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## **SOCIAL SCIENCE RESEARCH FUND:**

### **Prevention through Education: A Review of Current International Social Science Literature**

A focus on the prevention of bullying, tobacco, alcohol and social drug use in children, adolescents and young adults

Prepared for

**World Anti-Doping Agency**

**By the**

**Carnegie Research Institute**

**leeds metropolitan university**

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# Table of contents

---

<b>BACKGROUND &amp; INTRODUCTION</b> .....	<b>1</b>
Context.....	1
The aims and objectives of the review of literature .....	3
Search strategy .....	3
Data sources .....	4
<b>THE PREVENTION RECIPE: COMMON ELEMENTS OF SUCCESS.....</b>	<b>5</b>
<b>THEORETICAL APPROACHES TO PREVENTION EDUCATION .....</b>	<b>12</b>
<b>RESEARCH AND EVALUATION ISSUES .....</b>	<b>20</b>
<b>CONCLUSION .....</b>	<b>29</b>
<b>APPENDIX A: A REVIEW OF THE EVIDENCE REGARDING INTERVENTION TYPE AND SETTING .....</b>	<b>35</b>
Intervention type .....	35
Intervention setting: A focus on single-site settings .....	38
Mass media: Review evidence .....	46
Access restrictions: Review evidence .....	48
Summary of findings regarding single setting .....	50
Single vs. multi-component programmes.....	50
<b>APPENDIX B: A REVIEW OF THE EVIDENCE REGARDING INTERVENTION COMPONENTS.....</b>	<b>57</b>
Curriculum approaches.....	57
Knowledge-focused approaches (i.e., information giving/dissemination).....	58
Affective-focused approaches .....	60
Social skills training.....	61
Life skills training (e.g., Botvin LifeSkills Training [LST]).....	63
Intervention message .....	67
Intervention focus.....	68
Summary of findings .....	69
<b>APPENDIX C: A REVIEW OF THE EVIDENCE REGARDING INTERVENTION DELIVERY .....</b>	<b>71</b>
Interactive vs. passive interventions .....	71
Intervention deliverer .....	72
Treatment fidelity .....	76
Intervention intensity .....	78
Intervention length .....	80
Intervention follow-up.....	82
Booster sessions .....	84
Target population .....	86
<b>APPENDIX D: REVIEW PROCESS .....</b>	<b>95</b>
Secondary and tertiary review methodology .....	95
Primary research methodology .....	96
The reviews.....	98
Primary studies used to update the review.....	99
Geographical origins of the research literature.....	101
<b>REFERENCES .....</b>	<b>104</b>

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# List of figures and tables

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<b>Figure</b>	<b>Title</b>	
1	Knowledge and attitudes into action.....	14
2	Theories of Reasoned Action and Planned Behaviour.....	15
D1	An overview of the electronic search strategy employed to identify relevant secondary and tertiary level publications.....	96
D2	An overview of the electronic search strategy employed to identify relevant primary research.....	97

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<b>Table</b>	<b>Title</b>	
A1	Primary studies: Intervention type and effectiveness across the four research domains.....	38
D1	Period of time covered by reviews within each research domain.....	99
D2	Primary studies: Number and type of included studies within the four research domains.....	100
D3	Number of primary studies included in the update according to year (2002-2008).....	100
D4	Geographical locations of the research studies included in the secondary and tertiary level reviews.....	103

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# Executive summary

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## Introduction

The World Anti-Doping Agency (WADA) promotes, coordinates and monitors the global fight against doping in sport. This review is the result of WADA's identification of education and social science research as strategic priorities for developing evidence-based anti-doping education. To complete this commission we set out to identify evidence regarding the efficacy of prevention interventions across four social domains; bullying, alcohol, tobacco and social drug use. The main purpose of this review is to highlight the factors which have been determined, to date, as the most successful preventive approaches in these respective domains. Broad conclusions are drawn from the literature with a view to recommending 'recipes of success' which could be further refined and applied in the design of future anti-doping prevention programmes.

## The Literature Review Methodology

The review process comprised two main stages. Stage one involved an examination and summation of tertiary and secondary level reviews (e.g., reviews of reviews meta-analyses, systematic reviews), published in the scientific literature or by government agencies between 2002 and November 2008. Stage two comprised the execution of a comprehensive search and review of primary studies based on the fact that the studies were (i) experimental or quasi-experimental, (ii) published from 2002 onward and (iii) not included (or excluded) in the reviews of stage one.

## The Findings

Universal, school-based interventions are the most frequently studied prevention approach. This single setting offers the most systematic and efficient way of reaching the greatest number of young people each year. Although these interventions demonstrate immediate impact, their long-term effects are questionable. When school based programmes are integrated into multi-level strategies involving school, family and community approaches, effectiveness is enhanced. However, community-based prevention alone appears to be ineffective in changing the behaviours considered.

Based on the findings of research across the four domains, prevention programmes should be:

- Targeted at young people and adolescents when attitudes and values are being formed.
- Tailored to fit the target population (e.g., risk factors, developmental).
- Interactive and emphasising of active participation (e.g., role-plays, discussions).

- Derived from social influence approaches and focused on developing core life skills (e.g., communication, decision-making, refusal skills) as knowledge dissemination alone is ineffective in changing behaviour.
- Monitored and delivered with high degrees of fidelity<sup>1</sup>, ensuring that programme implementation is as directed.
- Delivered by well trained individuals who, demonstrably, deliver the programme with high fidelity.
- Based on booster sessions delivered over a number of years. This reinforces and builds on intervention messages.

A number of questions still remain, even in those fields with a long history of research and evaluation. For example, intervention intensity appears to be an important determinant of intervention efficacy. However, it is unclear whether an 'intense' programme comprises (i) more sessions, or (ii) more content with fewer sessions. Similarly, the importance of training deliverers to ensure fidelity has been emphasised across the literature, but there is no consensus regarding who fits the role of 'best' deliverer.

## Conclusion

This review has highlighted that, currently, there are no 'magical ingredients' to include in prevention programmes to ensure their effectiveness. However, there do seem to be some 'recipes for success' that should underpin any programme with primary prevention at its heart. Anti-doping education is a relatively young research field with few examples of best-practice. Therefore, anti-doping researchers, policy makers and practitioners are far from being able to rely on the level of evidence-based research that is currently available across the four domains we have considered in this review. It is also notable that even in these well established fields, more systematic research is needed to fully assess ideas across a variety of settings. Furthermore, researchers across each of these domains agree that little high quality information exists in developing countries in terms of prevention, evaluation and research. They also caution against assuming that research findings will readily transfer, and with equal impact, to prevent other undesirable/unhealthy behaviours.

On balance, this review has highlighted some of the lessons learned from research examining the prevention of bullying, alcohol, tobacco and social drug use. We hope the findings will assist active anti-doping educators in developing programmes from walled foundations rather than providing just bricks and mortar. The strategic goal of anti-doping education should be to develop an evidence-base that allows the 'critical ingredients' necessary for effective doping prevention education to be (i) discovered, (ii) applied and (iii) evaluated. In doing so, we will facilitate a long-term perspective which emphasises prevention, rather than detection, in the fight against doping in sport. Doping is a global issue and as such, requires 'connected' approaches, across countries and, most likely across the related organisations.

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<sup>1</sup> Fidelity refers to the degree to which programme providers implement programmes as intended by the developers.

# Background

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## CONTEXT

The World Anti-Doping Agency (WADA) promotes, coordinates and monitors the fight against doping in sport from a global position. Article 19 of the World Anti-Doping Code (WADC) states that anti-doping research “contributes to the development and implementation of efficient programs within Doping Control and to information and education regarding doping-free sport.” (WADA, 2009, p.101). Education occupies a central role in the efforts to prevent doping in sport, as defined by Article 18 of the 2009 WADC. The Code compels signatories to invest in anti-doping education since this fulfils part of the deterrence function required of signatory countries. According to the WADC, the basic principle for Anti-Doping education programmes is to preserve the spirit of sport from being undermined by doping. WADA states that the primary goal of such programmes is to prevent athletes from intentionally or unintentionally using prohibited substances and/or prohibited methods. When education is implemented appropriately, it can establish the basis for preventing current and future athletes from doping. This primary prevention approach is the focus of many health-based interventions because preventing an unhealthy/undesirable behaviour from starting is more effective than stopping (and then possibly having to offer tertiary care for) an established behaviour.

It is widely recognised that adolescence is the best time to intervene in the effort to prevent behaviours like doping from ever starting (Caltabiano et al. 2008). Indeed, most athletes will develop attitudes, values and beliefs towards doping in their mid-teens or younger and this presents a challenge for anti-doping programmes. Further, Farrington and Hawkins (1991) argue that, unintended, children’s problems with abusive and antisocial behaviour often extend into adulthood, which highlights the need for appropriate primary prevention of these problem behaviours. In this understanding, generic prevention of doping in future athletes should be based on educating athletes

at the same time as all other young people and in relation to other 'problematic' behaviours.

Anti-doping education and intervention research are limited by both their span and scale. Existing data are also limited by the chosen research designs which often restrict the capacity to transfer findings across settings, populations or communities (Backhouse et al. 2007). Further, there is a need to increase the overall level of research output, especially those based on rigorous methodological designs (e.g., Randomised Control Trials – RCT). These designs are especially well-suited to determine 'what works best'. Further, studies should compare 'best bet' intervention options to establish the everyday value of intervention approaches. Of the few published studies in this field, most have sought to improve knowledge, attitudes and intentions towards anabolic steroid use amongst male college or university athletes. Less attention has been paid to other performance-enhancing and recreational drugs, such as growth hormones, amphetamines or cocaine (Backhouse et al. 2007).

Young athletes rarely train alone. They occupy a wide training community and uphold relationships with their support personnel that can exert a critical and pivotal influence on shaping future behaviour. Therefore, it is vital that the young athlete's entourage (e.g., parents, coaches, team managers, doctors) are heavily involved in, and take responsibility for, reinforcing appropriate anti-doping messages. In 2007, we concluded (Backhouse et al.) that successful intervention strategies have adopted a comprehensive, multifaceted approach to drug use prevention, addressing a range of psycho-social variables including peer and media resistance training, body image and self-esteem issues and alternatives to drug use. The Adolescents Training and Learning to Avoid Steroids (ATLAS) and the Athletes Targeting Healthy Exercise & Nutrition Alternatives (ATHENA) provide the only high quality evidence available on the best way to education adolescents about doping (Goldberg & Elliot, 2005). Further, ATLAS and ATHENA are the only programmes that have been systematically monitored over an extended follow-up period. The success of these interventions may be, in part, based on their deep appreciation that athletes are part of a wider network and community.

## **THE AIMS AND OBJECTIVES OF THE REVIEW OF LITERATURE**

Based upon the need identified by WADA, this review collates and summarises peer reviewed publications in the social sciences regarding the primary prevention of bullying, alcohol, tobacco and social drug use. More specifically, our key objectives were to:

- Evaluate the findings of the secondary (systematic reviews, meta-analyses) and tertiary (review of review) prevention reviews which draw together primary research studies across the four social domains and identify the factors which had been determined, to date, as the most successful preventive approaches across the respective domains.
- Evaluate the findings of the latest primary research papers not included in the collated research reviews (due to the cut-off point) to examine any newly emergent themes.
- Consider the content and quality of the available evidence. Also, we aimed to highlight the intervention and evaluation issues across the four social domains.
- Offer recommendations to WADA on the evidence-based prevention approaches to inform future anti-doping education strategies and approaches.

This literature review is primarily aimed at the commissioners, providers of anti-doping education programmes and doping in sport researchers.

## **SEARCH STRATEGY**

In recent years, the increasing number of controlled and randomised controlled trials across social domains has allowed researchers to undertake secondary level research via systematic reviews or meta-analyses. These reviews use explicit, carefully designed methods to generate evidence-based conclusions. Where possible, we have drawn statistical outcomes from meta-analyses to summarise study results. Review evidence is further synthesised in tertiary level research (i.e., reviews of reviews) by appraising the spectrum of systematic reviews and meta-analyses. Therefore, the review process comprised two main stages.

First, we reviewed and summarised existing credible tertiary level reviews and secondary level reviews (systematic reviews, meta-analyses) available in the scientific literature for bullying, alcohol, tobacco and social drug use. In the second stage we completed a comprehensive search and review of primary studies that used experimental or quasi-experimental study designs. All these studies were published 2002 onward and had been omitted by our first stage. The review was conducted in line with the guidelines of the UK National Health Service Centre for Reviews and Dissemination. The literature examined in this report was limited to collated reviews and peer-reviewed articles published in the English language between 2002 and 13<sup>th</sup> November 2008.

### **DATA SOURCES**

An extensive search of the literature was conducted using these databases: PubMed, Medline, Ingenta, Academic Search Elite, CINAHL, PsycARTICLES, PsycINFO, SPORTDiscus, Web of Science and Library Information Science and Technology Abstracts. Additional publications were identified by reviewing the bibliographies of papers identified through the database search. Among others, the main key words included: 'prevention', 'intervention' and 'behaviour change' combined with selected terms relating to specific areas of interest (i.e., bullying, alcohol, social drugs and tobacco). Further details of the search strategy, including the strategy terms and inclusion criteria are shown in Appendix D. More specific 'hit' details can be obtained from the review authors. An Access database was set up to house the citation information and main abstract details for ease of storage, sorting and recall.

# The prevention recipe: Common elements of success

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Although the review did not generate a simple and exacting formula, we were able to clearly identify common elements of successful prevention in the four social domains. According to the available evidence, effective prevention programmes pursue a multifaceted approach addressing the specific needs and circumstances of the target population. Successful interventions aim to influence multiple determinants of behaviour, including individual attitudes, knowledge, life skills, motivations, interpersonal relationships and societal norms. Therefore, this section provides an overview of the key characteristics which define effective primary prevention education interventions. These broad conclusions are based on the evidence presented and evaluated in Appendices A, B and C.

***Prevention programmes should be interactive and activity oriented***

The consensus of reviewers across the four domains was that regardless of any other contributing factors (i.e., setting, approach, content, duration, or intensity), interventions are most effective when programme delivery is interactive (e.g., McGrath, Sumnall, McVeigh and Bellis, 2006). More recently, primary studies continue to reinforce the importance of participant interaction for achieving intervention effectiveness (e.g., Rock, Hammond and Rasmussen, 2004). This teaching method requires active participation of both the deliverer and the recipient and the emphasis is on sharing, cooperating and contributing (McGrath et al. 2006). Typically, this is

based on methods such as role-play, active modelling, debate, simulations, audiovisual activities and discussion. However, the challenge of engaging programme participants in this way should not be underestimated. Deliverers require a wide array of well-refined skills in order to facilitate interactive learning and appropriate training is vital.

***Prevention programmes should be underpinned by social influence approaches***

The adoption of social learning theory (Bandura, 1986) and social influence approaches in the 1980's represented a positive redirection in prevention education. The underlying conceptual framework for social influence approaches is that human behaviour is influenced by persuasive messages, often due to a lack of social skills (and/or intellectual defence mechanisms). In this context, individuals will begin to drink, smoke or use drugs because they are targeted with convincing messages (e.g., from the media or peers) which elicit an unhealthy/undesirable behaviour change. The theory posits that this change occurs because individuals lack the necessary knowledge or skills to resist this social pressure. Prevention based on this approach generally includes three key elements: (i) basic information, (ii) resistance skills training, (iii) normative information (see section three for further information regarding this theoretical approach).

Across the tobacco, alcohol and drug use behaviour domains there was a strong and consistent argument that this approach should form the basis of a prevention intervention targeting unhealthy/undesirable behaviours. Compared to other frameworks, the social influence approach has been shown to have a demonstrable effect on human behaviour (WHO, 2002). Support for the normative component of the social influence approach is stronger than the resistance skills training component. However, as prevalence of use increases, normative education becomes less effective (WHO, 2002). Undesirable/unhealthy behaviours are the result of the interplay between social (interpersonal) and personal (intrapersonal) factors and it's crucial that

prevention programmes recognise this interaction. Indeed, this is underscored by Bandura (1996) as he emphasises collective agency and the social origins of an individual's thought processes and behaviour. Importantly, learning takes place through a process of modelling and reinforcement from key social actors such as parents and peers.

***Prevention programmes should emphasise the development of life skills***

The Life Skills Training (LST) intervention is the most widely assessed programme in the substance use education field, having a 20 year history of implementation and evaluation (WHO, 2002). Although this approach has several shared features with the social influence approach, one distinctive feature of LST is an emphasis on the teaching of generic personal self-management skills and social skills. Examples of the skills typically included in this approach include: personal self-management skills (managing emotions, achieving goals); social skills (communication, assertiveness); cognitive skills (assertiveness, refusal skills) for resisting interpersonal and media influences; and adaptive coping strategies for dealing with stress and anxiety.

Given the consistency of the findings relating to the LST programmes, the reviews acknowledge that this prevention programme can reduce unhealthy/undesirable behaviours. Although a number of negative or null findings were reported, and concerns have been raised that some findings have been overstated (Canning et al. 2004), it was generally believed that the core framework of the LST programme should be incorporated in prevention programmes (McGrath et al. 2006; Roe and Becker, 2005). This was further supported in the World Health Organisation (2002) review which examined the prevention of psychoactive substance use (The WHO, 2002 review has not been included in the main review because of its focus on psychoactive substances which did not meet our inclusion criteria).

***Prevention programmes should be monitored to ensure fidelity***

Although many of the reviewers and primary studies did not consider or discuss fidelity in great detail, it was commonly agreed among those authors who did that if participants do not receive the intervention *as designed* it cannot serve its purpose. Treatment fidelity was an important mediator of effectiveness where it was addressed (e.g., Buller, Borland, Woodhall, Hines, Burris-Woodall et al. 2008; McGrath et al. 2006; Salmivalli, Kaukiainen & Voeten, 2003; Smith, Schneider, Smith & Ananiadou et al. 2004; Thomas, Baker & Lorenzetti, 2007; Vreeman & Carroll, 2007; Whitted & Dupper, 2005). In light of such consistent findings, evaluators and researchers of prevention education should include an assessment of implementation within the research design and analysis programme.

***Prevention programme designers and policy makers should commit to deliverer training***

With the exception of one review (Richardson, Allen, McCullough, Bauld, Assanand, Greaves et al. 2008), the importance of the amount of training received by intervention deliverers was demonstrable (e.g., Foxcroft, Ireland, Lister-Sharp, Lowe & Green, 2002; McGrath et al. 2006; Thomas, Baker & Lorenzetti, 2007; Vreeman & Carroll, 2007). Therefore, deliverer training should be a core component of all prevention interventions. Having said this, the relationship between deliverer training and intervention efficacy was not fully explored in recent primary studies. Consequently, in the most recent studies, the necessary detail is not available to inform the reader of the characteristics of the intervention deliverer, or the dose of training that they received.

***Prevention programmes should be based on the needs of the target population***

Considering the context of delivery is important when designing prevention programmes. If the goal is behaviour change, efforts will only be successful if the content of the intervention resonates with the target population and engages them through addressing their specific needs and values. The research literature demonstrates that although it is possible to adapt certain principles from prevention approaches that have been successful in one setting (e.g., a school in the USA) to another setting (e.g., a school in Croatia) (West, Abatemarco, Ohman-Strickland, Zec, Russo et al. 2008), the prevention approach will only be effective if it is tailored and specific to the social context in which the undesirable/unhealthy behaviour occurs. This limits the transferability of findings, especially where a clear case of contextual distinctiveness can be identified.

A strong review author consensus across the four domains was that prevention effectiveness relies on addressing the needs of those individuals who are likely to participate in the programme. Further, the inappropriateness of a 'one size fits all' approach was emphasised (McGrath et al. 2006). With these assertions in mind, engaging the target audience in designing and implementing programmes is fundamental to programme effectiveness (Canning, Millward, Raj & Warm, 2004). In order to facilitate this process, target groups must be clearly defined and preventive messages should be specifically developed with those groups in mind. Therefore, when designing education strategies and programmes the literature emphasised meeting the following needs:

- Empirically supported for the target group
- Developmentally appropriate and meaningful
- Enjoyable and engaging for the participants
- Culturally sensitive
- Provide a long-term perspective

In order to meet the first four bullet points, a formative phase is required prior to programme implementation. To satisfy the last point, monitoring and subsequent adaptation of programme content and design is necessary in order to ensure that it has ongoing relevance for target audiences who are, potentially, developing and changing (WHO, 2002). With human development in mind, there is a need to incorporate booster sessions so that an individual's knowledge and skill repertoire can keep pace with this process.

***Prevention programmes should target young people and adolescents***

On balance there was a consensus that interventions are most effective when targeted at young people and adolescents (typically between 11 and 14 years). Uniquely, however, the bullying review concluded that interventions may be more effective with children in primary (elementary/infant) schools. Still, when primary prevention is the intervention goal, children and young people are the target audience. This is owing to the fact that most young people are still to establish their beliefs and expectations about these various unhealthy/problem behaviours. Moreover, in the prevention of tobacco use, one review went a step further and outlined that health messages are most appropriate for children nearing adult age whereas cosmetic messages are most appropriate for younger children and adolescents (Richardson et al. 2008). The concept of risk perception appears to be important here. Therefore, age – as a proxy for developmental level - appears to be a key consideration in any intervention design. Questions to consider when reviewing current education programmes include:

- Are education campaigns specifically tailored to young people?
- Have developmental differences been considered in the design of education materials?
- Is the language and mode of communication appropriate?
- Does the programme address the risks that have the potential to lead to unhealthy/undesirable behaviours?

