Early Maternal Nurturing*.

Younoszai, T. M., Lohrmann, D. K., Seefeldt, C. A. et al. (1999) Trends from 1987 to 1991 in alcohol, tobacco, and other drug ATOD use among adolescents exposed to a school district-wide prevention intervention. *Journal of Drug Education*, **29**, 77-94.

Category 6: Individual non-experimental studies – cross-sectional (not reviewed)

Abdulahim, A. I., Rodriguez, G., Ryan, J. A. et al. (1998) The epidemiology of substance use among middle school students: The impact of school, familial, community and individual risk factors. *Journal of Child and Adolescent Substance Abuse*, **8**, 55-77.

Andrews, J. A., Tildesley, E., Hops, H. et al. (2002) *The Influence of Peers on Young Adult Substance Use*. *Health Psychology*, **21**(4), 349-357.

Arthur, M. W., Hawkins, J. D., Pollard, J. A., et al. (2002) Measuring risk and protective factors for substance use, delinquency, and other adolescent problem behaviors: The communities that care youth survey. *Evaluation Review*, **26**, 575-601.

Beinart, S., Anderson, B., Lee, S., et al. (2002) *Youth at Risk? A National Survey of Risk Factors, Protective Factors and Problem Behaviour among Young People in England, Scotland and Wales*. Communities That Care.

Beyers, J., Toumbourou, J., Catalano, R. et al. (2004) A cross-national comparison of risk and protective factors for adolescent substance use: The United States and Australia. *Journal of Adolescent Health*, **35**, 3-16.

Boreham, R. and Shaw, A. (2002) *Drug Use, Smoking and Drinking by Young People in England in 2001*. London: Office for National Statistics.

Boys, A., Marsden, J., Griffiths, P. et al. (1999) Substance use among young people: The relationship between perceived functions and intentions. *Addiction*, **94**, 1043-1050.

Brain, K., Parker, H. and Bottomley, T. (1998) *Evolving Crack Cocaine Careers: New Users, Quitters and Long-term Combination Drug Users in NW England*. Manchester: University of Manchester.

Brook, J. S., Whiteman, M., Balka, E. B. et al. (1997) African-American and Puerto Rican drug use: A longitudinal study. *Journal of the American Academy of Child and Adolescent Psychiatry*, **36**, 1260-1268.

Challier, B., Chau, N., Predine, R. et al. (2000) Associations of family environment and individual factors with tobacco, alcohol and illicit drug use in adolescents. *European Journal of Epidemiology*, **16**, 33-42.

Coffey, C., Carlin, J., Lynskey, M. et al. (2003) Adolescent precursors of cannabis dependence: Findings from the Victorian Adolescent Health Cohort Study. *British Journal of Psychiatry*, **182**, 330-336.

Cusick, L., Martin, A. and May, T. (2003) *Vulnerability and Involvement in Drug Use and Sex Work* (Home Office Research Study 268). London: Home Office.

- Dawes, M. A., Antelman, S. M., Vanyukov, M. M. et al.** (2000) Developmental sources of variation in liability to adolescent substance use disorders. *Drug and Alcohol Dependence*, **61**, 3-14.
- Dawes, M. A., Dorn, L. D., Moss, H. B. et al.** Hormonal and Behavioral Homeostasis in Boys at Risk for Substance Abuse. *Drug and Alcohol Dependence*, **55**, 165-176.
- DeWit, D.** (1998) Frequent childhood geographic relocation: Its impact on drug use initiation and the development of alcohol and other drug-related problems among adolescents and young adults. *Addictive Behaviors*, **23**, 623-634.
- DiClemente, R. J., Wingood, G. M., Crosby, R. et al.** (2001) Parental monitoring: Association with adolescents' risk behaviors. *Pediatrics*, **107**, 1363-1368.
- Duffy, K.** (2002) *Measuring Risk and Protective Factors in Substance Abusing Adolescents: Examining the Usefulness of the Behavior Assessment System for Children.*
- Emery, E. M., McDermott, R. J., Holcomb, D. R. et al.** (1993) The relationship between youth substance use and area-specific self-esteem. *Journal of School Health*, **63**, 224-228.
- Friedman, A. S., Ali, A. and McMurphy, S.** (1998) Father absence as a risk factor for substance use and illegal behavior by the adolescent sons. *Journal of Child and Adolescent Substance Abuse*, **8**, 79-95.
- Goulden, C. and Sondhi, A.** (2001) *At the Margins: Drug Use by Vulnerable Young People in the 1998/99 Youth Lifestyles Survey* (Home Office Research Study 228). London: Home Office.
- Gfroerer, J. and de la Rosa, M.** (1993) Protective and risk factors associated with drug use among Hispanic youth. *Journal of Addictive Diseases*, **12**, 87-107.
- Giancola, P. R.** (2003) Constructive thinking, antisocial behavior, and drug use in adolescent boys with and without a family history of substance use disorder. *Personality and Individual Differences*, **35**, 1315-1330.
- Glavak, R., Kuterovac, J. and Sakoman, S.** (2003) Perceived parental acceptance-rejection, family-related factors, and socio-economic status of families of adolescent heroin addicts. *Croatian Medical Journal*, **44**, 199-206.
- Graham, N.** (1997) A test of magnitude: Does the strength of predictors explain differences in drug use among adolescents. *Journal of Drug Education*, **27**, 83-104.
- Gutierrez, S. E., Molof, M. and Ungerleider, S.** (1994) Relationship of "risk" factors to teen substance use: A comparison of abstainers, infrequent users, and frequent users. *International Journal of the Addictions*, **29**, 1559-1579.
- Hammersley, R., Marsland, L. and Reid, M.** (2003) *Substance Use by Young Offenders: The Impact of the Normalisation of Drug Use in the Early Years of the 21st Century* (Home Office Research Study 261). London: Home Office.
- Harrier, L., Lambert, P. and Ramos, V.** (2001) Indicators of adolescent drug users in a clinical population. *Journal of Child and Adolescent Substance Abuse*, **10**, 71-87.
- Harrison, P. A. and Luxenberg, M. G.** (1995) Comparisons of alcohol and other drug problems among Minnesota adolescents in 1989 and 1992. *Archives of Pediatrics and Adolescent Medicine*, **149**, 137-144.
- Hermida, J-R. F., Villa, R. S., Seco, G. V. et al.** (2003) Evaluation of what parents know about their children's drug use and how they perceive the most common family risk factors. *Journal of Drug Education*, **33**, 337-353.

