WHO Technical Report

Alcohol Misuse Prevention for Young People: a rapid review of recent evidence

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Declaration of Interest

Professor Foxcroft's Department has received funding from Diageo to adapt and pilot the Strengthening Families Programme 10-14 in several European countries.

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Executive Summary

Background: In July 2006 the World Health Organisation commissioned this rapid review on the role of education, awareness and persuasion in preventing alcohol use, harmful consumption and related problems with a specific focus on new information. Although this rapid review does not conform to Cochrane systematic review standards and has not been peer reviewed, the new information provides a rapid update to the 2002 Cochrane review on the primary prevention of alcohol misuse for young people.

Method: A sensitive free-text search of the National Library of Medicine (PubMed) from 2001 to July 2006 identified 775 papers. These were screened by the author using inclusion criteria from the 2002 Cochrane review. Twenty-three studies were appraised and included in this rapid review. Of these 23, 18 were new studies and 5 papers reported new results from studies previously reported in the 2002 Cochrane review.

Results: Of the 23 studies included in this rapid review, twelve showed evidence of ineffectiveness for alcohol misuse prevention, and seven showed some statistically significant effects but were generally compromised by poor methods, high attrition, inappropriate analysis, or effect sizes of questionable public health relevance. Although the results from these studies are not very convincing, in some cases further high quality research may possibly be enlightening. Four studies were highlighted as showing provisional evidence of effectiveness: a social marketing media based intervention (one study) and the Strengthening Families Programme 10-14 (SFP10-14; three studies), although the effect size obtained in an independent evaluation of an adaptation of the SFP10-14 for African American families was smaller than that observed in other studies but still potentially of public health relevance.

Conclusions and Recommendations: Currently there is insufficient evidence for strong evidence-based prevention policy. There is also insufficent evidence to suggest that education, awareness and persuasion approaches are ineffective for the prevention of alcohol misuse amongst young people. Several recommendations follow from these conclusions:

1. More details of the social marketing media-based intervention would be helpful to assess the potential public health relevance of the reported outcome measure and effect size, and independent replication studies in different settings should be considered.

2. More independent large-scale replication studies of the SFP10-14 in different settings should be considered, in an attempt to reinforce or counter the sparse existing evidence.

3. The public health relevance of the various outcome measures used in prevention research has not yet been clarified, and this issue should be addressed soon so that prevention researchers and policy makers are fully informed of the potential impact from particular prevention interventions.

4. The prevention interventions described in this rapid review and the earlier 2002 Cochrane review should also be considered in terms of their effectiveness for the prevention of tobacco and other drug use, alongside alcohol misuse. This wider perspective should inform prevention policy and prevention science policy.

5. The proliferation of prevention programmes for which there is little or no good evidence is a problem in many countries. To counter this tendency, it is suggested that the Precautionary Principle is extended to alcohol and drug misuse prevention, along with four qualifying criteria, to enable a pragmatic approach to prevention policy and prevention science policy. High-level adoption of this extended principle could help control the proliferation of non-evidence based prevention programmes and, at the same time, improve the evidence base for policy decisions.

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Background and Scope for this Report

A Cochrane systematic review of the effectiveness of alcohol misuse primary prevention programmes for young people, focusing on educational and psychosocial interventions, was commissioned by the World Health Organisation and supported by the UK Alcohol Education and Research Council in 2000. Results from this Cochrane review were reported at the EU Ministerial Conference on Young People and Alcohol in Stockholm, 2001, published on the Cochrane Library in 2002 [1], and formed the basis for a paper published in Addiction in 2003 [2]. In July 2006 the World Health Organisation commissioned this rapid review on the role of education, awareness and persuasion in preventing alcohol use, harmful consumption and related problems with a specific focus on new information to provide an update to the 2002 Cochrane review.

Given the short timescale it has not been possible to undertake a comprehensive update to the 2002 Cochrane review, comprising exhaustive literature searching, screening and appraisal of studies, with extended intention-to-treat analyses of selected studies as provided in the 2002 review. Rather, the work undertaken for this report has been rapid and reasonably thorough, but did not conform to Cochrane standards and has not been peer reviewed.

What works? Evidence of Effectiveness

An important characteristic of Cochrane reviews is a focus on randomised controlled trials as providing the best evidence of effectiveness and, where possible, meta-analytic synthesis, or pooling, of results from individual trials. In a randomised trial, the only difference between the people in the groups being compared is that of most interest: the intervention(s) under investigation. Thus, any differences in the outcomes between the

groups being compared will be due to either the interventions they were allocated to receive, or the chance variations that will always exist between groups of people. In part because of these chance variations, the results of a single trial will rarely be sufficient in many circumstances. Most trials are too small and their results are not sufficiently robust against the effects of chance [3]. In addition, small trials might be too focused on a particular type of individual to provide a result that can be either easily or reliably generalised to future groups of individuals in other settings.

Critics of the Cochrane approach argue that there is an over reliance on the randomised trial for the burden of proof, and that well conducted cohort or case control studies will provide similar estimates of effectiveness and are more practical for some research questions. There has been a suggestion that in some instances well conducted observational studies provide similar estimates to randomised controlled trials [4-6] but other analyses have shown that randomised controlled trials have found an intervention to be ineffective when observational studies have found a benefit [7-11]. This is an ongoing debate and the Cochrane methods group are looking closely at the questions of if, and how, observational studies might be included in Cochrane reviews in the future, in such a way as to avoid the possibility of flawed conclusions. It might be suggested that whilst there is some uncertainty, and debate, over the value of observational studies, policy makers should refer to such evidence when considering what works in the alcohol misuse prevention field. However, we would argue against this for the following reasons:

- the possibility of bias is increased in observational studies because potential confounding factors are not randomly distributed between intervention and control groups.

- regression to the mean cannot be controlled when there is no control group, and therefore results from observational studies may be susceptible to misinterpretation.

- alcohol misuse prevention efforts are likely to achieve only a small or modest effect, at best. Detecting a small effect requires precise experimental control with sufficient numbers to increase precision and to preclude chance as a likely explanation of the effect.

- there are a great number of alcohol misuse prevention programmes available and it is important to have the best evidence to discriminate the most effective interventions.

- amongst the most effective interventions, it is important to have reliable and precise estimates of effectiveness so that the relative effectiveness and cost-effectiveness of interventions can be considered.

- interventions that target behaviour are often demanding and costly. They generally require numerous sessions run by highly skilled staff. Without good evidence of effectiveness, scarce resources might be better spent elsewhere, and the possibility of causing harm should be considered.

Therefore, for both scientific, ethical and economic reasons, the burden of proof in the field of alcohol misuse prevention research should be provided by well conducted randomised controlled trials. Such trials are increasingly common, reflecting the increasing acceptance of this burden of proof argument.

Within randomised controlled trials there is another important aspect to consider: which outcome measures are the best indicators of effectiveness. In the abstinence oriented approach there is, on the face of it, a simple distinction between use and non use, and measuring use and non use is therefore appropriate, notwithstanding reliability and validity challenges. Increasingly however, alcohol misuse prevention approaches are also relevant to harm minimisation objectives and it is in this area that we need to consider which harms and indicators of harms are the most important. For example, does delaying the onset of drinking by a year or so for young people represent an important harm minimisation achievement? Similarly, for current drinkers, what sort of reduction in the frequency or quantity of use would represent an important health and social gain from a particular prevention programme.

Following this, in a randomised controlled trial a statistically significant difference between the prevention group and a control group for an alcohol use or alcohol-related outcome measure should not immediately lead to the adoption of that prevention programme. Rather, the statistically significant effect should be interpreted in terms of

the potential impact on alcohol misuse at a population level. This is particularly important when studies use arbitrary outcome measures that have no clear and immediate relevance to overall epidemiology.

Evidence from the 2002 Cochrane Review: Summary

There were two objectives of the 2002 Cochrane systematic review [1]: 1. to identify and summarize rigorous evaluations of educational and psychosocial interventions aimed at the primary prevention of alcohol misuse by young people; and 2. to assess the effectiveness of primary prevention interventions over the longer-term (> 3 years).

The systematic review followed the methodological approach of the International Cochrane Collaboration, specifically the Drugs and Alcohol Review Group [12]. The general approach is to try and find all published and unpublished studies that are relevant and are of sufficient methodological quality. These studies are then rigorously evaluated and analysed by two or more Cochrane reviewers and the results are incorporated onto the Cochrane Collaboration Database of Systematic Reviews.

The 56 studies included in the systematic review reported a range of different prevention interventions over the short-, medium- and longer-term. These different prevention interventions represented a number of different theoretical perspectives, from knowledge only programmes through to normative, social learning and multi-component community based interventions. Different settings for prevention programmes and a range of different outcome measures added to the diversity of studies included in this systematic review. Although 56 studies is a large number of studies to include in a Cochrane systematic review the diversity of approaches to prevention, of settings, and of outcome measurement precluded a formal meta-analytic synthesis of results: no two studies were sufficiently similar.

Evidence of ineffectiveness is also an important consideration for policy makers and prevention workers, and in this regard we identified a number of prevention interventions where the evaluation evidence showed evidence of ineffectiveness, despite limitations of the evaluations. It was more difficult to draw conclusions about evidence of effectiveness

in the short- and medium-term. Overall, studies with a short-term follow-up provided no clear evidence of effectiveness that would be useful to policy makers and prevention workers. Over the medium-term three interventions were reportedly partially effective but two of these had limiting methodological shortcomings [13, 14] and in the third [15] the effect sizes were small and of questionable public health, and therefore policy, relevance.

Over the longer-term, the results of the 2002 Cochrane systematic review pointed to the potential of the Strengthening Families Programme (SFP10-14; formerly known as the Iowa Strengthening Families Programme, ISFP) [16] for the primary prevention of alcohol misuse. The Number Needed to Treat (NNT) for the SFP10-14 over 4 years for three alcohol initiation behaviours (alcohol use, alcohol use without permission and first drunkenness) was 9 (for all three outcomes), but the confidence intervals were wide indicating low statistical power.

The 2002 Cochrane review concluded that the SFP10-14 should be evaluated on a larger scale and in different settings, that culturally-focused interventions should be studied further, that an assessment of the most important outcome measures in alcohol misuse evaluation research should be undertaken, and that evaluation studies should in general improve their methods.

Studies Published since the 2002 Cochrane Review

The Cochrane review described above was completed and published on the Cochrane Library in 2002. However, since that time numerous further studies have been completed and published and these studies are summarized here. It should be noted that a full literature search has not been undertaken because of the short timescale for the production of this report. Rather, the studies listed in this section are those that the author was already aware of or identified through a quick search of one bibliographic database. In due course a full literature search will be undertaken for the period 2001-present and additional recently completed studies may be found. These full search results will then be incorporated into an updated version of the Cochrane review.

The literature search for this rapid review comprised the following free-text search terms entered into the US National Library of Medicine (PubMed) with results restricted to papers reporting clinical trials or randomised trials, reviews or meta-analysis, only human studies, and published since 2001:

PubMed Search Strategy, 2001 – July 2006

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Search (drink* OR alcohol* OR liquor* OR beer* OR wine* OR
spirits OR drunk* OR intoxicat*) AND (adolescen* OR teenage* OR
youth* OR young people OR early adult OR young adult) AND
(intervent* OR educat* OR promot* OR programme* OR adverti* OR
counsel* OR treatment* OR campaign* OR mass media OR policy OR
policies OR legislation) AND (prevent* OR reduc* OR improv* OR
increas* OR decreas* OR chang* OR cessation OR drink driv* OR dui
OR health OR abstain* OR stop* OR problem OR intoxicat* OR
drunk*) AND (evaluat* OR success* OR effectiv* OR measur* OR
examin* OR compar* OR trial* OR rct)
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The results from the search (title and abstract) were screened by the author and relevant papers ordered. Once obtained these papers were screened again by the author and studies not meeting the inclusion criteria for the 2002 Cochrane review were excluded. Studies meeting the inclusion criteria were rapidly appraised and details summarized in tabular form, as per the 2002 Cochrane review.

The search identified 775 papers and most of these were excluded on initial screening. Thirty-four papers were obtained and after further screening and appraisal, 23 were included in this rapid review (see Appendix 2). Of these 23, 18 were new studies, and 5 were new results from ongoing studies that had already reported some results and had been included in the 2002 Cochrane review. Consistent with that earlier review, this rapid review describes these more recent results in terms of length of follow-up from baseline measurement: short-term (up to 1-year), medium-term (1-3 years) and longer-term (3+ years).

Interventions with short-term follow-up (up to 1-year)

Ten studies identified in this rapid review showed no effect of the prevention intervention compared with a control group over the shorter-term for some if not all of the outcome measures reported [17-26].

Three studies showed some evidence of a statistically significant benefit of the prevention intervention over controls over the shorter-term. Botvin [27] reported a 2.5% reduction in binge drinking rates in a Life Skills Training (LST) intervention group, though this study was compromised by high attrition and lack of an intention-to-treat analysis (ITT) and so this finding should be interpreted cautiously. Schinke [28] reported a statistically significant effect of a computer-based intervention and found that those who received the intervention had lower mean 30-day alcohol use than controls. However, although randomization was by site, the analysis was at the individual level without taking account of clustering and therefore leading to a possible over-estimation of effect. Moreover, the actual effect size is difficult to interpret and is of dubious public health relevance. Wu [29] reported from a study of ImPACT, a parental monitoring and communication intervention, that the intervention reduced mean alcohol use, but there were some baseline differences in alcohol use between the intervention and control groups and the effect size is of dubious public health relevance.

One study [18] of a brief office based intervention showed increased alcohol use compared with controls, and this was a consistent effect across three alcohol use variables: 30-day use, 3-month use and 3-month binge drinking.

Interventions with medium-term follow-up (from 1- to 3-years)

Seven studies identified in this rapid review showed no effect of the prevention intervention compared with a control group over the medium-term for at least some of the outcome measures reported [19, 22, 30-34].

Eight studies reported some positive findings, in that some of the outcome measures reported showed significant differences between intervention and control groups over the medium-term. The short-term effect of LST [27] persisted into the medium-term, but note

the caution stated above. The Strong African American Families (SAAF) Programme is an adaptation of the Strengthening Families Programme 10-14 (SFP10-14) for African American youth and families. At a 29-month follow-up [20] and with an intention-to-treat (ITT) analysis, the SAAF group were 10% less likely to have started drinking than controls (19% vs 29%, $p<0.05$). However, it was not clear if this analysis accounted for clustering effects. In the same study a composite alcohol use measure was analysed in a complex structural equation model (SEM) and there appeared to be no direct effect of SAAF on the composite measure, but there was a small indirect effect mediated through youth protective factors. However, full details of this SEM along with alternative models were not presented so this result should be interpreted cautiously. In a *post hoc* analysis of Project ALERT data [30], baseline alcohol users had significantly lower alcohol misuse, alcohol related consequences and high risk use scores if they received the revised Project ALERT curriculum compared with controls. However, as this was a *post hoc* analysis this could be a chance finding and should be interpreted cautiously until further *a priori* studies provide confirmatory evidence. Moreover, the differences reported are difficult to interpret but do seem to be very small and therefore of dubious public health relevance. Although there were no significant effects of the School Health and Alcohol Harm Reduction Project (SHAHRP) [31] in basic analyses, more complex multi-level analysis showed one significant effect of the intervention, on a composite measure of 12-month consumption, but no significant effect on measures of risky consumption or own harm. This analysis was not ITT and there is the possibility that the calculation of the composite measure will have amplified any systematic measurement bias, so this result should be interpreted cautiously. Although Perry's study of DARE and DARE Plus [32] showed no significant effect of the DARE curriculum over controls for boys or girls, in a *post hoc* analysis there were some significant growth rate (rate of change) effects of DARE Plus for boys but not for girls. These are, however, *post hoc* analyses showing very small changes in growth rate and are of dubious public health relevance. The effects of the computer-based intervention reported by Schinke [28] persisted into the medium-term though the caveats mentioned above apply. Slater's Community Coalition and in-school media study [35] had a strong design and good analysis, with a significant reduction in lifetime alcohol use associated with a social marketing media-based

intervention. The effect size reported is potentially important and this intervention deserves further consideration. Spoth [34] reported 1.5 and 2.5 year follow-ups in a study examining both the Strengthening Families Programme (SFP10-14) and the Life Skills Training (LST) curriculum. At 1.5 years SFP10-14 appeared to be more important than LST for delaying alcohol initiation. At 2.5 years the combination of SFP10-14 and LST resulted in significantly lower mean weekly drunkeness scores than in the control group, but there was no significant difference for regular alcohol use. No alcohol initiation outcome measures were reported in the 2.5 year follow-up paper.