**Box 1**

**Key take home messages**

Drawing on the evidence-base which exists across the four domains, programmes aimed at the prevention of doping in sport should be:

- Targeted at young people and adolescents when attitudes and values are forming.
- Tailored to fit the target population (e.g., risk factors, developmentally).
- Emphasise active participation (e.g., role-plays, discussions).
- Derived from social influence approaches and focused on developing core life skills (e.g., communication, decision-making, refusal skills)
- Monitored and delivered with high degrees of fidelity, to ensure that programme implementation is as directed.
- Delivered by well-trained individuals to ensure content and fidelity.
- Based on the incorporation of booster sessions over a number of years to reinforce and build on programme messages.

# Theoretical approaches to prevention education

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**“Nothing is so practical as a good theory” Kurt Lewin**

Theories are important because they are the set of beliefs that underlie action (Weiss, 1998). Programme theory refers to the mechanisms by which programme outcomes are achieved; programme theory identifies levers of action. Ultimately, programme theory explains the causal links that tie programme inputs to expected outputs. It links programme resources, activities and ultimate goals (Weiss, 1998). In the early stages, programme designers will profit from the disciplined thinking that the theoretical approaches stimulate. This requires designers to make their assumptions explicit, which offers the opportunity to consider and refine their logic. Beyond the scope of this review, but pertinent to this issue, are the practices recommended to develop Logic Models and Intervention Mapping.

It is important to acknowledge that theoretical perspectives are continuing to develop. For this reason, the theories we address here may seem dated. This is inevitable given what we now know and that we are reviewing research papers that can be seen as historical records. Contemporary theorising emphasises the integration of features from a range of perspectives. This interactionism attempts to reflect the reality of how behaviour occurs. Crucially, current thinking about behaviour change is that it reflects a variety of interacting factors including (i) the processes associated with change and development, (ii) the balance of subjective estimates of reward and disincentives, (iii) considerations of social context and relationships and (iv) the impact of past experience (and associated interpretations).

## **INTRODUCTION TO THE THEORETICAL FRAMEWORKS**

Historically, prevention approaches have taken a number of theoretical positions. New theoretical approaches develop with the growth of conceptual dissatisfaction and

empirical under-performance of existing approaches. An important issue for any theoretical approach relates to how well (i) ideas can be operationalised by practitioners and (ii) they connect new ideas to better, or different, intervention outcomes.

Prior to the 1980s, information dissemination (knowledge-focused) and affective education approaches dominated (Canning et al. 2004). The knowledge-focused approach ('know-what') aimed to increase an individual's knowledge about the health implications of problem behaviours (e.g., social drug use). In contrast, the affective education approaches ('know-why') adopted a broader stance to focus on increasing self-understanding and awareness, and enhancing personal development and self-esteem. These two approaches have assumed that humans are rational and motivated to make sensible choices about their health, given sufficient information (Canning et al.). The social influences approach emerged nearly three decades ago in the understanding that most decisions are strongly influenced by their social context. Therefore, in this section we will briefly outline the dominant theoretical approaches for readers unfamiliar with these frameworks (see Appendix B for more information on theoretical application across the research papers reviewed). It was beyond the scope of this review to provide a thorough critique of contemporary theoretical frameworks, so the following information represents a descriptive account of the theory tenets.

## KNOWLEDGE-FOCUSED (COGNITIVE) APPROACHES

**CORE IDEA:** *This approach is based on the assumption that individuals act according to their knowledge and beliefs. Therefore, when individuals are informed of the nature and extent of the harm (biological & psychological) associated with a specific behaviour they will make informed and rational choices to modify this behaviour.*

The underlying assumption of the cognitive approaches is that knowledge about the health consequences of a behaviour will elicit a change in attitudes towards that behaviour and ultimately a behavioural action will ensue. These approaches underpin many contemporary public health and social-psychological approaches to predicting

and influencing behavior. The focus of these theories is primarily on the individual and the factors that determine human behaviour at any given time. To illustrate these themes, two key cognitive theories will be outlined.

***Cognitive model (1) – Health Belief Model (HBM; Becker, Maiman, Kirscht, Haefner & Drachman, 1977)***

The HBM is the most extensively researched model of health-related behaviours. It posits that individuals will not take preventive health action unless they:

- Possess minimal levels of health motivation and knowledge
- Perceive themselves at risk and vulnerable to the disease
- View the condition as threatening
- Are convinced of the efficacy of the treatment
- See few difficulties in undertaking the recommended action

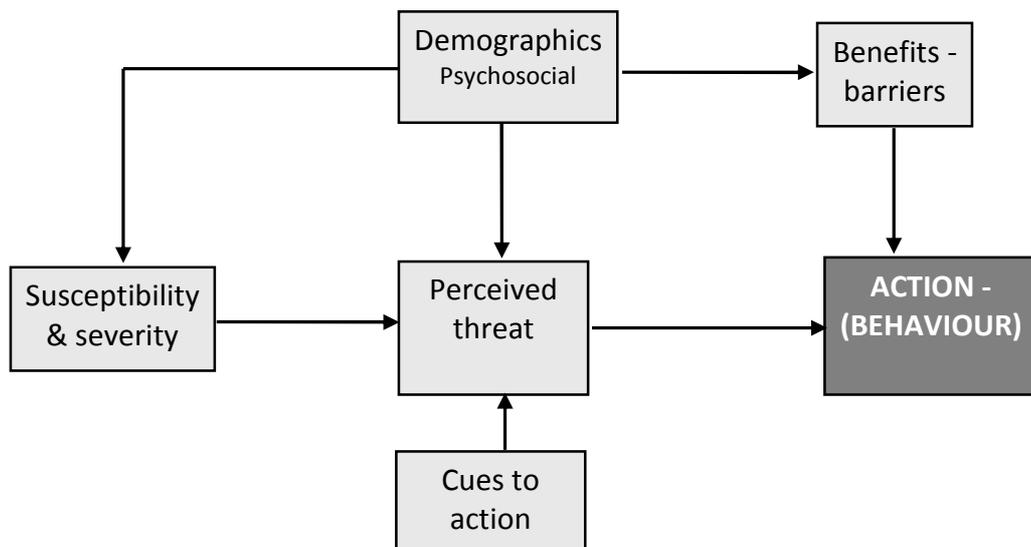


Figure 1. Health Belief Model.

According to this model, providing factual information about the negative effects and dangers of alcohol, tobacco and social drugs use will deter use, or prevent abuse by creating negative attitudes towards the unhealthy behaviour.

***Cognitive model (2) – Theories of Reasoned Action (Ajzen & Fishbein, 1980) and Planned Behaviour (Ajzen, 1985)***

The logic behind these two strongly related models is that behaviour is predicted by a rational decision (intention) and that intentions arise through three individualised constituents: (i) attitude towards the behaviour, (ii) perceptions of the social norms regarding the behaviour, and (iii) the perceived ease or difficulty of performing the behaviour. Ultimately, when an individual intends to lead a healthy lifestyle, without engaging in undesirable/unhealthy behaviours, this theory posits that it will be carried out. This model has been applied across a number of interventions and it offers a convenient structure to examine the relative impact of the three constituents in forming the behaviour of individuals (see figure 2).

Figure 2. Theories of Reasoned Action and Planned Behaviour

Knowledge provision appears to be the most popular content of prevention interventions. However, Roe and Becker (2005) theorised that ‘altering young people’s *awareness* of the dangers of drugs can be achieved by providing appropriate information, but that different *behaviour* does not inevitably follow’ (pg. 94). The assumption underscoring this approach is that knowledge is key to changing behaviour.

The theory holds that if individuals accrue an awareness of the relevant facts associated with the undesirable/unhealthy behaviour then they will use this information to make an informed choice to avoid the behaviour. It is clear that knowledge provision is necessary (and, as a mediating variable, it is often used as a key outcome variable), yet quite clearly it is not the most important element in an effective prevention programme. Further, knowledge approaches based on fear arousal have been seen as generally ineffective because the message has moral overtones which often do not correspond with the values or subjective experiences of young people. For example, engaging in the undesirable/unhealthy behaviour does not always lead to

immediate and severe health problems (Roe and Baker, 2005). Fear-based approaches can also be criticised for creating a strong behavioural desire without promoting proactive, adaptive alternatives.

**Based on existing evidence, we believe that:**

- *Knowledge focused frameworks do not lead to effective prevention efforts if they are delivered in isolation. This is a strong and consistent conclusion across all four research domains. Although knowledge development is necessary, this component needs to be balanced with skill development if the intervention is to be effective in changing behaviour.*

## **SOCIAL INFLUENCE APPROACH**

**CORE IDEA:** *The underlying assumption of this approach is that (i) inoculation experiences help individuals to resist social pressures (from peers, siblings, parents and media) and (ii) persuasion will reduce unhealthy/undesirable behaviours because individuals will have the skills to counteract the influence. Therefore, the development of social skills (e.g., decision making, refusal skills) is probably the most important component of social influence programmes.*

The social influence approach recognises that the initiation and early stage development of undesirable behaviours stem from direct or indirect social factors. This concept of social influence may arise from peers, the media and the family through processes such as modelling and persuasive communication. Therefore, the underlying conceptual framework for the social influence approach is that young people and adolescents begin to smoke, drink, or use drugs either because they succumb to the persuasive messages targeted at them or because they lack the necessary skills to resist specific social influences that encourage engagement in undesirable behaviour. Social influence approaches provide several of the core components used in the most consistently successful prevention approaches (see Appendix B).

When reviewing the primary papers and the reviews, it is clear that several authors did not refer to a theoretical grounding in social influences by name. However, their reports gave strong clues about theoretical origins, which enabled informed decisions, but many authors did not specify the theoretical elements they intended that interventions would alter. Neither did they detail how intended changes would facilitate long-term adaptive change. However, in both effective and ineffective interventions adopting a social influences approach typically included a focus upon developing refusal/resistance skills. The second most common focus within this approach was to include normative education.

A variety of theoretical models are discussed under the umbrella term ‘social influence approach’. Although categorised as a cognitive behaviour theory, the Theory of Reasoned Action comes under this heading in some studies (presumably due to the proposed causal link between subjective norm and intention). However, a number of the theories will now be briefly outlined.

### ***Social Cognitive Theory (Bandura, 1986)***

The social cognitive theory explains how people acquire and maintain certain behavioural patterns; emphasising the principle that behaviour, environment, and cognition operate together. This theory emphasises the social origins of an individual’s thought process and behaviour positing that "what people think, believe, and feel affects how they behave" (Bandura, 1986, p. 25). Further, collective agency is emphasised because humans live socially. According to the social cognitive theory, the fundamentals need to initiate behaviour include observing and modelling the behaviours, attitudes and emotional reactions of others, through vicarious learning. To acquire behaviours through the observation of others an individual must (i) pay attention, (ii) be able to retain or recall events or actions, (iii) be capable of reproducing the behaviour and (iv) be motivated to reproduce the behaviour (Bandura, 1986). For Bandura, self-reflection is a prominent feature of social cognitive theory. By engaging in self-reflection individuals attempt to make sense of their experiences, explore their own cognitions and self-beliefs, and in doing so they may alter their thinking and behaviour accordingly (Bandura).

A fundamental component of social cognitive theory is self-efficacy beliefs, "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, p. 391). According to self-efficacy theory, an individual's level of motivation, affective states and behavioural actions are mostly based on perception rather than on what is so. Therefore, self-efficacy beliefs are powerful predictors of behaviour as they help to determine what individuals do with their knowledge and skills.

Normative education emphasises the person-environment-behaviour interaction which represents the core framework for Bandura's model. As an example, an individual who believes that her peer group is positively inclined towards drug use will, therefore, be motivated to engage in this behaviour to gain social acceptance and affiliation. In contrast, an individual who socialises with friends who are disinclined to use drugs is more likely to also be disinhibited through anticipating disapproval from her peer group.

Thus, the normative approach addresses learners' misconceptions about the prevalence of alcohol, tobacco and social drug use and misuse (or any other risk-taking behaviour) and attempts to alter the inaccurate normative expectations which can ultimately lead to undesirable behaviours (McGrath et al. 2006). Three related assumptions underpin this approach. First, many young people over-estimate the extent of risk-taking behaviours amongst their peers. Second, they wrongly believe that these behaviours are 'normal'. Third, and because of these other misconceptions, they are vulnerable to social pressures to conform to an erroneous 'norm' (McGrath et al.).

### ***Social inoculation theory – (McGuire, 1964)***

In the assumption that avoidance behaviour does not always prove successful, social inoculation theory was developed to generate effective 'combat techniques' for different persuasive socially-framed behavioural challenges. This framework can be best understood as 'resistance to persuasion'. The theory relates to both the

persuader and the target of any persuasion approaches. From a persuader perspective the scale of defence that an individual might offer will develop sophisticated persuasion approaches to find and then exploit weaknesses in resistance. Refinements to the theory - and therefore to interventions based around this approach – relates to understanding that challenges can be delivered in any socially constituted scenario, while further sophistication emerges through considering (i) past experiences of (un)successful resistance, (ii) patterns of approaches and (iii) their effectiveness.

At the simplest level, the 'Just say no' approach is based on the tenets of the social inoculation theory which assumes that the decision to engage in unhealthy/undesirable behaviour is based on the ability to resist peer pressure. Therefore, developing resistance skills or refusal skills in young people and adolescents is believed to "inoculate" them from these pressures as it pre-treats through exposure to forms of the social appeals. Thus, social inoculation is analogous to physiological inoculation in the prevention of disease. Developing effective refusal skills is therefore an active ingredient in a number of prevention approaches that have been shown to be effective.

# In search of evidence-based programmes: Research and evaluation issues

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Reviewing the tertiary and secondary level reviews and primary studies identified specific gaps and inconsistencies within the literature regarding the prevention of social issues relevant to this review. Generally, intervention outcomes are not properly evaluated, making it hard to judge effectiveness. Further, in the prevention literature the school setting dominates meaning there is a dearth of evidence regarding the effectiveness of prevention education outside schools. Perhaps one of the most important issues that resonates across the four domains is that while studies show the impact of programmes on attitudes, knowledge, resistance skills and intentions, few have examined the impact on long-term behaviour. Further, the most commonly cited reasons for the exclusion of studies from the reviews included: (i) lack of suitable control groups (non-random allocation or non-equivalent groups), (ii) lack of pre-test information, (iii) high levels of attrition, (iv) inappropriate analysis for the unit of allocation, and (v) poor quality presentation of results (often in well-respected peer reviewed journals).

Review authors offered numerous ‘future recommendations’ from each of the four research domains. Anti-doping education providers should therefore take note of these suggestions when designing future intervention programmes. Given the lack of evidence-based practice in the anti-doping education field (Backhouse et al. 2007), the issue of implementing and disseminating education programmes in the absence of a strong research base that proves its effectiveness is real and addressing this issue is fundamental at a global level.

When designing future evaluation studies within the anti-doping education field, it seems sensible and cost effective to follow the guidance of those well established within the four social issue domains covered in this review. The issues identified in the literature will be considered in this section in the hope that it will guide future anti-doping endeavours.

#### Research and evaluation recommendation 1

***Attempt to make results comparable with those already published by standardising the reporting of outcome measures (Jones et al. 2007) and by selecting outcomes and scales that have been previously validated and accepted (Gates et al. 2006).***

Within each of the four research domains, the choice of outcome measures varied. For example, within the alcohol use prevention domain alone, study outcomes varied from specific measures of units of alcohol per week, past 30-day use, lifetime use, and ‘drunkenness’ (Foxcroft, Ireland, Lister-Sharp & Breen, 2002; Jones, James, Jefferson, Lushey, Morleo et al. 2007). In their review of bullying prevention, Smith, Schneider, Smith & Ananiadou (2004) noted that although there are many common outcome measures, there were too few similarities to compare the results with confidence. Therefore, the use of variable outcome measures may limit the ability to accurately measure the effects of the interventions and anti-doping education efforts should coordinate their evaluation approaches so that meaningful comparisons can be made. A more specific concern that could be related to the anti-doping field was that the effects of bullying interventions focus primarily on *indirect measures* of the behaviour, which often accounts for what the participants know about bullying rather than how they actually engage in the behaviour (Merrell, Gueldner, Ross & Isava, 2008).

From a reporting perspective, few studies provided outcome data in sufficient detail to allow sophisticated analytical presentation by reviewers, for example in the form of forest plots (Foxcroft et al. 2002; Jones et al. 2007). Forest plots can be a valuable addition to meta-analyses to allow readers to see the whole picture within the range

of findings. More specifically, forest plots can display; (i) studies in chronological order (e.g. from top to bottom), (ii) the strength of the studies/evidence (represented by the size of the central square), and (iii) the effect size (e.g. confidence intervals, odds ratios – represented by the position of the square with regard to the central line of the forest plot, and the length of the ‘arms’ extending from the square of a specific study, respectively).

### Research and evaluation recommendation 2

***Choose a correct strategy of analysis (Gates et al. 2006; Faggiano et al. 2005).***

***When analysing prevention programmes, the unit of allocation should be accounted for and intention to treat analyses should represent the standard***

Over all four research domains, there was a general pattern of not accounting for the unit of allocation (clustering) in the analysis. Wrongly, data were analysed as if the trial had been individually randomised (Gates, McCambridge, Smith & Foxcroft. 2006; Foxcroft et al. 2002; Jones et al. 2007; Sowden & Arblaster, 2008; Vreeman & Carroll, 2007). For example, Faggiano, Vigna-Taglianti, Versino, Zambon, Borraccino et al (2005) identified only six studies (of 32) that accounted for the cluster effect in their design and analysis. Moreover, few studies reported an ‘intention to treat’ analysis to account for the attrition (Foxcroft et al. 2002; Jones et al 2007).

Gates et al. (2006) found that most studies used methods such as analysis of covariance (ANCOVA) for their statistical analysis, modelling the outcome variables as a function of baseline characteristics, time and group allocation. Results were almost always presented using statistics and p-values, or a statement about statistical significance, rather than a measure of the difference between the groups and a confidence interval (Gates et al. 2006). Faggiano et al. (2005) also commented that many randomised controlled trials (RCTs) do not present effect measures; instead they only consider statistical indicators (p values) or other heterogeneous effect measures so they could not be combined in meta-analyses.

Finally, many of the multi-component studies did not identify the respective impact of the individual components (Sowden & Arblaster, 2008; Vreeman & Carroll, 2007).

Canning et al. (2004) suggested that this would be useful in future programmes of this type. However, such programmes will be difficult to implement, as they can be large and costly to establish findings with appropriate statistical power and sensitivity to change.

### Research and evaluation recommendation 3

***Employ control groups in order to examine the effectiveness of prevention interventions and employ randomised designs (Gates et al. 2006).***

Within Merrell et al. (2008), only three of 16 studies evaluated bullying prevention interventions through the most rigorous process known as true experimental design<sup>2</sup>. The validity of non-experimental designs, while often more feasible in school-based research, is often threatened by history. This points to the possibility of something other than the intervention leading to the results (Merrell et al. 2008). Quality therefore appears to be an issue across the four research domains. For example, Faggiano et al. (2005) concluded that none of the RCTs satisfied all the quality criteria used in the review (B and Cs). Further, 21 of 30 controlled prospective studies (CPS) were excluded due to a lack of comparable groups.

Across the four research domains there was no clear reporting of allocation concealment and randomisation (Foxcroft et al. 2002; Jones et al. 2007). Further, few studies reported whether participants had been matched at baseline (comparability) (Foxcroft et al. 2002; Jones et al. 2007). This presents an issue for those evaluating the programmes as they are not furnished with the necessary information to know if groups are comparable. Further, where the composition of the groups was reported they often did not share equivalent socioeconomic, social or cultural characteristics

<sup>2</sup>

In a true experimental design, two "equivalent" groups are selected; one group (the intervention or treatment group) receives the intervention and the other group (the comparison or control group) does not. In all other respects, the groups are treated the same. If intervention outcome differences are observed between these two groups the argument is that this must be due to the intervention programme which represented the only differences between the two groups.

(Gates et al. 2006; Sowden & Arblaster, 2008). This may be a source of bias, as there are likely to be differences between the control and intervention groups (Gates et al. 2006). Indeed, Faggiano et al. (2005) excluded 21 of 30 controlled prospective studies (CPS) studies due to a lack of comparability of groups (all participants should theoretically be from the same population). Exposed and unexposed participants must come from the same base population (e.g., geographical area), while identification and control of all confounding factors is essential.

Smith et al. (2004) found that control conditions were absent in many studies. In others, schools self-selected themselves for experimental and control conditions, meaning that the more motivated schools (or those motivated to begin the programme earlier) opted for the experimental condition, which favours positive outcome effects. However, the number of participants assigned to intervention or control groups was often not reported or was only available for baseline data (Foxcroft et al. 2002; Jones et al. 2007). Therefore, this reporting does not allow for attrition, which is a feature in more intense or long lasting interventions.

#### Research and evaluation recommendation 4

***Monitor, minimise (Gates et al. 2006) and clearly report attrition rates (Foxcroft et al. 2002).***

Attrition describes the number or proportion of individuals recruited into a study who “did not receive the intended intervention or were not assessed at the follow-up time points using the study’s instruments” (Foxcroft et al. 2002, p. 7). Higher attrition rates in the absence of intention to treat (ITT) analysis, threatens the validity of the results (Foxcroft et al. 2002). Losses to follow-up were generally high (e.g., Gates et al. 2006) and this can be illustrated as several bullying prevention interventions with positive results, including interventions (i) using mentoring, (ii) increased social workers, and (iii) social skills groups for younger children, were only studied on a single occasion. This limited follow-up restricts the programmes generalisability (Vreeman & Carroll,

2007) because it's impossible to detect patterns of change. The follow-up periods of included studies varied considerably. In one review (Gates et al. 2006) the range was from the immediate post-intervention period to six years post-intervention. Eight studies followed up participants for more than a year. Ideally, adolescents should be traced into adulthood in order to assess patterns of long-term responsiveness (Roe and Becker, 2005). The importance of adequate follow-up is clearly illustrated in the physical activity domain as 50% of those who begin a physical activity programme drop-out within the first six months (Dishman, 1988).