- Hussong, A. and Hicks, R.** (2003) Affect and peer context interactively impact adolescent substance use. *Journal of Abnormal Child Psychology*, **31**, 413-426.
- Jenkins, J. E.** (1996) The influence of peer affiliation and student activities on adolescent drug involvement. *Adolescence*, **31**, 297-306.
- Kikuchi, A. and Wada, K.** (2003) Factors associated with volatile solvent use among junior high school students in Kanto, Japan. *Addiction*, **98**, 771-784.
- Kilpatrick, D. G., Acierno, R., Saunders, B. et al.** (2000) Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology*, **68**, 19-30.
- Kilpatrick, D. G., Ruggiero, K. J., Acierno, R. et al.** (2003) Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the national survey of adolescents. *Journal of Consulting and Clinical Psychology*, **71**, 692-700.
- Konings, E., Dubois, A., Narring, F. et al.** (1995) Identifying adolescent drug users: Results of a national survey on adolescent health in Switzerland. *Journal of Adolescent Health*, **16**, 240-247.
- Labouvie, E. W. and McGee, C. R.** (1986) Relation of personality to alcohol and drug use in adolescence. *Journal of Consulting and Clinical Psychology*, **54**, 289-293.
- Lopez, J. S., Martinez, J. M., Martin, A. et al.** (2001) An exploratory multivariate approach to drug consumption patterns in young people based on Primary Socialization Theory. *Substance Use and Misuse*, **36**, 1611-1649.
- McArdle, P., Wiegersma, A., Gilvarry, E. et al.** (2002) European adolescent substance use: The roles of family structure, function and gender. *Addiction*, **97**, 329-336.
- Milberger, S., Faraone, S. V., Biederman, J. et al.** (1999) Substance use disorders in high-risk adolescent offspring. *American Journal on Addictions*, **8**, 211-219.
- Moon, D. G., Jackson, K. M. and Hecht, M. L.** (2000) Family risk and resiliency factors, substance use, and the drug resistance process in adolescence. *Journal of Drug Education*, **30**, 373-398.
- Newcomb, M. D., Maddahian, E., Skager, R. et al.** (1987) Substance abuse and psychosocial risk factors among teenagers: Associations with sex, age, ethnicity, and type of school. *American Journal of Drug and Alcohol Abuse*, **13**, 413-433.
- Obot, I. S., Wagner, F. A. and Anthony, J. C.** (2001) Early onset and recent drug use among children of parents with alcohol problems: Data from a national epidemiologic survey. *Drug and Alcohol Dependence*, **65**, 1-8.
- Ohannessian, C. M. and Hesselbrock, V.** (2004) Do personality characteristics and risk taking mediate the relationship between paternal substance dependence and adolescent substance use? *Alcoholism: Clinical and Experimental Research*, **28**, 79A.
- Oman, R., Vesely, S., Aspy, C. et al.** (2004) The potential protective effect of youth assets on adolescent alcohol and drug use. *American Journal of Public Health*, **94**, 1425-1430.
- Onofrio, B. M., Murelle, L., Eaves, L. J. et al.** (1999) Adolescent religiousness and its influence on substance use: Preliminary findings from the Mid-Atlantic school age twin study. *Twin Research*, **2**, 156-168.

- Paradise, M. J. and Cause, A. M.** (2003) Substance use and delinquency during adolescence: A prospective look at an at-risk sample. *Substance Use and Misuse*, **38**, 701-723.
- Piko, B.** (2000) Perceived social support from parents and peers: Which is the stronger predictor of adolescent substance use. *Substance Use and Misuse*, **35**, 617-630.
- Piko, B. and Fitzpatrick, K.** (2004) Substance use, religiosity, and other protective factors among Hungarian adolescents. *Addictive Behaviors*, **29**, 1095-1107.
- Powis, B., Griffiths, P., Gossop, M. et al.** (1998) Drug use and offending behaviour among young people excluded from school. *Drugs: Education, Prevention and Policy*, **5**, 245-256.
- Prinstein, M. J., Boergers, J. and Spirito, A.** (2001) Adolescents' and their friends' health-risk behavior: Factors that alter or add to peer influence. *Journal of Pediatric Psychology*, **26**, 287-298.
- Pudney, S.** (2002) *The Road to Ruin? Sequences of Initiation into Drug Use and Offending by Young People in Britain*. London: Home Office.
- Ramsay, M., Baker, P., Goulden, C. et al.** (2001) *Drug Misuse Declared in 2000: Results from the British Crime Survey* (Home Office Research Study 224). London: Home Office.
- von Ranson, K. M., McGue, M. and Iacono, W. G.** (2003) Disordered eating and substance use in an epidemiological sample: II. Associations within families. *Psychology of Addictive Behaviors*, **17**, 193-202.
- Rey, J. M., Sawyer, M. G., Raphael, B. et al.** (2002) Mental health of teenagers who use cannabis: Results of an Australian survey. *British Journal of Psychiatry*, **180**, 216-221.
- Rheingold, A. A., Smith, D. W., Ruggiero, K. J. et al.** (2004) Loss, trauma exposure, and mental health in a representative sample of 12- to 17-year-old youth: Data from the national survey of adolescents. *Journal of Loss and Trauma*, **9**, 1-19.
- Riehm, K. S., Bluthenthal, R., Juvonen, J. et al.** (2003) Adolescent social relationships and the treatment process: Findings from quantitative and qualitative analyses. *Journal of Drug Issues*, **33**, 865-896.
- Russac, R. J. and Powell, R. S.** (1997) Reasons adolescents don't use drugs: Exploring a "depth of acceptance" model. *Journal of Drug Education*, **27**, 349-361.
- Sale, E., Sambrano, S., Springer, J. et al.** (2003) Risk, protection, and substance use in adolescents: A multi-site model. *Journal of Drug Education*, **33**, 91-105.
- Scheier, L. M., Miller, N. L., Ifill-Williams, M., & Botvin, G. J.** (2002) Perceived Neighborhood Risk as a Predictor of Drug Use among Urban Ethnic Minority Adolescents: Moderating Influences of Psychosocial Functioning. *Journal of Child & Adolescent Substance Abuse*, **11**, 67-105.
- Schulenberg, J., Bachman, J. G., Malley, P. M. et al.** (1994) High school educational success and subsequent substance use: A panel analysis following adolescents into young adulthood. *Journal of Health and Social Behavior*, **35**, 45-62.
- Shekter, M.** (2000) *Risk and protective factors for adolescent substance use*. Thesis, University of Saskatchewan.
- Spooner, C., Mattick, R. P. and Noffs, W.** (2000) A study of the patterns and correlates of substance use of substance use among adolescents applying for treatment. *Australian and New Zealand Journal of Public Health*, **24**, 492-502.

Spruijt, E., DeGoede, M., Iedema, J. et al. (2000) Life experiences, identity and adolescent soft drug use in the Netherlands. *Journal of Alcohol and Drug Education*, **45**, 47-59.

Sussman, S., Dent, C. W. and Galaif, E. R. (1997) The correlates of substance abuse and dependence among adolescents at high risk for drug abuse. *Journal of Substance Abuse*, **9**, 241-255.

Sutherland, I. and Shepherd, J. P. (2001) Social dimensions of adolescent substance use. *Addiction*, **96**, 445-458.

Tarter, R., Schultz, K., Kirisci, L. et al. (2001) Does living with a substance abusing father increase substance abuse risk in male offspring? Impact on individual, family, school, and peer vulnerability factors. *Journal of Child and Adolescent Substance Abuse*, **10**, 59-70.

Wills, T. A., McNamara, G., et al. (1995) Parental education related to adolescent stress-coping and substance use: Development of a mediational model. *Health Psychology*, **14**, 464-478.

Wright, D. and Pemberton, M. (2004) *Risk and Protective Factors for Adolescent Drug Use: Findings from the 1999 National Household Survey on Drug Abuse*. Rockville, MD: SAMHSA.

Zastowny, T. R., Adams, E. H., Black, G. S. et al. (1993) Sociodemographic and attitudinal correlates of alcohol and other drug use among children and adolescents: Analysis of a large-scale attitude tracking survey. *Journal of Psychoactive Drugs*, **25**, 223-237.

Zoccolillo, M., Meyers, J. and Assiter, S. (1997) Conduct disorder, substance dependence, and adolescent motherhood. *American Journal of Orthopsychiatry*, **67**, 152-157.

Category 7: Qualitative studies (not reviewed)

Aldridge, J., Parker, H. and Measham, F. (1999) *Drug Trying and Drug Use Across Adolescence*. London: Home Office.

Bates, T., Buchanan, J., Corby, B. et al. (1999) *Drug Use Parenting and Child Protection: Towards an Effective Interagency Response*. Liverpool: The Liverpool Area Child Protection Committee

Coggans, N. and McKellar, S. (1994) Drug use among peers – peer pressure or peer preference? *Drugs: Education, Prevention and Policy*, **1**.

