A systematic review of social marketing effectiveness

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ABSTRACT

Purpose: To review the effectiveness of social marketing interventions in influencing individual behaviour and bringing about environmental and policy-level changes in relation to alcohol, tobacco, illicit drugs and physical activity. Social marketing is the use of marketing concepts in programmes designed to influence the voluntary behaviour of target audiences in order to improve health and society.

Methodology/Approach: Review of systematic reviews and primary studies using pre-specified search and inclusion criteria. Social marketing interventions were defined as those which adopted specified social marketing principles in their development and implementation.

Findings: A total of 54 interventions met the inclusion criteria. There was evidence that interventions adopting social marketing principles could be effective across a range of behaviours, with a range of target groups, in different settings, and can influence policy and professional practice as well as individuals.

Research limitations/implications: As this was a systematic review, the quality of included studies was reasonable and many were RCTs. However, many of the multi-component studies reported overall results only and research designs did not allow for the efficacy of different components to be compared. When reviewing social marketing effectiveness it is

important not to rely solely on the 'label' as social marketing is often misrepresented; there is a need for social marketers to clearly define their approach.

Practical implications: The review shows that social marketing can form an effective framework for behaviour change interventions and can provide a useful 'toolkit' for organisations that are trying to change health behaviours.

Originality/Value: The research described in this paper represents one of the few systematic examinations of social marketing effectiveness and is based on a clear definition of 'social marketing'. It highlights both social marketing's potential to achieve change in different behavioural contexts and its ability to work at individual, environmental and wider policy levels.

Six keywords: Social marketing, review, physical activity, alcohol, tobacco, drugs

INTRODUCTION

The unique feature of social marketing is that it takes learning from the commercial sector and applies it to the resolution of social and health problems. This idea dates back to 1951, when Wiebe asked the question 'Can brotherhood be sold like soap?' For the first time people began to think seriously that methods used very successfully to influence behaviour in the commercial sector might transfer to a non-profit arena. Wiebe evaluated four different social change campaigns, and concluded that the more similarities they had with commercial marketing, the more successful they were. Over the next two to three decades, marketers and public health experts developed and refined this thinking, learning particularly from international development efforts, where social marketing was used to inform family planning and disease control programmes (Manoff, 1985). Social marketing thinking and techniques spread to the developed world, and social marketing is now located at the centre of health improvement in several countries. In the USA, social marketing is increasingly being advocated as a core public health strategy for influencing voluntary lifestyle behaviours such as smoking, drinking, drug use and diet (CDC, 2005). Last year in the UK the potential of social marketing was recognised in the White Paper on Public Health, which talks of the "power of social marketing" and "marketing tools applied to social good" being "used to build public awareness and change behaviour" (Department of Health, 2004). The National Social Marketing Strategy for Health, led by the National Consumer Council and the Department of Health, has been established to "help realise the full potential of effective social marketing in contributing to national and local efforts to improve health and reduce health inequalities" (NCC/DH, 2005). As part of this work, a series of literature reviews were conducted to investigate the effectiveness of social marketing as a health intervention

approach. This paper reports findings from two of these reviews, one examining tobacco, alcohol and illicit drug interventions, and one examining physical activity interventions.

Defining Social Marketing

Social marketing - like generic marketing - is not a theory in itself. Rather, it is a framework or structure that draws from many other bodies of knowledge such as psychology, sociology, anthropology and communications theory to understand how to influence people's behaviour (Kotler & Zaltman, 1971). Several definitions of social marketing exist, but one of the most useful (Andreasen, 1995) describes social marketing as follows:

> "Social marketing is the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behaviour of target audiences in order to improve their personal welfare and that of society." (p7)

Four key features are illustrated in this definition. The first is a focus on voluntary behaviour change: social marketing is not about coercion or enforcement. The second is that social marketers try to induce change by applying the principle of exchange - the recognition that there must be a clear benefit for the customer if change is to occur (Houston & Gassenheimer, 1987). Thirdly, marketing techniques such as consumer oriented market research, segmentation and targeting, and the marketing mix should be used. Finally, the end goal of social marketing is to improve individual welfare and society, not to benefit the

organisation doing the social marketing; this is what distinguishes social marketing from other forms of marketing (MacFadyen et al, 2002).

The emphasis on society as well as the individual also illustrates another key point about social marketing: it can apply not only to the behaviour of individuals, but also to that of professionals, organisations and policymakers. As well as downstream, social marketing can be applied 'upstream'. It might seek to change the behaviour of professionals (encourage GPs or dentists to be more proactive in prevention, for example); the behaviour of retailers (make them more compliant with the law on selling tobacco or alcohol to minors, or persuade them not to stock confectionery at checkouts); and the behaviour of policymakers and legislators (convince them to pass smokefree legislation, improve housing policy, or to restrict advertising to children) (Hastings et al, 2000; Lawther et al, 1997).