#### Research and evaluation recommendation 5

***Monitor programme implementation (Gates et al. 2006; Smith et al. 2004) to ensure that clients are actually receiving the intended intervention; fidelity is a key factor in prevention effectiveness.***

Fidelity refers to the degree to which intervention providers implement programmes as intended by the programme developers. In drug use prevention, McGrath et al. (2006) commented that poor fidelity can lead to 'type III errors' (where 'observed results are falsely attributed to the conceptual underpinnings of the intervention' pg. 21). Fidelity was rarely monitored within reviews in any of the four research domains. However, programmes appeared more effective when high fidelity was achieved (e.g., McGrath et al. 2006).

Many evaluative studies of drug prevention programmes do not include a proven method to examine whether programmes are delivered correctly. Further, few studies provided clear descriptions or systematic monitoring of a programme. Therefore, it was not confirmed that students received programmes as intended (Skara & Sussman, 2003). 'Do besting' is always an issue when deliverers have different (perhaps conflicting) needs and aspirations. For example, in the school setting, teachers do 'what's best' for each pupil whether that fits with the intervention programme or not

and this is an issue that will continue to undermine intervention efforts in the ‘real world’.

### Research and evaluation recommendation 6

*Triangulate the data collected. Where possible, support self-reports by collecting information on outcomes from other sources, such as observations from teachers, classmates (peers), administrators, and even parents (Smith, Ananiadou & Cowie, 2003), or objective measures (e.g., in the context of tobacco, use saliva samples).*

All areas of research were highly reliant upon self-reports. This approach does not often wholly correspond with information obtained from peers or teachers or from observations (Merrell, Gueldner, Ross & Isava, 2008; Smith et al. 2004; Vreeman & Carroll, 2007). Further, the reporting of illegal behaviours or those that produce social stigma will always be problematic and subject to self-presentation bias. Therefore, there is a need to replace self-reporting with objective data measures, such as provided in saliva or blood tests (White & Pitts, 1998). Some substance abuse studies have used strategies such as biochemical validation and bogus pipeline techniques to increase the validity of self-reported use of drugs (Skara & Sussman, 2003).

#### **A BRIEF CONSIDERATION OF COST EFFECTIVENESS**

An almost total lack of cost effectiveness evaluations was obvious in all four research domains (Foxcroft et al. 2002; Sowden & Stead, 2003; Stead & Lancaster, 2005; Thomas & Perera, 2006; Thomas, Baker & Lorenzetti, 2007; Richardson et al. 2008; Sowden & Arblaster, 2008). For example, Jones et al. (2007) highlighted this issue in the field of prevention of tobacco use in young people, with only two of 52 programmes examining intervention cost-effectiveness. However, their methodological shortcomings meant that their findings should be interpreted with caution. Gates et al (2006) asserts that because the use of non-school educational, family training or multi-component community interventions is likely to involve

significant costs, decisions about the use of different settings and types of interventions should be based largely on economic considerations. Therefore, high-quality economic evidence would be beneficial to provide a sound basis for those service provision decisions.

### Box 2

#### Other research and evaluation issues identified in the literature

- Report all data useful for the estimation of validity: absolute numbers, relative risks, and statistical indicators (Gates et al. 2006).
- Execute large-scale randomised control trials (RCTs) with sufficiently large sample sizes to show clinically important differences in outcomes (Foxcroft et al. 2002; Gates et al. 2006) through statistical power.
- Examine comparisons between different combinations of interventions that have yet to be studied, such as ‘affective’ vs. ‘other’ (Faggiano et al. 2005) or ‘school-based’ vs. ‘community-based’ interventions (Thomas & Perera, 2006).
- Focus on areas already indicated as being most likely to yield positive changes in attitudes, normative beliefs, and behaviours that prevent and/or reduce drug use (Canning et al. 2004).
- Develop, execute and rigorously evaluate more culturally-focused interventions (Foxcroft et al. 2002)
- Include an evaluation of process and delivery and wherever possible an evaluation of impact and outcomes (Canning et al. 2004).
- Invest in deliverer training in order to ensure intervention fidelity (McGrath et al. 2006).
- Explore exactly which components or conditions are key to making the approach effective (Smith et al. 2004); the evaluations of single components of intervention (peer, parents, and booster sessions) are the priorities for research (Faggiano et al. 2005).

## COLLABORATIVE NETWORKING AND RESEARCH DISSEMINATION

A useful recommendation from the alcohol and drug misuse domains involved establishing an international register of alcohol and drug misuse prevention interventions (Foxcroft et al. 2002) with established criteria for rating prevention interventions in terms of safety, efficacy and effectiveness. The development of an

international register of anti-doping education, employing the criteria emphasised by Foxcroft would be welcomed and this is a process that should be driven and implemented at the global level.

# Conclusion

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This review has attempted to synthesise the available evidence on prevention programmes across four social behaviour domains; namely bullying, alcohol, tobacco and social drug use. To achieve this aim, the review relied on the pre-existing findings of high quality surveys of research (e.g., reviews and meta-analyses). We undertook this work in the understanding that these collections can also be summarised. Having undertaken this process, we confirm the assertion of Weiss (1998) that prevention programmes represent complicated phenomena. Even allowing for these complications, the research covered in this review is still extensive and, particularly that research undertaken in recent years, has considerable relevance to the anti-doping field. In this report we attempt to provide an accessible account about best practice in prevention research in the hope that this will encourage reflection and assist in the improved design of anti-doping prevention approaches.

In the academic and professional communities dissemination of basic research is essential and unquestioned (Weiss, 1998). Yet, in the prevention domain most intervention work goes unpublished. Consequently, our review is limited to the available published material, which brings an inherent bias. Further, most published prevention studies across the four domains have been located in the USA. This questions the general applicability of the conclusions they offer. Also, even though published work tends to stem from research organisations and numerous prevention programmes are being conducted every day across the continents, their impact on behaviour is not clear (WHO, 2002). A further limitation is the bias towards studies published in the English language.

These limitations notwithstanding, the review has generated an evidence-based cook book, with ‘recipes for success’. Through refinement these may prove valuable to the future development of anti-doping education programmes. Such transferability emanates from the notion that many social and health issues are linked to core root factors (UNESCAP, 2003). Authors, across the social domains, have consistently

emphasised the need for programme designers to engage in a formative planning process that canvasses the views of the individuals who will be targeted by the intervention. This essential preparatory work should be completed before any programme is finalised and then disseminated. Content and delivery developed in this way appears to be fundamental to ensuring participant engagement and learning. Furthermore, programmes should be; (i) targeted at athletes' early when attitudes and values are being formed; (ii) interactive and based on social and skill development; (iii) monitored and delivered with high degrees of fidelity; (iv) delivered by those who have received the necessary training; (iv) based on the incorporation of booster sessions in later years to reinforce the programme message.

In addition, we have touched lightly upon the theories that underpin successful prevention approaches. Theoretical frameworks focus attention on the mechanisms that guide programme delivery and that lead to influence on the outcomes of interest. Therefore, we look upon theories as helping to explain how programme inputs tie to programme outputs (or not); they also help to guide and direct intervention approaches. Despite decades of research, conceptually, much of the work done across the four domains has a limited theoretical basis. Where theories have been explored, there is strong evidence supporting the positive impact of those based on social influence perspectives. Several follow-up studies of social influence approaches demonstrate positive behavioural effects lasting up to three years (Canning et al. 2004). However, these effects tend to decay over time, which highlights the need for ongoing booster sessions. In the social influence approach, normative education is reported to be the strongest mediator for behaviour across the alcohol, tobacco and social drug use literature (McGrath et al. 2006; WHO 2002).

In 2007, Backhouse and colleagues reviewed the published articles on anti-doping education, concluding that while it is necessary to provide information on drug-related issues and to improve knowledge, an effective programme must also address the myriad of other variables that impact upon the decision to use performance enhancing drugs. These variables included alternatives to drug use, peer and media resistance

training and decision-making skills. We noted that programmes that effectively changed behaviours, attitudes or intentions relating to performance enhancing drugs were characterised by:

- Longer interventions (conducted over 2-10 weeks) comprising a number of teaching sessions rather than those delivered on a ‘one shot’ basis.
- Programmes that addressed a range of topics including drug and alcohol related issues, alternatives to drug use (nutrition, training methods) and media / peer pressure resistance.
- Increasing participant involvement and ownership in the programme either through peer lead teaching or homework / coursework assignments.

These conclusions are reinforced by the findings of this current review and feature within the ‘recipes of success’ detailed in section two. We also strongly assert that traditional cognitive and affective approaches to tobacco, alcohol, drug abuse and bullying prevention have not been effective, yet these approaches continue to dominate contemporary anti-doping programmes (Backhouse et al. 2007). To make better progress, a cumulative evidence-base is required; this would detail what has worked and, just as important, what has failed to make meaningful impacts in anti-doping approaches.

Also, programme goals need to be considered to ensure that they are clear and unambiguous and a consensus on what a programme is trying to achieve needs to be established. Therefore, active anti-doping educators will profit from learning about the components of programmes associated with greater success, presumably in ways similar to those which bring about change in the behaviours we reviewed here (i.e., based on activity, problem solving etc). At present, it is unclear how current anti-doping education programmes model the impact of delivery on risk factors associated with doping behaviour. Few studies have been carried out on the effects of anti-doping education and until this point, the only exception to this rule appears to be the two US-based interventions, ATLAS and ATHENA (Goldberg & Elliot, 2005).

ATLAS and ATHENA are focused on adolescent drug prevention and their pedagogy is based on a constructivist approach (Hanson, 2009). More specifically, these approaches aim to develop adolescent athletes' capacity to respond to doping issues within a peer-led problem-solving framework. This approach applies a number of common elements of prevention success, as outlined in section two. Moreover, ATLAS and ATHENA have been subject to over a decade of research and evaluation and positive, sustained results have been noted in doping attitudes and behaviour (Goldberg & Elliot, 2005). Currently ATLAS and ATHENA represent the best anti-doping evidence, yet their effectiveness has only been demonstrated in the context of the US. Further, they are heavily focused on team-based sports and specific forms of performance-enhancement. Uncertainty exists regarding the specific influence of individual programme components in preventing doping. On balance, there is no strong non-US information available for policy makers to establish best practice, evidence-based policy on anti-doping education for athletes. So, researchers should consider the transferability and effectiveness of ATLAS and ATHENA programmes in other anti-doping contexts.

Anti-doping education seeks to intervene in athlete's lives with the intention of preventing the use of performance enhancing substances and methods by facilitating change. In the future, researchers and policy makers should more obviously link programme content to impact. WADA and most International Federations (IFs) and National Sporting Bodies have developed specific educational and promotional campaigns to raise awareness of doping in sport, promote anti-doping behaviour and fulfil the education requirements outlined in the Code. To meet this directive, substantial resources are committed to programme delivery; yet, systematic evaluations appear scarce. It is also unclear whether or not such education efforts have led to behaviour change. Although programme evaluations are costly, failure to engage in this process will mean that anti-doping education does not progress which risks accusations of being unsystematic and fragmented. Going forward, key questions for the anti-doping programme designers and providers to consider include:

- 1) What is the anti-doping programme doing?
- 2) How is the programme being conducted?
- 3) What are the programme consequences?
- 4) What are the set of beliefs that underlie the actions? What are the hypotheses from which to build?
- 5) What ideas and assumptions link the programme inputs to the attainment of the desired ends?
- 6) How well is the programme following the guidelines it was originally set? (implementation fidelity)
- 7) Are the outcomes of the programme worth the money it costs?
- 8) Should the programme be continued, expanded, cut back, changed, or abandoned?
- 9) Does the programme work for everybody or are the effects only limited to a sub-group?

(Adapted from Weiss, 1998)

Although anti-doping educators can be informed by the findings of this review, it is important to recognise that doping has unique features and although we can build on the information presented, we should not be restrained by it. Currently, the research literature has not adequately addressed the risk and protective factors for doping in sport. This limits the ability to tailor anti-doping education programmes so that protective factors are enhanced and risk factors are reduced or reversed. By way of comparison, within the substance use domain Hawkins, Catalano and Miller (1992) have identified 17 risk factors that increase the chances of adolescents developing health and behaviour problems. This level of analysis, across contextual and individual and interpersonal factors allows programme designers to specifically target known risk and protective factors and we need to develop this evidence base in the doping in sport field.

## A NEED FOR GLOBAL DIRECTION

The recent Bay Area Laboratories Co-Operative (BALCO) scandal, involving numerous elite level athletes and support personnel, demonstrated that those who possess the knowledge to circumvent the system will do so when the rewards are high and risk is perceived to be low. We can anticipate that, unchanged, such a ‘cat and mouse’ game will continue should anti-doping remain focused on detection, which, at best, represents only secondary prevention. Primary prevention represents a complex problem and sophisticated preventive strategies are needed; negative campaigns focused on doping controls, the prohibited list and sanctions do not fit what is required for primary prevention, where positivity and engagement are crucial. Consequently, investing in evidence-based prevention is fundamental to effectively educate athletes and their support network so that should a choice be required, the rational decision making skills and resilience are in place to say (and to keep saying) *“No, I will achieve my ambitions in a better way”*.

An active prevention policy needs to be pursued because effective anti-doping education needs to be more deeply rooted in an understanding of the mechanisms by which sports doping is both initiated and maintained. Currently, the field is characterised by superficial connections between researchers and policy makers. Worse, education programmes are rarely evidence-based or systematically evaluated (Backhouse et al. 2007). These limitations need to be addressed strategically. Doping is a global issue and as such, requires ‘connected’ approaches, across countries and, most likely across the related organisations. WADA has the global directive to take up this challenge and lead to achieving the goal of doping free sport. To meet this overarching aim a long-term commitment to meeting the high costs of wide-ranging and fully resourced anti-doping prevention is needed. A best approach is often a combination of top-down and bottom-up approaches, adapted to local circumstances (WHO, 2002).

# Appendix A: A review of the evidence regarding intervention type and setting

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This section will provide a detailed analysis of the types of intervention employed in tackling the social issues considered in this review and the settings in which the programmes are delivered.

## INTERVENTION TYPE

In the social drug use domain, interventions are categorised according to the target population and there are advantages and disadvantages for each intervention type (McGrath et al. 2006). For example, universal<sup>3</sup> prevention programmes can be more expensive than selective or indicated prevention as they target a whole population (e.g., every pupil of a school). However, since selective<sup>4</sup> and indicated<sup>5</sup> prevention programmes are targeted at young people with risk factors associated with problem behaviours (e.g., young offenders) there is a risk of stigmatisation or labelling the participants, which could lead to more problems. Furthermore, possessing risk factors does not necessarily mean that an individual will develop said problem behaviour(s) (McGrath et al.).

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<sup>3</sup> Targets whole population groups (e.g. national, local community, school) and each member of the population is considered to benefit from the programme. An example of universal prevention is a school-wide policy or curriculum, as it is assumed to reach all the children at the school in which it is implemented.

<sup>4</sup> Targets a subset of the population whose risk of developing particular problem behaviour is above average. 'At-risk' is identified by the presence of biological, psychological, social or environmental risk factors (e.g., an after-school programme specifically for children with behavioural problems).

<sup>5</sup> Targets individuals who are at risk of developing the problem behaviour and may even demonstrate low levels of the problem behaviour. However, they do not meet the criteria for dependence. Indicated prevention programmes normally screen individuals to judge their level of risk.

***A focus on social drug use***

According to Canning et al. (2004), who examined the prevention of social drug use, there is a lack of evidence for selected and indicated prevention programmes. Even so, the authors represented the conclusions of Windle and Windle (1999) - that universal prevention programmes appear to be more effective for lower-risk adolescents than it is for those at higher-risk. In a more contemporary briefing update, McGrath et al. (2006) represented the similar conclusions of a review by Gottfredson and Wilson (2003) (re: that there is some evidence to imply that school prevention programmes that target at-risk students are more effective than those that target general student populations). Taken together, the findings suggest that for the general population a universal approach is appropriate, but that those who are 'at-risk' for or vulnerable to, particular problem behaviours should be acknowledged and treated with a selective or indicated programme. However, according to White and Pitts (1998), there is a lack of 'sound' evidence for targeted interventions outside schools (cited in Canning et al. 2004).

***A focus on bullying***

With regard to the prevention of bullying behaviours, it has been suggested that the multiple causes of bullying require multiple avenues for possible intervention (Vreeman & Carroll, 2007). The universal intervention within this domain is referred to as a 'whole-school' approach; it is based on the assumption that since bullying is a systemic problem an intervention must be directed at the entire school context rather than at individual bullies and victims (i.e., indicated prevention). Smith et al. (2004) suggested that whole-school approaches 'reflect a reasonable rate of return on the investment inherent in low-cost, non-stigmatising primary prevention programs' (pg. 557), but concluded that although this approach has led to important reductions in bullying in a number of cases, the results are too inconsistent to advocate a school-based approach only.

Vreeman and Carroll (2007) supported the view that whole-school approaches deliver a reasonable rate of return (Smith et al. 2004). They based this position of support on the finding that seven of ten studies examining the whole-school approach revealed positive outcomes, and that five of those seven studies revealed decreased bullying or

victimisation (Vreeman & Carroll, 2007). However, it should be noted that Vreeman and Carroll (2007) warned that there are significant barriers that may limit the effectiveness of a whole-school approach. For example, they suggested that whole-school interventions may not work for younger children.

As mentioned previously, one advantage of the whole-school approach is that it avoids the potentially problematic stigmatisation of either bullies or victims (Smith et al. 2004). This point has also been made with regards to the other problem behaviours covered in this review. However, a negative side effect noted in a US study was that of cross-fertilisation of beliefs (i.e., that problem behaviours, such as bullying, are legitimate). This reminds us that researchers and practitioners should always consider how their actions may produce unanticipated negative effects as well as anticipated positive effects (Merrell et al. 2008).

Unfortunately, the superiority of one type of intervention over others remains unclear as there were no recent primary studies that had specifically tested this hypothesis. However, Vazsonyi, Belliston and Flannery (2004) found that an interactive, universal, school-based violence prevention intervention resulted in decreases in teacher-reports of aggression in children classified as high-risk (versus medium- or low-risk). This contradicts the review level findings, which suggested that the general population require a universal intervention and those who are 'at-risk' or vulnerable require a selective or indicated programme.

### ***An update from the literature***

Sixty two of the latest research studies have examined universal prevention interventions, of those 32 were effective. Interestingly, from only six indicated interventions, all six were effective (see Table A1 for further details).

Table A1. Intervention type and effectiveness across the four research domains, based on primary research papers identified in the update.

Domain		Universal	Indicated	Selective	Combination	Total
Alcohol Use		12	1	-	-	13
	<i>Effective</i>	5	1	-	-	6
Bullying		12	1	1	1	15
	<i>Effective</i>	7	1	1	1	10
Social Drug Use		10	1	-	-	11*
	<i>Effective</i>	4	1	-	-	5
Tobacco Use		28	3	-	-	31
	<i>Effective</i>	16	3	-	-	19

N.B.\* This represents two papers less than the search figure D2 because two publications were a review/summary of all the previous experimental findings of the Project Towards No Drug Abuse (Sussman, Dent & Stacy, 2002) and Project DARE (West & O’Neal, 2004).

### Based on existing evidence, we believe that:

- ***There are mixed results in relation to which type of intervention is the most effective. However, on balance and despite being more expensive, universal interventions are more commonly implemented and evaluated.***

## INTERVENTION SETTING: A FOCUS ON SINGLE-SITE SETTINGS

### ***School based interventions: Review evidence***

Roe and Becker (2005) commented that most of the research regarding the prevention of social drug use has been carried out in school settings. Merrell et al. (2008) also stated that although bullying may occur in almost any context or setting where people gather and interact, schools have been the most frequently studied environment. Similarly, Thomas and Perera (2006) noted that school-based programmes for smoking prevention have been widely developed and evaluated, and suggested that this was because schools provide a route for communicating with a large population of young people. Faggiano et al. (2006) agreed with this suggestion when they stated that schools are appropriate settings for illicit drugs use prevention programmes because they offer the most systematic and efficient way of reaching a substantial number of young people every year, and added that, in most countries, schools can adopt and enforce a broad spectrum of educational policies. More importantly, despite studying

alcohol use, they highlighted that four out of five tobacco smokers initiate the behaviour (begin smoking) before adulthood. This indicates that the prevention of substance use must therefore focus on school-aged children and adolescents, before their beliefs and expectations about substance use are established (Faggiano et al. 2005)

Review evidence regarding the efficacy of school-based interventions to prevent social drug use was presented by Canning et al. (2004). They found that those aimed at adolescents can delay the start of misuse by non-users, and temporarily reduce use by some current users, although effects decreased with time (White & Pitts, 1998). Similarly, Jones et al. (2006) commented that school-based programmes for minority youth can beneficially influence/reduce alcohol and tobacco use. However, inconsistent evidence surrounds their effectiveness in reducing cannabis and other social drugs use, as well as risk- and protective-factors related to substance use (Jones et al. 2006). Further, Thomas and Perera (2006) commented that in the prevention of uptake of smoking (tobacco use), there is little evidence that school-based programmes are effective in the long-term.

With regard to the prevention of bullying, The Olweus Bullying Prevention Program pioneered the whole-school approach in Bergen, Norway. It was highly successful and consisted of training for school personnel, materials for parents, a videotaped classroom curriculum, and ongoing evaluation through a tailored questionnaire (Vreeman & Carroll, 2007). Vreeman and Carroll (2007) concluded that many school based interventions directly reduce bullying, with better results for interventions that involve multi-disciplines. They also commented that multi-disciplinary interventions may combine school-wide rules and sanctions, teacher training, classroom curriculum, conflict resolution training and individual counselling. In the same vein, Whitted and Dupper (2005) suggested that most successful school-based prevention programmes do more than reach out to the individual child; they also seek to change the culture and climate of the school. However, in the most up to date review, Merrell et al. (2008) concluded that school bullying interventions produce modest positive

outcomes, but are more likely to influence knowledge, attitudes and self-perceptions rather than actual bullying behaviours.