The Dartmouth Prevention Project [24] evaluated an office systems intervention and showed, unexpectedly, an increase in drinking initiation over the medium-term for those who received the alcohol prevention intervention. It is difficult to interpret this result as a negative effect as it is possibly spurious (i.e due to chance) or may even represent earlier but supervised drinking behaviour.

Interventions with long-term follow-up (3+ years)

Five studies identified in this rapid review showed no effect of the prevention intervention compared with a control group over the longer-term for at least some of the outcome measures reported [19, 33, 36-38]. These studies included an independent replication of the revised Project ALERT curriculum [37], and four year outcomes from Project Northland [33, 39].

Three studies reported some positive findings. Interestingly, in a growth curve analysis of 6.5 year outcomes from Project Northland [33], there were statistically significant differences in growth rates between intervention and control groups, though these differences are small and of dubious public health relevance. There are also some design problems with this study that limit interpretation. The effects of the computer-based intervention reported by Schinke [28] persisted into the longer-term though the caveats mentioned above apply. Six-year follow-up results from the evaluation of the Strenghtening Families Programme (SFP10-14) [40] showed persistence of effects from previous follow-up evaluations. These are currently only published as a growth-curve

model which showed potentially important delays in age of initiation between the intervention and control groups: for every 100 general population teenagers who had initiated alcohol use (without parental permission) by age 14.7 years, only 45 teenagers who received the intervention are likely to have initiated alcohol use at the same age. This is a potentially important finding.

Two studies reported increases in alcohol use associated with a prevention intervention over the longer-term. The Project Northland evaluation [39] indicates that when the intervention was withdrawn (the "interim" phase) higher drinking levels were found in the intervention group. The Dartmouth Prevention Project [24] found an increase in drinking initiation over the longer-term for those who received the alcohol prevention intervention. It is difficult to interpret this result as a negative effect as it is possibly spurious (i.e due to chance) or may even represent earlier but supervised drinking behaviour.

Interventions with evidence of little or no effectiveness

From the Table in Appendix 2, and the summaries presented above, there are a number of interventions for which there is some evidence of little or no effectiveness. These interventions are: Family Matters [17], a brief Office-based intervention [18], The Gatehouse Project [19], the Lions Quest Skills for Adolescence [41], Sembrano Salud [22], a Family-School Partnership intervention or Good Behavior Game Classroom intervention [36], an Emergency Department Interactive Computer Programme [23], DARE [32], the Dartmouth Prevention Project [24], STARS [38], a sport-based intervention [26], and a brief motivational intervention [25].

Interventions with insufficient evidence to allow provisional conclusions

For some of the interventions included in this rapid review, it is not appropriate to say that there is evidence of ineffectiveness, nor is it appropriate to flag these interventions as showing some good evidence of effectiveness. This is because of methodological shortcomings, for example low statistical power, high attrition, inappropriate or *post hoc* analyses and unclear effect sizes that are of dubious public health relevance. The

evaluation of LST [27] suffered from high attrition and no ITT analysis, combined with effect sizes of dubious public health relevance. Moreover, the joint evaluation of LST and SFP10-14 [34] highlights the value of SFP10-14 over LST, at least for drinking initiation. Ellickson's evaluation of the revised Project ALERT [30] tended to show no effect apart from a small statistically significant effect for baseline users in a *post hoc* analysis. However, in an independent replication study [37] of the revised Project ALERT curriculum no effects were found. The evaluation of SHAHRP [31], showed no statistically significant effects in basic analyses though if the differences reported were confirmed in better powered and analysed replication studies then they may be of interest. Project Northland [33] showed a small effect at two years but this had disappeared by four years. However, in a more complex analysis at 6.5 years, there was a small effect of dubious relevance in terms of differences in growth rates. A computer-based intervention [28] showed persistent effects over 1, 2 and 3 year-follow-ups but the analysis did not account for clustering and showed effect sizes of unclear relevance. The ImPACT programme [29] had a statistically significant effect on average alcohol use scores, though the effect size is of dubious public health relevance.

Interventions with provisional evidence of some effectiveness

Slater's study [35] of a norms-based social marketing prevention intervention showed a significant effect of media in reducing the rate of lifetime alcohol use amongst young people (OR=0.398, p=0.009) over a 2-year follow-up period. The study involved 16 communities and 4216 students across the four major regions of the United States. There was moderate attrition however and the sample was largely white. Overall, this is a potentially useful study and deserves further attention. More information from this study would be useful, including longer-term follow-ups and any details of other outcome measures that have not been reported. This intervention should be considered for replication studies in other settings.

As in the 2002 Cochrane review, the Strengthening Families Programme 10-14 (SFP10-14) is worth highlighting. Six-year follow-up results [40] demonstrate that the significant effect of the intervention on drinking initiation persist over the longer-term, with effect

sizes that may be of public health relevance. There was moderate attrition in this study over the longer-term. The same research team also reported from a different SFP10-14 evaluation [34], albeit in the same setting, which showed similarly notable effects of the SFP10-14 intervention on drinking initiation over the medium-term, and also a significant effect on weekly drunkeness when SFP10-14 was combined with a LST intervention, but there was no statistically significant effect on regular alcohol use though the direction of effect was similar. An independent evaluation of an adapted version of the SFP10-14 for African American familes is just beginning to report [20]. This study had remarkably low attrition, just 6% over a 29-month follow-up period. There was a statistically significant difference at 29-month follow-up for alcohol initiation between the intervention and control groups despite this study having lower power than other SFP10-14 evaluations, but the magnitude of effect was smaller than similar stage effects in the two other studies reported by Spoth's team [34, 40], although the effect size remains of potential public health relevance. However, it was not clear if this analysis accounted for clustering effects. The results for a composite alcohol use measure were less clear, with the intervention having an indirect effect in a complex multivariate analysis. More information from these studies would be useful, including longer-term follow-ups and any details of other outcome measures that have not been reported. The SFP10-14 intervention should be considered for replication studies in other settings.

Are Prevention Effects Large Enough to be Worth the Effort?

Assuming replication studies are able to confirm the provisional evidence for effectiveness highlighted above. Would that be enough to persuade policy makers that these interventions are worthwhile? Not quite, because policy makers would undoubtedly ask the question: "How should we interpret this evidence; what does it mean?".

In order to address this point, the first step would be to calculate the potential impact of an intervention at the population level. For example, in the SFP10-14 study [40], the authors calculated that for every 100 general population teenagers who had initiated alcohol use (without parental permission) by age 14.7 years, only 45 SFP10-14 adolescents are likely to have initiated the same behaviour at that age. From knowledge

of the development of alcohol use and misuse, and from the epidemiology of alcohol misuse and harms, we should be able to say whether or not this sort of effect is worthwhile, and we could then model the impact of the programme if implemented across a whole population, using appropriate assumptions and sensitivities, so that policy makers could see the potential overall benefit.

Helpfully, the question "are prevention effects large enough to be worth the effort" was posed by Caulkins and colleagues in a report from the RAND Drug Policy Research Centre in the United States [42]. Analysing the costs and effectiveness of several established alcohol and drug prevention programmes, this report concluded that where a universal prevention programme has only a relatively small impact, then the investment may still be worthwhile.

The authors' mathematical model took 10 factors and combined them to provide an assessment of the benefits of school-based alcohol and drug prevention in terms of health-care costs and wider societal costs (e.g. loss of productivity) avoided due to cases prevented, with a discount factor applied because these costs would be incurred in the future. This assessment was then set alongside the cost of providing the prevention programme, and a straightforward comparison was made. The report's conclusion that the health and social benefits per participant stemming from reduced alcohol, tobacco and drug use (US$840 from alcohol, tobacco, cocaine and marijuana) appear to exceed the economic costs of running the programmes (c.US$150 per participant), seemed to be robust in the face of a fairly wide-ranging sensitivity analysis.

These findings assume that prevention programmes have an effect on multiple substance use: alcohol, tobacco, cocaine and marijuana in the mathematical model. The model shows that the major benefit is in fact from reductions in the use of alcohol and tobacco, accounting for approximately two thirds of the benefit, even if heroin and methamphetamines are added to the model, but the conclusion remains that prevention programmes that directly or indirectly have an impact on multiple substances rather than programmes that have an effect on just one behaviour, for example marijuana use, are likely to be more cost effective.

Overall, this model suggests that alcohol and drug prevention programmes are worthwhile (at least in the USA as this data forms the basis for the model), but only if such programmes have a measurable effect demonstrated in high quality scientific studies. However, the model does not tell us which alcohol and drug prevention programme provides the best value in particular settings. One prevention programme may be four times as effective as another, but at three times the cost. Alternative prevention programmes, and the opportunity costs of implementing one over another, need to be considered fully so that policy makers can decide which programme provides the best value.

In the Face of Scientific Uncertainty: the Precautionary Principle

The results of this rapid review, together with the results from the 2002 Cochrane review, generally paint a picture of scientific uncertainty. Although many prevention interventions have not been found to be effective, and there are some studies where methodological shortcomings preclude any provisional conclusions, there are a small number of prevention interventions for which there is some evidence of effectiveness, albeit in only one or two studies and in particular geographical and cultural settings. This clearly is not sufficient for strong evidence based prevention policy, as there is a need for replication studies in different settings to confirm or disconfirm provisional findings. As pointed out in the introduction to this report, most single trials are too small and their results are not sufficiently robust against the effects of chance [3]. But neither is this a conclusion that alcohol education and misuse prevention is ineffective, as some have argued [43, 44]. This does, however, leave policy makers with an absence of strong evidence on which to make decisions, and it is in this context that the following suggestion regarding the precautionary principle is made.

The precautionary principle was initially developed to cover environmental hazards, for instance the United Nations 1992 Rio Declaration [45] states that "Nations shall use the precautionary principle to protect the environment. Where there are threats of serious or irreversible damage, scientific uncertainty shall not be used to postpone cost-effective measures to prevent environmental degradation". Similarly, the oft-quoted Wingspread

Statement [46] recommends that "where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, bears the burden of proof". This means that those wishing to introduce a new product, for example a new pesticide, are required to provide convincing evidence for its safety otherwise regulatory bodies can exert the precautionary principle to limit the use of the product.

More recently there have been calls to extend the precautionary principle to other areas of public safety, for example public health actions [47] including injury prevention [48] where it is argued that the original focus of the precautionary principle on environmental hazards is "*visionary but short sighted*" [48]. Accordingly, the principle can be extended to, for example, cell phone use in cars, or the use of bicycle helmets. In these examples there is still debate about what the evidence tells us, but under the extended precautionary principle the benefit of any doubt about harmfulness would prompt policy makers to take action to prevent cell phone use in cars (as many countries have now done through legislation), or to promote cycle helmet use (as many countries now do through health promotion activities). This suggested development of the precautionary principle is more complex than it might at first seem, with not only an expansion into public safety, but also an extension into the area where there is overlap between the prevention of harm and the promotion of health. Simply stated, the original precautionary principle might be expressed as:

> *Prohibiting an activity where there is scientific uncertainty of potential harm from the activity is justified;*

whereas the extended principle would also add the following:

> *Supporting an activity where there is scientific uncertainty of potential benefit from the activity may be justified.*

The original, or primary, form of the principle follows from the notion that one should do no harm, or nonmaleficence, whereas the extended, or secondary, form is based on the

notion of beneficence. Both are important notions for public health and specifically for alcohol policy and prevention.

Extending the precautionary principle in this way it is possible to see how it might be applied as a value in alcohol and drug prevention policy where there is provisional or equivocal evidence about the effectiveness of prevention programmes, and where the potential for harm if an unknowingly effective programme is not implemented is considered to be high. From the provisional evidence of effectiveness in this report and the earlier 2002 Cochrane review, coupled with the potential for disbenefit or harm if potentially effective programmes are not implemented, policy makers arguably have a rationale for invoking the precautionary principle until such time as further evidence emerges which convincingly rejects the currently provisional or limited evidence of effectiveness.

Although the precautionary principle is arguably an important concept when applied to the field of alcohol and drug prevention, and therefore might be one of the explicit values held by policy makers, there is a danger that the principle might be loosely applied to support preventive actions where there is no or poor evidence for effectiveness or cost effectiveness or, worse still, if there was a risk that a prevention programme might do more harm than good. This possibility has been raised [49-51] although it is also possible that any iatrogenic effects from prevention programmes are spurious statistical artefacts [1, 2]. In any case, the primary form of the precautionary principle (nonmaleficence) should generally be dominant over the secondary form of the principle (beneficence). Any loose or unclear application of the precautionary principle would be unfortunate as it would undermine the principle and essentially make it unworkable: the principle should not, in any circumstance, be applied so that just any preventive action can be justified. Rather, four qualifying criteria should be established:

- The costs and harms associated with a lack of effective action are considered to be high.
- There is some provisional high quality evidence of effectiveness for a specific preventive action, with no indication that the preventive action is in itself harmful, but

further research is needed to provide convincing evidence either for or against the preventive action.

- Cost-effectiveness studies or models point to the potential of the preventive action to reduce costs and harms.

- Further high quality studies are fully resourced and planned or ongoing to establish convincing evidence for or against the specific preventive action so that the opportunity cost associated with a possibly ineffective preventive action can be minimised.

Providing the precautionary principle is only used when these four qualifying criteria are satisfied then we should have an important and workable principle.

One aspect where this formulation differs from earlier and narrower statements of the precautionary principle is responsibility for the burden of proof. According to the Wingspread Declaration [46], the proponents of the activity should bear the burden of proof. But with alcohol and drug use and misuse it is the general lack of activity which is potentially harmful, and it is difficult to see who the proponents for not undertaking a specific preventive action would be, other than those who think the opportunity cost is too high and that prevention resources would be better invested elsewhere. Because of this the burden of proof should, for practical reasons, rest with those who have responsibility for alcohol and drug policy and for the best use of public funds, i.e. governments. The final criterion above is therefore important otherwise there is a danger that public money will continue, year after year, to be wasted on ineffective alcohol and drug prevention programmes.

Alcohol and drug prevention policy makers have probably, for many years, been using an implicit form of the precautionary principle. Otherwise why would there be so many prevention programmes supported in many parts of the world that are not evidence based? And the proliferation of non-evidence based prevention programmes is certainly a cause of concern for many scientists and policy makers. What is suggested here is that this implicit value set should be developed into an explicit and workable statement of the

precautionary principle that will not only form the basis for preventive action in the face of scientific uncertainty, but will also form the basis for supporting further research to limit the opportunity cost associated with ineffective preventive action. In this way, prevention policy and prevention science policy are joined in pragmatism. Governments and other agencies may wish to consider incorporating this explicit statement of the precautionary principle, along with the four qualifying criteria, as part of their alcohol and drug prevention policy value set.

Conclusions and Recommendations

This rapid review examined studies relevant to the effectiveness of primary or universal alcohol misuse prevention programmes for young people published since the 2002 Cochrane review on the same topic, and focusing on educational and psychosocial interventions. In conclusion, currently there is insufficient evidence for strong evidence-based prevention policy. There is also insufficent evidence to conclude that education, awareness and persuasion approaches are ineffective for the prevention of alcohol misuse amongst young people.