Fountain, J., Bartlett, H., Griffiths, P. et al. (1999) Why say no? Reasons given by young people for not using drugs. *Addiction Research*, **7**, 339-353.

Henderson, S. (1998) *Drugs Prevention in Rural Areas: An Evaluation Report*. London, Home Office.

Jones, S. and Power, R. (1990) Observation to intervention: Drug trends in west London. *International Journal on Drug Policy*, **2**, 13-15.

McKeganey, N., Barnard, M. and McIntosh, J. (2002) Paying the Price for their Parents' Addiction: Meeting the Needs of the Children of Drug-Using Parents. *Drugs: Education, Prevention and Policy*, **9**(3): 233-246.

Prepeliczay, S. (2002) Socio-cultural and Psychological Aspects of Contemporary LSD Use in Germany. *Journal of Drug Issues*. **32**, 431-458.

Category 8: Commentaries (not reviewed)

Adger, H. Jr. (1991) Problems of alcohol and other drug use and abuse in adolescents. *Journal of Adolescent Health*, **12**, 606-613.

- Aggleton, P.** (1995) *Health Promotion and Young People*. London: University of London.
- Aggleton, P., Hurry, J. and Warwick, I.** (2000) *Young People and Mental Health*. Chichester: John Wiley and Sons.
- Argall, P. and Cowderoy, B.** (1997) We can take it: Young people and drug use. In *Good Practice in Risk Assessment and Risk Management 2: Protection, Rights and Responsibilities* (eds H. Kemshall and J. Pritchard), pp. 118-126. Jessica Kingsley.
- Barnow, S., Lucht, M., Hamm, A. et al.** (2004) The relation of a family history of alcoholism, obstetric complications and family environment to behavioural problems among 154 adolescents in Germany: Results from the children of alcoholics study in Pomerania. *European Addiction Research*, **10**, 8-14.
- Beman, D. S.** (1995) Risk factors leading to adolescent substance abuse. *Adolescence*, **30**, 201-208.
- Botvin, G. J., Malgady, R. G., Griffin, K. et al.** (1998) Alcohol and marijuana use among rural youth: Interaction of social and intrapersonal influences. *Addictive Behaviors*, **23**, 379-387.
- Bravender, T. and Knight, J. R.** (1998) Recent patterns of use and associated risks of illicit drug use in adolescents. *Current Opinion in Pediatrics*, **10**, 344-349.
- Brown, R.** (2002) Risk factors for substance abuse in adolescents. *Pediatric Clinics of North America*, **49**, 247-255.
- Burkhart, G., Olszewski, D., Martel, C. et al.** (eds) (2003) *Drug Use Amongst Vulnerable Young People*. EMCDDA.
- Bushell, H., Crome, I. and Williams, R.** (2002) How can risk be related to interventions for young people who misuse substances? *Current Opinion in Psychiatry*, **15**, 355-360.
- Cicchetti, D. and Rogosch, F.** (1999) Psychopathology as risk for adolescent substance use disorders: A developmental psychopathology perspective. *Journal of Clinical Child Psychology*, **28**, 355-365.
- Clark, D. B. and Winters, K. C.** (2002) Measuring risks and outcomes in substance use disorders prevention research. *Journal of Consulting and Clinical Psychology*, **70**, 1207-1223.
- Comerci, G. D and Schwebel, R.** (2000) Substance abuse: An overview. *Adolescent Medicine*, **11**, 79-101.
- Cosden, M.** (2001) Risk and resilience for substance abuse among adolescents and adults with LD. *Journal of Learning Disabilities*, **34**, 352-358.
- Crome, I. B.** (2004) Substance abuse and dependence in adolescence: Epidemiology, risk factors and treatment. *Journal of Child Psychology and Psychiatry*, **45**, 1180.
- Czechowicz, D.** (1988) Adolescent alcohol and drug abuse and its consequences – An overview. *American Journal of Drug and Alcohol Abuse*, **14**, 189-197.
- Davis, N.** (1997) Persuasive communications in the mass media: Implications for preventing drug-related behavior among youths. *Journal of Child and Adolescent Substance Abuse*, **6**, 49-56.
- Davis, R. B., Wolfe, H., Orenstein, A. et al.** (1994) Intervening with high risk youth: A program model. *Adolescence*, **29**, 763-774.

- Esposito, S. and Spirito, A.** (2004) Adolescent substance use and suicidal behavior: A review with implications for treatment research. *Alcoholism: Clinical and Experimental Research*, **28**, 77S-88S.
- Florenzano, U. A.** (1993) Risk factors and youth: The role of family and community. *Journal of Adolescent Health*, **14**, 619.
- Flory, K. and Lyman, D.** (2003) The relation between attention deficit hyperactivity disorder and substance abuse: What role does conduct disorder play? *Clinical Child and Family Psychology Review*, **6**, 1-16.
- Freeman, R. C., Collier, K. and Parillo, K. M.** (2002) Early life sexual abuse as a risk factor for crack cocaine use in a sample of community-recruited women at high risk for illicit drug use. *American Journal of Drug and Alcohol Abuse*, **28**, 109-131.
- Freshman, A. and Leinwand, C.** (2001) The implications of female risk factors for substance abuse prevention in adolescent girls. *Journal of Prevention and Intervention in the Community*, **21**, 29-51.
- Giesbrecht, N.** (2003) Substance abuse and dependence in adolescence: Epidemiology, risk factors and treatment. *Addiction*, **98**, 1327-1328.
- Gilvarry, E.** (2000) Substance abuse in young people. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, **41**, 55-80.
- Hallfors, D. and Van, D.** (2002) Strengthening the role of two key institutions in the prevention of adolescent substance abuse. *Journal of Adolescent Health*, **30**, 17-28.
- Highet, G.** (2004) Young People, Cannabis and Family Life. *Edinburgh: Centre for Research on Families and Relationships, Research Unit in Health, Behaviour and Change.*
- Kandel, D. B.** (2003) Does marijuana cause the use of other drugs? *Journal of the American Medical Association*, **289**, 482-483.
- Kelley, A. E., Schochet, T. and Landry, C.** (2004) Risk taking and novelty seeking in adolescence – Introduction to Part I. *Adolescent Brain Development: Vulnerabilities and Opportunities*, **1021**, 27-32.
- Kodjo, C. and Klein, J.** (2002) Prevention and risk of adolescent substance abuse: The role of adolescents, families and communities. *Pediatric Clinics of North America*, **49**, 257-268.
- Liepman, M. R., Calles, J. L., Kizilbash, L. et al.** (2002) Genetic and nongenetic factors influencing substance use by adolescents. *Adolescent Medicine*, **13**, 375-401.
- Malanga, C. J. and Kosofsky, B. E.** (2003) Does drug abuse beget drug abuse? Behavioral analysis of addiction liability in animal models of prenatal drug exposure. *Developmental Brain Research*, **147**, 47-57.
- Mason, M.** (2004) Preadolescent psychiatric and substance use disorders and the ecology of risk and protection. *Journal of Child and Adolescent Substance Abuse*, **13**, 61-81.
- Miller, P.** (2004) Evidence in cannabis research. *British Journal of Psychiatry*, **184**, 542.
- Nunes, J. V. and Parson, E. B.** (1995) Patterns of psychoactive substance use among adolescents. *American Family Physician*, **52**, 1693-1696.
- Poikolainen, K.** (2002) Antecedents of substance use in adolescence. *Current Opinion in Psychiatry*, **15**, 241-245.

Raj, T. (2000) *Programme of Action to Reduce Class A Drug Use, Particularly Heroin and Cocaine, Among Young People Aged 25 and Under in the UK*. UK: Drug Prevention Board.