When the latest primary research is considered, there is no aberration in the pattern noted in the large scale reviews; school-based interventions dominate single-setting research. More specifically, from a total of 31 tobacco use prevention intervention studies, 22 were school-based. Similarly, 87% of bullying prevention studies examined school-based interventions and every intervention in this domain had a school-based component. For alcohol use prevention there was also a consistent school-based element (included in 69% of studies). In contrast, only five of 13 social drug use studies covered *only* school-based interventions (others cover community or ‘out-of-school’ settings).

### ***School based interventions: An update from the latest literature***

Within the update of the primary studies across all four research domains, school-based interventions were found to be both effective (e.g., Sun, Miyano, Rohrbach, Dent, Sussman, 2007; Sussman, Miyano, Rohrbach, Dent & Sun, 2007; Wiborg & Hanewinkel, 2002) and ineffective (e.g., Andreou, Didaskalou & Vlachou, 2007; Jenson & Dieterich, 2007; Metz, Fuemmeler & Brown, 2006; Meyer, Roberto, Boster & Roberto, 2004; Schulze, Mons, Edler & Potschke-Langer, 2006; Share, Quinn & Ryan, 2004; Van Dyke & Riesenborg, 2002). By way of illustration, Meyer et al. (2004) implemented a universal bullying prevention intervention (the ‘Get Real About Violence’ curriculum) and found that the greatest effects were upon verbal aggression, including behaviour, behavioural intent and attitudes, intent to watch a fight, intent to spread rumours about a fight, and beliefs and opinions about fighting and violence in general. However, there were limited effects on reducing verbal aggression and other behavioural outcomes, including fighting, making fun of someone and spreading rumours.

### **Based on existing evidence, we believe that schools-based interventions:**

- ***Are the most frequently studied single-setting environment and are widely developed and evaluated.***

- *Offer the most systematic and efficient way of reaching a substantial number of young people every year.*
- *Have immediate impact but their longer term effects are questionable and appear to decrease over time.*

### ***Community-based interventions: Review evidence***

Sowden and Stead (2003) recognise that decisions to use tobacco are made within a broad social context and that this led to the development and implementation of community-wide prevention programmes. Foxcroft et al. (2002), who reviewed the prevention of alcohol use in young people, suggested that policy makers must consider community interventions because the potential benefit stretch to the general population. To be successful, community interventions may potentially encapsulate a combination of interventions from other settings (i.e., schools, access restrictions, media campaigns and family). In the smoking prevention domain all but two (of 17) studies reviewed by Sowden and Stead (2003) incorporated a school-based element within the community intervention. The use of some form of media was common to 11 (of 17) interventions, although the intensity, duration and media content differed widely between studies.

Sowden and Stead (2003), compared 13 community ‘interventions’ with no intervention controls, of which only two (that were part of cardiovascular disease prevention programmes) reported a lower prevalence of smoking. Only one of three studies comparing community interventions to school-based programmes alone found differences in reported smoking prevalence (Sowden & Stead, 2003). One study reported a reduced rate of the increase in smoking prevalence in a community receiving a multi-component intervention compared to a community exposed to a mass media campaign alone. A final study reported a significant difference in smoking prevalence between a group receiving a media, school and homework intervention compared to a group receiving the media component only (Sowden & Stead, 2003). More specifically, smoking rates increased over time in both groups, but there was a reduced rate of increase of ‘last month’ smoking rates in the multi-component community intervention compared to the media only group (15% vs 22% [p<0.05])

(Sowden & Stead, 2003). However, the authors caution that the evidence in support of the effectiveness of community interventions in helping prevent the uptake of smoking in young people should not be aggregated, because no two community initiatives can ever be the same.

In their review, Foxcroft et al. (2002) concluded that if community interventions can impact on important youth alcohol misuse outcomes at the same time as impacting on other groups within the community a single community intervention may be more cost-effective than a multi-component approach targeting different groups. However, this review only covered evaluative studies up to 2001 and there is insufficient and inconsistent evidence to determine whether community-based interventions have effects on risk and protective factors related to substance use in minority populations (Jones et al. 2006).

### ***Community-based interventions: An update from the latest literature***

Unfortunately, within the alcohol prevention domain, there were only three primary studies (Komro, Perry, Veblen-Mortenson, Farbakhsh, Kugler, Alfano et al. 2006; Komro, Perry, Veblen-Mortenson, Farbakhsh, Toomey, Stigler et al. 2008; Schinke, Schwinn & Ozanian, 2005) that examined a community intervention; all proved ineffective. Similarly, within the bullying prevention primary studies, only two interventions had a (minimal) community element (Bayer, Lozano & Rivara, 2007; Swaim & Kelly, 2008), and in this case one was effective and one was not effective. Within the 31 tobacco use prevention primary studies, only four interventions included a community-based element, and only one of these studies was solely community-based (D’Onforio, Moscovitz & Braverman, 2002). Moreover, results showed that the intervention was not effective in preventing tobacco use in youth (10-14 years).

Within the social drug use prevention domain, only one study examined a prevention programme delivered at the community level (Saxe, Kadushin, Tighe, Beveridge, Livert, Brodksy et al. 2006) and the programme was reported to be ineffective. On balance, the lack of ‘pure’ community based interventions within the latest research literature may indicate that researchers have recognised that these interventions alone are not

worthwhile as effectiveness has not been consistently demonstrated. Presently, recommendations on how community programmes should be delivered overshadows efficacy descriptions (WHO, 2002).

**Based on existing evidence, we believe that:**

- *Alone, community based prevention interventions appear to be ineffective.*
- *Adding a community based element to an intervention based in other settings (e.g., school, family) may enhance the effectiveness of the intervention.*
- *Transferring effective community-based intervention elements is extremely difficult due to the fact that no two communities will ever be the same.*

***Family-based interventions: Review evidence***

The possible effectiveness of parental involvement in prevention programmes was highlighted by McGrath et al. (2006). It has been suggested that parental interest in particular, in the form of parental indifference, lack of supervision, and lack of knowledge about their children’s friends, can increase the risk of a child using tobacco (Thomas & Perera, 2006). Thomas, Baker and Lorenzetti (2007) added that parental behaviour also emerged as a significant determinant of adolescent tobacco use in a number of their included studies. They found that: (i) four of nine studies that compared a family intervention with a control had a significant positive effect, (ii) one showed a significant negative effect, (iii) one of five studies that compared a family with a school intervention had a significant positive effect, and (iv) all seven studies comparing the incremental effects of a family tobacco-focused intervention against a family non-tobacco-focused safety intervention showed positive effects.

McGrath et al. (2006) presented evidence that suggested that behavioural training, family skills training and family therapy were the most effective family-strengthening interventions. However, more research is needed to determine whether (i) these are more effective than other types of approaches and (ii) if specific types of family interventions are more effective (McGrath et al. 2006). Similarly, there is inconsistent

evidence about the effectiveness of family-based interventions in changing the substance use behaviours of populations of mixed ethnicities (Jones et al. 2006). Further, Canning et al. (2004) advised of no strong evidence for the effects of parental involvement in the prevention of drug use, while also highlighting an issue of low parental participation rates.

Thomas, Baker and Lorenzetti (2007) suggested a number of reasons for the modest effectiveness of family-based interventions (with specific reference to tobacco use, but the principles can be transferred to the other behaviours in question). These included: (i) follow-ups were too short, (ii) comparing a family intervention to a no-intervention control may produce more positive significant findings than comparing one or more active interventions with another, and (iii) that creating interventions with numerous elements/foci (e.g., gun safety, general health) may cause ‘noise’ that masks the key preventive message for the specific problem behaviour that the intervention was initially designed to prevent.

None of the authors who had examined the prevention of bullying behaviours specifically identified and evaluated family-based interventions since all prevention interventions were school-based. However, involving the family in both the design and implementation of bullying prevention interventions was a common recommendation.

### ***Family-based: An update from the latest literature***

Like school-based interventions, the evidence for the effectiveness of family-based interventions within the primary research studies was mixed. For example, Brody, Murry, Kogan, Gerrard, Gibbons, Molgaard et al. (2006) found that an interactive family-based alcohol prevention intervention focusing upon the teaching of child, parent and family skills through techniques such as (i) limit setting, (ii) monitoring, (iii) racial socialisation, (iv) communication, (vi) discussing clear expectations about alcohol use and inductive discipline, to be effective in reducing the number of adolescents who initiated alcohol use. The family-based intervention also slowed the rate of increase in the use of alcohol in those who were already users (when compared to a no treatment control).

Similarly, the worth of a family-based intervention component was demonstrated by Schinke, Schwinn, diNoia & Cole (2004) and Schinke, Schwinn and Cole (2006) because when compared to a control group, a combined CD-ROM-based and family-based alcohol use prevention intervention and a CD-ROM-based intervention alone were effective in reducing 30-day alcohol (tobacco and marijuana) use. However, the intervention with the additional family-based component was more effective than the CD-ROM intervention alone. It should be noted that the CD-ROM only and CD-ROM + family programmes were both interactive and included booster sessions. Therefore, in this instance it is possible that the intensity of the intervention, rather than the setting, contributed the greatest impact. In sum, the mediating effect of intervention intensity requires further investigation.

In contrast, Komro et al. (2006) isolated the family/'home'-based element of the multi-component (additional school and community elements) Project Northland (previously found to effective in Minnesota; Perry et al. 2002) and applied that aspect of the programme to an intervention in Chicago. In doing so, they found that although the intervention resulted in lower levels of factors associated with alcohol use (i.e., normative and outcomes expectations), no differences were found in many other protective factors (e.g., parent/child communication and family alcohol discussions) or alcohol use behaviours. This suggests that the family-based component - 'Slick Tracy Home Team Program' - which covered topics such as advertising, facts and myths about alcohol use, role models, peer pressure and the consequences of using alcohol through activities including discussions and creating posters, is not a significant contributor to the overall success of Project Northland.

**Based on existing evidence, we believe that:**

- ***It is not possible to draw firm conclusions from the current evidence base about the efficacy of family interventions to prevent undesirable behaviours. Further, it is unclear whether or not a family-based intervention is sufficiently intense to produce a long-term behavioural effect.***

***CD-ROM/computer-based***

The use of multimedia, such as CD-ROMs, for knowledge transfer and education has grown in recent years. Universities and schools have seen an expansion in the availability of computer facilities, coupled with advancement in Internet related technologies. Such developments have provided new opportunities to deliver educational materials using digital media. However, to date limited data exists regarding the efficacy of CD-ROM interventions in preventing undesirable behaviours. However, early findings are promising. One could speculate that this could be due to the fact that multimedia approaches are typically interactive, emphasise co-operative learning and can be accessed by many, even in remote locations, with ease.

Williams, Griffin, Macaulay, West & Gronewold (2005) examined the efficacy of an interactive, ‘out-of-school’ drug abuse prevention intervention using CD-ROM delivery among adolescents (12-13 yrs old). They found that the intervention, which consisted of life skill straining (LST) with a focus upon general personal and social competence skills, social resistance skills and normative education, resulted in significant positive effects upon (i) pro-drug attitudes, (ii) normative expectations for peer and adult substance use, (iii) anxiety reduction skills, and (iv) relaxation skills knowledge. However, the authors did not examine the lack of effect on actual drug use behaviours and further research is warranted on the effectiveness of behaviour change.

**Based on existing evidence, we believe that:**

- ***CD-ROM-based interventions show promise, but data is limited and further research is warranted given the interactive nature of multimedia approaches.***

**MASS MEDIA: REVIEW EVIDENCE**

This section briefly examines the impact of mass media on the prevention of tobacco use owing to the focus of the review literature. Sowden and Arblaster (2008) defined mass media as ‘channels of communication (such as television, radio, newspapers, bill boards, posters, leaflets and booklets) intended to reach large numbers of people that are not dependent on person to person contact’ (pg. 1). This potential to reach and

modify the knowledge, attitudes and behaviour of a large number of people has led to the use of the mass media to deliver preventive health messages (Sowden & Arblaster, 2008). It has been suggested that the mass media is particularly appropriate for delivering anti-smoking messages to young people because they are exposed to, and are often greatly interested in, the media (Sowden & Arblaster, 2008). Richardson et al. (2008) agreed that data indicates that mass media interventions can influence children and young people's use of tobacco, as well as their knowledge, attitudes and beliefs about the consequences of using tobacco. However, they also highlighted that not all evidence was consistent.

Sowden and Arblaster (2008) found that only six from 63 studies identified by their search met all of their inclusion criteria (and were an RCT design). Of these, two studies concluded that the mass media was effective in influencing the tobacco use of young people (i.e., resulted in reduction of tobacco use), one found that a mass media campaign was effective compared to no intervention, and the second found a mass media campaign combined with a school-based programme to be more effective than a school-based programme alone. According to Sowden and Arblaster (2008), the effective campaigns had a solid theoretical basis, used formative research to design the campaign messages, and the message was broadcast reasonably intensively over extensive periods. However, the authors highlighted that the studies also had methodological weaknesses, including the number of participants lost to follow-up in the intervention groups being smokers at baseline than in the control group (18% vs. 13%).

The timing and type of broadcast can influence campaign effectiveness. For example, older youths often prefer radio to television (Sowden & Arblaster, 2008). Richardson et al. (2008) noted an array of factors that influence tobacco campaign effectiveness including: (i) message content, (ii) target audience, (iii) duration of the mass media campaign, (iv) audience demographics and (vi) the number of anti-tobacco message sources. In regard to the influence of the message source, Richardson et al. (2008) concluded that prevention campaigns produced by tobacco companies are less effective than anti-tobacco campaigns produced by tobacco control bodies. According

to the evidence presented by Richardson et al. (2008), youths perceived campaigns created by the tobacco industry to be less interesting, less convincing and less engaging, as well as being less effective at keeping their friends from initiating or continuing smoking behaviours, when compared to campaigns produced by tobacco control bodies (Farrelly et al. 2002; Henriksen et al. 2006). For example, Farrelly et al. found that several attitudes and beliefs (e.g. smoking ‘does not look cool’) changed by 6.6%-26.4% as a result of the ‘TRUTH’ (anti-smoking) campaign in youths aged 12-17. However, unfortunately, there was no data regarding effects of the campaign on smoking behaviours.

While Sowden and Arblaster (2008) concluded that there is some evidence that the mass media can be effective in preventing the use of tobacco in young people, they also concluded that the evidence for this is not strong. Similarly, Richardson et al. (2008) advised that not all of the evidence is consistent but mass media campaigns appear to benefit younger youth more than their older counterparts. Overall, it is not clear whether mass media interventions delay, rather than prevent, the use of tobacco by children and young people as no studies in the literature examined this question (Richardson et al. 2008).

**Based on existing evidence, we believe that:**

- *It is not possible to draw firm conclusions about the efficacy of mass media intervention to prevent undesirable behaviours. Although evidence of efficacy exists, the findings are inconsistent and the long-term behavioural effects appear unknown*

**ACCESS RESTRICTIONS: REVIEW EVIDENCE**

Access restrictions are founded upon the basic assumption that if people are unable to access drugs, tobacco or alcohol it may decrease the number of people who develop related problem behaviours (Stead & Lancaster, 2005). However, although perceiving difficulties in obtaining these products may act as a deterrent to their use in young people, poor compliance with access laws is well documented (Forster, 1998). It is also important to note that decreasing access to commercial sources of these products,

through methods such as the legislation regarding their sales could lead to an increased use of other sources, such as friends, parents, siblings or even theft (Stead & Lancaster, 2005).

The review of Stead and Lancaster (2005) found that six out of 11 controlled trials with retailers reduced the level of illegal sales (compared to a control group). Measuring changes in the self-reported ease of access to tobacco (and essentially alcohol and social drugs) is important to demonstrate that an intervention has had an impact on an individual's purchasing behaviour. If young people and adolescents do not perceive that buying these products has become more difficult, then it is unlikely that they have changed their use of these products (Stead & Lancaster, 2005). Stead and Lancaster (2005) emphasised that individual perception of availability might be as important as actual availability and that experimental smokers might be more affected by perceived difficulty of access.

Stead and Lancaster (2005) noted that no access restriction strategy within their included studies had achieved complete, sustained compliance, and concluded that there is limited evidence of a positive effect of access restriction interventions on youth's perceptions of ease of access to tobacco, and on smoking behaviour. Legislation alone is insufficient; both enforcement and community policies improve compliance by retailers, but impact on underage smoking prevalence using these alone may be small if level of compliance attained does not sufficiently restrict access (Stead & Lancaster, 2005). A graduated system of penalties from warnings to fines, and ultimately loss of licences, may be most appropriate where legal systems allow it (Stead & Lancaster, 2005).

According to Richardson et al. (2008), there is evidence that access restriction interventions effectively change the number of sales to young people, reduce young people's access cigarettes and merchant compliance, and that comprehensive interventions are more effective than individual restrictions alone. Furthermore, active reinforcement and requiring age/ID can decrease sales of tobacco. However, nearly all studies examining access restrictions looked at the effect of the interventions on illegal

sales rather than behaviour (i.e., rates of smoking uptake). Therefore, there is a lack of information regarding mechanisms of change that are core to intervention impact.

**Based on existing evidence, we believe that:**

- *A focus on legislation alone is insufficient to bring about behaviour change as these restrictions can be circumvented.*
- *Conclusions are based upon the reduction in the number of sales rather than a decrease in undesirable behaviour itself.*
- *There is a lack of understanding regarding the mechanisms of change.*

**SUMMARY OF FINDINGS REGARDING SINGLE SETTING**

According to Gates et al. (2006), there is a lack of evidence showing that non-school-based interventions are effective in preventing or reducing social drug use by young people. Jones et al. (2006) agreed that there is limited evidence to support the individual effectiveness of both family- and community-based interventions in preventing substance misuse in youth from minority populations; possibly due to intervention overlap. For example, it is hard to distinguish where a family-based intervention ends and a community-based or school-based intervention begins. Furthermore, Thomas, Baker and Lorenzetti (2007) agreed that crossover exists within family-, school- and community-based interventions. In the absence of school-based tobacco prevention measures, Richardson et al. (2008) stated that exposure to anti-tobacco mass media messages was not successful in reducing tobacco use among adolescents. In addition, despite Faggiano et al. (2008) acknowledging that, for young people, peers, family and social context are strongly implicated in early drug use (and therefore potentially so with other problem behaviours), they concluded that schools offer the most systematic and efficient way of reaching young people.

**SINGLE VS. MULTI-COMPONENT PROGRAMMES**

***General children, adolescents and young people: Review evidence***

Multi-component programmes are interventions applied at a number of levels. These levels may be across a number of settings (i.e., school, community and family) or within a setting (such as individuals, classes or a whole school). For example, McGrath

et al. (2006) commented that multi-component programmes may combine school curricular interventions with school-wide environmental changes, parent training programmes, mass media campaigns, and/or community-wide interventions. Unfortunately, the review evidence indicated that few studies have assessed the effectiveness of individual elements of multi-component programmes.

According to Gates et al. (2006), studies of multi-component community interventions have not found any strong effects on social drug use outcomes. This conclusion was based on the findings of five cluster-randomised studies: four (Schinke, Tepavac & Cole, 2000; Perry, et al. 2003; Flay, Graumlich, Segawa, Burns & Holliday, 2004; Biglan, Ary, Smolkowski, Duncan & Black, 2000) compared the addition of a community intervention to a school-based drug education programme alone, while the fifth compared a community intervention with no intervention (Wu, Detels, Zhang, Li & Li, 2003), and reported a large reduction in new drug users in intervention villages compared to control villages. However, Gates et al. (2006) commented that the findings should be interpreted with caution owing to the methodological weaknesses. They themselves executed their own calculations using data extracted from the publication and their results did not support this positive conclusion.

In the alcohol domain, 12 programmes (within 25 studies) combined a school-based intervention with family, community and/or media components and three programmes (Healthy School and Drugs Project, Keepin' it REAL, and Be Under Your Own Influence) were found to produce short term effects (Jones et al. 2007). These effects spanned alcohol use behaviours, such as overall alcohol use, weekly alcohol use, the number of drinks per occasion of drinking, the number of drinks consumed in the past 30 days, the number of drinking days in the past 30 days and lifetime incidence of drunkenness. Jones et al. (2007) concluded that evidence suggests that programmes which begin in early childhood, combining school-based curricular interventions with parent education that target a range of problem behaviours including alcohol use, can have long-term effects on heavy and patterned drinking behaviours.

Similarly, Whitted and Dupper (2005) concluded that the most effective approaches for preventing or minimising bullying in schools involved comprehensive, multi-level strategies targeting bullies, victims, bystanders, families and communities (Atlas & Pepler, 1998). Vreeman and Carroll (2007) also highlighted that whole-school bullying prevention interventions with multiple components directed at different levels of the school organisation were more successful in reducing victimisation and bullying, than interventions that included only classroom-level curricula or social skills programmes. This concurs with the conclusions of Smith, Ananiadou and Cowie (2003) who also commented that most bullying prevention programmes have been multi-level or multifaceted, but added that there is no clear evidence as to which components have been the most important.

Sowden and Stead (2003) concluded that coordinated multi-component programmes can reduce tobacco use among young people, and do so more effectively than single strategies alone. This conclusion was based on the finding that only two out of 12 studies that compared a community intervention alone (vs. 'no intervention' control) were found to be effective. As an example of a successful multi-component intervention, Biglan et al. (2000) developed anti-tobacco activities, family communications, media advocacy and access restriction initiatives. Also in the tobacco use prevention domain, Thomas and Perera (2006) found that three of the four high quality multi-modal interventions that they reviewed showed a positive significant effect. These authors suggested that these effects were attributable to a combination of social influences models with other components, such as community interventions and generic social competence training (Thomas & Perera, 2006). However, they cautioned that since few of these types of interventions have been subject to the same rigorous evaluation as the social influence based interventions, further research is warranted in order to conclude on the effectiveness of multi-modal interventions combining school and community approaches.