Twenty-three studies were included in this rapid review. Of these, twelve showed evidence of ineffectiveness, seven showed some statistically significant effects but were generally compromised by poor methods, high attrition or inappropriate analysis and the effect sizes were typically of dubious public health relevance. At this time, these interventions might possibly be considered for further high quality research because there is a general lack of good evidence for or against them. Four studies were highlighted as showing provisional evidence of effectiveness: a social marketing media based intervention (one study) and the Strengthening Families Programme 10-14 (SFP10-14; three studies), although the effect size obtained in an independent evaluation of an adaptation of the SFP10-14 for African American families was smaller than that observed in other studies. These two different approaches both merit further consideration and evaluation in independent replication studies in different settings.

This rapid review, and the 2002 Cochrane review, focused on primary or universal prevention interventions. Therefore it is not possible to comment on the effectiveness of secondary or targetted prevention interventions. For example, the effectiveness of social norms interventions for heavy drinking college students has not been covered in this rapid review, but this approach this has been examined in several trials and is the focus of an ongoing Cochrane review. Therefore the relative merits of universal or targetted prevention approaches have not been considered. Similarly, the relative merits of legal, fiscal or coercive approaches to reducing alcohol misuse amongst young people have also not been considered in this report.

The public health relevance of the various outcome measures used in prevention research has not yet been clarified, and this issue should be addressed as a matter of some concern. For example, delaying the onset of alcohol use amongst young people seems to be the major effect of the SFP10-14, but the importance of this effect in terms of reducing subsequent alcohol-related harms is not clear. Similarly, the importance of reductions in the frequency or quantity of drinking amongst young people need to be clarified and understood.

Universal alcohol misuse prevention for young people may be cost-effective according to a model from the RAND Drug Policy Research Centre, but ideally when combined with prevention of tobacco and other drugs. Although this rapid review has focused on alcohol misuse prevention, most of the prevention interventions described in this report are generic alcohol and drug prevention programmes, and therefore they should also be considered in terms of their effectiveness for the prevention of tobacco and other drug use alongside alcohol misuse. This wider perspective should inform prevention policy and prevention science policy.

The proliferation of prevention programmes for which there is little or no good evidence is a problem in many countries. To counter this tendency, it is suggested that the Precautionary Principle is extended to alcohol and drug misuse prevention, along with four qualifying criteria, to enable a pragmatic approach to prevention policy and prevention science policy. High-level adoption of this extended principle could help

control the proliferation of non-evidence based prevention programmes and, at the same time, improve the evidence base for policy decisions.

Appendix 1: Detailed Results from 2002 Cochrane Review

There were two objectives of the 2002 Cochrane systematic review [1]: 1. to identify and summarize rigorous evaluations of psychosocial and educational interventions aimed at the primary prevention of alcohol misuse by young people; and 2. to assess the effectiveness of primary prevention interventions over the longer-term (> 3 years).

The systematic review followed the methodological approach of the International Cochrane Collaboration, specifically the Drugs and Alcohol Review Group [12]. The general approach is to try and find all published and unpublished studies that are relevant and are of sufficient methodological quality. These studies are then rigorously evaluated by two or more Cochrane reviewers and the results are incorporated onto the Cochrane Collaboration Database of Systematic Reviews.

For the purpose of this systematic review, young people were defined as children, adolescents and young adults aged up to 25 years-old, and studies included in this systematic review evaluated psychosocial or educational interventions aimed at preventing the onset of alcohol use or alcohol misuse by young people. Systematic electronic database searches identified over 6000 titles, although many titles appeared more than once. A number of papers, including unpublished reports, were also found from other sources. After these titles and abstracts were previewed, over 600 papers/ reports/ dissertations were obtained and screened against the inclusion criterion of design, relevance and outcome and many papers were excluded at this stage. Detailed examination of remaining papers through the completion of systematic data extraction forms led to a substantial number being rejected, leaving 56 studies that met the review's quality inclusion criteria.

As the heterogeneity of settings, design of studies, source and format of interventions, outcomes measured and target group was substantial, an overall estimate of effect (i.e. a meta-analysis) would have little practical meaning. Therefore the data were analysed in the form of a structured narrative systematic review [52]. An additional intention-to-treat (ITT) analysis was presented for selected studies reporting positive outcomes over the

longer-term (3+ years). This comprises a re-analysis of study results on an intention-to-treat basis as this information is of more relevance to policy makers.

Interventions with short-term follow-up (up to 1-year)

Fifteen studies reported partially effective short-term interventions [53-67]. It is difficult to assess the potential of these projects from such short-term results, especially as the pattern and scale of positive outcomes for these studies is unconvincing. Many of these studies reported some effective and some ineffective outcomes, and it is difficult to know what to make of such mixed results.

Twenty-four interventions with only a short-term follow-up reported some non-significant outcomes [54, 59, 60, 63-83], and there were no clear or systematic differences between those judged partially effective and those judged ineffective. Indeed, some interventions reported both significant and non-significant effects, depending on the outcome variable used.

Four studies reported interventions which appeared to increase drinking behaviour (relative to control groups) in the short-term [65, 72, 75, 84]. The interventions carried out in these studies did not appear to be characteristically different from the studies described above as partially effective or ineffective: most interventions combined social skills training with knowledge-based education. This phenomenon may be artefactul, due to poor design, method or analysis (e.g. *post hoc* tests) and should therefore be interpreted cautiously.

Interventions with medium-term follow-up (from 1- to 3-years)

Of the twelve studies reporting medium-term partially effective interventions [13-15, 85-93], few were convincingly effective, and most were marred by methodological shortcomings. Studies worth noting are (a) the STARS school and family intervention [15], based in two schools, comprising a strong design, low attrition, and significant effects on alcohol use and misuse, although the effect sizes seem small; (b) Botvin's [14] culturally focused intervention evaluation, although design limitations hamper

generalisability; and (c) Scaggs' [13] PhD work based on the "self-in-situation theoretical model", although with this study differential attrition is a problem.

Nineteen studies that carried out a medium-term follow-up found no evidence of intervention effectiveness [13, 15, 59, 84-88, 90, 91, 93-101]. Several of these had previously reported some short-term significant effects, and this suggests that any early reductions in drinking behaviour achieved by the intervention had eroded in the medium-term.

Two interventions were found to increase drinking behaviour in the medium-term. Duryea [87] reported that the intervention group (knowledge and social skills programme; U.S. teenagers) reported more excessive drinking than a control group three years later. Hopkin's [88] found evidence of a negative effect of an intervention (social skills and affective education; U.S. teenagers) in 10% of alcohol-related variables. As mentioned above, this phenomenon may be artefactul, due to poor design, method or analysis (e.g. *post hoc* tests) and should therefore be interpreted cautiously.

Interventions with long-term follow-up (3+ years)

Three studies reported effective longer-term interventions:

Botvin [86] followed up several thousand U.S. teenagers six years after initial administration of a Life Skills Training (LST) intervention, which is a multi-modal drug education programme. They reported significantly less self-reported drunkenness in those teenagers who received the intervention compared with a control group, although the effect size seems small. Botvin [86] also report more convincing results for those teenagers who attended at least 60% of the intervention sessions - a "Hi-fidelity sample" - but this analysis is flawed as the direct comparability of this sub-group with the full control group is compromised (i.e. this is not an "intention-to-treat" analysis).

Schinke [102] reported a long-term follow-up of a culturally focused school and community intervention with Native Americans. A skills based intervention group were around 7% less likely than a control group to be weekly drinkers three and a half years

after baseline measurement. This was statistically significant although the public health impact of this effect is difficult to judge.

Spoth [16] conducted an evaluation of a family-based intervention using a strong design, and although there was a moderate attrition rate, there was also a consistent pattern of effectiveness across the three drinking behaviour variables they reported. Importantly, the effectiveness of this intervention seemed to increase over time, reflecting the developmentally oriented intervention outcome model on which the intervention is based. This intervention deserves further consideration and study on the basis of these results.

Five other studies reported long-term follow-ups. Ellickson [84] reported from a large sample study of U.S. teenagers in a trial of Project ALERT, which incorporated information and social skills education. Early signs of partial effectiveness were not repeated over the long-term - by the end of High School (five year follow-up) no effects of the intervention remained. Longer-term outcome results from Project Northland [92] showed that at four year follow-up there were no significant effects of the Project Northland intervention over the control group. Wynn [103] reported a longer-term follow-up of the Alcohol Misuse Prevention Study (AMPS) of Dielman and colleagues [94] and stated that there was no significant effect of the AMPS curriculum on tenth grade alcohol misuse. Clayton [104] followed up a Drug Abuse Resistance Education (DARE) intervention after five and ten years (when participants were 20 years-old), and found that DARE status was unrelated to alcohol use at follow-up. The evaluation by Loveland-Cherry [105] showed a mixed pattern of results. There was a significant but very small positive effect of the intervention on alcohol use, no significant effect on alcohol misuse, and the authors also showed in a *post hoc* sub-group analysis that those individuals in the intervention group who were already drinkers at baseline were less likely to use and misuse alcohol at follow-up compared with similar controls.

Interventions with no evidence of effectiveness

Of the interventions described above as reporting no effects of the intervention over the short, medium or longer-term, it may be that some were poorly evaluated and that

therefore ineffectiveness has not been confirmed. For many interventions, however, it is probably reasonable to say that the evidence base does not support their continued use in the primary prevention of alcohol misuse for young people, other than in further research studies. These interventions are: "DAPPER" [68], "Alcohol Education in Schools" [85], "A Drug Abuse Prevention Programme" [69], "It's your decision" [71], "DARE" [81, 104], "AMPS" [91, 94], "Multi-component Inoculation Programme" [73], "Project ALERT" [84], "HLAY" [88], "Shifting Gears" [95], "A Drug Education Course" [78], "RPDD" [79], "PALS" [80], "MPP" [96], "Project Northland" [92], "PASS" [97], "Stay SMART" [100] and "Towards No Drug Abuse" [99].

Intention-To-Treat Re-analysis

The partially effective longer-term studies included in this intention-to-treat re-analysis are [86], [102] and [16]. It would not be meaningful to re-analyse the other longer-term studies in the same way; however this does run the danger of presentation bias.

In Table A1-1 and Table A1-2 the proportions (pI and pC) of individuals with events (including the estimated number of events for drop-outs) in each group were calculated. The absolute risk reduction (ARR) was the difference between the proportions (pC - pI). A 95% confidence interval was found for the ARR using the normal approximation for the difference between proportions. The standard error of each proportion was estimated using the number assessed since estimated data does not provide extra information. The ARR and its confidence limits were inverted to give the number needed to treat (NNT) [106] with 95% confidence interval.

Table A1-1 here

Table A1-2 here

The most interesting result from the intention-to-treat reanalysis is the NNT of 9 ([16], see Table A1-1). This indicates that for every 9 individuals who receive the intervention, there will be one fewer person reporting that they have ever used alcohol, used alcohol without permission, or ever been drunk, four years later. The 95% confidence interval indicates that the true (population) value will be in this range 95% of the time. When the 95% confidence interval for the NNT includes infinity, then this simply indicates that the statistic is not significant. However, the sample size needs to be considered as the width of the confidence interval is directly proportional to the size of the sample. It may be that a more promising intervention has a wider confidence interval simply because of a smaller sample size in the evaluation, but this does not mean that the intervention has less potential [107].

Main points from the 2002 Cochrane Systematic Review

The 56 studies included in the systematic review reported a range of different prevention interventions over the short-, medium- and longer-term. These different prevention interventions represented a number of different theoretical perspectives, from knowledge only programmes through to normative, social learning and multi-component community based interventions. Different settings for prevention programmes and a range of different outcome measures added to the diversity of studies included in this systematic review. Although 56 studies is a large number of studies to include in a Cochrane systematic review the diversity of approaches to prevention, of settings, and of outcome measurement precluded a formal meta-analytic synthesis of results: no two studies were sufficiently similar. Therefore the main results of this systematic review were presented in the form of a narrative synthesis, structured by follow-up period.

Evidence of ineffectiveness is also an important consideration for policy makers and prevention workers, and in this regard the 2002 Cochrane review identified a number of prevention interventions where the evaluation evidence shows evidence of ineffectiveness, despite limitations of the evaluations. It was more difficult to draw conclusions about evidence of effectiveness in the short- and medium-term. Studies with a short-term follow-up provided no clear evidence of effectiveness that would be useful

to policy makers and prevention workers. Over the medium-term three interventions were highlighted but two of these had limiting methodological shortcomings [13, 14] and in the third [15] the effect sizes were small and of questionable public health, and therefore policy, relevance.

Over the longer-term, the results of the 2002 Cochrane review pointed to the potential value of the Strengthening Families Programme 10-14 (SFP10-14; [16]) as an effective intervention for the primary prevention of alcohol misuse. The Number Needed to Treat (NNT) for the SFP10-14 over 4 years for three alcohol initiation behaviours (alcohol use, alcohol use without permission and first drunkenness) was 9 (for all three outcomes), but with wide confidence intervals indicating low statistical power.

The 2002 Cochrane review concluded that the SFP10-14 should be evaluated on a larger scale and in different settings, that culturally-focused interventions should be studied further, that an assessment of the most important outcome measures in alcohol misuse evaluation research should be undertaken, and that evaluation studies should in general improve their methods.

Table A1-1: Intention-to-treat analysis for selected studies (student as unit of analysis)

Program (follow-up)	**Outcome**	**Baseline N**	**Follow-up N**	**Outcome event rate** (follow-up only)	**Outcome event N** (follow-up only)	**Estimated outcome event N** (attrition only: control event rate used as basis for estimation in all groups)	**Total outcome event N** (actual + estimated)	**ARR (95% CI)**	**NNT (95% CI)** (rounded up)
Skills Training (culturally focused) (Schinke et al, 2000) (3.5 years)	4+ drinks in last week	A: 455 B: 462 C: 479	A: 388 B: 399 C: 412	A: 0.23 B: 0.25 C: 0.30	A: 89 B: 102 C: 124	A: 20 B: 19 C: 20	A: 109 B: 121 C: 145	A vs C: 6.23% (0.09% to 12.36%) B vs C: 4.09 (-2.17% to 10.27%)	A vs C:17 (9 to 1149) B vs C:25 (10 to ∞)
Strengthening Families Program (SFP) (Spoth et al, 2001) (4 years)	Ever used alcohol	ISFP: 205 PDFY: 187 Ctrl: 174	ISFP: 131 PDFY: 122 Ctrl: 126	ISFP: 0.50 PDFY: 0.60 Ctrl: 0.67	ISFP: 65 PDFY: 73 Ctrl: 85	ISFP: 50 PDFY: 44 Ctrl: 32	ISFP: 115 PDFY: 117 Ctrl: 117	ISFP vs Ctrl: 11.39% (-0.40% to 23.19%) PDFY vs Ctrl: 4.97% (-6.90% to 16.83%)	ISFP vs Ctrl: 9 (5 to ∞) PDFY vs Ctrl: 21 (6 to ∞)
Strengthening Families Program (SFP) (Spoth et al, 2001) (4 years)	Ever used alcohol without permission	ISFP: 232 PDFY: 215 Ctrl: 200	ISFP: 148 PDFY: 140 Ctrl: 145	ISFP: 0.40 PDFY: 0.51 Ctrl: 0.59	ISFP: 59 PDFY: 72 Ctrl: 85	ISFP: 49 PDFY: 44 Ctrl: 32	ISFP: 108 PDFY: 116 Ctrl: 117	ISFP vs Ctrl: 11.98% (0.63% to 23.33%) PDFY vs Ctrl: 4.69% (-6.82% to 16.19%)	ISFP vs Ctrl: 9 (5 to 160) PDFY vs Ctrl: 22 (7 to ∞)
Strengthening Families Program (SFP) (Spoth et al, 2001) (4 years)	Ever been drunk	ISFP: 232 PDFY: 216 Ctrl: 207	ISFP: 148 PDFY: 141 Ctrl: 150	ISFP: 0.26 PDFY: 0.35 Ctrl: 0.44	ISFP: 39 PDFY: 50 Ctrl: 66	ISFP: 37 PDFY: 33 Ctrl: 25	ISFP: 76 PDFY: 83 Ctrl: 91	ISFP vs Ctrl: 11.27% (0.31% to 22.24%) PDFY vs Ctrl: 5.56% (-5.73% to 16.86%)	ISFP vs Ctrl: 9 (5 to 327) PDFY vs Ctrl: 18 (6 to ∞)