Randolph, K. (2004) The dynamic nature of risk factors for substance use among adolescents. *Journal of Child and Adolescent Substance Abuse*, **13**, 33-47.

Reid, G., Aitken, C., Beyer, L. et al. (2001) Ethnic communities' vulnerability to involvement with illicit drugs. *Drugs: Education, Prevention and Policy*, **8**, 359-374.

Schiffman, R. (2004) Drug and substance use in adolescents. *MCN: The American Journal of Maternal Child Nursing*, **29**, 21-27.

Simkin, D. (2002) Adolescent substance use disorders and comorbidity. *Pediatric Clinics of North America*, **49**, 463-477.

Solhkhah, R. (2003) The intoxicated child. *Child and Adolescent Psychiatric Clinics of North America*, **12**, 693-722.

Solhkhah, R. and Armentano, M. (2002) Adolescent substance abuse and psychiatric comorbidity. In: Marsh, D.T., Fristad, M.A. (eds). *Handbook of Serious Emotional Disturbance in Children and Adolescents*. (pp. 304-319) New York, NY, US: John Wiley & Sons.

Sood, K. (2002) An overview of substance abuse in adolescents. *Maryland Medicine*, **3**, 18-20.

Standing Conference on Drug Abuse (SCODA) (1998) *Drug Prevention Conference: Interventions Targeted at Young People At Risk of Drug Misuse: Detailed Report*. SCODA.

Swadi, H. (1999) Individual risk factors for adolescent substance use. *Drug and Alcohol Dependence*, **55**, 209-224.

Swadi, H. (1992) Relative risk factors in detecting adolescent drug abuse. *Drug and Alcohol Dependence*, **29**, 253-254.

Tarter, R. (2002) Etiology of adolescent substance abuse: A developmental perspective. *American Journal on Addictions*, **11**, 171-191.

Weinberg, N. (2001) Risk factors for adolescent substance abuse. *Journal of Learning Disabilities*, **34**, 343-351.

Wilens, T., Spencer, T. and Biederman, J. (2000) *Attention-deficit/hyperactivity disorder with substance use disorders*.

References considered "Not Applicable" from initial searches

Center on Addiction and Substance Abuse (1994) *Reducing Teen Smoking Reduces Marijuana Use*. Columbia University.

Akins, S., Mosher, C., Rotolo, T. et al. (2003) Patterns and correlates of substance use among American Indians in Washington State. *Journal of Drug Issues*, **33**, 45-72.

Baer, J., Peterson, P. and Wells, E. (2004) Rationale and design of a brief substance use intervention for homeless adolescents. *Addiction Research and Theory*, **12**, 317-334.

Bauer, C. R. (1999) Perinatal effects of prenatal drug exposure: Neonatal aspects. *Clinics in Perinatology*, **26**, 87-106.

Bennett, K. J., Brown, K. S., Boyle, M. et al. (2003) Does low reading achievement at school entry cause conduct problems. *Social Science and Medicine*, **56**, 2443-2448.

- Berman, S. M., Ozkaragoz, T., Noble, E. P. et al.** (2003) Differential associations of sex and D-2 dopamine receptor (DRD2) genotype with negative affect and other substance abuse risk markers in children of alcoholics. *Alcohol*, **30**, 201-210.
- Bhattacharya, G.** Drug Abuse Risks for Acculturating Immigrant Adolescents: Case Study of Asian Indians in the United States. *Health and Social Work*, **27** (3), 175-183.
- Bird, L.** (1999) *The Fundamental Facts – All the Latest Facts and Figures on Mental Illness*. London: The Mental Health Foundation.
- Bjerklie, D.** (2003) One tokes, the other doesn't. *Time*, **3 February 2003**.
- Blair, M., Stewart-Brown, S., Waterston, T. et al.** (2003) Child health in the UK. In *Child Public Health* (eds. M. Blair, S. Stewart-Brown, T. Waterston, et al), pp. 11-52.0 Oxford: Oxford University Press.
- Blanken, A. J.** (1993) Measuring use of alcohol and other drugs among adolescents. *Public Health Reports*, **108**, 25-30.
- Booth, R. E. and Kwiatkowski, C. F.** (1999) Substance abuse treatment for high-risk adolescents. *Current Psychiatry Reports*, **1**, 185-190.
- Brook, D., Brook, J., Pahl, T. et al.** (2002) The longitudinal relationship between drug use and risky sexual behaviors among Colombian adolescents. *Archives of Pediatrics and Adolescent Medicine*, **156**, 1101-1107.
- Burns, J. J., Cottrell, L., Perkins, K. et al.** (2004) Depressive symptoms and health risk among rural adolescents. *Pediatrics*, **113**, 1313-1320.
- Canino, G., Anthony, J. C., Freeman, J. et al.** (1993) Drug abuse and illicit drug use in Puerto Rico. *American Journal of Public Health*, **83**, 194-200.
- Canterbury, R. J., Gressard, C. F., Vieweg, W. V. et al.** (1991) Alcohol and cocaine use among first-year college students. *Southern Medical Journal*, **84**, 13-21.
- Carlson, S. R., Malone, S. M., Iacono, W. G. et al.** (2003) Change in P3 amplitude across late adolescence in males is associated with their father's substance dependence and antisociality. *Psychophysiology*, **40**, S31.
- Carta, M. G., Altamura, A. C., Hardoy, M. C. et al.** (2003) Is recurrent brief depression an expression of mood spectrum disorders in young people? Results of a large community sample. *European Archives of Psychiatry and Clinical Neuroscience*, **253**, 149-153.
- Castillo, M., Giancola, P. R., Lu, S. Y. et al.** (1999) Adolescent females with a substance use disorder: Affiliations with adult male sexual partners. *American Journal on Addictions*, **8**, 190-200.
- Catalano, R. F., Hawkins, J. D., Wells, E. A. et al.** (1990) Evaluation of the effectiveness of adolescent drug abuse treatment, assessment of risks for relapse, and promising approaches for relapse prevention. *International Journal of the Addictions*, **25**, 1085-1040.
- Chartier, M. J., Walker, J. R. and Stein, M. B.** (2003) Considering comorbidity in social phobia. *Social Psychiatry and Psychiatric Epidemiology*, **38**, 728-734.
- Chen, K., Chen, C., Fagot, C. et al.** (2001) Tobacco, betel quid, alcohol, and illicit drug use among 13- to 35-year-olds in I-Lan, rural Taiwan: Prevalence and risk factors. *American Journal of Public Health*, **91**, 1130-1134.