***General children, adolescents and young people: Primary evidence update***

Within the primary studies of the tobacco use prevention domain, there were mixed results regarding the contribution and combinations of intervention components. From

the social drug use prevention studies, Spoth, Clair, Shin & Redmond (2006) examined two studies. The first compared two family-based programmes (Iowa Strengthening Families Program [ISFP] and Preparing for Drug Free Years [PDFY]) and a no-intervention control condition. The second compared the family-based Iowa Strengthening Families Program (which has been renamed the Strengthen Families Program 10-14 [SFP 10-14] enhanced with the addition of a school-based life skills training (LST) element (with booster sessions) versus the LST element alone. The first study demonstrated the effectiveness of the ISFP in its own right. ISFP was more effective than the PDFY and control conditions. In the second study, the ISFP, with an additional school-based LST element, was more effective than the school-based LST programme alone – which also highlights the positive contribution of the familial component as an enhancement to a school-based intervention.

Within bullying prevention primary studies, there were several effective multi-component interventions. For example, Swaim and Kelly (2008) provided an example of a successful multi-component intervention when they examined the media, school and community-based anti-violence (bullying) 'Resolve It, Solve It' programme. Their central intervention component was a media campaign in which older peers (local high school students) served as models in print, radio, and television public service announcements. Further, the peers led local school and community activities that reinforced the campaign messages. Compared to a control group, students in the intervention group displayed significant differences in rates of growth for intent for violence, physical assault against people, verbal victimisation, and perceived safety at school (Swaim & Kelly, 2008). However, there were no differences for verbal assault, physical assault against objects, physical victimisation, or self-efficacy for avoiding violence.

Also in the bullying prevention domain, McLaughlin, Laux and Pescara-Kovach (2006) demonstrated the value of multi-component interventions when they compared a basic cognitive-behavioural treatment (8 sessions of 1 hour) with the same treatment plus either additional videos (3 x 30 minutes) or additional videos and a CD-ROM (from 3-8 weeks). They found that the basic intervention and the intervention with additional

videos produced reductions in victimisation, and that the intervention with additional videos and CD-ROM produced significant reductions in bullying (McLaughlin, Laux & Pescara-Kovach, 2006). Interestingly, the magnitude of the effects seen in the intervention with the most components (additional videos and CD-ROM) were the largest with decreases in bullying and victimisation resulted in medium effect sizes of 0.47 and 0.48, respectively. The additional videos intervention also produced a statistically significant decrease in victimisation in the order of a medium effect size of 0.43 but not bullying. In contrast, the basic intervention produced only small effect sizes with regards to both bullying and victimisation of 0.19 and 0.18 respectively.

Within the studies of primary prevention of social drug use, Eischens, Komro, Perry, Bosma & Farbakhsh (2004) investigated the Minnesota Drug Abuse Resistance Education Plus (DARE+) project, which is the original DARE school-based curriculum with additional community, parent involvement, and extracurricular activity components. Eischens et al. (2004) focused specifically on the potential association between participation in the extracurricular activities component of the DARE + project with adolescent substance use, which was planned by peer leaders. Two years after taking part in the 'drug' prevention intervention, students (particularly boys) participating in the extracurricular activities reported significantly less alcohol use and fewer intentions to use alcohol than students that did not (Eischens et al. 2004).

Within the tobacco use prevention domain, a number of authors supported the use of multi-component interventions (e.g. Josendal, Aaro, Torsheim & Rasbash, 2005). For example, Ariza, Nebot, Tomas, Gimenez, Valmayor, Tarilonte, et al. (2008) contributed to the support for multi-component interventions when they reported the results of the European Smoking Prevention Framework Approach (ESFA) in Spanish adolescents. The intervention was universal, interactive, and included booster sessions. It was multi-component in two ways. Firstly, it had components within more than one setting. More specifically, it consisted of community-based activities involving youth clubs and tobacco sales, providing brochures for parents and a school-based programme (including the reinforcement of a smoke-free school policy and smoking cessation for teachers). Secondly, it had multiple methods and aims, including role-

plays, creating posters, reading comics, a smoke-free class competition, teacher workshops, a teachers guide, cessation programme for teachers, a letter about activities to parents, an invitation to parents to participate, disseminating flyers, contacting sports organisations and coaches, access point analysis and control of tobacco access (Ariza et al. 2008). At one year follow-up, the proportion of new smokers in the intervention group was lower than the control group for both boys (4.5% vs. 6.7%, respectively) and girls (5.6% vs. 11.7%) ( $p < 0.001$ ). In addition, at three year follow-up, the proportion of regular smokers in the intervention group was less than the control group for both boys (18.6% vs. 21.6%, respectively) and girls (31.2% vs. 38.3%) ( $p < 0.001$ ) (Ariza et al. 2008). These findings support the effectiveness of multi-modal smoking prevention programmes that include components and strategies for adults who influence to adolescents (i.e., both teachers and parents). Unfortunately, despite listing smoking attitudes, social pressures, self-efficacy to resist pressure, subjective and intentions to smoke in the future as variables measured, no data regarding these variables was presented in the publication.

Similarly, Meshack, Hu, McAlister, Gottlieb & Huang (2004) examined the influence of the intensity of anti-smoking media campaigns and differing types of anti-smoking community and school-based programmes in an interventions efficacy. They compared eight intervention conditions, comprising: (i) a no intervention control, (ii) a low-intensity media intervention, (iii) high-intensity media intervention, (iv) an enhanced school intervention alone, (v) an enhanced school with low intensity media intervention, (vi) an enhanced school with high intensity media intervention, (vii) a comprehensive, school and community, with low intensity media intervention and (viii) a comprehensive, school and community, with high intensity media intervention. Both the school-based and the comprehensive school and community interventions were more effective than the no intervention control in decreasing tobacco use and intentions to use (Meshack et al. 2004). The most consistent changes, at least short-term, in reducing adolescent tobacco use, susceptibility to smoking and pro-smoking attitudes were achieved by combining the intensive media campaign with the comprehensive community programme condition (Meshack et al. 2004).

**Based on existing evidence, we believe that multi-modal interventions aimed at the general school age population:**

- *Are generally effective when they involve comprehensive, multi-level strategies comprising school, family and community approaches.*
- *Are often more successful than single strategies alone when social influence model approaches are combined with other components (e.g., familial) such as familial interventions.*
- *Have immediate impact but their longer term effects are questionable and further research is warranted. Indeed, a greater volume of studies involving the same rigorous evaluations as some of the single-setting social influence interventions are required.*
- *Should be tailored to the target population. Authors of drug specific multi-modal interventions caution against the generalisation of findings to the prevention of other drugs and substances.*

#### ***Specific populations: Review evidence***

One systematic review suggests that multi-component community-based approaches are most effective for high-risk youth at preventing, delaying, or reducing drug use than school and community projects alone. Compared with low-risk youth, this population may respond more favourably to comprehensive interventions targeting alcohol, cannabis, tobacco and generic substance use (Jones et al. 2006). Further, there is evidence to suggest that a multi-component intervention approach can positively impact children with aggressive and behavioural problems, and produce long-term improvements in social skills, academic achievement and parental discipline, compared to no intervention (Jones et al. 2006). In contrast, there is insufficient evidence to determine whether multi-component programmes are effective in reducing or preventing substance use in students identified as at risk of school dropout, truants or students in alternative education provision or young offenders (Jones et al. 2006).

# Appendix B: A review of the evidence regarding intervention components

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This section will provide a detailed analysis of the components of prevention programmes found to be effective in tackling the unhealthy/undesirable behaviours examined in this review. We have attempted to adopt the nomenclature which represents the way prevention strategies are analysed, compared and discussed in the research literature and in evaluation exercises.

## **CURRICULUM APPROACHES**

The most comprehensible way to appreciate curricular education is if a curriculum is viewed as a way of delivering an intervention. Curricular education is able to adopt a number of theoretical approaches and encompass some, or many, of the other types of intervention content (methods) outlined within this section. The term curricular approach was most often employed within the bullying prevention literature.

Curriculum interventions were generally designed to promote an anti-bullying attitude within the classroom to help children develop pro-social conflict resolution skills; most of these interventions draw on the social cognitive principles of behavioural change, with a focus on changing students' attitudes, altering group norms, and increasing self-efficacy (Vreeman & Carroll, 2007). By definition, it is understandable that interventions may be fundamentally curricular in nature, but may be referenced according to their specific components (e.g. a social influences approach or the specific skills training involved). Vreeman and Carroll (2007) concluded that both direct (behaviour) and indirect (e.g., attitude) outcomes related to bullying are not consistently improved by curricular interventions; they based this conclusion on the findings that only four out of 10 studies evaluating curriculum approaches showed

decreased bullying, and of the four effective interventions three showed no improvement in some populations (Vreeman & Carroll, 2007).

### **KNOWLEDGE-FOCUSED APPROACHES (i.e., INFORMATION GIVING/DISSEMINATION)**

**CORE IDEA:** *The assumption of this approach is that an individual will change their behaviour when they are informed about the nature and extent of harm associated with a given behaviour. For example, information is provided on the biological and psychological impact of drug use.*

Knowledge provision appears to be the most popular content of prevention interventions. However, Roe and Becker (2005) theorised that ‘altering young people’s *awareness* of the dangers of drugs can be achieved by providing appropriate information, but that different *behaviour* does not inevitably follow’ (pg. 94). McGrath et al. (2006) supported this idea, by stating that information dissemination approaches may have a positive impact on the knowledge and attitudes of young people related to drugs, but not actual drug use. In the same research domain, Canning et al. (2004) also concluded that information-based programmes have had little effect on substance misuse behaviour. As Canning et al. (2004) is a tertiary level review, specific details regarding the type of information or knowledge being promoted was not provided (e.g., whether it was regarding the psychological or biological effects). However, in general, information based interventions have included topics such as physical consequences and harm-minimisation, social consequences, raising awareness of drugs and altering social norms.

Faggiano et al. (2005) presented similar findings regarding the effectiveness of information-based interventions. They stated that knowledge-focused programmes improve mediating variables (particularly drug knowledge) when compared with usual curricula but when final outcomes (i.e., drug use/behaviour) are considered, this approach is not more effective than usual curricula, affective-focused, or skills-based programmes (Faggiano et al. 2005). Faggiano and colleagues attempted to detail the content of knowledge focused prevention in their review. However, difficulties arose in

presenting this information because only one of four studies that had examined knowledge-based interventions had given details of the specific type of information provided during the intervention. For example, they detailed the work of Sigelman and colleagues (2003) who implemented four different knowledge-based interventions: (i) ‘control’ – which included information regarding flu and chicken-pox transmission, prevention and treatment, (ii) ‘basic’ – which gave information on how drugs produce their effects (it was not stated whether these were physiological and/or psychological effects), (iii) ‘biologically enhanced’ – which was a the ‘basic’ information plus information regarding the effects of drugs on the nervous and circulatory systems, and (iv) ‘tobacco myths’ – which was the ‘basic’ information with additional information regarding the short and long term effects of tobacco use and differences between the effects of tobacco, alcohol and cocaine.

Thomas and Perera (2006) found that high quality information-giving programmes alone were effective, yet when compared to other models of delivery they were either less effective or no different. It was concluded that due to the limited number of rigorous studies, it is difficult to exclude a beneficial effect of (tobacco) information dissemination alone, but that ultimately there is little positive evidence available to support this intervention (Thomas & Perera, 2006). According to social learning theory (Bandura, 1988), learning and thus behaviour change is the product of an interaction of factors involving the person and the environment so change reflects more than cognitive factors alone and prevention programmes should reflect this interaction.

With regard to interventions that restrict access (reviewed by Stead and Lancaster, 2005), each component within the programmes provided information-giving, and included education about legal requirements, notification of the results of compliance checks and warnings of enforcement. Authors concluded that ‘simply giving information to retailers about the law is not effective’ (Stead & Lancaster (2005). Thus, the general consensus of the review evidence with regard to knowledge-based, or information dissemination interventions, was that they are changing knowledge, but not conduct.

The assumption underscoring this approach is that knowledge is key to changing behaviour. The theory goes that if individuals accrue an awareness of the relevant facts associated with the undesirable/unhealthy behaviour then they will make an informed choice, based on this information, not to engage in the behaviour. It is clear that knowledge provision is necessary (and as a mediating variable it is often used as an indicator in outcome evaluation) but it does not appear to be the most important part of an effective prevention programme. Further, fear arousal models, which typically underscore knowledge approaches, are acknowledged as being generally ineffective because the message has moral overtones and is not congruent with young people’s subjective experiences – engaging in the undesirable/unhealthy behaviour does not always lead to immediate and severe health problems (Roe and Becker, 2005).

**Based on existing evidence, we believe that:**

- *Information giving alone is not an effective prevention component. This is a strong and consistent conclusion across all four research domains. Although knowledge development is necessary, it needs to be balanced with skill development if the intervention is to be effective in changing behaviour. Indeed, knowledge-focused approaches can be counterproductive if developed in isolation as they can develop an individual’s sense of curiosity (which could lead to a behaviour change).*

**AFFECTIVE-FOCUSED APPROACHES**

**CORE IDEA:** *Affective education interventions focus on developing individual feelings of value and self-worth. Ultimately the aim is to increase self-esteem. Therefore, understanding failure and appreciating personal strengths through self-awareness is encouraged.*

According to Faggiano et al. (2005) affective-focused programmes improve decision making skills and drug knowledge compared to knowledge-focused interventions. However, McGrath et al. (2006) found that affective-focused programmes had no convincing effect on drug-use behaviour. Faggiano et al. commented that their

ineffectiveness may be because information dissemination and affective-focused education are based on intuition rather than theory, whereby these types of interventions are designed and implemented based on what the researchers assume or believe to be appropriate, rather than what theory would logically suggest or has previously proven to be appropriate (Botvin, 2000).

Within their review of mass media interventions for the prevention of tobacco use in young people, Sowden and Arblaster (2008) commented that one of only two successful programmes that they identified had included provocative messages intended to cause affective personal reactions. It was hypothesised that this would lead to more related discussion and interpersonal communication, and thus reduce tobacco use (Hafstad, Stray-Pederson & Langmark, 1997). However, feelings of value and self-worth are not targeted and therefore it's not clear within this sits entirely within the affective education approach.

**Based on existing evidence, we believe that:**

- *The value of affective interventions appears low but elements of this approach are encouraged within multi-component interventions.*

**SOCIAL SKILLS TRAINING**

**CORE IDEA:** *Teaching and enhancing the social skills (e.g., assertiveness, decision-making, resistance to peer pressure) of the target population may help reduce unhealthy/undesirable behaviours because the target population are better able to implement refusal strategies. Social skills are probably the most important component of social influence programmes.*

Social skills training interventions are targeted at enhancing any number of social skills, including assertiveness, decision-making, conflict resolution, communication skills and improving peer relationships. In the review of Faggiano et al. (2005), social skills programmes were the most commonly employed approach (used in 25 out of 32 studies) and they were found to effectively increase drug knowledge, decision-making

skills, self-esteem, resistance to peer pressure, and drug use including the use of marijuana (RR 0.8) and hard drugs (heroin) (RR 0.5).

Within the tobacco use prevention primary studies, Byrne and Mazanov (2005) provided further evidence of the value of social skills interventions when they compared three universal, interactive interventions; (i) health-oriented, (ii) fitness-oriented and (iii) social skills/stress management-oriented intervention. The components of the interventions varied according to their approach. The health-oriented intervention paid attention to the toxicity of tobacco products, biological effects of smoking and the various illnesses that smoking can cause through role-plays and handouts. The fitness-oriented intervention also paid attention to the biological effects of smoking, but gave additional attention to how smoking can effect and impair fitness, sports ability, professional athletes and their sporting image. The social skills intervention focussed upon social behaviour, peer pressure, self-esteem, social confidence, perceived maturity, stress management, life and resistance skills, media influences and alternatives to smoking (Byrne & Mazanov, 2005). At post-intervention testing, they found that the health-oriented intervention was significantly better than the fitness- or social skills-oriented interventions in controlling smoking behaviour (Byrne & Mazanov, 2005). However, at the one-year follow-up test, the social skills intervention was more effective in controlling smoking behaviour than the other interventions (Byrne & Mazanov, 2005). The authors concluded that, although a health education approach cannot be dismissed as an element of adolescent smoking prevention, an intervention that builds resistance to the effects of peer pressure through social skills and stress management appears to provide the most enduring means of controlling smoking behaviour in adolescence (Byrne & Mazanov, 2005).

In contrast, Vreeman and Carroll (2007) identified four out of twenty-six studies that had examined targeted bullying prevention interventions involving social and behavioural skills groups for children involved in bullying. They found that three out of four social skills training studies identified no clear reduction in bullying. In the single successful intervention, the most positive outcomes occurred for the youngest

students (3rd grade: DeRossier, 2004). In this instance, the intervention resulted in (i) decreased aggression on peer reports, (ii) decreased bullying on self-reports, and (iii) fewer anti-social affiliations based on self-reports from previously aggressive children. According to Vreeman and Carroll (2007), this was the only social skills training intervention that showed clear reductions in bullying as a result of the intervention. Although these targeted interventions provided social skills training, Vreeman and Carroll (2007) concluded that their failure stemmed from the very narrow focus on one area of the problem. Thus suggesting that single-level interventions offer an inability to combat bullying effectively (Vreeman & Carroll, 2007) – i.e., you cannot just target those already effected by bullying (victims, bullies), you must tackle the problem at all levels (e.g. school-wide policies and practices and familial elements).

Similarly, Whitted and Dupper (2005) commented that social skills training such as conflict resolution and peer mediation strategies have been relatively ineffective with bullies. However, they suggested that the lack of an effect was most likely because bullying behaviour results from a power imbalance rather than deficits in social skills, and that bullies plan and anticipate the reaction of their victim and proceed in a manner that does not result in adult detection; this type of manipulation requires highly developed social skills (Coivin, Tohin, Beard, Hadan & Sprague, 1998). This argument may help to explain why the findings significantly contrast those observed across the other social issues covered in this review.

### **LIFE SKILLS TRAINING (e.g., Botvin LifeSkills Training [LST])**

**CORE IDEA:** *This approach involves a multi-component approach focusing on the development of social skills, personal skills and knowledge. This model aims to enable adolescents to resist social influences and to equip them with a variety of skills for achieving general competence. For example, Botvin’s LifeSkills Training (LST) focuses on developing the confidence, personal and social skills necessary for handling challenging situations.*

The life skills approach emphasises the teaching of generic personal and social skills alone or in combination with elements of the social influence approach (Botvin, 2000). The original LST intervention, devised by Botvin uses cognitive-behavioural skills

training methods, such as behavioural rehearsal and homework assignments (Botvin, 2000). Rather than merely teaching information about the dangers of smoking, alcohol and drug abuse, the LST promotes healthy alternatives to risky behaviour through activities designed to:

- Teach students the necessary skills to resist social (peer) pressures to smoke, drink, and use drugs
- Help students to develop greater self-esteem and self-confidence
- Enable students to effectively cope with anxiety
- Increase their knowledge of the immediate consequences of substance abuse
- Enhance cognitive and behavioural competency to reduce and prevent a variety of health risk behaviours

(<http://www.lifeskillstraining.com>)

Normative education seeks to address any misconceptions that learners might have about the prevalence of drug use and misuse (or any other risk-taking behaviour) because the social influences approach suggests that inaccurate normative expectations can ultimately lead to drug use (or again, other problem behaviours) (McGrath et al. 2006). There are three related assumptions which underpin this approach. First, that many young people over-estimate the extent of risk-taking behaviours amongst their peers. Second, that they wrongly believe that these behaviours are the norm. Third, that because of these misconceptions they are vulnerable to social pressure to conform to this norm. Resistance skills training aims to equip young people with skills to recognise, cope with or avoid situations where there will be peer pressure to use drugs (or once more, display other problem behaviours) (McGrath et al. 2006). These elements can also be applied to the other problem behaviours.

### ***Life skills approaches: Review evidence***

McGrath et al. (2006) suggested that there is good evidence for the effectiveness of the LST interventions in the prevention of social drug use. Roe and Becker (2005) presented similar evidence in their review of the prevention of drug misuse within school settings. Based on the same research Coggans, Cheyne & McKellar (2003) also

concluded that this intervention can have a small but enduring positive impact on drug use, including cannabis, when delivered with high fidelity (according to the programme plan) (McGrath et al. 2006). However, according to Cuijpers (2002) some elements of the LST interventions may be more effective than others. For example, Cuijpers suggested that there was no convincing evidence for the effectiveness of resistance-skills training, such as the 'Just say no campaign' (McGrath et al. 2006).

Canning et al. (2004) reported that the LST intervention of Botvin and colleagues demonstrated continuing success five years after the end of the programme (White & Pitts, 1998). However, a recent external evaluation by Coggans et al. (2003) suggested that neither LST nor other primary prevention interventions are likely to have a major impact on drug use and drug problems. This assertion is based on evidence that a well-implemented LST programme can positively affect knowledge, attitudes and behaviour with respect to smoking and alcohol use, but that there is limited evidence of these effects on cannabis and other illicit drugs use. Yet, LST is one of the few interventions that has been extensively evaluated and for which there is research evidence of a small but positive impact on drug use (Coggans et al. 2003). Reductions in one of more behaviours (smoking, consuming alcohol or using cannabis) have ranged from 3%-8% (Canning et al. 2004).