Key: Schinke - A: Problem-solving, personal coping, interpersonal communication - all incorporating native American myths, legends and stories; B: as A but also involving local community residents; C: Control. **Spoth -** ISFP: Iowa Strengthening Families Programme; PDFY: Preparing for the Drug Free Years programme; Ctrl: control group

Table A1-2: Intention-to-treat analysis for selected studies (school as unit of analysis)

Program (follow-up)	**Outcome**	**Number of schools**	**Outcome event rate** (follow-up only)	**Estimated event rate** (ITT)	**S.E. of event rate**	**ARR (95% CI)**	**NNT (95% CI)** (rounded up)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	Monthly alcohol use	A: 18 B: 16 C: 22	A: 0.61 B: 0.57 C: 0.60	A: 0.61 B: 0.58 C: 0.60	A: 0.03 B: 0.03 C: 0.02	A vs C: N/A B vs C: 1.81% (-5.25% to 8.88%)	A vs C: N/A B vs C: 56 (12 to ∞)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	Weekly alcohol use	A: 18 B: 16 C: 22	A: 0.29 B: 0.24 C: 0.29	A: 0.29 B: 0.26 C: 0.29	A: 0.02 B: 0.02 C: 0.02	A vs C: N/A B vs C: 3.02% (-2.52% to 8.56%)	A vs C: N/A B vs C: 34 (12 to ∞)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	3+ drinks per occasion	A: 18 B: 16 C: 22	A: 0.57 B: 0.55 C: 0.59	A: 0.58 B: 0.57 C: 0.59	A: 0.02 B: 0.55 C: 0.02	A vs C: 1.21% (-4.34% to 6.75%) B vs C: 2.42% (-105.46% to 110.29%)	A vs C: 83 (15 to ∞) B vs C: 42 (1 to ∞)
Life Skills Training (LST) (Botvin et al, 1995) (6 years)	Drunkenness in last month	A: 18 B: 16 C: 22	A: 0.34 B: 0.33 C: 0.40	A: 0.36 B: 0.36 C: 0.40	A: 0.02 B: 0.03 C: 0.02	A vs C: 3.62% (-1.92% to 9.17%) B vs C: 4.23% (-2.84% to 11.30%)	A vs C: 28 (11 to ∞) B vs C: 24 (9 to ∞)

Key: A: teacher delivered (formal training + feedback); B: teacher delivered (video training); C: Control

Appendix 2: Characteristics of Recent Studies

Study	Methods	Participants	Interventions	Outcomes	Notes
Bauman [17]	Design: RCT (by individual) Follow-up: 12 months Attrition: 55.4% consented and completed baseline; 77.1 % followed up at both 3 and 12 months.	Age: 12 to 14 years Sex: male/female profile similar to 1990 US census Ethnicity: non-Hispanic whites over-represented compared with 1990 US census Size: N=1326 parent-adolescent pairs Setting: throughout contiguous United States Country: USA	Programme: Family Matters Focus: alcohol and tobacco Theoretical base: several social and behavioural science theories, incl. value expectancy theory, Health Belief Model, social learning theory, social inoculation theory, socialization, social control, social development and family interaction Key components: 4 booklets mailed to families plus telephone discussions with health educators Duration: once all booklets have been completed Primary staff: health educators	(i) Alcohol use Odds Ratio = 1.26, p=1.00	No statistically significant effect found
Boekeloo [18]	Design: RCT (by individual, stratified by provider, sex and age) Follow-up: 4 to 12 months post baseline Attrition: 8%	Age: 12 to 17 year-olds Sex: 44% male Ethnicity: 79% African American Size: 447/892 agreed to participate; 26 primary care providers in 5 practices	Programme: Brief Office based intervention Focus: alcohol use and misuse Theoretical base: Social Cognitive Theory and the Health Belief Model Key components: adolescent priming (AP): 15 min. pre-visit audio programme to educate about alcohol and to prime for discussion; provider prompting	**4 to 12 months post intervention** (i) drank last 30 days Ctrl: 23.5% AP: 37.8% (OR=2.31 (1.31-4.07)) AP+PP: 29.7% (OR=1.25 (0.76-2.06)) (ii) drank last 3 months Ctrl: 30.1% AP: 43.7% (OR=1.76 (1.12-2.77)) AP+PP: 38.4% (OR=1.22 (0.79-1.89)) (iii) binged last 3 months Ctrl: 5.1%	Analysis did not take account of clustering or use ITT. No effect of intervention over controls in expected directed; however some indication that intervention increased alcohol use reports over control groups.

Study	Methods	Participants	Interventions	Outcomes	Notes
		Setting: Five managed care group practices in Washington DC Country: USA	(PP): educational materials and self-assessments to prompt discussion Duration: brief (one session) Primary staff: primary care providers	AP: 11.1% (OR=3.00 (1.44-6.24)) AP+PP: 13.0% (OR=2.86 (1.13-7.26))	
Bond [19]	Design: Cluster RCT Follow-up: each year for 3 years (ie three waves) Attrition: 26/32 schools agreed to participate; 81% of students in intervention schools and 68% of students in control schools completed baseline; 3%, 8% and 10% attrition at waves 1-3, respectively.	Age: 13-14 years at baseline Sex: 46.8% male Ethnicity: 87.5% Australian born Size: 26 schools; 3623 students at baseline Setting: 12 districts from two education regions in Melbourne Country: Australia	Programme: The Gatehouse Project Focus: emotional wellbeing and health risk behaviours Theoretical base: not stated Key components: building a sense of security and trust; increasing skills and opportunities for good communication; building a sense of positive regard through values participation in aspects of school life. Duration: whole school approach + materials taught over a ten week period in year 1 (c. 15 hours); intervention team provided average of 40 hrs per school professional development activity Primary staff: teachers	**Year 1 Prevalence** <u>(i) Any drinking</u> Int: 39.4%; Ctrl: 44.0% OR=0.83 (0.63-1.09) Adj.OR=0.93 (0.71-1.21) <u>(ii) Regular drinker</u> Int: 9.4%; Ctrl: 10.0% OR=0.93 (0.59-1.47) Adj.OR=1.09 (0.77-1.57) <u>(iii) Binge drinker</u> Int: 17.4%; Ctrl: 19.3% OR=0.88 (0.63-1.23) Adj.OR=0.95 (0.69-1.32) **Year 2 Prevalence** <u>(i) Any drinking</u> Int: 50.3%; Ctrl: 53.6% OR=0.88 (0.65-1.19) Adj.OR=1.00 (0.78-1.28) <u>(ii) Regular drinker</u> Int: 7.5%; Ctrl: 8.1% OR=0.92 (0.56-1.49) Adj.OR=1.05 (0.70-1.57) <u>(iii) Binge drinker</u> Int: 22.7%; Ctrl: 24.4% OR=0.91 (0.64-1.30) Adj.OR=0.99 (0.70-1.38)	Good design and strong analysis, taking account of clustering effects. Some evidence of differential baseline responsiveness between intervention and control schools. Remarkably low attrition over 3 years of follow-up. No statistically significant effects of the intervention on drinking behaviour. No clearly distinguishable patterns in data. Authors report higher ICC than expected for substance use: therefore study probably underpowered to detect small effects.

Study	Methods	Participants	Interventions	Outcomes	Notes
				Year 3 Prevalence (i) Any drinking Int: 66.3%; Ctrl: 70.2% OR=0.83 (0.55-1.28) Adj.OR=0.96 (0.69-1.33) (ii) Regular drinker Int: 4.5%; Ctrl: 4.4% OR=1.02 (0.62-1.68) Adj.OR=1.13 (0.77-1.66) (iii) Binge drinker Int: 33.3%; Ctrl: 34.6% OR=0.94 (0.63-1.39) Adj.OR=1.02 (0.71-1.46)	
Botvin [27]	Design: RCT (by school stratified by smoking prevalence) Follow-up: 1 and 2 years Attrition: c.90% of eligible students participated, but only 58% (3041) completed both 1- and 2- year follow-ups.	Age: 7th grade students at baseline Sex: 56% female Ethnicity: 57% African American, 24% Hispanic, 8% Asian, 3% White Size: 5233 at baseline in 19 schools Setting: schools in New York City Country: USA	Programme: Life Skills Training Focus: alcohol, tobacco and other drugs Theoretical base: social learning theory; problem behaviour theory; communication theory Key components: cognitive-behavioural skills to raise self-esteem, resistance, assertiveness, relationship, anxiety management & communication skills Duration: 15 sessions + 10 + 5 booster sessions in following years (based on information from other studies) Primary staff: teachers, videos and peers	**One year-follow-up** (i) Binge drinking (> 5 drinks per occasion), adjusted for covariates Int: 1.8% Ctrl: 4.3% OR=0.41 (0.18-0.93) **Two-year follow-up** (i) Binge drinking (> 5 drinks per occasion), adjusted for covariates Int: 2.2% Ctrl: 5.2% OR=0.40 (0.22-0.74)	High attrition and no ITT analysis. Analysis did account for clustering effects though. Available case analysis showed significant effect of intervention. This should be assessed again within an ITT analysis and the effect size considered for importance in public health terms.

Study	Methods	Participants	Interventions	Outcomes	Notes
Brody [20, 108]	Design: Cluster RCT (by Community) Follow-up: 3 months post-test; 29 months from pre-test Attrition: c.6%	Age: 11 year-olds and their parents / primary caregivers Sex: 53.7% female (youth) Ethnicity: African American Size: 8 county units randomised; 478 eligible; 330 consented and enrolled; 305 analysed Setting: nine rural counties in Georgia Country: USA	Programme: Strong African American Families (SAAF) Program Focus: alcohol use and youth protective factors Theoretical base: based on Strengthening Families Programme [40]. Key components: Parents taught involved-vigilant parenting, adaptive racial socialization strategies, communication, expectations about alcohol use. Youth learn about following rules, adaptive behaviours when experiencing racism, goals for the future, peer norms, resistance skills. Duration: 7 sessions Primary staff: video tapes (narrator-led exercises) and groupwork. Group leaders recruited from local community (college graduates preferred)	**3-months post-test** (i) Alcohol use initiation since pre-test SAAF 0.06; Ctrl 0.13 ($Z=2.23$, $p<0.05$) **29-months follow-up** (i) Alcohol use initiation since pre-test SAAF 0.19; Ctrl 0.29 ($Z=2.16$, $p<0.05$) (iii) Composite Alcohol Use Index: Intervention correlated directly with outcome at -0.04; indirectly through youth protective (latent) factor at 0.37 (Int. to youth protective factor) and 0.29 (youth protective factor to composite index)	Good design and ITT analysis. Not clear if analysis accounted for clustering effect. Low attrition. Adaptation and replication of SFP10-14. Significant effects on alcohol initiation. Results for alcohol composite index presented in the form of a Structural Equation Model: no basic analysis of this variable provided. SEM showed no direct effect of intervention on alcohol composite, but there was a small indirect effect mediated through youth protective factors. Alternative SEM models were not presented, however, so this result should be interpreted cautiously. *Authors contacted for more information.*

Study	Methods	Participants	Interventions	Outcomes	Notes
Eisen [21, 41]	Design: RCT (by school) Follow-up: 1 and 2 year post-baseline (at end of intervention year) Attrition: 77% of eligible population of schools consented to participate. N=7426 (71%) of eligible population were consented (by parents) to participate. N=6239 (84%) followed up at 1-year and N=5691 (77%) followed up at 2-years. NB higher attrition rates amongst baseline marijuana users.	Age: 6th graders (96.1% aged 11-12years at baseline) Sex: 51.7% female Ethnicity: 33.9% Hispanic American; 25.7% white; 17.6% African American Size: 34 middle schools (N=7426 students) Setting: schools from major metropolitan areas (Los Angeles, Detroit and Washington) Country: USA	Programme: Lions Quest Skills for Adolescence (SFA) Focus: alcohol and drugs Programme type: multicomponent life skills education programme Theoretical base: social influence and social cognition models Key components: challenges of teenage years; self-confidence and communication; managing emotion; peer relationships; living healthy and drug free Duration: 40 sessions (35-45 mins) delivered by teachers during 7th grade year. 8 key sessions. Teachers trained in a 3-day workshop. Primary staff: teacher (trained)	**1-year follow-up** *Baseline non-users (difference and 95% CI):* (i) Lifetime alcohol use: 29.61% SFA vs 30.19% Ctrl (Diff: -0.58 (-3.11 to 4.27) (ii) 30 day alcohol use: 7.17% SFA vs 7.25% Ctrl (Diff: -0.08 (-2.33 to 1.57) (iii) Binge drinking (3+ in last 30 days): 3.15% SFA vs 3.58% Ctrl (Diff: -0.43 (-1.91 to 0.66) *Baseline users (difference and 95% CI):* (i) TO Binge drinking FROM 30 day alcohol use: 16.98% SFA vs 20.45% Ctrl (Diff: -3.47 (-15.07 to 8.14) **2-year follow-up** (i) Lifetime alcohol use: 66.97% SA vs 66.33% Ctrl (Diff: -0.64 (-2.25 to 3.53), p=.66 (ii) 30 day alcohol use: 22.85% SFA vs 23.18% Ctrl (Diff: -0.33 (-3.01 to 2.35), p=.80 (iii) Binge drinking (3+ in last 30 days): 12.67% SFA vs 13.11% Ctrl (Diff: -0.44 (-2.78 to 1.91), p=.71	Good analysis: intention to treat and accounting for hierarchical design effects No clear or significant effects of programme for full sample. Post-hoc analysis showed significant effect of SFA on follow-up binge drinking rates for baseline binge drinkers only.