- Chiolero, A. and Schmid, H.** (2002) Repeated self-reported injuries and substance use among young adolescents: The case of Switzerland. *Sozial und Preaventivmedizin*, **47**, 289-297.
- Clarke, D.** (2003) Gambling and the trait of addiction in a sample of New Zealand university students. *New Zealand Journal of Psychology*, **32**, 39-48.
- Cohen, J., Mannarino, A., Zhitova, A. et al.** (2003) Treating child abuse-related posttraumatic stress and comorbid substance abuse in adolescents. *Child Abuse and Neglect*, **27**, 1345-1365.
- Costello, E. J., Mustillo, S., Erkanli, A. et al.** (2003) Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, **60**, 837-844.
- Crittenden, P. and Claussen, A.** (2002) Developmental psychopathology perspectives on substance abuse and relationship violence. In: Wekerle, C. and Wall, A. (eds.) *The Violence and Addiction Equation: Theoretical and Clinical Issues in Substance Abuse and Relationship Violence*.
- de las Cuevas, C., Sanz, E. and de la Fuente, J.** (2003) Benzodiazepines: More "behavioural" addiction than dependence. *Psychopharmacology*, **167**, 297-303.
- Dembo, R. and Walters, W.** (2003) Innovative approaches to identifying and responding to the needs of high risk youth. *Substance Use and Misuse*, **38**, 1713-1738.
- DePompei, R. and Corrigan, J. D.** (2001) Double trouble: Substance abuse and traumatic brain injury in youth. *Brain Injury Source*, **5**.
- Dierker, L. and Merikangas, K.** (2001) Familial psychiatric illness and posttraumatic stress disorder: Findings from a family study of substance abuse and anxiety disorders. *Journal of Clinical Psychiatry*, **62**, 715-720.
- Elander, J., Lusher, J., Bevan, D. et al.** (2003) Pain management and symptoms of substance dependence among patients with sickle cell disease. *Social Science and Medicine*, **57**, 1683-1696.
- Embry, D. D.** (2004) Community-based prevention using simple, low-cost, evidence-based kernels and behavior vaccines. *Journal of Community Psychology*, **32**, 575-591.
- Ensminger, M., Juon, H. and Fothergill, K.** (2002) Childhood and adolescent antecedents of substance abuse in adulthood. *Addiction*, **97**, 833-844.
- Ernst, M., Moolchan, E. T. and Robinson, M. L.** (2001) Behavioral and neural consequences of prenatal exposure to nicotine. *Journal of the American Academy of Child and Adolescent Psychiatry*, **40**, 630-641.
- European Monitoring Centre for Drugs and Drug Addiction** (2000) *2000 Annual Report on the State of the Drugs Problem in the European Union*. Luxembourg: Office for Official Publications of the European Communities.
- Everett, S. A., Giovino, G. A., Warren, C. W. et al.** (1998) Other substance use among high school students who use tobacco. *Journal of Adolescent Health*, **23**, 289-296.
- Finlinson, H. A., Oliver-Velez, D., Deren, S. et al.** (2003) Puerto Rican drug users' experiences of physical and sexual abuse – Comparisons based on gender and developmental stage. *Violence Against Women*, **9**, 839-858.
- Fisher, C. B.** (2003) Adolescent and parent perspectives on ethical issues in youth drug use and suicide survey research. *Ethics and Behavior*, **13**, 303-332.

Frone, M. (2003) Predictors of overall and on-the-job substance use among young workers. *Journal of Occupational Health Psychology*, **8**, 39-54.

Fuller, C. M., Vlahov, D., Ompad, D.C., Shah, N., Arria, A. M. and Strathdee, S.A. (2002). High-risk behaviors associated with transition from illicit non-injection to injection drug use among adolescent and young adult drug users: a case-control study. *Drug Alcohol Dependence*. **66**(2):189-98.

Gabel, L. L., Siegal, H. A. and Hostetler, J. (1993) Preventing substance abuse: An interview paradigm. *Journal of Family Practice*, **37**, 503-505.

Gerhard, H. (2001) Party-drugs: Sociocultural and individual background and risks. *International Journal of Clinical Pharmacology and Therapeutics*, **39**, 362-366.

Ginis, K. A. M. and Leary, M. R. (2004) Self-presentational processes in health-damaging behavior. *Journal of Applied Sport Psychology*, **16**, 59-74.

Godley, S. H., Jones, N., Funk, R. et al. (2004) Comparing outcomes of best-practice and research-based outpatient treatment protocols for adolescents. *Journal of Psychoactive Drugs*, **36**, 35-48.

Goldberg, L., Elliot, D., MacKinnon, D. et al. (2003) Drug testing athletes to prevent substance abuse: Background and pilot study results of the SATURN Student Athlete Testing Using Random Notification study. *Journal of Adolescent Health*, **32**, 16-25.

Goodstadt, M. S., Chan, G. C., Sheppard, M. A. et al. (1986) Factors associated with cannabis nonuse and cessation of use: Between and within survey replications of findings. *Addictive Behaviors*, **11**, 275-286.

Gorman, D. M. (2003) The best of practices, the worst of practices: The making of science-based primary prevention programs. *Psychiatric Services*, **54**, 1087-1089.

de Graaf, R., Bijl, R. V., Smit, F. et al. (2002) Risk factors for 12-month comorbidity of mood, anxiety, and substance use disorders: Findings from the Netherlands Mental Health Survey and Incidence Study. *American Journal of Psychiatry*, **159**, 620-629.

Green, C. (1999) Substance use: Whose problem is it? *Journal of Child Health Care*, **3**, 27-30.

Guiao, I. Z., Blakemore, N. M. and Wise, A. B. (2004) Predictors of teen substance use and risky sexual behaviors: Implications for advanced nursing practice. *Clinical Excellence for Nurse Practitioners*, **8**, 52-59.

Handelsman, D. J. and Gupta, L. (1997) Prevalence and risk factors for anabolic-androgenic steroid abuse in Australian high school students. *International Journal of Andrology*, **20**, 159-164.

Harachi, T. W., Catalano, R. F., Kim, S. et al. (2001) Etiology and prevention of substance use among Asian American youth. *Prevention Science*, **2**, 57-65.

Harvey, A. R. and Hill, R. B. (2004) Africentric youth and family rites of passage program: Promoting resilience among at-risk African American youths. *Social Work*, **49**, 65-74.

Health Advisory Service (1996) *Children and Young People – Substance Misuse Services. The Substance of Young Needs: Commissioning and Providing Services for Children and Young People who Use and Misuse Substances. A Manual of Guidance for Commissioners, Purchasers and Providers.* London: HMSO.

- Heinze, H. J., Toro, P. A. and Urberg, K. A.** (2004) Antisocial behavior and affiliation with deviant peers. *Journal of Clinical Child and Adolescent Psychology*, **33**, 336-346.
- Hjern, A.** Illicit Drug Abuse in Second-generation Immigrants: A Register Study in a National Cohort of Swedish Residents. *Scandinavian Journal of Public Health*, **32**(1), 40-46.
- Igwe, S. A.** (1992) Nigeria's health at risk. *Africa Health*, **14**, 45-46.
- Isralowitz, R. E. and Trostler, N.** (1996) Substance use: Toward an understanding of its relation to nutrition-related attitudes and behavior among Israeli high school youth. *Journal of Adolescent Health*, **19**, 184-189.
- Ives, R. and Tasker, T.** (1999) *Volatile Substance Abuse: A Report on Survey Evidence*. London: Health Education Authority.
- James, W. H., Kim, G. K. and Moore, D. D.** (1997) Examining racial and ethnic differences in Asian adolescent drug use: The contributions of culture, background and lifestyle. *Drugs: Education, Prevention and Policy*, **4**, 39-51.
- Joffe, A., Yancy, W. S., Jacobs, E. A. et al.** (2004) Legalization of marijuana: Potential impact on youth. *Pediatrics*, **113**, E632-E638.
- Johnson, J.** (2001) *Sibling, peer, and personality influences on substance use: A multivariate genetic analysis*.
- Johnson, T. P., Cho, Y. I., Fendrich, M. et al.** (2004) Treatment need and utilization among youth entering the juvenile corrections system. *Journal of Substance Abuse Treatment*, **26**, 117-128.
- Journal of the American Academy of Child and Adolescent Psychiatry** (1998) Summary of the practice parameters for the assessment and treatment of children and adolescents with substance use disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, **37**, 122-126.
- Kaminer, Y.** (1999) Addictive disorders in adolescents. *Psychiatric Clinics of North America*, **22**, 275-288.
- Kan, C., Hilberink, S. and Breteler, M.** (2004) Determination of the main risk factors for benzodiazepine dependence using a multivariate and multidimensional approach. *Comprehensive Psychiatry*, **45**, 88-94.
- Kendall-Tackett, K.** (2002) The health effects of childhood abuse: Four pathways by which abuse can influence health. *Child Abuse and Neglect*, **26**, 715-729.
- Kemshall, H. and Pritchard, J.** (1996) *Good Practice in Risk Assessment and Risk Management*. London: Kingsley.
- Kessler, D. T. and Klein, M. A.** (1995) Drug use patterns and risk factors of adolescents with physical disabilities. *International Journal of the Addictions*, **30**, 1243-1270.
- Kilibarda, M.** (1993) HIV infection among drug abusers in the Belgrade area. *Bulletin on Narcotics*, **45**, 135-146.
- Kim, S., Crutchfield, C., Williams, C. et al.** (1998) Toward a new paradigm in substance abuse and other problem behavior prevention for youth: Youth development and empowerment approach. *Journal of Drug Education*, **28**, 1-17.
- Kindlundh, A. M., Isacson, D. G., Berglund, L. et al.** (1999) Factors associated with adolescent use of doping agents: Anabolic-androgenic steroids. *Addiction*, **94**, 543-553.