Despite identifying many methodological limitations of the studies included in their review, Faggiano et al. (2005) concluded that programmes based on life skills (i.e., LST) are the most effective in reducing drug use, and that skills-based programmes appear to be effective in deterring early-stage drug use. These programmes are targeted at the individual-level risk and protective factors known to be associated with adolescent drug use (Faggiano et al. 2005). Owing to their beneficial effects, programmes should include cognitive, decision-making, anxiety-managing and social skills, for the school contexts and for planning complex community interventions against drug use (Faggiano et al. 2005). With regard to the prevention of tobacco use, Thomas and Perera (2006) also reported that LST studies were effective, as they found a 25% reduction in pack-a-day cigarette smoking at 6 years follow-up (end of the 12<sup>th</sup> grade)

as a result of implementing an intervention during the 7<sup>th</sup> to 9<sup>th</sup> grades of school in the US.

In contrast, when reviewing the literature related specifically to black and minority ethnicity populations, Jones et al. (2006) noted that there is evidence to suggest that school-based LST or generic life skills, on their own or in combination with other approaches, are not effective in reducing long-term substance misuse. They also reported on the inconsistent evidence about the effectiveness of life skills approaches at changing attitudes and knowledge relating to substance abuse (Jones et al. 2006). Therefore, further research is required which examines the efficacy and effectiveness of this approach in black and minority ethnic populations.

***Life skill training approaches: An update from the literature***

From the primary studies, both Eisen, Zellman, Massett & Murray (2002) and Eisen, Zellman and Murray (2003) provided support for the efficacy of LST interventions when they found that a teacher-led, interactive, school-based drug prevention intervention within 34 American schools (N=7,426-pre, N=6,239-post, N=5,691-1 yr follow-up, 11-14 years) beneficially impacted an array of post-intervention outcomes. These included: (i) delaying the transitions of drinking to smoking, (ii) drinking to marijuana use, (iii) binge drinking to marijuana and (iv) reducing lifetime marijuana use. They also found that recent (in the last 30 days) marijuana use was lower at one-year follow-up. The intervention consisted of 40 lessons of 35-45 minutes (average number of lessons delivered = 32.74 lessons) teaching life skills that focussed on social competency, refusal skills, cognitive-behavioural skills, building self-esteem, personal responsibility, decision making, resistance to social influences, knowledge, self-confidence, managing emotions, peer relationships and living healthy. It should be noted that self-reported marijuana use at baseline was related to attrition, i.e., baseline marijuana users were more likely to drop out of the intervention. Therefore, there is a need for more sophisticated programmes that meet the needs of non-users and users.

In opposition to those primary studies providing strong evidence for the effectiveness of LST interventions, Williams, Griffin, Macaulay, West & Gronewold (2005) examined the efficacy of an ‘out-of-school’ substance abuse-preventive intervention using CD-ROM technology to deliver the LST program among adolescents in the sixth and seventh grades (12- to 13-years-old). This involved the use of interactive audio and visual content to teach social resistance skills, general personal and social competence skills, and normative education. Results from the study showed that the LST CD-ROM intervention, compared to a control, elicited significant positive intervention effects on drugs knowledge, pro-drug attitudes, normative expectations for peer and adult substance use, anxiety reduction skills, and relaxation skills knowledge as a result of the CD-ROM LST intervention. However, there were no significant effects on actual drug use behaviours (Williams et al. 2005).

**Based on existing evidence, we believe that:**

- *Life skills’ training demonstrates consistent prevention efficacy and is therefore recommended as a best practice approach to the prevention of unhealthy/undesirable behaviours.*

**INTERVENTION MESSAGE**

Under the concept of intervention message, different communications produce different outcomes. For example, in the prevention of tobacco use, Richardson et al. (2008) concluded that health messages are most appropriate for older adolescents whereas cosmetic messages are appropriate for children and younger adolescents. This conclusion was based on the findings of Smith & Stutts (2006) who showed that although both advertisements with a cosmetic focus and advertisements with a health focus were similarly effective in making youths less likely to smoke, health ads were significantly more effective in lowering intentions to start smoking and increasing intentions to quit smoking. Also, health ads were found to have a greater impact on smoking behaviour and intentions to quit smoking in males and cosmetic ads were found to have a greater impact on smoking behaviour and intentions to quit for females (Smith & Stutts, 2006).

However, despite Richardson and colleagues (2008) concluding that health messages are most appropriate for older adolescents and cosmetic messages are appropriate for children and younger adolescents, details and data regarding the different effects of the two types of ad (health vs. cosmetic) in relation to age do not appear in either the text or in the table of included studies. Therefore, it is unclear why these conclusions are derived.

Social drugs have different meanings globally. Therefore, the generalisability of US-based interventions that call for abstinence from alcohol has questionable transferability. Unfortunately, despite the seemingly obvious importance of message content, there has been very little attention paid to this element of preventive interventions at both review and primary study level. We feel that this is an area that has not been given the due attention that it deserves. Intuitively message content seems to be a key intervention component that should serve to facilitate the direction and focus of a programme. Is it possible that the omission of details relating to the content of the intervention messages underscores the reason why a number of past interventions have been unsuccessful? Are these intervention programmes failing to acknowledge and consider key core elements?

### **INTERVENTION FOCUS**

In their review, Foxcroft et al. (2002) identified 56 studies; 32 interventions were aimed at generic substance use (including alcohol), where alcohol baseline and outcome measures were clearly reported and 24 were targeted specifically at alcohol. In total, 36% of the reviewed studies showed evidence of ineffectiveness, leading to the conclusion that the focus of an intervention (e.g., alcohol alone, all substances, general health, or other focuses) has no influence on effectiveness (Foxcroft et al. 2002). Yet, Jones et al. (2006) presented evidence to suggest that in comparison to low-risk youths, high-risk/vulnerable youths may respond more favourably to comprehensive interventions targeting alcohol, cannabis, tobacco, and generic substance use (Streke, 2004). Similarly, McGrath et al. (2006) highlighted the inappropriateness of a 'one size fits all' approach to (drug use) prevention which

further suggests that intervention appropriateness relates to a consideration of the target audience.

In a further refinement, Canning et al. (2004) also suggested that while there are clear advantages in sharing learning across the substances (i.e., adopting a combined focus approach), there may be further benefits from drug specific prevention. This was based on three main ideas;

- The behavioural epidemiology of drug use varies by drug.
- While one intervention may effectively reduce legal drug use, it does not necessarily follow that it will be effective with illicit drugs.
- Few studies focus exclusively on drug awareness, education and prevention in relation to polydrug use (a combination of drugs taken on the same occasion to enhance or counteract the effects of one another).

## **SUMMARY OF FINDINGS**

With regard to the specific content of an intervention, the most common consensus from the evidence we reviewed was that the inclusion of skills training within a prevention intervention was of great value in reducing unhealthy/undesirable behaviours. On balance, the dominant approach is the teaching of resistance skills and norm setting either alone or in combination with general personal and social skills. To date, the LST programme is the most extensively examined approach and evidence of efficacy and effectiveness has been demonstrated. Although the skills tend to be generic in nature, they are taught in relation to the preventive behaviour goal. As discussed in Appendix A, the review evidence suggested that the idea of a multi-component intervention should be applied to the content of the programme itself and therefore skills training approaches meet this need appropriately. Coordinated multi-component programmes appear more effective in reducing unhealthy/undesirable behaviours among young people than single strategies alone. We previously outlined the importance of tailoring the selection of programme components to the target population at which the intervention is aimed. However, although the importance of including the target population in the design process is emphasised (Whitted &

Dupper, 2007), this process appears scarce. The message content of prevention interventions is poorly examined and seemingly content influence is not fully understood. Details regarding message content and message focus are notably absent from the research literature and further research is warranted.

# Appendix C: A review of the evidence regarding intervention delivery

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## INTERACTIVE VS. PASSIVE INTERVENTIONS

**CORE IDEA:** *Passive (didactic) interventions offer minimal participant interaction (e.g., lectures or presentations); interactive interventions are those that encourage participant activity and provide the opportunity to practice skills (e.g., role playing, discussion groups, or problem solving).*

Across the four behaviour domains, the message from the review literature is consistent and clear; interactive educational programmes are more effective than non-interactive interventions (Jones et al. 2006; McGrath et al. 2006; Canning et al. 2004). Cuijpers (2002) posits that interactive methods offer opportunities for participants to (i) communicate, (ii) practice the skills they are being taught and (iii) give and receive feedback. The primary studies used to update the existing literature reviews support the assertion of the superiority of interactive approaches because of the 48 interactive interventions, 65% were effective. However, even though 10 of the 13 newer social drug use prevention programmes were interactive, only half were effective.

Rock, Hammond and Rasmussen (2004) provided an example of an effective interactive intervention when their universal (school-wide) bullying prevention programme resulted in less frequent occurrences of bullying behaviours in school children, ~8-11 years. These interactive activities were delivered by the children's regular classroom teachers and included discussions, making posters, role-playing, 'cooperative games' and forming class rules. However, in this setting the issue of treatment fidelity is relevant as it is difficult to determine the impact of pre-existing relationships with intervention deliverers; many of whom are class teaching staff.

**Based on existing evidence, we believe that:**

- *Interactive prevention programmes are more effective than non-interactive interventions; the evidence that leads us to this conclusion is strong.*

**INTERVENTION DELIVERER**

Faggiano et al. (2005) reported mixed results regarding the most effective person to deliver a prevention programme for social drug use. They highlighted evidence from studies where programmes were significantly more effective, with regard marijuana knowledge and attitudes at post-test, when delivered by peers. For example, in two studies conducted by Botvin and colleagues (1984; 1990) marijuana attitudes at one-year follow-up were lower in a teacher-led group and marijuana use indexes were significantly lower in peer-led group versus teacher-led group both at post-test and at one year follow-up (Faggiano et al. 2005). In another study, when compared with external educators, a positive effect of peers was evident for drug knowledge (WMD - 3.42; 95% CI -6.81 to -0.03) (Botvin, 1994), but not significant for the other outcomes at two-year follow-up, including (i) marijuana and drugs attitudes, (ii) marijuana intentions and use, (iii) adult and peer cocaine use, (iv) adult and peer drug use and (v) decision making skills, self-esteem and self-efficacy (Faggiano et al. 2005).

Also within the research domain of social drug use, Parkin and McKeganey (2000) suggested that in peer-led interventions the child or young person delivering the programme tends to benefit the most from the experience and Canning et al. (2004) concluded that the effectiveness of peer-led drug education could not be firmly established owing to methodological problems such as choice of outcome measures, lack of appropriate controls, issues of self-selection, low participation and excessive attrition. In addition, the diverse nature of the methodologies alone makes it difficult to identify the components that contribute to their success (Canning et al. 2004). However, McGrath et al's (2006) briefing update provided some evidence in favour of the effectiveness of peer- education in school-based drug prevention programmes although they cautioned that peer educators can only help increase a programme's effectiveness, not produce positive effects per se. They suggested that it be useful to examine (i) the attributes or skills that constitute an effective programme provider, (ii)

how training can improve those skills and, (iii) the effect of different deliverers on the effectiveness of different programme components (e.g., booster sessions).

Thomas, Baker and Lorenzetti (2007) also commented that the effectiveness of a programme is influenced by the quality of staff training and how well they deliver the programme (treatment fidelity, see page 79). Similarly, in the prevention of social drug use, McGrath et al. (2006) identified that Skara and Sussman (2003) had shown that the variability of training intensity for providers (deliverers) affected programme outcomes with those interventions delivered by intensively trained staff reducing individuals' intentions to drink, compared to groups taught by less intensively trained staff and versus those given curriculum guidelines only. In addition, Vreeman and Carroll (2007) also commented that school staff commitment to implementing a bullying prevention intervention may play a crucial role in its success.

Further, according to Richardson et al. (2008), the way in which an intervention is delivered does influence effectiveness. However, this support is based on the limited information regarding the influence of the status of the person delivering an intervention, that effectiveness is still dependent upon the aforementioned factors (e.g., message content, etc) and that findings are inconsistent (Richardson et al. 2008). Despite these concerns, most review authors concluded that training received by the person delivering the intervention is important and therefore programme designers are encouraged to address this factor in all interventions. A point to note though is that in the counselling literature, roughly 15% of the outcome variance is attributed to 'approach' in comparison to 30% attributable to pre-existing factors, such as rapport (Sexton et al. 1997) and this raises another potential confounding factor.

### ***Intervention deliverer: An update from the literature***

Unfortunately, the potential relationship between deliverer training and intervention efficacy is rarely explored in primary studies. In fact, many primary studies within all four domains failed to identify who delivered the intervention or detail their training. Where details were provided, the training most commonly lasted less than one week (e.g. Brody, Murry, Kogan, Gerrard, Gibbons, Molgaard, et al. 2006; Campbell, Starkey,

Holliday, Audrey, Bloor, Parry-Langdon et al. 2008; Eisen et al. 2002; Hanewinkel & Asshauer, 2004; Pbert et al. 2008). As an illustration, Campbell et al. (2008) detailed their training of peer supporters (to enable the peer supporters to engage in informal conversations with their peers about the effects of using tobacco and the benefits of abstaining). This training provided the peer supporters with (i) information about the short-term health, financial and environmental risks of smoking and (ii) developing their skills in conflict resolution, communication and listening. Training the peer supporters involved ‘participatory learning activities’ (i.e., of an interactive nature), including role-plays, student-led research, small group work, discussions and games.

Despite the positive findings of the reviews in relation to employing peers to deliver interventions (e.g., Canning et al. 2004; McGrath et al. 2006), interventions were most commonly delivered by teachers or members of the research staff in the studies that comprised the latest literature update. As highlighted above, in the prevention of tobacco use with young people in school settings, there are no high quality studies comparing peer- with teacher-led programmes (Thomas and Perera, 2006) and this issue has still not been addressed in more recent studies. More specifically, only two of 31 tobacco use prevention interventions made use of peers and only one of 19 tobacco prevention studies found to be effective commented on the impact of the person delivering the intervention. In this study, Pbert et al. (2008) concluded that the addition of telephone calls from peer counsellors had reinforced an intervention delivered by a paediatrician.

Campbell et al. (2008) compared a peer-led universal, interactive, school-based intervention (A Stop Smoking In Schools Trial – ASSIST) with a usual education control in Welsh and English schoolchildren (N=59 schools, N=10,730 - baseline, N=9,349 – post, N=9147 – 1 year follow-up, N=8756 – 2 year follow-up, 12-13 years). The intervention involved ‘influential’ students (as nominated by their peers) being trained as peer supporters, whose role was to encourage their peers not to smoke outside the classroom through informal conversations about smoking during travel to and from school, in breaks, at lunchtime, and after school in their free time (Campbell, Starkey, Holliday, Audrey, Bloor, Parry-Langdon, et al. 2008). The results showed that the odds

ratio (with 95% confidence intervals) of being a smoker was reduced in the intervention schools (compared with control schools); 0.75 (0.55–1.01) immediately after the intervention; 0.77 (0.59–0.99) at one-year follow-up; and 0.85 (0.72–1.01) at two-year follow-up (Campbell et al. 2008). According to the students level of risk (high-risk being those who were occasional, experimental, or ex-smokers at baseline), the odds ratios for the high-risk group at post-intervention, one- and two-year follow-up were also reduced; 0.79 (0.55–1.13 [n=3561]); 0.75 (0.56–0.99 [n=3483]), and 0.85 (0.70–1.02 [n=3294]), respectively (Campbell et al. 2008). Campbell et al. (2008) concluded that implementing ASSIST on a population basis could lead to a reduction in adolescent smoking prevalence with profound public-health importance.

Within the tobacco prevention primary studies, Valente, Unger, Ritt-Olson, Cen & Johnson (2006) compared the effects of three leader and group selection methods (i). ‘random group’- leaders nominated by students with groups created randomly, ii). ‘network group’- same method as 1, but groups created by assigning students to the leaders they nominated, and iii). ‘teacher group’- leaders and groups created by teachers). The context was of two tobacco prevention interventions: a social influences intervention (CHIPS) and a social influences intervention with a multi-cultural emphasis (FLAVOR). At one year follow-up, the main effects of the curriculum and network assignments were non-significant on smoking initiation. However, interaction terms of curriculum and assignment methods were significant. Within CHIPS, the network and teacher conditions were less effective than the random group condition, and more effective than the random group condition with Flavor (Valente et al. 2006). In a further refinement of ‘deliverer’ issues, the authors suggested that even the methods used to select leaders or create groups will influence the efficacy of interventions, and that this effect may be curriculum dependent (Valente et al. 2006).

The social drug use prevention intervention literature does not yet distinguish the most effective deliverers. In the latest update of primary research, delivery ranged from self-instruction to teachers, health educators, project staff, community leaders and police officers. Paralleling the tobacco use prevention literature, many studies failed to discuss the possible mediating effect of the programme deliverer. However,

Longshore, Ghosh-Dostidar & Ellickson (2007) commented that their social drug use prevention intervention may have been effective only in girls due to their ‘connection’ with the female teachers who delivered the programme. Alternatively, it may not have been a ‘rapport’ effect at all; another interpretation is that girls may have related more to the social influences approach provided. Further research is therefore warranted.

Within the alcohol use prevention domain, only four of 13 included studies employed or discussed peers. Similarly, only one of 15 bullying prevention intervention studies considered the contribution of peers. Swaim and Kelly (2008) implemented a media campaign ("Resolve It, Solve It") within schools, where local high school students (older peers) served as models in print, radio, and television public service announcements and spearheaded local school and community activities. This intervention led to significant beneficial differences in rates of growth for intent for violence, physical assault against others, verbal victimisation, and perceived safety at school, when compared to a control group. However, no differences were found for verbal assault, physical assault against objects, physical victimisation, or self-efficacy for avoiding violence.

**Based on existing evidence, we believe that:**

- *It is not yet possible to distinguish the most effective deliverers of prevention education; however, peer leaders show promise in certain contexts as peer interaction has been labelled a key component of success.*

**TREATMENT FIDELITY**

Fidelity refers to the extent to which the programme providers are following prescribed practices as intended by the programme developers. In drug use prevention, McGrath et al. (2006) commented that poor fidelity can lead to ‘type III errors’ (where ‘observed results are falsely attributed to the conceptual underpinnings of the intervention’ pg. 21). Further, according to Whitted and Dupper (2005), one of the most common mistakes made by schools is the partial implementation of (bullying prevention) programmes because of time constraints. They concluded that programmes should be carried out as they were designed. This point is reinforced

within bullying prevention. Smith et al. (2004) found that programmes that monitored ‘treatment integrity’ (fidelity) resulted in more positive outcomes than programmes lacking any formal monitoring. Further, Vreeman and Carroll (2007) commented that the implementation of an intervention can vary significantly and this can alter the results. In tobacco use prevention, Thomas, Baker and Lorenzetti (2007) agreed that the fidelity of implementation was related to positive outcomes (essentially intervention effectiveness). Although Sowden and Arblaster (2008) briefly described the degree to which some of the mass media tobacco use prevention interventions had been recalled or recorded, they did not link this to outcomes/effectiveness.

McGrath et al. (2006) highlighted that many drug prevention intervention studies do not include a process evaluation to examine whether programmes are delivered correctly. Where they do, interventions have demonstrated low fidelity. Although Thomas and Perera (2006) did not discuss the impact of fidelity on the results within their review of school-based tobacco use prevention, they did address ‘performance bias’. They described this as ‘problems with the implementation of the intervention, often due to incomplete intervention (or contamination of the control group)’ (pg. 6) as one of six measures of study quality. Only seven of the 19 original reviews commented on fidelity; which highlights the need for closer attention in subsequent research. The only exception was in bullying prevention literature, which contributed three of the seven reviews that considered fidelity.

The most recent primary research identified in the update demonstrates that researchers are mindful of the importance of fidelity. Buller, Borland, Woodall, Hall, Hines, Burris-Woodall, et al. (2008) concluded that fidelity is the major challenge in delivering interventions via the internet, both for health educators and researchers. They implemented a universal, interactive, internet-based intervention (Consider This) with 11 – 15 year old Australian and US schoolchildren (N=2,077 - Australia, N=1,234 - US), which comprised six x 45-60 minute sessions, based on a social cognitive (with social influences) approach. The results showed that the intervention was only effective in the Australian sample who reported reduced 30-day smoking prevalence (Buller et al. 2008). Buller et al. commented that despite the fidelity of the programme

implementation being low in many classes, a dose-response relationship with reduced smoking prevalence was evident. In this understanding, the data represented small benefits from the intervention that was unlikely to be of practical significance unless they are increased by improved fidelity. It seems logical that such a ‘dose-response’ statement may be generalisable to interventions other than those that are internet-based.

**Based on existing evidence, we believe that:**

- *Intervention fidelity is a vital determinant of prevention success. However, monitoring of intervention programmes is an issue as few studies include a process evaluation to determine whether programmes are delivered appropriately.*

**INTERVENTION INTENSITY**

In the prevention of social drug use, despite presenting evidence that intensive programmes given a large amount of curriculum time (e.g., 10 or more sessions) are effective, and that intensity alone does not necessarily ensure effectiveness (White & Pitts, 1998), Canning et al. (2004) concluded that the findings from White and Pitts (1998) were not convincing. Within this same research domain, Gottfredson and Wilson (2003) provided further evidence of the non-significant effects of programme intensity on efficacy. In addition, according to Thomas, Baker and Lorenzetti (2007), the number of sessions (intensity) in the community-based tobacco use prevention interventions in their review varied greatly and revealed no clear relationship between intensity and programme effectiveness. Therefore, intensity alone appears not to be the key issue; you must be doing the right things at the right times as well.

In contrast, Sowden and Arblaster (2008) found that the two successful mass media programmes included in their review of tobacco use interventions were similar in terms of intensity and duration, and that these elements were different across the studies that did not report positive findings. The first of the two successful interventions reported an average of 190 TV, 350 cable TV and 350 radio slots purchased in each of the four years when the campaign was running (Flynn, Worden,

Secker-Walker, Badger & Geller, 1995). In the second of the successful interventions, Hafstad et al. (1997) reported that 167 TV and cinema slots were purchased in each of three annual intervention campaigns (Sowden & Arblaster, 2008). Unsuccessful campaigns were of a much lower intensity and duration. The authors concluded that both intensity and duration of any mass media campaign are likely to be important factors in influencing health-related behaviours, such as those of interest here (Sowden & Arblaster, 2008). An explanation is because this approach at least ensures some level of exposure. Unfortunately, none of the five bullying prevention or two alcohol use prevention reviews commented on the intensity of the interventions they evaluated.