Study	Methods	Participants	Interventions	Outcomes	Notes
				Baseline binge drinkers: (iii) Binge drinking (3+ in last 30 days): 27% SFA vs 37% Ctrl, p<0.01	
Elder [22]	Design: RCT (by school) Follow-up: 1 and 2 years Attrition: 22/25 schools agreed to participate; 537 out of 658 (82%) at final follow-up	Age: not stated Sex: 49% female Ethnicity: Hispanic Migrants Size: 660 adolescent and parent/caregiver pairs Setting: Families came from 22 schools and 15 school districts in San Diego County Country: USA	Programme: Community-based tobacco and alcohol use prevention: "Sembrano Salud" Focus: alcohol and tobacco use Theoretical base: Stress and coping model; social influence concepts e.g. coping, self-esteem, self-efficacy, risk taking; situation factors Key components: Presentation of information, modeling and behaviour rehearsal; development of parental support and parent-child communication. Control group received first aid and home safety instruction. Duration: adolescents attended 8 weekly 2-hour sessions; parents attended 3 session jointly with their adolescent. Primary staff: group leaders recruited from local universities and colleges	**1-year follow-up** (i) 30 day drinking rates Int: 9.3%; Ctrl: 7.1% **2-year follow-up** (i) 30 day drinking rates Int: 6.8%; Ctrl: 5.3% Adj. OR=1.21 (0.73-1.97)	Good design and appropriate analysis, adjusting for clustering effect. Good retention of participants over two years. No significant effect of intervention over comparison group at any follow up. No significant effect after adjusting for baseline covariates.
Ellickson [30]	Design: RCT (by school, blocked by geographic region) Follow-up: 18 months post-baseline, following 8th grade	Age: Grades 7 & 8 (ages 12-14) Sex: 50% male Ethnicity: 12.5% non-white (mostly	Programme: Project ALERT (Revised: 3 new lessons in Grade 7 including additional material on alcohol misuse) Focus: alcohol, tobacco, other drugs	(i) overall alcohol misuse, range 0-8 (mean score) Baseline non users: 0.22 ALERT vs 0.30 ctrl (n.s.) Baseline experimenters: 0.64 ALERT vs 0.65 ctrl (n.s.) Baseline users: 1.78 ALERT vs 2.23	Good design and appropriate analysis. Differences for baseline users although statistically significant are small and of questionable

Study	Methods	Participants	Interventions	Outcomes	Notes
	session Attrition: 1.6% students refused to participate at baseline and 0.4% refused at follow-up. 4689 (86.6% completed baseline survey; 4276 (91.2%) of baseline group completed follow-up survey	native American) Size: N=4689 students from 55 middle schools Setting: 9 schools in cities with >50,000 residents; 11 in towns of 5,000 to 25,000 residents; rest in rural communities Country: USA	Programme type: social & life skills Theoretical base: social influence model; health belief model; self-efficacy theory Key components: develop reasons not to use drugs, discuss pressures to use drugs, resistance skills, prevalence of drug use. Duration: 7th grade - 11 sessions; 8th grade - 3 sessions Primary staff: delivered by teachers trained with a 1-day workshop	ctrl ($p<0.05$) <u>(ii) alcohol-related consequences, range 0-5 (mean score)</u> Baseline non users: 0.13 ALERT vs 0.18 ctrl (n.s.) Baseline experimenters: 0.38 ALERT vs 0.39 ctrl (n.s.) Baseline users: 1.04 ALERT vs 1.29 ctrl ($p<0.05$) <u>(iii) high risk use, range 0-3 (mean score)</u> Baseline non users: 0.11 ALERT vs 0.11 ctrl (n.s.) Baseline experimenters: 0.27 ALERT vs 0.25 ctrl (n.s.) Baseline users: 0.74 ALERT vs 0.92 ctrl ($p<0.01$)	importance. These results seem to be from *post hoc* tests and therefore need to be replicated in subsequent follow-ups and studies. One complex analysis [109] on a sub-sample of schools suggests that results may be mediated by exposure to alcohol advertising: baseline (7th grade) students were significantly less likely to be drinkers at grade 9 if they had less exposure to alcohol advertising. However, this effect is only apparent when all other variables are included in a complex regression equation, making interpretation and conclusions less clear. A more parsimonious regression model revealed no significant effect of advertising.
Furr-Holden [36]	Design: RCT (by class within schools) Follow-up: 5, 6 and 7 years after randomization Attrition: 97% parental consent to participate; 84% assessed at follow-up (mean age 13	Age: mean 6.2; range 5.3 to 7.7 years at baseline (recruited in 1993) Sex: Males "slightly more than" 50% of sample Ethnicity: 85-90%	Programme: (i) Family-School Partnership intervention (FSP); (ii) Classroom-Centred intervention (CC) incorporating Good Behavior Game (GBG) Focus: alcohol and drugs Programme type: multi-component skills and parenting	**Outcome results combined across all outcome assessments (i.e. 5, 6 and 7 year follow-ups)** <u>Alcohol use without parental permission:</u> (i) Incidence rates at follow-up Control: 52/178 (29%) FSP: 73/196 (37%) CC: 65/192 (34%)	Possible contamination between classes within schools: could weaken any effect of the intervention. Good analysis: Intention to treat and regression analysis accounted for clustering effect.

Study	Methods	Participants	Interventions	Outcomes	Notes
	years)	Afro-American, remainder Euro-American Size: 9 schools; 27 classes; 678 children Setting: Nine urban primary schools in one catchment area in one of the mid-Atlantic states Country: USA	Theoretical base: general child development theory Key components: (i) FSP: training for teachers and other staff in parent-school communication; weekly home-school learning and communication; 9 workshops for parents led by teacher and psychologist/social worker. (ii) CC: curricular enhancements; improved classroom behaviour management; supplementary strategies for underperforming children; GBG activities (iii) Controls: standard educational setting Duration: FSP and CC interventions spread across first grade year Primary staff: teachers and school psychologist or social worker	(ii) RR (95% CI) from regression models (compared with Control) *A: no covariate adjustment* *B: adjusted for covariates* FSP (*A*): 1.23 (0.80,1.88) FSP (*B*): 1.07 (0.67,1.71) CC (*A*): 1.06 (0.69, 1.63) CC (*B*): 0.95 (0.58, 1.54)	No statistically significant effects.
Maio [23]	Design: RCT (by individual, blocked) Follow-up: 3 and 12 months Attrition: 85% consent rate; 88.5% participants followed-up at 12 months	Age: 14-18 years (average 15.9) Sex: 33% female Ethnicity: 67% white, 18% black, 16% other Size: N=655 at baseline (329 Int; 326 Ctrl) Setting: emergency department in 2-	Programme: Emergency Department (ED) Interactive Computer Program Focus: alcohol Theoretical base: Social Learning Theory Key components: Int: interactive computer program depicting a virtual house party; Ctrl: no intervention Duration: one interactive	**12 month outcomes, mean (sd) scores** <u>(i) Alcohol Misuse Index (n.s.)</u> Baseline: Int 2.1 (5.0), N=271; Ctrl 2.0 (4.2), N=271 12 months: : Int 1.8 (3.7), N=271; Ctrl 2.1 (4.7), N=271 <u>(ii) Binge drinking (n.s.)</u> Baseline: Int 1.2 (2.6), N=289; Ctrl 1.0 (2.4), N=271 12 months: : Int 1.4 (2.9), N=271; Ctrl 1.2 (2.8), N=271	Good design and appropriate analysis. Satisfactory allocation concealment. No statistically significant effects.

Study	Methods	Participants	Interventions	Outcomes	Notes
		sites in Michigan; participants had presented with a minor injury Country: USA	computer session Primary staff: research assistant		
McBride [31, 76, 110]	Design: RCT (by school but one school refused to be randomised to so was assigned to control group; authors assumed randomization after a sensitivity analysis) Follow-up: 8, 20 and 32 months from baseline Attrition: no details of participation rates within schools. 24.1% attrition at final follow-up	Age: 13 years at Phase 1 Sex: no details Size: N = 1111 (intervention) and N = 1232 (control) Setting: school Country: Australia	Programme: The School Health and Alcohol Harm Reduction Project (SHAHRP) Focus: alcohol Theoretical base: primarily social inoculation Key components: Various strategies for "interactive dissemination" including delivery of utility information, skillrehearsal, individual and small group decision making, and scenario based discussions. 64% of activities were interactive. Duration: Phase 1: 17 activities over 8-10 lessons; Phase 2: 12 activities over 5-7 weeks Primary staff: teachers using manuals and structured lesson plans	A three-level multi-level regression model showed a significant effect of the intervention (group x time effect) for 12 month consumption but not for measures of risky consumption or own harm. The three-level multi-level regression model also showed some significant interaction effects for context of use, though these are not clearly interpretable and are reported inconsistently. **32 months follow-up: basic analysis** <u>(i) No. of standard drinks in last 12 months (mean and 95% CI)</u> Int. baseline: 30.2 (11-49) Int. final follow-up: 273.8 (217-330) Ctrl baseline: 19.7 (12-27) Ctrl. final follow-up: 362.7 (283-443) <u>ii) Hazardous or harmful drinking once a month or more often (% and 95% CI)</u> Int. baseline: 11.3 (8.8-14.3) Int. final follow-up: 32.2 (28.2-36.2) Ctrl baseline: 13.3 (10.5-16.8) Ctrl. final follow-up: 33.9 (29.7-39.8)	Baseline differences between the intervention and control were statistically significant for both context of use and harms associated with own use of alcohol. Therefore there is a possibility of selection bias. Multi-level analysis taking account of nested design, but no Intention To Treat analysis. The multi-level statistical model showed one significant effect of the intervention, but as the 12 month consumption measure was log-transformed and not standardized interpretation is difficult. The interpretable effect sizes are shown in a more basic analysis and although not significant, the difference between the point estimates for 12-month consumption in the Int. and Ctrl. Groups might be of interest. This

Study	Methods	Participants	Interventions	Outcomes	Notes
				<u>iii) Own harm index (mean and 95% CI)</u> Int. baseline: 2.0 (1.5-2.5) Int. final follow-up: 9.8 (8.3-11.3) Ctrl baseline: 1.5 (1.1-1.9) Ctrl. final follow-up: 12.5 (10.5-14.4)	suggests that the study might be underpowered. However, the 12-month consumption measure is a composite construction from self-reported frequency and quantity measures, multiplied up to provide a 12-month estimate. This composite measure might therefore inflate any systematic reporting bias between the Int. and Ctrl. Group. There are some inconsistencies in the reporting of results in different papers.
Perry [33, 39, 111]	Design: RCT (by school district) NB: Control schools offered Phase I curricula in 1994 to 1997 (i.e. delayed intervention group) Follow-up: 2.5, 4 and 6.5 years from baseline Attrition: 19% (no significant differences in attrition analysis) at 4 years; 32% at final follow-up	Age: sixth grade at baseline; students graduated from high school in 1998 (final follow-up) Sex: 53% male Size: 2351 students at baseline Setting: Community intervention Country: six counties in North East Minesota,	Programme: Project Northland Focus: Alcohol Programme type: Social skills and parental socialisation Theoretical base: Not stated Key components: 6th grade: "Slick Tracy Home Team Program" - 4 sessions of activity story books completed as homework with parents- Notes for parents also issued. 7th grade: "Amazing Alternatives! Program" - parents evening; 3 week peer-led classroom sessions; home programme booklets mailed to	**2.5 year follow-up** <u>i) Past month alcohol use:</u> Int: 6.9% - 23.6% Ctrl: 3.9% - 29.2% ($p<0.05$) <u>ii) Past week alcohol use:</u> Int: 3.8% - 10.5% Ctrl: 20% - 14.8% ($p<0.05$) **4 year follow-up** Perry et al (2000) report no significant differences between intervention and control groups at a four year follow-up (after two years without an intervention programme). **6.5 year follow-up: growth curve**	Analysis by individual but allocation by school district in medium term results. Growth curve model at end of Phase 2 provide a more robust hierarchical analysis. Probable contamination as control schools were given Phase 1 intervention prior to and during the Phase 2 intervention. This is a poor design feature. Significant but small positive effect of intervention in medium term, although this effect dissipated when the

Study	Methods	Participants	Interventions	Outcomes	Notes
		U.S.A.	parents; further notes for parents 8th grade: "Powerlines" - an 8 session classroom curriculum, a theatre production, further notes for parents and continuation of peer-led/participation programmes Community intervention task force: Comprising civic leaders, law enforcers, parents & volunteers, focused on law enforcement and underage alcohol sales, plus business involvement Key components: Interim Phase (1995-1996) "Shifting Gears" when students were in Grade 9; no intervention in Grade 10 Key components: Phase 2 11th grade: "Class Action" - 6 session classroom curriculum focusing on social and legal consequences and community responsibilities Parents received behavioural tips; print media campaigns; peer action teams; community action teams to reduce commercial and social access to alcohol (the "centrepiece" of Phase 2) Duration: see above Primary Staff: Teachers, peer leaders and community based adults	**analysis results 1998 (post Phase 2)** <u>(i) Past month alcohol use (mean and SE)</u> Int. baseline 1.96 (0.07) growth rate 0.13 (0.03) Ctrl. baseline 1.83 (0.07) growth rate 0.20 (0.03) NB score range 1 to 7 <u>(ii) Past week alcohol use (mean and SE)</u> Int. baseline 1.39 (0.04) growth rate 0.07 (0.02) Ctrl. baseline 1.33 (0.03) growth rate 0.10 (0.02) NB score range 1 to 7 <u>(iii) Binge drinking (5 or more drinks in a row in last 3 weeks) (mean and SE)</u> Int. baseline 1.60 (0.06) growth rate 0.09 (0.03) Ctrl. baseline 1.45 (0.05) growth rate 0.18 (0.02) NB score range 1 to 6	intervention was withdrawn. NB results from interim phase indicate higher drinking levels in intervention group but no clear explanation for this. Growth curve analysis results show statistically significant differences in growth rates between intervention and controls, though these are small and of unclear public health relevance. NB the baseline rates used were from the beginning of Phase 2. Possibly a more interesting analysis would have been to model from Phase 1 baseline for Phase 2 outcomes. No significant difference in success rate of purchase attempts by minors in off-sale and all outlets.

Study	Methods	Participants	Interventions	Outcomes	Notes
Perry [32]	Design: RCT (by school) Follow-up: 18 months post-baseline Attrition: 16%	Age: Seventh Grade students Sex: 51.6% male Ethnicity: 67.3% white Size: 24 schools comprising 6278 eligible – 6237 (92.7%) completed baseline Setting: schools & neighbourhoods in Minneapolis, St. Paul Country: USA	Programme: DARE and DARE Plus Focus: alcohol, drugs and violence Theoretical base: not stated Key components: DARE (16 schools): skills to resist influences to use drugs and to handle violent situations; character building and citizenship; DARE plus (8 schools): peer-led parental involvement programmes, youth-led extra-curricular activities, community adult action teams and postcard mailings to parents; Ctrl (8 schools): no intervention Duration: DARE: 10 sessions Primary staff: DARE trained police officers	**18 month follow-up growth Curve Analysis results (boys)** <u>(i) Past Year Alcohol Use (mean and SE)</u> Ctrl: baseline 1.31 (0.04), growth rate 0.26 (0.03) DARE: baseline 1.31 (0.03), growth rate 0.21 (0.03); growth rate vs Ctrl p=0.12 DARE Plus: baseline 1.29 (0.03), growth rate 0.19 (0.03); growth rate vs Ctrl p=0.04 NB score range 1 to 7 <u>(ii) Past Month Alcohol Use (mean and SE)</u> Ctrl: baseline 1.11 (0.02), growth rate 0.14 (0.02) DARE: baseline 1.10 (0.02), growth rate 0.11 (0.02); growth rate vs Ctrl p=0.12 DARE Plus: baseline 1.09 (0.02), growth rate 0.08 (0.02); growth rate vs Ctrl p=0.01 NB score range 1 to 7 <u>(iii) Ever been drunk (mean and SE)</u> Ctrl: baseline 1.09 (0.02), growth rate 0.15 (0.02) DARE: baseline 1.10 (0.02), growth rate 0.11 (0.02); growth rate vs Ctrl p=0.07 DARE Plus: baseline 1.07 (0.02), growth rate 0.11 (0.02); growth rate vs Ctrl p=0.07 NB score range 1 to 6 **18 month follow-up growth Curve Analysis results (girls)**	Good design and appropriate analysis for clustering. No ITT analysis however. No significant effect of DARE curriculum over Controls for boys or girls. Some significant growth rate effects of DARE Plus for boys but these are small and of unclear public health relevance. No significant effects of DARE Plus for girls.