- Koniak, G. and Brecht, M. L.** (1995) Linkages between sexual risk taking, substance use, and AIDS knowledge among pregnant adolescents and young mothers. *Nursing Research*, **44**, 340-346.
- Kokotailo, P. K., Langhough, R. E., Cox, N. S. et al.** (1994) Cigarette, alcohol and other drug use among small city pregnant adolescents. *Journal of Adolescent Health*, **15**, 366-373.
- Kral, A. H., Molnar, B. E., Booth, R. E. et al.** (1997) Prevalence of sexual risk behaviour and substance use among runaway and homeless adolescents in San Francisco, Denver and New York City. *International Journal of STD and AIDS*, **8**, 109-117.
- Kulig, K., Brener, N. D. and McManus, T.** (2003) Sexual Activity and Substance Use among Adolescents by Category of Physical Activity plus Team Sports Participation. *Archives of Pediatrics and Adolescent Medicine*, **157**, 905-912.
- Leigh, B. C. and Miller, P.** (1995) The relationship of substance use with sex to the use of condoms among young adults in two urban area of Scotland. *AIDS Education and Prevention*, **7**, 278-284.
- Lende, D.** (2004) *Pattern and Paradox: Adolescent Substance Use and Abuse in Bogota, Colombia*.
- Leshner, A. I.** *From the Top: Child's Drug Use Can Go Way Beyond "Recreational"*.
- Levine, S. and Coupey, S.** (2003) Adolescent substance use, sexual behavior, and metropolitan status: Is "urban" a risk factor? *Journal of Adolescent Health*, **32**, 350-355.
- Lieb, R., Schuetz, C. G., Pfister, H. et al.** *Mental Disorders in Ecstasy Users: A Prospective-longitudinal Investigation*.
- Lisnov, L., Harding, C. G., Safer, L. A. et al** (1998) Adolescents' perceptions of substance abuse prevention strategies. *Adolescence*, **33**, 301-311.
- Lochman, J. E. and Wells, K. C.** (2003) Effectiveness of the Coping Power program and of classroom intervention with aggressive children: Outcomes at 1-year follow up. *Behavior Therapy*, **34**, 493-515.
- Lohr, M. J., Gillmore, M. R., Gilchrist, L. D. et al.** (1992) Factors related to substance use by pregnant, school-age adolescents. *Journal of Adolescent Health*, **13**, 475-482.
- Lowe, E. D.** (2003) Identity, activity, and the well-being of adolescents and youths: Lessons from young people in a Micronesian society. *Culture Medicine and Psychiatry*, **27**, 187-219.
- Lynskey, M. T., Heath, A. C., Bucholz, K. K., Slutske, W.S., Madden, P.A.F., Nelson, E.C., Statham, D.J. and Martin, N.G.** (2003) Escalation of Drug Use in Early-Onset Cannabis Users vs Co-twin Controls. *JAMA*, **289**, 427-433.
- McCambridge, J. and Strang, J.** (2004) The efficacy of single-session motivational interviewing in reducing drug consumption and perceptions of drug-related risk and harm among young people: Results from a multi-site cluster randomised trial. *Addiction*, **99**, 39-52.
- McConville, B. and Harrison, H.** (2001) *Saving Young Lives: Calls to Childline about Suicide*. London: Childline.
- Melbye, K., Khamboonruang, C., Kunawararak, P. et al.** (2002) Lifetime correlates associated with amphetamine use among northern Thai men attending STD and HIV anonymous test sites. *Drug and Alcohol Dependence*, **68**, 245-253.

- Miller, J., Lochman, J. E., Coie, J. D. et al.** (1998) Comorbidity of conduct and depressive problems at sixth grade: Substance use outcomes across adolescence. *Journal of Abnormal Child Psychology*, **26**, 221-232.
- Moos, R., Moos, B. and Finney, J.** (2001) Predictors of deterioration among patients with substance-use disorders. *Journal of Clinical Psychology*, **57**, 1403-1419.
- Morgan, S. E., Palmgreen, P., Stephenson, M. T. et al.** (2003) Associations between message features and subjective evaluations of the sensation value of antidrug public service announcements. *Journal of Communication*, **53**, 512-526.
- Morojele, N., Flisher, A., Muller, M. et al.** (2002) Measurement of risk and protective factors for drug use and anti-social behavior among high school students in South Africa. *Journal of Drug Education*, **32**, 25-39.
- Morral, A., McCaffrey, D. and Paddock, S.** (2002) Reassessing the marijuana gateway effect. *Addiction*, **97**, 1493-1504.
- Murphy, D. A., Durako, S., Muenz, L. et al.** (2000) Marijuana use among HIV-positive and high-risk adolescents: A comparison of self-report through audio computer-assisted self-administered interviewing and urinalysis. *American Journal of Epidemiology*, **152**, 805-813.
- Nair, P., Schuler, M., Black, M. et al.** (2003) Cumulative environmental risk in substance abusing women: Early intervention, parenting stress, child abuse potential and child development. *Child Abuse and Neglect*, **27**, 997-1017.
- Neill, M. Lidz, V and Heilbrun, K.** (2003) Adolescents with psychopathic characteristics in a substance abusing cohort: Predictors, correlates, and treatment process and outcome. *Law and Human Behavior*, **27** (3), 299-313.
- Olson, E.** (2000) Gay teens and substance use disorders: Assessment and treatment. *Journal of Gay and Lesbian Psychotherapy*, **3**, 69-80.
- Oro, A. S. and Dixon, S. D.** (1987) Perinatal cocaine and methamphetamine exposure: Maternal and neonatal correlates. *Journal of Pediatrics*, **111**, 571-578.
- Ortega, A., Rosenheck, R., Alegria, M. et al.** (2000) Acculturation and the lifetime risk of psychiatric and substance use disorders among Hispanics. *Journal of Nervous and Mental Disease*, **188**, 728-735.
- Pagare, D., Meena, G. S., Singh, M. M. et al.** (2004) Risk factors of substance use among street children from Delhi. *Indian Pediatrics*, **41**, 221-225.
- Page, R. M.** (1990) Shyness and sociability: A dangerous combination for illicit substance use in adolescent males? *Adolescence*, **25**, 803-806.
- Patton, G. C., Coffey, C., Carlin, J. B. et al.** (2002) Cannabis use and mental health in young people: Cohort study. *British Medical Journal*, **325**, 1195-1198.
- Pentz, M. A.** (2003) Evidence-based prevention: Characteristics, impact, and future direction. *Journal of Psychoactive Drugs*, **35** (Suppl. 1), 143-152.
- Pentz, M. A., Johnson, A., Dwyer, J. H. et al.** (1989) A comprehensive community approach to adolescent drug abuse prevention: Effects on cardiovascular disease risk behaviours. *Annals of Medicine*, **21**, 219-222.
- Perlis, R. H., Miyahara, S., Marangell, L. B. et al.** (2004) Long-term implications of early onset in bipolar disorder: Data from the first 1000 participants in the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD). *Biological Psychiatry*, **55**, 875-881.