Upon examination of the latest research literature across the four domains (n=72), it was noted that specific details regarding the intensity of the interventions were often omitted. Therefore, questions still remain regarding the delivery intensity. For example, does an intense programme consist of *more sessions* or is it *more content* within fewer sessions? The interventions found to be effective (which provided intensity-related information), ranged from two sessions - each of 90 minute duration (Conrod, Castellanos & Mackie, 2008) to 40 sessions – each of 35 to 40 minute duration (mean implementation approximately 32 sessions (Eisen, Zellman, Massett & Murray, 2002; Eisen, Zellman & Murray, 2003). With regard to the relationship between intensity and the effectiveness of prevention interventions, it appears that more content (greater variety within the available time) may be the key issue. For example, the study of Conrod, Castellanos and Mackie (2008) found that an interactive, indicated school-based alcohol use prevention intervention targeting high-risk adolescents (median age – 14 years) was effective in reducing the rate of increases in drinking from baseline to 6 months post-intervention, yet comprised only two sessions, each of 90 minutes duration. The key to the success of the intervention could lie in the amount and nature of the content that they were able to include within the two sessions, which included psycho-educational, motivational interviewing and cognitive-behavioural components, and covered goal setting, enhancing motivation, exploring personalities, coping, and understanding emotional responses from physical, cognitive and behavioural perspectives.

**We believe, based on existing evidence, that:**

- *Intervention intensity is an important determinant of intervention efficacy but further research is needed in order to answer the question - does an intense programme consist of more sessions or is it more content within fewer sessions?*

**INTERVENTION LENGTH**

Based on our review evidence, we can conclude that prevention interventions vary in length, with most projects lasting one or two years. However, as the majority of prevention programmes are based in a school-setting (there are rarely more than 200 days in the annual school year) it is not clear how informative programme length is when detailed in years. Still, this intervention factor will now be considered.

In the bullying prevention literature the Seville Project had the longest intervention (four years) and was one of the most successful (Smith, Ananiadou & Cowie, 2007). Therefore, Smith, Ananiadou & Cowie (2007) concluded that programme length is an important variable. Richardson et al. (2008) and Sowden and Arblaster (2008) also stressed the importance of intervention length because their review found that tobacco-use prevention mass media interventions are most effective when they are long in duration and generate greater exposure intensity (where exposure intensity represents the number of times an individual was exposed to [i.e., heard/saw] the media intervention). Equally, they note that lack of exposure and longevity are barriers to effective mass media interventions (Richardson et al. 2008).

Increased exposure to anti-tobacco messages over time decreased intentions to smoke and rates of smoking initiation. At the same time, negative attitudes towards the tobacco industry increased and access restriction effectiveness improved (Richardson et al. 2008). They added that there is some evidence that compliance with access restrictions increases over time, but that effectiveness may not be self-sustainable and may be impacted by social sources of tobacco. In contrast, when reviewing school-based interventions for the prevention of tobacco use in young people, Thomas and Perera (2006) found that the longest and most intense (eight years) programme

(Spoth, Redmond & Shin, 2001) was ineffective, suggesting that the factors influencing the effectiveness of interventions will vary greatly dependent upon the type of intervention. In this instance, fatigue effects may have ensued. Although, Thomas and Perera (2006) stated that this intervention spanned eight years, on closer inspection of the table of included studies, the delivery was between grades 6 and 10 (age 11 and 16 years), and it was the final follow-up that was eight years from baseline testing. Also, Thomas and Perera (2006) did not discuss or detail whether the content of the intervention had changed over the period of delivery in order to be developmentally appropriate for the aging population.

Within the social drug use domain, Canning et al. (2004) noted small but consistent changes in eight out of 10 interventions of one year or more in length. However, McGrath et al. (2006) reported that both short (<4.5 months) and long (>4.5 months) interventions had comparable effects. This indicates that longer interventions may not result in further benefits and thus are not cost effective (McGrath et al. 2006). With the single exception of Smith, Ananiadou and Cowie (2003), other authors (e.g. Smith et al. 2004) of bullying prevention reviews gave details of the length of the intervention without discussing the potential impact on intervention effectiveness. Few authors in other domains, including both alcohol prevention reviews (Foxcroft et al. 2002; Jones et al. 2007), discussed intensity as a potential contributory element in intervention effectiveness.

On balance, the review evidence is conflicted with regard to the need for long and intense interventions. It appears that these factors are not pivotal in behaviour change. However, perhaps the most important point was made by Thomas and Perera (2006) when they asserted that factors influencing the effectiveness of interventions will vary greatly dependent upon the type of intervention. Unfortunately, the length of interventions was often not detailed within the 29 tobacco use prevention studies we used to update the evidence base. For those that were both effective and had stated the length of the intervention there were variations between two weeks (Etter & Laszlo, 2005) and three years (Josendal, Aaro, Torsheim & Rasbash, 2005). Therefore, this also indicates that the length of interventions may not be one of the most

significant contributory elements of effectiveness. However, until trials of equivalent content, but different durations, can be complete this will remain unconfirmed.

In contrast, West & O’Neil (2008) highlighted the influence of intervention length upon effectiveness when they reviewed an American school-based alcohol use prevention intervention (Project Northland), which had been previously been effective (Perry et al. 2002) in reducing (i) the tendency to use alcohol, (ii) past month alcohol use and (iii) binge drinking (see included studies) which had been adapted to suit the culture of the Croatian city, Split (this is a good example of recognising the importance of culture and the person x environment ‘fit’). After the first year of implementation the intervention was not effective. Yet, West & O’Neil (2008) identified that after the second year of implementation there were benefits for females including a significant positive effect for alcohol use in the past seven days, 30 days and 12 months. This highlights that interventions may achieve effectiveness following a lag period. Therefore, it is important to consider not only how long the intervention will be, but also the duration of the follow-up period. However, in this study the outcomes were not analysed in a manner that could demonstrate effectiveness on actual initiation of alcohol use (West et al. 2008). Instead, the authors presented the overall score from the researcher designed Tendency to Use Alcohol Scale but they didn’t comment on the changes across individual items of the scale.

**Based on the existing evidence, we believe that:**

- *The length of prevention interventions may not be one of the most significant contributory elements of programme effectiveness. However, until trials of equivalent content, but different durations, are undertaken this potential influence will remain unconfirmed.*

**INTERVENTION FOLLOW-UP**

Across the reviews a consistent conclusion radiates; there is a lack of clear, long-term follow-up evidence making it difficult to determine the value of prevention programmes in the longer term prevention of bullying, alcohol, tobacco and social drug use. Foxcroft et al. (2002) examined the prevention of alcohol use reporting the

findings of their included studies according to their length of follow-up. Fifteen of 56 studies reported partially effective short-term interventions ( $\leq 1$  year follow-up); 12 reported medium-term partially effective interventions (1-3 years follow-up), but few were convincingly effective. Further, most were marred with methodological shortcomings. Only three studies reported effective longer-term ( $\geq 3$  years follow-up) interventions. The first of those was Botvin's (1995a) six-year LST programme, which resulted in significantly less self-reported drunkenness; although Foxcroft et al. (2002) commented that the effect size seemed small. Botvin suggested high fidelity was a factor in their success, while Foxcroft et al. (2002) advised that the direct comparison between a subgroup of those who received the intervention against the whole of the control group had compromised all the findings. The second study was that of Schinke (2000), which lasted 3.5 years and was a culturally-focused (Native Americans) programme. Results showed that a skill-based group were ~7% less likely than a control group to be weekly drinkers. The final study was Spoth (2001), in which a family-based intervention produced a consistent pattern of effectiveness across three outcomes ('ever used alcohol', 'ever used alcohol without permission' and 'ever been drunk'). Intervention effectiveness seemed to increase over time, which Foxcroft et al. (2002) hypothesised was due to the developmentally-oriented intervention outcome model on which the intervention was based. Due to these findings, Foxcroft et al. (2002) commented that this intervention deserves more research attention.

Some of the studies that reported successful outcomes, at long- or medium-term, had previously reported some short-term significant effects. On the other hand, some interventions effective in the short-term were ineffective at the later time points. Foxcroft et al. (2002) showed that any early reductions in drinking behaviour achieved by the interventions in their review had eroded over time.

Within the tobacco use prevention domain, Thomas, Baker and Lorenzetti (2007) included studies where follow-up varied between one and 29 years. Employing a substantially lengthy follow-up period is in agreement with the views of Roe and Becker (2005), who, in their review of social drug use prevention, concluded that adolescents should ideally be traced into adulthood to assess whether initial benefits

can be sustained over time. Vreeman and Carroll (2007) concluded that although several interventions within their review revealed positive effects at post-test, studying the outcomes on a single occasion limits the generalisability of the findings.

**Based on existing evidence, we believe that:**

- *Prevention programmes currently lack the longitudinal design that is necessary to assert firm conclusions on the long-term effectiveness of prevention efforts. Despite the inherent difficulties in longitudinal research, future research endeavours should strive to follow young people and adolescents receiving the intervention into adulthood.*

**BOOSTER SESSIONS**

The logic of booster sessions within prevention programming is that things change, so it's important to provide refresher sessions on the main content of formerly conducted interventions. When examining the evidence regarding the prevention of social drug use at a tertiary level, Canning et al. (2004) re-emphasised the conclusions of White and Pitts (1998); effective programmes have tended to include booster sessions, or an equivalent component. McGrath et al. (2006) also presented evidence that most of the programmes found to have a positive impact on cannabis use had booster sessions or comparable add-on components that aimed to reinforce the effects of a programme (Skara & Sussman, 2003). However, they also presented the evidence of Cuijpers (2003) who questioned the lack of statistical testing of the relationship between booster sessions and programme outcomes. Therefore, McGrath and colleagues cautioned that this link should be viewed as hypothetical. In addition, Canning et al. (2004) noted the lack of evidence about the level and type of booster sessions that is best employed, particularly after a short or medium term intervention (i.e., quantity, how long after intervention end). Therefore, further research should consider these elements.

***Booster sessions: An update from the literature***

Unfortunately, despite strong assertions that booster sessions could be of particular importance to the success of prevention interventions, evidence regarding their

inclusion was limited across the research domains. For example, only 4 of the 31 tobacco use prevention studies had included them (all of which were effective). Most importantly, there was a lack of booster sessions in the bullying prevention domain. However, Fekkes, Pijpers and Verloove-Vanhorick (2006) provided evidence of the importance of booster sessions within this domain when they implemented an anti-bullying school-based intervention. The researchers advised participating schools that the first year of the intervention was compulsory, but that a second year of intervention was voluntary. After the first year of intervention, positive effects on children being bullied, victimisation and active bullying behaviours were observed (when compared to a control condition), and despite some schools continuing to implement the intervention for a second year (mostly at very low levels), the second year follow-up assessment revealed no effects (Fekkes, et al. 2006). The authors concluded that schools must continue anti-bullying measures every year to maintain effects and keep bullying at a consistently low level. Unfortunately, the detail regarding the intervention content and intensity limits replication.

Within the alcohol prevention primary studies, only three of 13 interventions included booster sessions, of which two were effective. Despite the small number of booster sessions, their value was clearly demonstrated by comparing two alcohol use prevention studies (Schinke et al. 2004 and Schinke, Schwinn and Ozanian, 2005). Schinke et al. (2004) compared a CD-ROM and family-based intervention with a CD-ROM only intervention and found both to be effective in reducing 30-day alcohol (tobacco and marijuana) use. The intervention consisted of 10 x 45 minute CD-ROM lessons, with 2 x 30 minute CD-ROM booster sessions and a 30 minute videotape to be viewed by the family as a whole. This was accompanied by a four hour workshop which also acted as a booster. In comparison, Schinke, Schwinn and Ozanian (2005) implemented only the CD-ROM without the extra CD-ROM booster sessions. Without the booster sessions, a positive change was noted in perceived harm of alcohol use and assertiveness skills but drinking rates (behaviour) were not affected.

Within the social drug use prevention studies, a higher proportion of interventions included booster sessions than in the tobacco use and alcohol use prevention domains.

More specifically, six studies had employed the use of booster sessions and 67% were proven to be effective. The successful interventions indicated that the addition of booster sessions made a significant contribution to programme effectiveness. For example, Longshore et al. (2007) tested the effects of their original intervention (Project Alert) implemented in American schools through 7<sup>th</sup> and 8<sup>th</sup> grade against an extended version (Project Alert Plus - with five booster sessions added in 9<sup>th</sup> grade). They concluded that the additional (five) booster sessions were a sound investment as the Project Alert Plus intervention significantly curbed weekly marijuana use (plus alcohol use and other outcomes). In contrast, the basic Project Alert did not. The standard intervention aimed to build skills, motivate resistance, understand the consequences of drug use, highlight the benefits of non-use, build confidence, identify social pressures, build norms against use and emulate role models for non-use through small group activities. The enhanced intervention addressed coping with risky situations and emotional distress, strengthening norms and raising awareness of media influences and diverse social networks through school- and home-based learning activities involving their parents (Longshore et al. 2007). Perhaps, in this instance, it would be worthwhile investigating whether or not it was the booster sessions and/or the parental involvement that lead to the behaviour change.

**Based on existing evidence, we believe that:**

- *Programmes that include booster sessions appear more effective. However, at present there is no conclusive evidence regarding the dosage required to constitute adequate follow-up.*

**TARGET POPULATION**

The logic behind the identification of target groups when designing prevention interventions is that behaviour change is enhanced if the risk and precipitating factors associated with a given group are addressed accordingly. Obviously, this is common practice in selective prevention programmes because the interventions focus on specific groups based on research on risk factors and known risk groups. However, intervention component tailoring can also apply to universal prevention. For example,

universal programmes can be tailored to different age groups and in doing so, developmental differences are recognised.

### ***Ethnic groups***

Ethnic groups are characterised by important socio-cultural differences, even when equated for factors such as education and income (Yeats et al. 2002). Although ethnic or cultural differences alone do not constitute vulnerability, an individual's exposure to vulnerability factors such as those identified by Hawkins, Catalano & Miller (1992) has been noted. For example, Wallace and Muroff (2002) have reported significant vulnerability differences between African American and white youths; white youths were more exposed to individual (e.g., sensation seeking) and interpersonal (e.g., peer use) factors, whereas African American youths were more exposed to contextual (economic and academic) vulnerability factors. Therefore, in light of the importance of understanding risk and vulnerability factors when designing prevention programmes, this is a research area worthy of investigation.

Indeed, in their review of the primary prevention of alcohol misuse in young people, Foxcroft et al. (2002) concluded that culturally-focused interventions may be effective, but require further research. They based their conclusion on a study (Schinke, Tepavac & Cole, 2000) that highlighted the potential value of culturally-focused skills training over the long-term. McGrath et al. (2006) presented evidence that incorporating bicultural competence approaches to skills training has been shown to be effective for reducing the prevalence of drug use in Native American youth (Hawkins, Cummins & Martlatt, 2004). According to McGrath et al. (2006) the bicultural competence approach 'aims to provide participants with coping skills to negotiate between mainstream and native cultures' (pg. 19). They also commented that this should increase the cultural sensitivity of the programme, which, it is thought, should make the programme more meaningful for participants (McGrath et al. 2006). Although contexts differ, McGrath et al. (2006) suggested that adding bicultural approaches to skills training for some youth ethnic minority populations may be useful.

Within the original review evidence, Canning et al. (2004) suggested that researchers must develop, execute and rigorously evaluate more culturally-focused interventions. Within the primary studies, there was agreement in all four research domains that interventions are most likely to be effective when they are ethnically or culturally appropriate (e.g. tobacco use: Valente, Unger, Ritt-Olson, Cen & Johnson, 2006; Zollinger, Saywell, Muegge, Wooldridge, Cummings & Caine, 2003). Komro et al. (2008) also refined the original Project Northland intervention to suit a different US city (developed in Minnesota, applied in Chicago) and when compared to a ‘treatment as usual’ condition, the intervention was not effective in reducing alcohol use. The authors concluded that this highlights the importance of testing previously validated interventions with diverse populations (Komro et al. 2008).

Karnell, Cupp, Zimmermann, Feist-Price & Bennie, (2006) also took elements of the original Project Northland (American alcohol use prevention intervention) and developed the content to be implemented in South Africa. Although the intervention was effective in preventing risky sexual behaviour related to drinking, it was not effective on any of four alcohol use outcomes: (i) having ever consumed alcohol, (ii) frequency of alcohol use in the past 14 days, (iii) quantity of alcohol consumed on the last occasion of drinking and (iv) drinking-related problems.

**Based on existing evidence, we believe that:**

- ***Targeting ethnic groups specifically within programme design is complex and further research is required which differentiates according to risk and vulnerability across groups. Focusing on targeting an intervention based on risk and vulnerability factors, rather than ethnic group may be more fruitful. Therefore, further research is warranted before conclusive statements can be offered.***

**Age**

The logic behind considering the age of the target group is that every age has a developmental span. Hitting that just right is the problem when comparing age-appropriateness. However, in the tertiary literature the age of the target population

was not reported in some published reviews (e.g. Canning et al. 2004). For those reviews that did report on age varied ranges were evident. For example, Thomas, Baker and Lorenzetti (2007) and Thomas and Perera (2006) categorised participants into children (ages 5-12) and adolescents (ages 13-18); Jones et al. (2007) and Richardson et al. (2008) included those 'young people' under 18 years old; Faggiano et al. (2005) included both primary and secondary school pupils. The majority of reviews considered 'young people' to be those individuals under 25 years old (e.g., Foxcroft et al. 2002; Gates et al. 2006; Jones et al. 2007; Sowden & Arblaster, 2003; Sowden & Stead, 2003). Despite the age bracket covering those up to the age of 25 years, McGrath et al. (2006) highlighted that there is a lack of evidence for young people over the age of 18. They suggested that this is most likely because it is at this time that young people leave education, which is where most interventions have been implemented (McGrath et al. 2006).

With regard to specific ages at which interventions are most effective, Roe and Becker (2005), in their study of the prevention of social drug use, suggested that 11-13 years of age is the most crucial period for prevention interventions. Authors believed that this period represents a vital window of opportunity for intervention because it may be at this point that vulnerable young people might begin to use drugs for the first time. Therefore an intervention at this point has high relevancy because it is delivered before patterns of problematic behaviour become more established (Roe & Becker, 2005). Similarly, McGrath et al. (2006) presented some evidence to suggest that school programmes for young people are most effective when they are delivered to pupils aged between 11 and 14 years old (Gottfredson & Wilson, 2003), although this conclusion was based on a weak effect size ( $d = 0.09$ ) for the sub-population and McGrath et al. (2006) did not themselves suggest, or indeed present from Gottfredson and Wilson (2003), details or explanations as to why this period of age might be appropriate. Further, it was not significantly different from effect sizes for younger or older populations (McGrath et al. 2006). Yet, this age banding appeared to be the common consensus across the tobacco, alcohol and social drug use literature.

Taking a different view, Harris and Petrie (2003) commented that it may be wise to implement bullying prevention programmes with children as young as two years old, as this is at a time that is before they have learned aggressive behaviours, or can still ‘unlearn’ those behaviours before they stabilise (Whitted & Dupper, 2005). In addition, Whitted and Dupper (2005) presented suggestions that because bullying among elementary school children may be an antecedent to more violent behaviours in later grades, it is critical that prevention efforts begin in elementary school. Unfortunately, no further explanation was given as to why this may be.

According to Smith, Ananiadou and Cowie (2003), some bullying prevention programmes have had a stronger positive effect on primary school pupils than secondary school pupils (Smith & Sharp, 1994). Their evidence suggested that this may be due to the developmental characteristics of older children and organisational features of secondary schools (Stevens, de Bourdeaudhuij & Van Oost, 2000). Younger children may be more willing to accept teacher authority, curriculum activities and school policies that reflect teacher influence, whereas older children, especially those involved in bullying and other anti-social activities, may explicitly reject teacher influence and values advocated by the school (Smith, Ananiadou & Cowie, 2003). They also presented evidence suggesting that the general peer climate and attitudes towards victims also become somewhat more negative in adolescence, particularly among boys (Olweus & Endresen, 1998).

The issue of age may be one of pragmatism rather than a developmental ‘window’ of opportunity. Since secondary schools are larger and organised by year-group rather than by class, whole-school processes are more difficult to promote effectively (Smith, Ananiadou & Cowie, 2003). Smith, Ananiadou and Cowie (2003) concluded that the pattern of programme effects with older students indicates the need to deliver intervention programmes earlier (perhaps at pre-school age) or be tailored more to suit particular age groups. Since research on the stability of victim and bully status suggests that few pupils enter into stable victim roles before ages eight to nine years future intervention programs might focus on children younger than age eight to nine

years to prevent vulnerable children from being systematically targeted and stereotyped (Smith, Ananiadou & Cowie, 2003).

In their review on the prevention of social drug use, McGrath et al. (2006) highlighted that three out of four smokers become established smokers before age 18. Therefore, they claimed that drug prevention interventions, including other substances such as tobacco, were not undertaken in the unproven assumption of greater ‘worth’ before 18 years of age. McGrath et al. (2006) also commented that when students leave full-time education they may experience drastic changes in their environment, including their social network. These changes could increase an individual’s susceptibility or opportunity to start using drugs or to engage in ‘binge’ or ‘regular’ drinking because they may become involved in different social networks that may possess more tolerant standard from undesirable/unhealthy behaviours. For this reason it is important that these populations are not overlooked.