Study	Methods	Participants	Interventions	Outcomes	Notes
				(i) Past Year Alcohol Use (mean and SE) Ctrl: baseline 1.23 (0.03), growth rate 0.25 (0.04) DARE: baseline 1.27 (0.03), growth rate 0.27 (0.04); growth rate vs Ctrl p=0.35 DARE Plus: baseline 1.25 (0.03), growth rate 0.23 (0.04); growth rate vs Ctrl p=0.36 NB score range 1 to 7 (ii) Past Month Alcohol Use (mean and SE) Ctrl: baseline 1.08 (0.02), growth rate 0.12 (0.03) DARE: baseline 1.08 (0.02), growth rate 0.13 (0.02); growth rate vs Ctrl p=0.40 DARE Plus: baseline 1.08 (0.02), growth rate 0.08 (0.03); growth rate vs Ctrl p=0.15 NB score range 1 to 7 (iii) Ever been drunk (mean and SE) Ctrl: baseline 1.07 (0.02), growth rate 0.12 (0.02) DARE: baseline 1.07 (0.02), growth rate 0.13 (0.02); growth rate vs Ctrl p=0.33 DARE Plus: baseline 1.07 (0.02), growth rate 0.07 (0.02); growth rate vs Ctrl p=0.11 NB score range 1 to 6	
St. Pierre [112]	Design: RCT (by class within school) Follow-up: 3 years post-baseline	Age: 7th grade students at baseline Sex: 50.5% male	Programme: Project ALERT (Revised: 3 new lessons in Grade 7 including additional material on alcohol misuse) Focus: alcohol, tobacco, other	Graph shows no difference between ALERT and Control Group at final follow-up for alcohol use in past month. **Multivariate statistical analysis:**	No benefit of ALERT in this good replication study. Possible contamination because of allocation by

Study	Methods	Participants	Interventions	Outcomes	Notes
	Attrition: 72.5% completed all 5 waves of data collection	Ethnicity: 81.4% Caucasian Size: 1649 students in 8 schools Setting: Pennsylvania middle schools Country: USA	drugs Programme type: social & life skills Theoretical base: social influence model; health belief model; self-efficacy theory Key components: develop reasons not to use drugs, discuss pressures to use drugs, resistance skills, prevalence of drug use. Duration: 7th grade - 11 sessions; 8th grade - 3 sessions Primary staff: classroom educators and trained local adults	<u>(i) Past month alcohol use</u> beta = -0.011 (SE=.170), n.s. <u>(ii) Past year alcohol use</u> beta = -0.071 (SE=.153), n.s. <u>(i) Binge drinking</u> beta = -0.001 (SE=.256), n.s.	class within school, though authors discount this by comparison with substance use rates in other schools. Otherwise, good analysis taking account of hierarchical nature of data. Authors also repeated analytical strategy from original ALERT study but this also showed no benefit for ALERT programme.
Schinke [28]	Design: RCT (by site after stratification by geography and ethnic-racial background) Follow-up: annually to 3 years Attrition: 7.9%, 11.8% and 6.7% in CD, CD+P and Ctrl groups, respectively (3 years)	Age: 10 to 12 at baseline (mean=11.5) Sex: 51.4% female Size: N=514 Setting: Youths recruited from 43 New York City, New Jersey and Delaware community agencies Country: USA	Programme: Computer Based Intervention with and without Parental Involvement Focus: alcohol and drugs Theoretical base: social learning, problem behaviour and family interaction theory Key components: goal setting, coping, peer pressure, refusal skills, norm correcting, self-efficacy, problem solving, decision making, effective communication and time management Duration: Youth: 10 45-minute sessions + 30-minute booster sessions. Parents: 1 30-minute	<u>(i) mean (SD) Alcohol over past 30 days (4-6 item Likert scale)</u> **Baseline (N=514)** CD: 0.7 (0.18) CD+P: 0.7 (0.21) Ctrl: 0.7 (0.17) **1-Year (N=513)** CD: 0.8 (0.16), p<0.05 vs Ctrl. CD+P: 0.8 (0.14), p<0.05 vs Ctrl. Ctrl: 1.2 (0.24) **2-Year (N=452)** CD: 0.9 (0.38), p<0.05 vs Ctrl. CD+P: 0.9 (0.19), p<0.05 vs Ctrl. Ctrl: 1.4 (0.41) **3-Year (N=469)** CD: 1.0 (0.22), p<0.05 vs Ctrl. CD+P: 0.9 (0.17), p<0.05 vs Ctrl.	Analysis at individual rather than site level: therefore no consideration of ICC Significant effects persist over time, though effect sizes of unclear public health benefit

Study	Methods	Participants	Interventions	Outcomes	Notes
			videotape with print material + 2-hour workshop and CD interaction as booster sessions Primary staff: Interactive CD-ROM	Ctrl: 1.6 (0.34)	
Slater [35]	Design: RCT (by community with group matching minimization method) Follow-up: 2 years Attrition: 68.6% provided data at all four measurement points	Age: sixth and seventh graders (mean age at baseline 12.2 years) Sex: 52% female Ethnicity: 83.3% white Size: 16 communities and 4216 students Setting: 16 communities across the four major regions of the US (northeast, southwest, Midwest, west). Country: USA	Programme: Community Coalition and in-school media Focus: alcohol and marijuana Theoretical base: social-ecological framework (norms based social marketing) Key components: Community Coalition: community readiness workshops, training in using campaign media; In-school media: print materials and promotional items (e.g. t-shirts, water bottles etc) Duration: 2 years coalition and media effort Primary staff: school counselors and community prevention workers	**OR for combined community coalition and in-school media versus control communities** <u>(i) Lifetime alcohol use</u> 0.398, p=0.009	Strong design and analysis Significant effect of media in reducing rate of alcohol use amongst young people; merits replication research This study also included an in-school alcohol curriculum condition (All Stars) but this is not included here because of failed randomization.
Spoth [34, 113]	Design: RCT (by school) Follow-up: 1.5 and 2.5 years post-baseline Attrition: 18% overall (similar rates in each group) at year 1.5; 27%	Age: 7th Grade Sex: 53% male Ethnicity: 96% Caucasian Size: N = 1664 (year 1.5); N =	Programme: Strengthening Families programme and Life Skills Training Focus: alcohol and other drugs Programme type: strengthening families programme and life	**1.5 year follow-up** <u>i) new alcohol users (prop'n)</u> LST: 35.2% LST+SFP: 25.7% Control: 36.7% **2.5 year follow-up**	Baseline equivalence in all groups. Analysis accounts for ICC but no ITT analysis. Year 1.5: SFP appears to be the important component in the

Study	Methods	Participants	Interventions	Outcomes	Notes
	overall at year 2.5 (no differential attrition)	1650 (year 2.5) Setting: schools in a midwestern state Country: USA	skills training Theoretical base: SFP: Bio psychosocial model LST: social learning Key components: SFP: including parent and youth building and practice promoting skill development and knowledge acquisition. Duration: SFP: 7 x 2 hour evening sessions and 4 similar booster sessions 1 year later. LST: 15 x 40 minute classroom sessions and 5 similar booster sessions 1 year later. Primary staff: facilitators	<u>(ii) regular alcohol use (adj. mean (SE))</u> LST: 0.229 (0.025), n.s. vs Ctrl LST+SFP: 0.198 (0.025), n.s vs Ctrl Control: 0.240 (0.026) (scale 0-1) <u>(iii) weekly drunkenness (adj. mean (SE))</u> LST: 0.038 (0.011), n.s. vs Ctrl LST+SFP: 0.034 (0.010), p=.03 vs Ctrl Control: 0.056 (0.011) (scale 0-1)	combined LST and SFP intervention for delaying alcohol initiation. Year 2.5: Combined LST+SFP significant for weekly drunkenness but not for regular alcohol use, though effects in same direction. No results reported for alcohol initiation at this timepoint.
Spoth [40, 114, 115]	Design: RCT (by school) Follow-up: 1, 2, 4 and 6 years following baseline Attrition: 2 years: 293 families completed 2 year follow-up. Therefore attrition = 34% from baseline. 4 years: 303 families completed 4 year follow-up. Therefore attrition = 32%. An attrition analysis showed no differential	Age: 6th Grade at baseline Sex: 54% female adolescents Size: 846 families recruited, 446 completed baseline tests (238 ISFP, 208 controls) Setting: Universal, family focused interventions (with allocation and recruitment	Programme: Iowa Strengthening Families Programme (ISFP) (now called Strengthening Families Programme 10-14 (SFP10-14) Focus: Drugs including alcohol Programme type: Parenting/family socialization Theoretical base: biopsychosocial model Key components: ISFP: Parents & children taught to clarify expectations, appropriate discipline, manage strong emotions and communicate	**1 year follow-up** <u>i) Alcohol initiation index (mean (se) scores)</u> ISFP: 0.50 (0.07) Ctrl: 0.73 (0.07), Effect size = 0.26 **2 year follow-up** <u>i) Alcohol initiation index (mean (se) scores)</u> ISFP: 0.78 (0.10) Ctrl: 1.43 (0.10) Effect size = 0.39 **Following results: baseline - yr1 - yr2 - yr4** <u>ii) Ever used alcohol:</u>	Strong design but moderate attrition although robust attrition analysis. Potentially important results for the effectiveness of ISFP; increasing effect size over time and at 2 and 4 year follow-up the effect size is large. 6-year results show persistence of effect but more detail is awaited from pending publications. The four year follow-up

Study	Methods	Participants	Interventions	Outcomes	Notes
	attrition between families or schools. 6 years: 304 students from 23 schools. Therefore attrition = 32%.	through schools) Country: USA	effectively. Children also taught peer skills Ctrls: information leaflets only Duration: 7 family sessions/once per week (ave, 2 hours each) Primary Staff: 2-3 person teams	ISFP: 12.4% - 26.7% - 35.3% - 49.6% Ctrl: 16.1% - 36.1% - 56.0% - 67.5% <u>iii) Ever used alcohol without permission:</u> ISFP: 2.5% - 8.7% - 19.0% - 39.9% Ctrl: 4.5% - 20.0% - 41.8%- 58.6% <u>iv) Ever been drunk:</u> ISFP: 1.9% - 6.8% - 9.8% - 26.4% Ctrl: 1.9% - 9.0% - 19.1% - 44.0% **6-year follow-up results** Currently only reported as a growth-curve model, but showing persistence of earlier effects: approximately 15% difference (NB read from graph) in lifetime alcohol use without permission between ISFP and Ctrl groups. Growth-curve model showed potentially important delays in age of initiation between ISFP and controls. The authors calculated that for every 100 general population teenagers who had initiated alcohol use (without parental permission) by age 14.7 years, only 45 ISFP adolescents are likely to have initiated the same behaviour at that age.	also included results for a second intervention group in this study - the 5 session "Preparing for the Drug Free Years (PDFY)" programme. However no baseline alcohol data were presented for this group and statistical tests showed no significant effect of this intervention over the control group (although there was a trend).
Stevens [24]	Design: RCT (by family) Follow-up: 12, 24 and 36 months Attrition: 4096 families	Age: 5th or 6th grade at baseline Sex: 46% female in Group A; 50% in Group B	Programme: Dartmouth Prevention Project Focus: alcohol and tobacco Theoretical base: office systems approach	**12 Months OR (95% CI)** <u>(i) Child ever drinker</u> OR=1.17 (0.92,1.48) **24 Months OR (95% CI)** <u>(i) Child ever drinker</u> OR=1.27 (1.03,1.55)	No significant preventive effects, but an unexpected increase in drinking initiation in the alcohol arm (A) over time. Difficult to interpret this

Study	Methods	Participants	Interventions	Outcomes	Notes
	approached; 3145 (77%) consented and completed baseline; 73% completed all three follow-up points.	Size: 3145 families Setting: 12 paediatric primary care practices in Massachusetts, New Hampshire and Vermont Country: USA	Key components: Increased parent-child communication in two groups: (A) alcohol and tobacco use; (B) gun safety, bicycle helmet, seatbelt use. Groups received regular messages and reinforcements about appropriate behaviour, communication skills, parenting skills, and family activities. Duration: intervention initiated during primary care visit and continued for 36 months with quarterly newsletters Primary staff: paediatric primary care workers	**36 Months OR (95% CI)** (i) Child ever drinker OR=1.30 (1.07, 1.57)	result as a negative effect, possibly spurious or might represent earlier but supervised drinking.
Werch [38]	Design: RCT (by individual within school) Follow-up: Yearly during 2-year intervention programme (1997, 1998) and 1-year post-intervention (1999) Attrition: 22% at one year post-intervention follow-up, evenly distributed by group	Age: 6th Grade (mean=12.08 years) at baseline (1996) Sex: 50% male Size: N=650 from 2 schools (one neighbourhood school and one 'Magnet' school); 87% of those eligible were recruited Setting: School Country: USA	Programme: STARS (Start Taking Alcohol Risks Seriously) Focus: Alcohol Programme type: affective, social skills Theoretical base: Social cognitive theory (MCMOS prevention model) Key components: Int: Year 1 - brief one to one consultation with nurse about avoiding alcohol use, followed by 10 prevention postcards to parents/guardians. Year 2 - follow-up nurse consultation (booster sessions) and 4 take home packs for the family)	**1-year post-intervention (1999) outcomes (3-3.5 years from baseline)** i) Ever tried alcohol: Neighbourhood: Int: 38%; Ctrl: 44.9% (n.s.) Magnet: Int: 54%; Ctrl: 61.7% (n.s.) ii) 7-day use: Neighbourhood: Int: 10.0%; Ctrl: 11.2% (n.s.) Magnet: Int: 10.7%; Ctrl: 12.0% (n.s.) iii) 30-day use: Neighbourhood: Int: 10.0%; Ctrl: 13.2% (n.s.) Magnet: Int: 11.3%; Ctrl: 17.4% (n.s.) iv) 30-day heavy use: Neighbourhood: Int: 6.0%; Ctrl: 9.3% (n.s.)	Randomisation by individual within school, therefore possibility of contamination. No significant effects but low sample size: study possibly underpowered

Study	Methods	Participants	Interventions	Outcomes	Notes
			Ctrl: 15 page alcohol education booklet Duration: see above Primary staff: Registered nurses	Magnet: Int: 4.7%; Ctrl: 8.7% (n.s.)	
Werch [26]	Design: Design: RCT (by individual within school) Follow-up: three months post-intervention Attrition: 452 followed up (c.10% attrition)	Age: 465 eight graders, mean age 13.2 years Sex: 62.1% female Ethnicity: 50.7% caucasian; 36.3% African American; 12.9% other Size: 465 students Setting: three schools in northeast Florida: one inner city, one suburban, one rural Country: USA	Programme: Sport-based Intervention Focus: alcohol use and physical activity Theoretical base: Social Cognitive Theory, Health Belief Model, Behavioural Self-Control theory, Theory of Planned Behaviour, Social Bonding Theory and Multi-Component Motivational Stages prevention model. Key components: a) brief sport consultation (SPORT); b) brief sport plus alcohol consultation (SPORT+); c) brief sport plus alcohol consultation plus mailed parent print materials (SPORT+P) Duration: SPORT: one consultation session, mean length 9 minutes. SPORT+: mean consultation length 26 minutes. SPORT+P had five parental SPORT cards mailed – one per week. Primary staff: school nurse	**Estimated Marginal Means (SE) (ANOVA) for various alcohol measures:** <u>(i) 30 day frequency</u> SPORT: Baseline 1.21 (.064); Follow-up 1.19 (.051); N=152; n.s. SPORT+: Baseline 1.29 (.064); Follow-up 1.18 (.052); N=150; n.s. SPORT+P: Baseline 1.20 (.063); Follow-up 1.17 (.051); N=152; n.s. <u>(ii) 30 day quantity</u> SPORT: Baseline 1.22 (.070); Follow-up 1.16 (.060); N=152; n.s. SPORT+: Baseline 1.25 (.071); Follow-up 1.26 (.060); N=150; n.s. SPORT+P: Baseline 1.28 (.070); Follow-up 1.18 (.059); N=152; n.s. <u>(iii) 30 day heavy use</u> SPORT: Baseline 1.05 (.043); Follow-up 1.06 (.027); N=152; n.s. SPORT+: Baseline 1.11 (.044); Follow-up 1.04 (.027); N=150; n.s. SPORT+P: Baseline 1.13 (.043); Follow-up 1.04 (.027); N=152; n.s. <u>(iv) Alcohol problems</u> SPORT: Baseline .30 (.136); Follow-up .14 (.127); N=152; n.s. SPORT+: Baseline .87 (.137); Follow-up .64 (.128); N=150; n.s. SPORT+P: Baseline .52 (.136);	Randomisation by individual within school, therefore possibility of contamination. Large number of statistical tests leading to possibility of chance findings. Subgroup analyses (not reported here – see paper) showed some differences according to prior alcohol use status, but no clear findings supporting any particular version of the intervention.