- Petronis, K. R. and Anthony, J. C.** (2000) Perceived risk of cocaine use and experience with cocaine: Do they cluster within US neighborhoods and cities? *Drug and Alcohol Dependence*, **57**, 183-192.
- Pihl, R. O. and Peterson, J.** (1996) Characteristics and putative mechanisms in boys at risk for drug abuse and aggression. *Annals of the New York Academy of Sciences*, **794**, 238-252.
- Piko, B. and Fitzpatrick, R.** (2002) Without protection: Substance use among Hungarian adolescents in high-risk settings. *Journal of Adolescent Health*, **30**, 463-466.
- Pugatch, D., Strong, L. L., Has, P. et al.** (2001) Heroin use in adolescents and young adults admitted for drug detoxification. *Journal of Substance Abuse*, **13**, 337-346.
- Reichert, T. and Chelius, K.** (1996) Addiction begins in childhood: Endangering of children and adolescents does not only exist of hard drugs. *Praxis Magazin Med*, **5**, 38-42.
- Rew, L., Taylor, S. and Fitzgerald, M. L.** (2001) Sexual abuse, alcohol and other drug use, and suicidal behaviors in homeless adolescents. *Issues in Comprehensive Pediatric Nursing*, **24**, 225-240.
- Saint, J. and Crandall, L.** (2004) Ethnic differences in the salience of risk and protective factors for alcohol and marijuana: Findings from a statewide survey. *Journal of Ethnicity in Substance Abuse*, **3**, 11-27.
- Sarkar, K., Panda, S., Das, N. et al.** (1997) Relationship of national highway with injecting drug abuse and HIV in rural Manipur, India. *Indian Journal of Public Health*, **41**, 49-51.
- Sattah, M. V., Supawitkul, S., Dondero, T. et al.** (2002) Prevalence of and risk factors for methamphetamine use in northern Thai youth: Results of an audio-computer-assisted self-interviewing survey with urine testing. *Addiction*, **97**, 801-808.
- Scafidi, F. A., Field, T., Prodromidis, M. et al.** (1997) Psychosocial stressors of drug-abusing disadvantaged adolescent mothers. *Adolescence*, **32**, 93-100.
- Scaramella, L. V. and Keyes, A.** (2001) The social contextual approach and rural adolescent substance use: Implications for prevention in rural settings. *Clinical Child and Family Psychology Review*, **4**, 231-251.
- Shenkman, E., Youngblade, L. and Nackashi, J.** (2003) Adolescents' preventive care experiences before entry into the State Children's Health Insurance Program (SCHIP). *Pediatrics*, **112**, E533-E541.
- da Silva, V. A., de Aguiar, A. S., Felix, F. et al.** (2003) Brazilian study on substance misuse in adolescents: Associated factors and adherence to treatment. *Revista Brasileira de Psiquiatria*, **25**, 133-138.
- Simoni, W. and Strickler, G.** (2004) Risk factors associated with problem use of prescription drugs. *American Journal of Public Health*, **94**, 266-268.
- Soteriades, E., DiFranza, J., Savageau, J. et al.** (2003) Symptoms of nicotine dependence and other predictors of student smoking at school: Implications for school smoking policy. *Journal of School Health*, **73**, 154-158.
- Speranza, M., Corcos, M., Stephan, P. et al.** (2004) Alexithymia, depressive experiences, and dependency in addictive disorders. *Substance Use and Misuse*, **39**, 551-579.
- Spoth, R., Goldberg, C., Neppl, T. et al.** (2001) Rural-urban differences in the distribution of parent-reported risk factors for substance use among young adolescents. *Journal of Substance Abuse*, **13**, 609-623.

- Springer, S. A. and Gastfriend, D. R.** (1995) A pilot study of factors associated with resilience to substance abuse in adolescent sons of alcoholic fathers. *Journal of Addictive Diseases*, **14**, 53-66.
- Stanton, B., Li, X., Cottrell, L. et al.** (2001) Early initiation of sex, drug-related risk behaviors, and sensation-seeking among urban, low-income, African-American adolescents. *Journal of the National Medical Association*, **93**, 129-138.
- Stenbacka, M.** (2003) Problematic alcohol and cannabis use in adolescence – Risk of serious adult substance abuse? *Drug and Alcohol Review*, **22**, 277-286.
- Suleiman, R., Shareef, M., Kharabsheh, S. et al.** (2003) Substance use among university and college students in Jordan. *Arab Journal of Psychiatry*, **14**, 94-105.
- Thiede, H., Valleroy, L. A., MacKellar, D. A. et al.** (2003) Regional patterns and correlates of substance use among young men who have sex with men in 7 US urban areas. *American Journal of Public Health*, **93**, 1915-1921.
- Thomas, J. R.** (1997) Sobering facts. *Missouri Medicine*, **94**, 57-58.
- Thompson, E. A., Horn, M., Herting, J. R. et al.** (1997) Enhancing outcomes in an indicated drug prevention program for high-risk youth. *Journal of Drug Education*, **27**, 19-41.
- Tims, F., Dennis, M., Hamilton, N. et al.** (2002) Characteristics and problems of 600 adolescent cannabis users in outpatient treatment. *Addiction*, **97**, 46-57.
- Turner, R. J. and Lloyd, D. A.** (2004) Stress burden and the lifetime incidence of psychiatric disorder in young adults – Racial and ethnic contrasts. *Archives of General Psychiatry*, **61**, 481-488.
- Tweed, S. H.** (1998) Intervening in adolescent substance abuse. *The Nursing Clinics of North America*, **33**, 29-45.
- Valois, R. F., Dunham, A. C., Jackson, K. L. et al.** (1999) Association between employment and substance abuse behaviors among public high school adolescents. *Journal of Adolescent Health*, **25**, 256-263.
- Velez, C. N. and Ungemack, J. A.** (1995) Psychosocial correlates of drug use among Puerto Rican youth: Generational status differences. *Social Science and Medicine*, **40**, 91-103.
- Wadsworth, E., Moss, S., Simpson, S. et al.** (2004) Factors associated with recreational drug use. *Journal of Psychopharmacology*, **18**, 238-248.
- Weatherby, N. L., Schultz, J. M., Chitwood, D. D. et al.** (1992) Crack cocaine use and sexual activity in Miami, Florida. *Journal of Psychoactive Drugs*, **24**, 373-380.
- Weiser, M., Reichenberg, A., Rabinowitz, J. et al.** (2003) Self-reported drug abuse in male adolescents with behavioural disturbances, and follow-up for future schizophrenia. *Biological Psychiatry*, **54**, 655-660.
- Weissman, M. M., McAvay, H., Goldstein, R. B. et al.** (1999) Risk/protective factors among addicted mothers. *American Journal of Drug and Alcohol Abuse*, **25**, 661-679.
- White, H. R., Loeber, R., Stouthamer, L. et al.** (1999) Developmental associations between substance use and violence. *Development and Psychopathology*, **11**, 785-803.
- Williams, C., Ashman, S. and Robb, I. J.** (2001) Adolescent initiation of injection drug use. *Public Health Reports*, **116**, 280.

Winters, K. and Anderson, N. (2000) Gambling involvement and drug use among adolescents. *Journal of Gambling Studies*, **16**, 175-198.

Winters, K. C., Anderson, N., Bengston, P. et al. (2000) Development of a parent questionnaire for use in assessing adolescent drug use. *Journal of Psychoactive Drugs*, **32**, 3-13.