#### ***Age: An update from the literature***

The original review literature (Smith, Ananiadou & Cowie, 2003) suggested that bullying prevention interventions may be more effective when implemented with children in elementary (infant) schools. Yet, the prevention of tobacco, alcohol and social drug use, may be most effective with adolescents between 11 and 13 years old. This may represent a time when access increases. Twenty-five of the 29 tobacco use prevention primary studies included in this review addressed populations aged 11 – 18 and the most common time frame for implementation of interventions was between 11 and 14 years. This was in-line with the recommendations taken from the reviews. Similarly, of the 14 included social drug use prevention studies, 11 were implemented interventions with target populations between 11 and 14 years of age.

Interestingly, although extant research within the bullying prevention domain advised implementing bullying prevention programmes during elementary school, primary school (Smith, Ananiadou & Cowie, 2003) or even with children as young as 2 years old (Whitted & Dupper, 2005), most of the studies included within the literature update were based on populations of 8-12 years. Also, in opposition to the aforementioned

suggestions of the authors within the tertiary level review, Shapiro (2002) found that the positive effects of an interactive anti-bullying intervention - The Peacemakers Program – assessed using the teacher-reported Aggressive Behaviour Checklist (ABC) and number of suspensions from school were more profound for the older (middle school – 11-14 years) students than for younger (elementary school – 9-11 years) students.

**Based on existing evidence, we believe that:**

- *The 11-14 year age category is often reported as the optimal age group for prevention implementation across the four social domains. However, when planning interventions it is important to consult with the target group to ensure that the content is meaningful to that group and that cognitive skills (rather than chronological age) are considered.*

**Gender**

Although many published reviews did not report gender differences, Smith, Ananiadou and Cowie (2003) presented evidence that both Norwegian (Olweus) studies indicate that girls are more receptive to anti-bullying interventions. Richardson et al. (2008) concluded that the findings regarding the impact of gender on the prevention of tobacco use through mass media interventions were inconclusive. Unfortunately, no other reviews commented on the relationship between intervention effectiveness and gender.

Within the bullying prevention primary studies, Swaim and Kelly (2008) found that a multi-component (media, school and community-based) anti-violence/bullying intervention ('Resolve It, Solve It') resulted in significant differences in rates of growth for intent for violence, physical assault against people, verbal victimization, and perceived safety at school, when compared to a control group (Swaim & Kelly, 2008). Examined by gender, the data showed that the effects upon physical assault against people were only significant among females and changes in verbal victimisation and perceived school safety were only observed among males. Shapiro (2002) also highlighted that interventions may be more effective with a particular gender because

they found that boys responded most positively to an interactive anti-bullying intervention (The Peacemakers Program).

Longshore et al. (2007) emphasised the potential mediating influence of gender on intervention effectiveness. They implemented an interactive, indicated, school-based drug prevention intervention, based on the social influences approach within 45 American schools. Beneficial effects were only found in at-risk girls exposed to an enhanced (addition of booster sessions – Project ALERT Plus) intervention, when compared to girls who received no treatment (control) or a basic intervention (Project ALERT) and to boys receiving any of the three conditions. These effects may have been due to the Social Influences nature of the intervention – as they hypothesised that girls at this age are more responsive to social influences. Further, effects may also relate to the girls ability to relate to the female teachers delivering the intervention (Longshore et al. 2007).

**Based on existing evidence, we believe that:**

- *The mediating effect of gender on prevention interventions is not clear and further research is required.*

***Socioeconomic status***

Little is known about the impact that socioeconomic status may have with regard to the various different elements in all types of interventions. For example, Richardson et al. (2008) noted a lack of information regarding the impact of socioeconomic status on the effectiveness of tobacco use prevention in young people. Within the primary studies there remained a lack of evidence regarding the potential mediating effects of socioeconomic status. Several studies included proxies of socioeconomic status (e.g. household income, educational level of parents), but none discussed the impact on or relationship between these factors and intervention effectiveness.

**Based on existing evidence, we believe that:**

- *The mediating effect of socioeconomic status on prevention interventions is not clear and further research is required.*

***Specialist populations***

Jones and colleagues (2006) review of social drug use research focused specifically on specialist, or ‘at-risk/vulnerable’ populations. This review drew several conclusions, including that there is insufficient evidence to determine whether television campaigns targeting high sensation-seeking adolescents influenced (i) substance use knowledge, (ii) attitudes, and intentions to use, and (iii) self-reported cannabis use. Further, there is insufficient evidence to determine whether substance use prevention interventions targeting young homeless people have any effect on risk and protective factors related to substance use or are effective in reducing substance use behaviours. Further, Jones et al. (2006) commented that only one RCT targeted each of the populations of (i) children of divorce, (ii) institutionalised youth, (iii) abused females and (iv) ‘latchkey’ students. In this context, there is limited evidence from which to draw conclusions.

Since much of the research over all four areas has taken place in school environments, it is important to highlight that those who have ceased education, either due to ‘dropping-out’, expulsion, or simply due to age (>18 years) have, but should not have, been overlooked. The review of Jones et al. (2006) identified major gaps in the research for six specific groups in particular:

- Young people who are (or have been) looked after by local authorities or in foster care
- Young people who are (or have been) homeless or who move frequently
- Pupils excluded from school or truanting
- Young people involved in commercial sex work
- Young people with behavioural conduct disorders
- Young people with mental health problems

For some of these populations there is adequate substance use service provision, and research is therefore needed into the effectiveness of existing approaches. However, for most populations, basic levels of using specialist substance services are required before evaluation research can proceed.

# Appendix D: Review Process

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The review process consisted of two main stages: the first stage was to review and summarise past credible systematic reviews, meta-analyses and, where relevant, best practice summaries that were published in scientific literature or by government agencies between 2002 and November 2008; the second stage was to execute a comprehensive search and review of primary studies that used experimental or quasi-experimental study designs, which were published from 2002 onward and had not been included (or excluded) in the foregoing reviews.

## **SECONDARY AND TERTIARY REVIEW METHODOLOGY**

As detailed above, the review methodology required the identification of past credible secondary (systematic reviews, meta-analyses) and tertiary (reviews of reviews) level publications. A clear advantage of utilising these sources is that authors at review level often identify common themes and patterns of effective intervention components; this differs from the focus of authors of primary studies, who typically concentrate upon the measurement and comparison of outcomes without discussing or isolating effective programme elements

### ***Search terms and inclusion criteria***

- i) 'tobacco', 'drugs', 'alcohol', 'bullying'
- ii) 'prevention'
- iii) 'review', 'systematic review', 'meta-analysis'

Reviews that met the following criteria were included:

- Secondary (reviews, meta-analyses) or tertiary (reviews of reviews) level publications.
- Systematically examined studies focused on preventing bullying, alcohol, tobacco and social drug use.
- Peer reviewed and published from 2002 onwards.

An overview of the electronic search strategy is displayed in Figure D1 (a detailed breakdown of the electronic search strategy is available upon request). Manual searches of the references lists of the reviews identified via the electronic search and included in our review were also carried out.

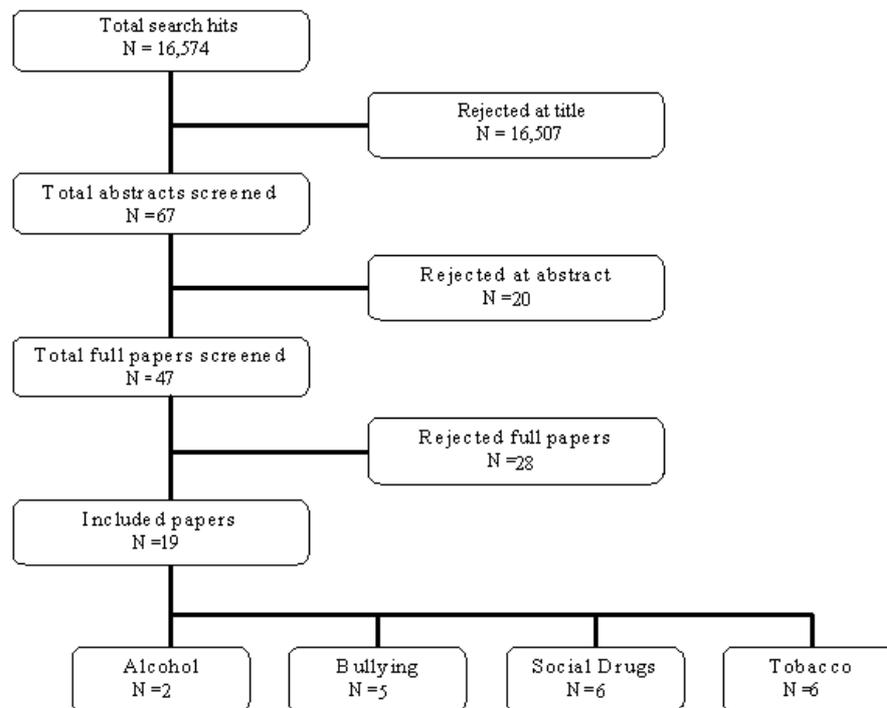


Figure D1. An overview of the electronic search strategy employed to identify relevant secondary and tertiary level publications.

## PRIMARY RESEARCH METHODOLOGY

Following the identification of secondary and tertiary level publications, it was necessary to execute a comprehensive search to identify relevant primary studies.

### *Search terms and inclusion criteria*

- i) 'tobacco', 'drugs', 'alcohol', 'bullying'
- ii) 'prevention', 'behaviour change', 'stop', 'abstain'.
- iii) 'intervention', 'initiative', 'campaign', 'strategy'
- iv) 'education'

Research papers that met the following criteria were included:

- Primary studies
- Systematically examined studies focused on preventing bullying,

- alcohol, tobacco and social drug use.
- Peer reviewed and published from 2002 onwards.
- Not included (or excluded) in previous reviews

The search was limited to articles published in the English language. Manual searches of the references lists of the included primary research articles were also executed.

### **Search stages**

Sifting of search ‘hits’ consisted of three stages, as recommended by Lloyd Jones (2004): Papers were first reviewed by title, then by abstract and, finally by full text, excluding those at each stage that did not satisfy the inclusion criteria. Searching revealed 2,495 potentially relevant search ‘hits’ (figure D2). In cases of uncertainty the paper was evaluated by two members of the research team and a consensus reached by discussion. A full search hit list can be provided upon request.

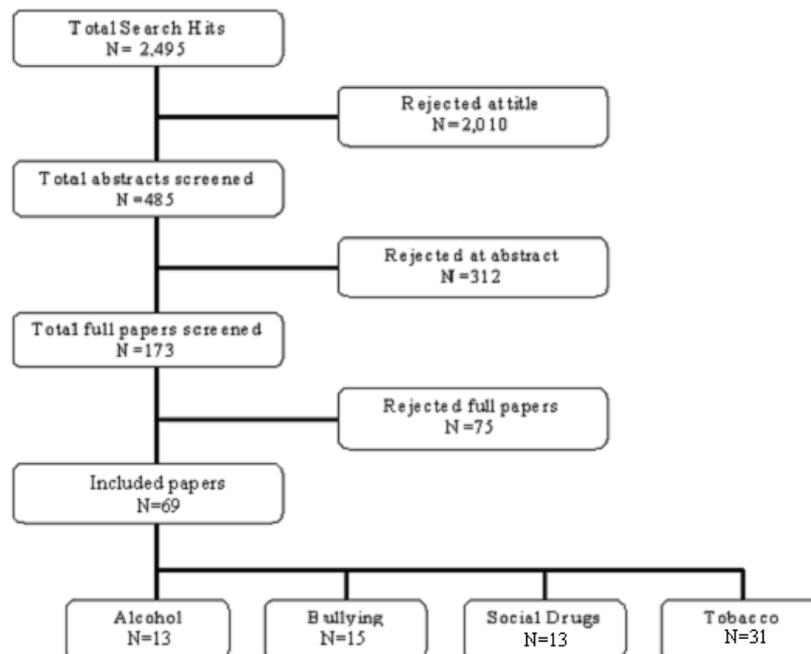


Figure D2. An overview of the electronic search strategy employed to identify relevant primary research papers.

## THE REVIEWS

The review level literature regarding each of the four research domains was of variable quantity and standard. The broadest spectrum of settings was covered by the literature examining the prevention of tobacco use. Six reviews were available, including five Cochrane Systematic Reviews (Sowden & Arblaster, 2008; Sowden & Stead, 2003; Stead & Lancaster, 2005; Thomas, Baker & Lorenzetti, 2007; Thomas & Perera, 2006). The sixth review was conducted by the National Institute for Clinical Excellence (NICE; Richardson et al. 2008). Respectively, they covered mass media, access restrictions, and family-, community- and school-based interventions. Four systematic reviews address the prevention of social drug use (Faggiano et al. 2005; Gates et al. 2006; Jones et al. 2006; Roe & Becker, 2005). Additionally, in relation to the prevention of bullying behaviours four systematic or meta-analytic reviews (Smith Ananiadou & Cowie, 2003; Smith et al. 2004; Merrell et al. 2008; Vreeman & Carroll, 2007) and one 'best practice' guidance document (Whitted & Dupper, 2005) were available. Fewest documents at this level were available for alcohol use prevention, where there were only two reviews (Foxcroft et al. 2002; Jones et al. 2007). All review level documents were focused upon children, adolescents or young people, which most authors viewed as reflecting individuals less than 25 years old. Logically, some authors included younger populations as their focus was on school-based prevention.

The period of time covered by the reviews in the four research domains varies greatly (along with the specification of review start and end dates), as illustrated in Table D1. Furthermore, Table D1 highlights the variety of settings covered by the reviews; although it is clear that the dominant setting for primary prevention interventions is the school setting across the four domains.

Table D1. Period of time covered by reviews within each research domain.

Domain	Author	Start Date	End Date	Setting
<b>Alcohol Use</b>	Foxcroft et al. (2002)	1983*	2001	School
	Jones et al. (2007)	1990	2006	School
<b>Bullying</b>	Merrell et al. (2008)	1980	2004	School
	Smith, Ananiadou & Cowie (2003)	Not stated	Not stated	School
	Smith et al. (2004)	1989*	2002	School
	Vreeman & Carroll (2007)	1966	2004	School
	Whitted & Dupper (2005)	N/A	N/A	School
<b>Social Drug Use</b>	Canning et al. (2004)	1996	2001	Review of reviews Mixed settings
	Faggiano et al. (2005)	1966	2004	School
	Gates et al. (2006)	1966	2004	Non-school
	Jones et al. (2006)	1990	2006	Community
	McGrath et al. (2006)	2002	2004	Review of reviews Mixed settings
	Roe & Becker (2005)	1994*	2003*	Mixed setting- Vulnerable young people
<b>Tobacco Use</b>	Richardson et al. (2008)	1992	2007	Mass media/ access restrictions
	Sowden & Stead (2003)	1998	2002	Community
	Sowden & Arblaster (2008)	1966	1998	Mass media
	Stead & Lancaster (2005)	1966	2004	Access restrictions
	Thomas & Perera (2006)	1966	2006	School
	Thomas, Baker & Lorenzetti (2007)	1987*	2007	Family

N.B. \* denotes the date of the earliest *included* study where inclusion dates were not specified.

### Primary studies used to update the review

In a similar pattern to the review level literature, the number of primary studies identified, that were published after the reviews, varied between 13 (alcohol use prevention) and 31 (tobacco use prevention) (see Table D2 for details) for each of the four research domains.

Table D2. Number and type of included studies within four research domains.

Research Domain	RCTs	Quasi-Experimental	Total
Alcohol Use	12	1	13
Bullying	9	6	15
Social Drug Use	10	2	13*
Tobacco Use	20	9	31^

N.B.\* denotes two publications that were a summary of all the previous experimental findings of the Project Towards No Drug Abuse (Sussman, Dent & Stacy, 2002) and Project DARE (West & O’Neal, 2004); ^ represents two studies of cost-effective analysis (Hoeflmayr & Hanewinkel, 2008; Ross et al. 2006).

As stated in the methodology, studies identified by the search strategy that had been previously included or excluded by the original review authors will not be discussed. The range within the publication years of the included primary studies also varied between the four domains (see Table D3 for details).

Table D3. Number of primary studies included in the update according to year (2002-2008).

Research Domain	2002	2003	2004	2005	2006	2007	2008
Alcohol Use	1	0	1	2	4	2	3
Bullying	1	0	5	1	3	4	1
Social Drug Use	3*	1	2	1	3	2	1*
Tobacco Use	4	3	2	3	10	3	6

N.B.\* denotes two publications that were a summary of all the previous experimental findings of the Project Towards No Drug Abuse (Sussman, Dent & Stacy, 2002) and Project DARE (West & O’Neal, 2004);

Tables D1, D2 and D3 highlight that tobacco use prevention has benefited from the largest volume of research to date, closely followed by the prevention of social drug use. The 1990s represented a decade of intensive research across the four domains relative to the other decades of study. Research conducted in the 2000s is gaining momentum.

## **GEOGRAPHICAL ORIGINS OF THE RESEARCH LITERATURE**

With the exception of the bullying domain, the USA dominated the prevention evidence base. In relation to research and innovations in the prevention intervention efforts for bullying, Merrell et al. (2008) stated that American educators and mental health professionals have been relatively recent players at the international table with research and prevention mostly led by Europe, Canada and Australia. However, Vreeman and Carroll (2007) reviewed 26 studies, of which ten were carried out in the USA, and the remaining studies were conducted in the UK (6), Italy (2), and Norway (2), with Belgium, Czechoslovakia, Switzerland, Australia, Canada and South Africa each hosting one evaluative study (Table D4). Within the same research domain (bullying), the review of Merrell et al. (2008) identified only 16 studies spread between six nations: the UK, USA, Belgium, Canada, Italy and Norway. They reported that the largest number of participants was from the UK (44%: or 6,675 of 15,386), followed by the USA and Norway with approximately 16% each. Although the largest number of participants was from the UK, six studies were from the USA and four were from the UK.

As Table D4 illustrates, all of the studies included in the review by Gates et al. 2006, were conducted in the USA except for McCambridge & Strang (2004; London, UK) and Wu et al. (2002; Yunnan, China). In the same research domain, when examining prevention interventions implemented with vulnerable or 'at-risk' young people, Jones et al. (2006) reported that 194 from 208 (94%) of the included primary studies were set in the USA.

In prevention of alcohol use, Jones et al. (2007) commented that 101 of the 134 evaluative studies they included took place in the USA, with only seven in Australia, three in the UK, two in the Netherlands, and one each in Sweden, Canada, Norway, Israel, Spain and Russia. Foxcroft et al. (2002) commented that 84% of the intervention evaluations that they included had taken place in the USA. Of the others, three were Canadian, two British, one Swedish, one Norwegian, one Australian, and one was an international study encompassing Australia, Chile, Norway and Swaziland (Table D4).

In the prevention of tobacco use in young people, again, USA was the dominant country of evaluative studies. From six reviews, the average proportion of studies that were conducted within the USA was 73% (range 63-83%). The remaining studies, over all six reviews, were based in Canada, the UK, Australia, Netherlands, Italy, Norway, France, Germany, Mexico, India, Finland, Spain, South Korea, Sweden, or had an international focus spanning one or more of those listed (Table D4).

Table D4. Geographical locations of the research studies included in the secondary and tertiary level reviews.

Domain	Author	Total studies	Location					
			US	UK	Australia	Canada	Rest of Europe	Rest of World
<b>Bullying</b>	Merrell et al. (2008)	16	6	4	-	2	2 Belgium, 1 Italy, 1 Norway	-
	Smith, Ananiadou & Cowie (2003)	9	1	2	-	1	1 Belgium, 1 Norway 1 Germany, 1 Spain, 1 Switzerland	-
	Smith et al. (2004)	14	3	1	1	2	2 Norway, 1 Belgium 1 Italy, 1 Finland 1 Germany, 1 Switzerland	-
	Vreeman & Carroll (2007)	26	10	6	1	1	2 Italy, 2 Norway, 1 Belgium 1 Switzerland, 1 Czechoslovakia	1 South Africa
<b>Social Drug Use</b>	Canning et al. (2004)	15 <i>1 meta-analysis 1 syst review 13 'other' reviews</i>	9	6	-	-	-	-
	Faggiano et al. (2005)	32	30	1	-	1	-	-
	Gates et al. (2006)	17	15	1	-	-	-	1 China
	Jones et al. (2006)	208	195	4	-	4	2 Switzerland 1 Croatia	1 Hong Kong 1 Thailand
	McGrath et al. (2006)	7 <i>2 meta-analyses 3 syst. reviews 2 lit. reviews</i>	6	-	-	-	-	1 Unknown
	Roe & Becker (2005)	16	14	-	-	1	-	1 Unknown
<b>Alcohol Use</b>	Foxcroft et al. (2002)	56	46	2	1	3	1 Norway, 1 Sweden	1 Chile, 1 across Australia, Chile, Norway and Swaziland
	Jones et al. (2007)	134	101	3	7	1	2 Netherlands, 1 Sweden, 1 Spain	1 Russia 1 Israel
<b>Tobacco Use</b>	Richardson et al. (2008)	61	48	3	3	-	4 Sweden	1 South Korea 1 New Zealand 1 international
	Sowden & Arblaster (2008)	6	5	-	-	-	1 Norway	-
	Sowden & Stead (2003)	17	11	3	2	-	1 Finland	-
	Stead & Lancaster (2005)	34	21	3	8	1	-	1 Unknown
	Thomas, Baker & Lorenzetti (2007)	22	16	1	1	-	2 Norway 1 Finland	1 India
	Thomas & Perera (2005)	94	66	2	2	6	5 Netherlands 3 Italy 2 Germany 2 Norway 1 Finland 1 Spain 1 France	1 India 1 Mexico 1 across Denmark, Finland, Netherlands, Portugal, Spain and UK

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## SECONDARY AND TERTIARY LEVEL REVIEWS

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## Tobacco Use

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