Study	Methods	Participants	Interventions	Outcomes	Notes
				Follow-up .45 (.127); N=152; n.s. <u>(v) Length of alcohol use</u> SPORT: Baseline 1.39 (.080); Follow-up 1.32 (.071); N=152; n.s. SPORT+: Baseline 1.49 (.081); Follow-up 1.44 (.072); N=150; n.s. SPORT+P: Baseline 1.37 (.080); Follow-up 1.27 (.071); N=152; n.s. <u>(vi) Alcohol initiation</u> SPORT: Baseline 2.93 (.150); Follow-up 2.78 (.151); N=152; n.s. SPORT+: Baseline 3.06 (.151); Follow-up 2.93 (..152); N=150; n.s. SPORT+P: Baseline 2.74 (.149); Follow-up 2.59 (.150); N=152; n.s.	
Werch [25]	Design: RCT (by individual within school) Follow-up: 4 months Attrition: 13% distributed evenly across intervention and control groups	Age: 11th and 12th grade students who had drank alcohol in last year Sex: 58.4% female Ethnicity: 53% white; 37% black; 9.1% other. Size: 232 students Setting: suburban high school in North East Florida Country: USA	Programme: Brief motivational intervention Focus: alcohol risk reduction Theoretical base: brief motivational intervention Key components: five-item screening instrument followed by brief one-on-one alcohol risk reduction consultation and a tip sheet reinforcing key messages Duration: brief intervention consultation Primary staff: Research staff who had received a two day training.	**Marginal Mean (SE) with higher score = higher risk** <u>Beer: 30 day frequency:</u> Int: 0.61(0.12); Ctrl: 0.86(0.12); p=.12 <u>Beer: 30 day quantity:</u> Int: 0.74(0.12); Ctrl: 0.85(0.12); p=.52 <u>Beer: 30 day heavy use:</u> Int: 0.19(0.06); Ctrl: 0.24(0.06); p=.57 <u>Beer: "chugging" (drinking as fast as you can):</u> Int: 0.17(0.06); Ctrl: 0.18(0.06); p=.90 <u>Wine: 30 day frequency:</u> Int: 0.20(0.06); Ctrl: 0.16(0.06); p=.58 <u>Wine: 30 day quantity:</u> Int: 0.13(0.05); Ctrl: 0.17(0.05); p=.57 <u>Wine: 30 day heavy use:</u> Int: 0.02(0.02); Ctrl: 0.03(0.02); p=.75 <u>Wine: "chugging" (drinking as fast as you can):</u> Int: 0.01(0.01); Ctrl: 0.00(0.01); p=.30	No benefit of intervention over controls at follow-up. Multiple statistical testing raises possibility of chance effects Analysis did not take account of clustering effects Fairly small sample from just one school, with possible contamination between intervention and control students

Study	Methods	Participants	Interventions	Outcomes	Notes
				Flavoured Coolers: 30 day frequency: Int: 0.52(0.11); Ctrl: 0.58(0.11); p=.68 Flavoured Coolers: 30 day quantity: Int: 0.67(0.11); Ctrl: 0.58(0.11); p=.57 Flavoured Coolers: 30 day heavy use: Int: 0.07(0.05); Ctrl: 0.14(0.05); p=.33 Flavoured Coolers: "chugging" (drinking as fast as you can): Int: 0.08(0.04); Ctrl: 0.08(0.04); p=.96 Fortified Wine: 30 day frequency: Int: 0.05(0.03); Ctrl: 0.08(0.03); p=.38 Fortified Wine: 30 day quantity: Int: 0.08(0.03); Ctrl: 0.08(0.03); p=.97 Fortified Wine: 30 day heavy use: Int: 0.00(0.00); Ctrl: 0.00(0.00); p= Fortified Wine: "chugging" (drinking as fast as you can): Int: 0.00(0.00); Ctrl: 0.00(0.00); p= Distilled Spirits: 30 day frequency: Int: 0.71(0.13); Ctrl: 0.79(0.13); p=.65 Distilled Spirits: 30 day quantity: Int: 0.68(0.13); Ctrl: 0.77(0.12); p=.64 Distilled Spirits: 30 day heavy use: Int: 0.17(0.07); Ctrl: 0.29(0.07); p=.24 Distilled Spirits: "chugging" (drinking as fast as you can): Int: 0.15(0.06); Ctrl: 0.15(0.06); p=.99 Malt Liquor: 30 day frequency: Int: 0.10(0.07); Ctrl: 0.33(0.07); p=.01 Malt Liquor: 30 day quantity: Int: 0.08(0.05); Ctrl: 0.24(0.05); p=.04 Malt Liquor: 30 day heavy use: Int: 0.04(0.05); Ctrl: 0.13(0.05); p=.16 Malt Liquor: "chugging" (drinking as fast as you can): Int: 0.02(0.03); Ctrl: 0.05(0.036); p=.44	

Study	Methods	Participants	Interventions	Outcomes	Notes
Wu [29]	Design: RCT (by site) Follow-up: 12 months Attrition: 29% over 12 months	Age: 12 to 16 years (media age 14 years) Sex: 58% female Ethnicity: black Size: 817 (3 groups: FOK only; FOK + ImPACT; FOK + ImPACT + Booster Setting: 35 housing developments, community centres and recreation centres in Baltimore, Maryland Country: USA	Programme: Focus on Kids (FOK) plus Informed Parents and Children Together (ImPACT) Focus: FOK: HIV risk reduction; ImPACT: parental monitoring and communication Theoretical base: Social learning theory Key components: FOK: decision making, goal setting, communication, negotiating, consensual relationships, information; ImPACT: prental monitoring and communication Duration: FOK: 8 sessions + booster at 6 and 10 months; ImPACT: 20-minute video and 2 role-plays Primary staff: health education worker	<u>(i) Drank alcohol, five point scale (mean scores: baseline – follow-up)</u> FOK only: 0.23 – 0.31 (N=243) FOK+ImPACT: 0.28 – 0.22 (N=172) FOK+ImPACT+Booster: 0.28 – 0.23 (N=165) p=.009 for FOK vs Combined FOK+ImPACT and FOK+ImPACT+Booster groups.	The addition of the ImPACT intervention seemed to reduce drinking when compared with the results from the FOK group alone. However, the mean difference, though statistically significant, is small and the public health relevance of this effect size is not clear.

Bibliography

1. Foxcroft D, Ireland D, Lister-Sharp DJ, Lowe G, Breen R. *Primary prevention for alcohol misuse in young people.* The Cochrane Database of Systematic Reviews 2002, Issue 3. Art. No.: CD003024. DOI: 10.1002/14651858.CD003024., 2002.
2. Foxcroft D, Ireland D, Lister-Sharp D, Lowe G, Breen R. *Longer-term primary prevention for alcohol misuse in young people: a systematic review.* Addiction, 2003. **98**: 397-411.
3. Ioannidis JPA. *Why most published research findings are false.* PLoS Medicine, 2005. **2**(8 (e124)): 696-701.
4. Benson K, Hartz AJ. *A comparison of observational and randomized controlled trials.* New England Journal of Medicine, 2000. **342**: 1878-1886.
5. Concato J, Shah N, Horwitz RI. *Randomized, controlled trials, observational studies and the hierarchy of research designs. .* New England Journal of Medicine, 2000. **342**: 1887-1892.
6. Britton A, McKee M, Black N, McPherson K, Sanderson C, Bain C. *Choosing between randomised and non-randomised studies: a systematic review.* Health Technology Assessment, 1998. **2**(13).
7. Chalmers TC, Matta RJ, Smith Jr. H, Kunzler AM. *Evidence favouring the use of anticoagulants in the hospital phase of acute myocardial infarction.* New England Journal of Medicine, 1977. **297**: 1091-1096.
8. Sacks H, Chalmers TC, Smith Jr H. *Randomized versus historical controls for clinical trials. .* American Journal of Medicine, 1982. **72**: 233-240.
9. Gotzsche PC, Olsen O. *Is screening for breast cancer with mammography justifiable? .* Lancet, 2000. **355**: 129-134.
10. Hulley S, Grady D, Bush T, Furberg C, Herrington D, Riggs B, al. e. *Randomized trial of estrogen plus progestin for secondary prevention of coronary heart disease in postmenopausal women.* Journal of the American Medical Association, 1998. **280**: 605-613.

11. Pocock SJ, Elbourne DR. *Randomized trials or observational tribulations?* **.** New England Journal of Medicine, 2000. **342**: 1907-1909.
12. Ferri M, Davoli M, Ali R, Auriacombe M, Chengzheng Z, Faggiano F, Farrell M, Foxcroft D, Ling W, Mattick R. *Cochrane Drugs and Alcohol Group*, in *In: The Cochrane Library: Issue 3*. 2002, Update Software: Oxford.
13. Scaggs LS. *A substance abuse awareness prevention program knowledge, attitudes and behaviours*, in *Unpublished Ph.D. Dissertation, Ohio State University*. 1985.
14. Botvin GJ, Schinke SP, Epstein JA, Diaz T, Botvin EM. *Effectiveness of culturally focused and generic skills training approaches to alcohol and drug abuse prevention among minority adolescents two-year follow-up results*, in *Psychology of Addictive Behaviours*. 1995. p. 183-194.
15. Werch CE, Pappas DM, Carlson JM, Edgemon P, Sinder JA, DiClemente CC. *Evaluation of a Brief Alcohol Prevention Program for Urban School Youth*, in *American Journal of Health Behaviour*. 2000. p. 120-131.
16. Spoth RL, Redmond C, Shin C. *Randomized Trial of Brief Family Interventions for General Populations Adolescent Substance Use Outcomes 4 Years Following Baseline*, in *Journal of Consulting and Clinical Psychology*. 2001. p. 1-15.
17. Bauman KE, Foshee VA, Ennett ST, Pemberton M, Hicks KA, King TS, Koch GG. *The influence of a family program on adolescent tobacco and alcohol use.* Am J Public Health, 2001. **91**(4): 604-10.
18. Boekeloo BO, Jerry J, Lee-Ougo WI, Worrell KD, Hamburger EK, Russek-Cohen E, Snyder MH. *Randomized trial of brief office-based interventions to reduce adolescent alcohol use.* Arch Pediatr Adolesc Med, 2004. **158**(7): 635-42.
19. Bond L, Patton G, Glover S, Carlin JB, Butler H, Thomas L, Bowes G. *The Gatehouse Project: can a multilevel school intervention affect emotional wellbeing and health risk behaviours?* J Epidemiol Community Health, 2004. **58**(12): 997-1003.
20. Brody GH, Murry VM, Kogan SM, Gerrard M, Gibbons FX, Molgaard V, Brown AC, Anderson T, Chen YF, Luo Z, Wills TA. *The Strong African American*

Families Program: a cluster-randomized prevention trial of long-term effects and a mediational model. J Consult Clin Psychol, 2006. **74**(2): 356-66.

21. Eisen M, Zellman GL, Massett HA, Murray DM. *Evaluating the Lions-Quest "Skills for Adolescence" drug education program: first-year behavior outcomes.* Addict Behav, 2002. **27**(4): 619-32.
22. Elder JP, Litrownik AJ, Slymen DJ, Campbell NR, Parra-Medina D, Choe S, Lee V, Ayala GX. *Tobacco and alcohol use-prevention program for Hispanic migrant adolescents.* Am J Prev Med, 2002. **23**(4): 269-75.
23. Maio RF, Shope JT, Blow FC, Gregor MA, Zakrajsek JS, Weber JE, Nypaver MM. *A randomized controlled trial of an emergency department-based interactive computer program to prevent alcohol misuse among injured adolescents.* Ann Emerg Med, 2005. **45**(4): 420-9.
24. Stevens MM, Olson AL, Gaffney CA, Tosteson TD, Mott LA, Starr P. *A pediatric, practice-based, randomized trial of drinking and smoking prevention and bicycle helmet, gun, and seatbelt safety promotion.* Pediatrics, 2002. **109**(3): 490-7.
25. Werch C, Jobli E, Moore MJ, DiClemente CC, Dore H, Brown CH. *A brief experimental alcohol beverage-tailored program for adolescents.* J Stud Alcohol, 2005. **66**(2): 284-90.
26. Werch C, Moore M, DiClemente CC, Owen DM, Jobli E, Bledsoe R. *A sport-based intervention for preventing alcohol use and promoting physical activity among adolescents.* J Sch Health, 2003. **73**(10): 380-8.
27. Botvin GJ, Griffin KW, Diaz T, Ifill-Williams M. *Preventing binge drinking during early adolescence: one- and two-year follow-up of a school-based preventive intervention.* Psychol Addict Behav, 2001. **15**(4): 360-5.
28. Schinke SP, Schwinn TM, Di Noia J, Cole KC. *Reducing the risks of alcohol use among urban youth: three-year effects of a computer-based intervention with and without parent involvement.* J Stud Alcohol, 2004. **65**(4): 443-9.
29. Wu Y, Stanton BF, Galbraith J, Kaljee L, Cottrell L, Li X, Harris CV, D'Alessandri D, Burns JM. *Sustaining and broadening intervention impact: a*

longitudinal randomized trial of 3 adolescent risk reduction approaches. Pediatrics, 2003. **111**(1): e32-8.

30. Ellickson PL, McCaffrey DF, Ghosh-Dastidar B, Longshore DL. *New inroads in preventing adolescent drug use: results from a large-scale trial of project ALERT in middle schools.* Am J Public Health, 2003. **93**(11): 1830-6.
31. McBride N, Farringdon F, Midford R, Meuleners L, Phillips M. *Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP).* Addiction, 2004. **99**(3): 278-91.
32. Perry CL, Komro KA, Veblen-Mortensen S, Bosma LM, Farbakhsh K, Munson KA, et al. *A randomized controlled trial of the middle and junior hig school DARE and DARE plus programs.* Archives of Pediatrics and Adolescent Medicine, 2003. **157**(2): 178-84.
33. Perry CL, Williams CL, Komro KA, Veblen-Mortenson S, Stigler MH, Munson KA, Farbakhsh K, Jones RM, Forster JL. *Project Northland: Long-term outcomes of community action to reduce adolescent alcohol use.* Health Educ Res, 2002. **17**(1): 117-32.
34. Spoth R, Randall KG, Shin C, Redmond C. *Randomized study of combined universal family and school preventive interventions: patterns of long-term effects on initiation, regular use, and weekly drunkeness.* Psychology of Addictive Behaviors, 2005. **19**(4): 372-381.
35. Slater MD, Kelly KJ, Edwards RW, Thurman PJ, Plested BA, Keefe TJ, Lawrence FR, Henry KL. *Combining in-school and community-based media efforts: reducing marijuana and alcohol uptake among younger adolescents.* Health Educ Res, 2006. **21**(1): 157-67.
36. Furr-Holden CDM, Ialongo NS, Anthony JC, Petras H, Kellam SG. *Developmentally-inspired drug prevention middle school outcomes in a school-based randomized prevention trial.* Drug and Alcohol Dependence, 2004. **73**(2): 149-58.

37. St Pierre TL, Osgood DW, Mincemoyer CC, Kaltreider DL, Kauh TJ. *Results of an independent evaluation of Project ALERT delivered in schools by Cooperative Extension.* Prev Sci, 2005. **6**(4): 305-17.
38. Werch CE, Owen DM, Carlson JM, DiClemente CC, Edgemon P, Moore M. *One-year follow-up results of the STARS for Families alcohol prevention program.* Health Educ Res, 2003. **18**(1): 74-87.
39. Perry CL, Williams CL, Komro KA, Veblen-Mortenson S, Forster JL, Bernstein-Lachter R, Pratt LK, Dudovitz B, Munson KA, Farbakhsh K, Finnegan J, McGovern P. *Project Northland High School Interventions: Community Action to Reduce Adolescent Alcohol Use.* Health and Education Behaviour, 2000. **27**((1)): 29-49.
40. Spoth R, Redmond C, Shin C, Azevedo K. *Brief family intervention effects on adolescent substance initiation school-level growth curve analyses 6 years following baseline.* Journal of Consulting and Clinical Psychology, 2004. **72**(3): 535-42.
41. Eisen M, Zellman GL, Murray DM. *Evaluating the Lions-Quest "Skills for Adolescence" drug education program. Second-year behavior outcomes.* Addict Behav, 2003. **28**(5): 883-97.
42. Caulkins JP, Pacula RL, Paddock S, Chieas J. *School-based drug prevention: what kind of drug use does it prevent?* 2002, Santa Monica, CA: RAND.
43. Rehm J, Babor TF, Room R. *Education, persuasion and the reduction of alcohol-related harm: a reply to Craplet (2006).* Addiction, 2006. **101**: 452-543.
44. Foxcroft D. *Alcohol education: absence of evidence or evidence of absence.* Addiction, 2006. **101**(7): 1057-9.
45. United Nations Environment Programme (UNEP). *Rio declaration on environment and development*, in *Made at the United Nations Conference on Environment and Development, Rio de Janeiro, Brazil*. 1992.
46. Wingspread. *The precautionary principle.* Jane's Environment and Health Weekly, 1998. **586**.