Workman, R., Leon, G., Pinhey, T. et al. (2002) Highlights of findings from the 1999 Guam study of youth risk behaviors. *Pacific Health Dialog*, **9**, 233-236.

Wu, Z., Detels, R., Zhang, J. et al. (1996) Risk factors for intravenous drug use and sharing equipment among young male drug users in Longchuan County, south-west China. *AIDS*, **10**, 1017-1024.

Yarnold, B. M. (1998) Steroid use among Miami's public school students, 1992: Alternative subcultures – religion and music versus peers and the “body cult”. *Psychological Reports*, **82**, 19-24.

Yates, G. L., MacKenzie, R., Pennbridge, J. et al. (1988) A risk profile comparison of runaway and non-runaway youth. *American Journal of Public Health*, **78**, 820-821.

Young, S., Toone, B. and Tyson, C. (2003) Comorbidity and psychological profile of adults with Attention Deficit Hyperactivity Disorder. *Personality and Individual Differences*, **35**, 743-755.

Zickler, P. *Twins Study Links Early Marijuana Use to Increased Risk of Abuse or Dependence.*

Other references cited in the text

ACMD (Advisory Council on the Misuse of Drugs) (1998). *Drug Misuse and the Environment*. London: Stationery Office.

Balding, J. (2000) *Young People and Illegal Drugs into 2000*. Exeter: Schools Health Education Unit.

Balding, J. (2005) *Trends: Young People and Illegal Drugs. Attitudes to and experience of illegal drugs 1987–2004*. Exeter: Schools Health Education Unit.

Boreham, R. and Blenkinsop, S. (2004) *Drug use, smoking, and drinking among young people in England in 2003*. London, The Stationery Office. (http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsStatistics/PublicationsStatisticsArticle/fs/en?CONTENT_ID=4118153&chk=p9kEpR; accessed 08/02/2007).

Boys, A. and Marsden, J. (2003) Perceived functions predict intensity of use and problems in young poly substance users. *Addiction*, **98**, 951–963

Calabrese, R. and Adams, J. (1990) Alienation: a cause for juvenile delinquency. *Adolescence*, **25**, 435-440.

Canning, U., Millward, L., Raj, T. and Warm, D. (2004). *Drug use prevention among young people: a review of reviews*. London. Health Development Agency.

Center on Addiction and Substance Abuse (1994) *Cigarettes, Alcohol, and Marijuana: Gateways to Illicit Drugs*, New York.

Chivite-Matthews, N., Richardson, A., O'Shea, J., Becker, J., Owen, N., Roe, S. and Condon, J. (2005) *Drug Misuse Declared: Findings from the 2003/04 British Crime Survey England and Wales*. London. Home Office Research Development and Statistics Directorate.

Clayton, R. (1992). Transitions in drug use: risk and protective factors. In *Vulnerability to Drug Abuse* (eds M. D. Glantz and R. W. Pickens) pp 15-52. Washington DC: American Psychological Association.

Crome, I. B. (2004) Comorbidity in young people: perspectives and challenges. *Acta Neuropsychiatrica*, **16**, 47-53

Dillon D, Grewal I, Chivite-Matthews N, Brown R, Weddell E and Smith N. Risk, protective factors and resilience to drug use: identifying resilient young people and learning from their experiences. Home Office, 2006.

Davey Smith, G. and Ebrahim, S. (2002) Data dredging, bias or confounding. *British Medical Journal*, **325**, 1437–1438.

Donovan, J, Jessor, R. and Costa, F. (1991). Adolescent health behaviour and conventionality-unconventionality: an extension of problem-behaviour theory. *Health Psychology*, **10**, 52-61.

Frisher, M., Crome, I., Green C. et al. (2005) Individual and population risk of drug use among adolescents attending an English Youth Offending Team: An epidemiological approach. *Journal of Forensic Psychiatry and Psychology*, **16**, 11-23.

Gorsuch, R. (1980) Interactive models of nonmedical drug use. In. *Theories on drug abuse: selected contemporary perspectives* (NIDA Research Monograph No. 30) (eds Lettieri *et al*) pp 18-23.. Rockville, Maryland. National Institute on Drug Abuse.

Guo, J., Hill, K. G., Hawkins, J. D. et al. (2002) A developmental analysis of sociodemographic, family and peer effects on adolescent illicit drug initiation. *Journal of the American Academy of Child Psychology*, **41**, 838-845.

Hawkins, D. (2002) *Adolescent Substance Abuse: A Public Health Priority. An evidence-based, comprehensive, and integrative approach.* Providence, RI: Brown University Center for Alcohol and Addiction Studies.

Health Promotion Agency for Northern Ireland (2004) Section 5: Risk and Protective Factors . At <http://www.drugsalcohol.info/drugs>; accessed 08/02/2007.

Hibell, B., Andersson, B., Bjarnason, T. et al. (2004) *The ESPAD Report 2003. Alcohol and other Drug use among students in 35 European Countries.* Stockholm: The Swedish Council for Information on Alcohol and Other Drugs, The Pompidou group at the Council of Europe.

Hill AB. (1965) The environment and disease: association or causation? *Proc R Soc Med* **58**:295-300

Hill, E & Newlin, D (2002) Evolutionary approaches to addiction. *Addiction* **97** (4), 375-379

Jeffery, D., Klein, A. and King, L. (2002) *UK Drug Report on Trends in 2001* (Report from the UK Focal Point to EMCDDA). London: Drugscope,

Kaplan, H. and Johnson, R. (1992) Relationships between circumstances surrounding initial illicit drug use and escalation of drug use: moderating effects of gender and early adolescent experiences. In *Vulnerability to Drug Abuse* (eds M. Glantz and E. W. Pickens) pp 299-358. Washington DC: American Psychological Association.

Lingford-Hughes, A., Welch, S. and Nutt, D. J. (2004) Evidence-based guidelines for the pharmacological management of substance misuse, addiction and comorbidity: Recommendations from the British Association of Psychopharmacology. *Journal of Psychopharmacology*, **18**, 293-335.

- Lynskey, M. T., Heath, A. C., Bucholz, K. K. et al.** (2003) Escalation of drug use in early-onset cannabis users vs co-twin controls. *JAMA*, **289**, 427 – 433.
- Macleod, J., Oakes, R., Copello, A. et al.** (2004) Psychological and social sequelae of cannabis and other illicit drug use by young people: a systematic review of longitudinal, general population studies. *Lancet*, **15**, 1579-1588.
- Measham, F., Parker, H. and Aldridge, J.** (1998) *Starting, Switching, Slowing and Stopping*. London: Home Office.
- Melrose, M. and Brodie, I.** (2001) *Vulnerable Young People and Drugs: Opportunities to Tackle Inequalities*. London: Drugscope.
- Parker, H.** (2003) Pathology or modernity? Rethinking risk factor analyses of young drug users. *Addiction Research and Theory*, **11**, 141–144.
- Rhodes, J. and Jason, L.** (1988) *Preventing Substance Abuse Among Children and Adolescents*. New York: Pergamon Press, 1988.
- Shedler, J. and Block, J.** (1990) Adolescent drug use and psychological health: A longitudinal inquiry. *American Psychologist*, **45**, 612-630.
- Tec, N.** (1974). Parent-child drug abuse: Generational continuity or adolescent deviancy. *Adolescence*, **4**, 351-464.
- Werner, E.** (1989) High-risk children in young adulthood: A longitudinal study from birth to 32 years. *American Journal of Orthopsychiatry*, **59**, 72-81.
- Zinberg, N.** (1984) *Drug, Set and Setting*. New York: Yale University Press.

Produced by the Research Development and Statistics Directorate, Home Office

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ISBN: 978 1 84726 180 9

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