47. Goldstein BD. *The precautionary principle also applies to public health actions.* American Journal of Public Health, 2001. **91**: 1358-1362.
48. Pless IB. *Expanding the precautionary principle.* Injury prevention, 2003. **9**: 1-2.
49. Moos H. *Iatrogenic effects of psychosocial interventions for substance use disorders: prevalence, predictors, prevention.* Addiciton, 2005. **100**: 595-604.
50. National Research Council. *Informing America's policy on illegal drugs: what we don't know keeps hurting us*. Committee on Data and Research for Policy on Illegal Drugs. Charles F. Manski, John V. Pepper, and Carol V. Petrie, editors. Committee on Law and Justice and Committee on National Statistcis. Commission on Behavioral and Social Sciences and Education. 2001, Washington, D.C.: National Academy Press.
51. Werch CE, Owen DM. *Iatrogenic effects of alcohol and drug prevention programs.* Journal of Studies on Alcohol, 2002. **63**: 581-590.
52. Khan KS, Riet tG, Glanville J, Sowden AJ, Kleijnen J. *Undertaking Systematic Reviews of Research on Effectiveness*. Vol. CRD Report No. 4, 2nd Edition. 2001, York, U.K.: NHS Centre for Reviews and Dissemination, University of York.
53. Baldwin S. *Alcohol Education and Young Offenders Medium and short-term effectiveness of education programmes*. 1990, Springer-Verlag: Berlin. p. 87-97.
54. Cook R, Lawrence H, Morse C, Roehl J. *An evaluation of the alternatives approach to drug abuse prevention.* International Journal of the Addictions, 1984. **19**: 767-787.
55. Monti PM, Spirito A, Myers M, Colby SZ, Barnett NP, Rohsenow DJ, Woolard R, Lewander W. *Brief Intervention for harm Reduction With Alcohol-Positive Adolescents in a Hospital Emergency Department.* Journal of Consulting and Clinical Psychology, 1999. **67**((6)): 989-994.
56. Caplan M, Weissberg RP, Grober JS, Sivo P, et al. *Social competence promotion with inner city and suburban young adolescents Effects on social adjustment and alcohol use.* Journal of Consulting and Clinical Psychology, 1992. **60**: 56-63.

57. Gilchrist LD, Schinke SP, Trimble JE, Cvetkovich GET. *Skills enhancement to prevent substance abuse among American Indian adolescents.* International Journal of the Addictions, 1987. **22**: 869-879.

58. Gliksman L, Douglas RR, Smythe C. *The impact of a high school alcohol education programme utilizing a live theatrical performance A comparative study.* Journal of Drug Education, 1983. **13**: 229-248.

59. Hansen WB, Graham JW. *Preventing alcohol, marijuana, and cigarette use among adolescents Peer pressure resistance training versus establishing conservative norms*, in *Prev. Med*. 1991. p. 414-430.

60. Harmon MA. *Reducing the risk of drug involvement among early adolescents: an evaluation of Drug Abuse Resistance Education (DARE).* Evaluation Review, 1993. **17**: 221-239.

61. Holder HD. *A community prevention Trial To Reduce Alcohol-Involved Trauma*, in *Addiction*. 1997. p. (whole issue).

62. Pentz MA, Johnson CA, Dwyer JH, MacKinnon DM, Hansen WB, Flay BR. *A Comprehensive Community Approach to Adolescent Drug Abuse Prevention Effects on Cardiovascular Disease Risk Behaviours*, in *Annals of Medicine*. 1989. p. 219-222.

63. Perry CL, Grant M. *Comparing peer-led to teacher-led youth alcohol education in four countries. (Australia, Chile, Norway and Swaziland.).* Alcohol Health & Research World, 1988. **12**.

64. Werch CE, Anzalone DM, Brokiewicz LM, Felker J, Carlson JM, Castellon-Vogel EA. *An Intervention for Preventing Alcohol Use Among Inner-city Middle School Students*, in *Archives of Family Medicine*. 1996. p. 146-152.

65. Werch CE, Carlson JM, Pappas DM, Edgemon P, DiClemente CC. *Effects of a Brief Alcohol Preventive Intervetion for Youth Attending School Sports Physical Examinations*, in *Substance Use and Misuse*. 2000. p. 421-432.

66. Wilhelmson BU, Laberg JC, Klepp K. *Evaluation of two Student and Teacher involved Alcohol Prevention Programmes.* Addiction, 1994. **89**: 1157-1165.

67. Williams AF, DiCocco LM, Unterberger H. *Philosophy and Evaluation of an Alcohol Education Programme.* Quarterly Journal of Studies on Alcohol, 1968: 685-702.

68. Allison K, Silver G, Dignam C. *Effects on students of teacher training in use of a drug education curriculum.* Journal of Drug Education, 1990. **20**: 31-46.

69. Beaulieu MA, Jason LA. *A drug abuse prevention program aimed at teaching seventh grade students problem solving strategies.* Children and Youth Services Review, 1988. **10**: 131-149.

70. Botvin GJ, Baker E, Renick N, Filazzola AD, Botvin EM. *A cognitive behavioral approach to substance abuse prevention.* Addictive Behaviors, 1984. **9**: 137-147.

71. Bremberg S, Arborelius E. *Effects on adolescent alcohol-consumption of a school-based student-centered health counseling programme.* Scandinavian Journal of Social Medicine, 1994. **22**: 113-119.

72. Brewer LC. *Social skills training as a deterrent to entry level drug experimentation among 15-year-old adolescents*, in *Unpublished Ph.D. Dissertation, University of Pennsylvania*. 1991.

73. Durrant LH. *A multicomponent approach to prevention of adolescent substance abuse.* Unpublished Ph.D. Dissertation, University of Utah, 1986.

74. Goldberg L, MacKinnon DP, Elliot DL, Moe EL, Clarke G, Cheong J. *The Adolescents Training and Learning to Avoid Steroids Program*, in *Arch Pediatr Adolesc Med*. 2000. p. 332-338.

75. Goodstadt MS, Sheppard MA. *Three approaches to alcohol education.* Journal of Studies on Alcohol, 1983. **44**: 362-380.

76. McBride N, Midford R, Farringdon F, Phillips M. *Early results from a school alcohol harm minimizaiton study the School Health and Alcohol Harm Reduction Project.* Addiction, 2000. **95**((7)): 1021-1042.

77. Magura S, Kang S, Shapiro JL. *Outcomes of intensive AIDS education for male adolescent drug users in jail.* Journal of Adolescent Health, 1994. **15**: 457-463.

78. Moskowitz JM, Malvin JH, Schaeffer GA, Schaps E. *An experimental evaluation of a drug education course.* J Drug Education, 1984. **14**(1): 9-22.

79. Newman IM, Anderson CS, Farrell KA. *Role rehearsal and efficacy Two 15 month evaluations of a ninth grade alsohol education programme.* Journal of Drug Education, 1992. **22**: 55-67.

80. Palinkas LA, Atkins CJ, Miller C, Ferreira D. *Social Skills training for drug prevention in high-risk female adolescents.* Preventive Medicine, 1996. **25**(6): 692-701.

81. Ringwalt C, Ennett ST, Holt KD. *An outcome evaluation of project DARE.* Health Education Research, 1991. **6**: 327-337.

82. Werch CE, Pappas DM, Carlson JM, Diclemente CC. *Short and Long Term Effects of a Pilot Prevention Program to Reduce Alcohol Consumption.* Substance Use and Misuse, 1998. **33**((11)): 2303-2321.

83. Werch CE, Carlson JM, Pappas DM, DiClemente CC. *Brief Nurse Consultations for Preventing Alcohol Use Among Urban Youth*, in *Journal of School Health*. 1996. p. 335-338.

84. Ellickson PL, Bell RM. *Drug prevention in junior high: a multi-site longitudinal test.* Science, 1990. **247**: 1299-1305.

85. Bagnall G. *Alcohol Education for 13 year olds - Does it Work? Results from a controlled Evaluation*, in *British Journal of Addiction*. 1990. p. 89-96.

86. Botvin GJ, Baker E, Dusenbury L. *Long term follow-up results of a randomised drug abuse prevention trial*, in *Journal of the American Medical Association*. 1995. p. 1106-1112.

87. Duryea EJ, Okwumabua JO. *Effects of a preventive alcohol education programme after three years*, in *Journal of Drug Education*. 1988. p. 23-31.

88. Hopkins RH, Mauss AL, Kearney KA, Weisheit RA. *Comprehensive Evaluation of a model alcohol education curriculum.* Journal of Studies on Alcohol, 1988. **49**: 38-50.

89. Hansen WB, Johnson CA, Flay BR, Graham JW, Sobel J. *Affective and social influences approaches to the prevention of multiple substance abuse among seventh grade students Results from project SMART*, in *Preventive Medicine*. 1988. p. 135-154.

90. Marlatt GA, Baer JS, Kivlahan DR, Dimeff LA, Larimer ME, Quigley LA, Somers JM, Williams E. *Screening and Brief Intervention for High-Risk College Student Drinkers Results From a 2-Year Follow-Up Assessment.* Journal of Consulting and Clinical Psychology, 1998. **66**((4)): 604-615.

91. Shope JT, Copeland LA, Marcoux BC, Kamp ME. *Effectiveness of a School-Based Substance Abuse Prevention Program*, in *Journal of Drug Education*. 1996. p. 323-337.

92. Perry CL, Williams CL, Veblen-Mortenson S, Toomey TL, Komro KA, Anstine PS, McGovern PG, Finnegan JR, Forster JL, Wagenaar AC, Wolfson M. *Project Northland Outcomes of a Communitywide Alcohol Use Prevention program during Early Adolescence*, in *American Journal of Public Health*. 1996. p. 956-965.

93. Wagenaar AC, Murray DM, Gehan JP, Wolfson M, Forster JL, Toomey TL, Perry CL, Jones-Webb R. *Communities Mobilizing for Change on Alcohol Outcomes froma Randomized Community Trial*, in *Journal of Studies on Alcohol*. 2000. p. 85-94.

94. Dielman TE, Shope JT, Butchart AT, Campanelli PC. *Prevention of adolescent alcohol misuse: an elementary school programme.* Journal of Pediatric Psychology, 1986. **11**: 259-282.

95. Klepp KI, Kelder SH, Perry CL. *Alcohol And Marijuana Use Among Adolescents Long-Term Outcomes Of The Class of 1989 Study.* Annals of Behavioural Medicine, 1995. **17**((1)): 19-24.

96. Pentz MA, Dwyer JH, MacKinnon DP, Flay BR, Hansen WB, Wang EYI, Johnson CA. *A mulicommunity trial for primary prevention of adolescent drug abuse effects on drug use prevalence*, in *JAMA, The Journal of the American Medical Association*. 1989. p. 3259-3266.

97. Sheehan M, Schonfeld C, Ballard R, Schofield F, Najman J, Siskind V. *A Three Year Outcome Evaluation of a Theory Based Drink Driving Education Program.* Journal of Drug Education, 1996. **26**((3)): 295-312.

98. Shope JT, Copeland LA, Maharg R, Dielman TE. *Effectiveness of a High School Alcohol Misuse Prevention Program*, in *Alcoholism Clinical and Experimental Research*. 1996. p. 791-798.

99. Sussman S, Dent CW, Stacy AW, Craig S. *One-Year Outcomes of Project Towards No Drug Abuse*, in *Preventive Medicine*. 1998. p. 632-642.

100. St Pierre TL, Kaltreider DL, Mark MM, Aikin KJ. *Drug prevention in a community setting A longitudinal study of the relative effectiveness of a three year primary prevention programme in Boys & Girls Clubs across the nation.* American Journal of Community Psychology, 1992. **20**: 673-706.

101. Rosenbaum DP, Flewelling R, Bailey S, Ringwalt C, Wilkinson D. *"Cops in the Classroom" A longitudinal evaluation of Drug Abuse Resistance Education*, in *Journal of research in Crime and Delinquency*. 1994. p. 1-31.

102. Schinke SP, Tepavac LO, ColeKc. *Preventing substance use among native American youth three-year results.* Addictive Behaviors, 2000. **25**(3): 387-97.

103. Wynn SR, Schulenberg J, Kloska DD, Laetz VB. *The Mediating Influence of Refusal Skills in Preventing Adolescent Alcohol Misuse.* Journal of School Health, 1997. **67**((9)): 390-395.

104. Clayton RR, Cattarello A, Walden KP. *Sensation seeking as a potential mediating variable for school-based prevention intervention. a two-year follow-up of DARE.* Health Communication, 1991. **3**(4): 229-239.

105. Loveland-Cherry CJ, Thomson-Ross L, Kaufman SR. *Effects of a Home-Based Family Intervention on Adolescent Alcohol Use and Misuse.* Journal of Studies on Alcohol / Supplement, 1999. **13**: 94-102.

106. Cook J, Sackett DL. *The number needed to treat - a clinically useful measure of treatment effect.* British Medical Journal, 1995: 452-454.

107. Sterne JAC, Davey Smith G. *Sifting the evidence - what's wrong with significance tests?*, in *British Medical Journal*. 2001. p. 226-231.

108. Brody GH, Murry VM, Gerrard M, Gibbons FX, Molgaard V, McNair L, Brown AC, Wills TA, Spoth RL, Luo Z, Chen YF, Neubaum-Carlan E. *The Strong*

African American Families Program: translating research into prevention programming. Child Dev, 2004. **75**(3): 900-17.

109. Ellickson PL, Collins RL, Hambarsoomians K, McCaffrey DF. *Does alcohol advertising promote adolescent drinking? Results from a longitudinal assessment.* Addiction, 2005. **100**(2): 235-46.
110. McBride N, Farringdon F, Midford R, Meuleners L, Phillips M. *Early unsupervised drinking - reducing the risks. The School health and Alcohol Harm Reduction Project.* Drug and Alcohol Review, 2003. **22**: 263-276.
111. Perry C, Williams C, Veblen-Mortenson S, Toomey T, Komro K, Anstine P, McGovern P, Finnegan J, Forster J, Wagenaar A, Wolfson M. *Project Northland: Outcomes of a community wide alcohol use prevention program during early adolescence.* American Journal of Public Health, 1996. **86**(7): 956-65.
112. St. Pierre TL, Osgood DW, Mincemoyer CC, Kaltreider DL, Kauh TJ. *Results of an independent evaluation of Project ALERT delivered in schools by Cooperative Extension.* Prev Sci, 2005. **6**(4): 305-17.
113. Spoth R, Redmond C, Trudeau L, Shin C. *Longitudinal substance initiation outcomes for a universal preventive intervention combining family and school programs.* Psychology of Addictive Behaviours, 2002. **16**: 129-134.
114. Spoth R, Redmond C, Shin C. *Randomized trial of brief family interventions for general populations adolescent substance use outcomes 4 years following baseline.* Journal of Consulting and Clinical Psychology, 2001: 1-15.
115. Spoth RL, Redmond CLH. *Alcohol Initiation Outcomes of Universal Family-Focused Preventive Interventions One- and Two Year Follow-Ups of a Controlled Study.* Journal of Studies on Alcohol, 1999. **13**: 103-111.