Previous Evidence of Effectiveness

Although many primary studies claiming to evaluate the effectiveness of individual social marketing programmes have been conducted, there have been only a small number of reviews of its effectiveness in general as a health behaviour change approach. For example, a recent review of the effectiveness of social marketing interventions designed to promote condom use among "poor and vulnerable" groups found that, although the programmes were struggling to reach the poorest groups, they had achieved some success in addressing social and regulatory constraints to access (Price, 2001). Another review, of social marketing nutrition and physical activity interventions, found that, although social marketing had been effective in altering some behaviours, its overall effects were limited (Alcalay & Bell, 2000).

However, these reviews have a number of limitations. Methods have not always been systematic, and there is often insufficient information on the search strategy and inclusion criteria. In particular, reviews often fail to state explicitly how social marketing interventions have been defined, and conceptualise social marketing in widely differing ways. For example, in family planning reviews social marketing is often taken to mean, primarily, free distribution of condoms. In others, social marketing is misconstrued as simply social advertising or communications (eg. Alcalay & Bell, 2000).

One difficulty has been the lack of an agreed and easily operationalised definition of a social marketing intervention. Generic definitions, such as Andreasen's above, are not precise enough to help decide whether a specific intervention does or does not qualify as social marketing. One solution to the difficulty is simply to select interventions that are labelled social marketing programmes by their managers or evaluators. However, recent experience of reviewing 'social marketing nutrition interventions' demonstrated that relying solely on the label is a problematic approach (McDermott et al, 2005a; McDermott et al, 2005b). Firstly, it excludes many interventions which are not labelled social marketing but which appear to incorporate social marketing principles. Secondly, it includes interventions which, despite their label, are poor examples of social marketing or not social marketing at all. For example, the misperception that social marketing equals advertising means that many interventions which are essentially media campaigns are erroneously described as social marketing (Stead & Hastings, 1997). The resulting evidence base, if a search is restricted only to interventions called 'Social Marketing', is likely to be limited and flawed.

A more useful solution is to ask what essential ingredients should be present in a social marketing intervention. In 2002, Andreasen identified what he termed six essential

benchmarks of a ‘genuine’ social marketing intervention; one which applies social marketing throughout rather than as an add-on (see Table I).

TAKE IN TABLE I

In a previous systematic review (McDermott et al, 2005a; McDermott et al, 2005b), we used these benchmarks as a set of criteria against which potentially eligible interventions could be assessed. If an intervention was judged to meet all six criteria it was defined as having adopted a social marketing approach, regardless of the label which the author used to describe the programme. The same criteria have been used in the reviews reported here to identify social marketing interventions.

METHODS

Two different search strategies were used.

(i) Alcohol, Tobacco, Drugs

For alcohol, tobacco and drugs (ATD) interventions, a search was conducted for good quality systematic reviews, and the included reference lists for these reviews formed the sample frame for potentially eligible social marketing intervention studies. This strategy had two advantages: it reduced the search process to one that was manageable in the timeframe, and it ensured that all the studies subsequently included had already been judged of sufficient methodological quality, by previous reviewers, to yield reliable evidence.

The initial search for systematic reviews of ATD interventions was limited to reviews designed, conducted and the studies analysed in such a way that biases were minimised and therefore deemed to be of good quality (as defined by Khan et al, 2001). The key sources were taken to be: the Cochrane Database of Systematic Reviews; the Centre for Reviews and Dissemination's databases (Database of Abstracts of Reviews of Effects and Health Technology Assessment Database); the EPPI-Centre (the Evidence for Policy and Practice Information and Co-ordinating Centre's) publications list; and NICE (the National Institute for Health and Clinical Excellence's) publications database. No limits were set on the types of interventions; as social marketing interventions can use many different methods and be implemented in many different settings, it was not desirable to exclude any intervention types at this stage. This yielded 35 systematic reviews, covering a diverse range of interventions (for example, health promotion in schools, interventions for preventing tobacco sales to minors, therapeutic drug treatment programmes, workplace interventions). Unless there was enough information in the reviews on individual interventions to assess them against the six social marketing benchmarks, full text studies were retrieved. Supplementary papers were often required to provide information on, for example, a programme's development. From the 35 reviews, 310 individual studies were retrieved and assessed in full text against Andreasen's six criteria. Thirty five studies met all six of Andreasen's criteria for a social marketing intervention, and were included in the review. By 'a study', we mean all the published papers reporting on a single evaluation of a specific programme (for example, where a programme was followed up over several years within one evaluation, all the outcome papers are included as one study). Sometimes the same programme or variants of it are evaluated in different settings with different participants; in this case, each evaluation is counted as a separate study, again each potentially comprising more than one paper.

(ii) Physical Activity

Initially a search was conducted for any existing systematic reviews, non-systematic reviews and individual intervention studies in which the label 'social marketing' had been applied to programmes. A series of electronic databases was searched using combinations of the search terms physical activity, exercise and social marketing: the Cochrane Library; PsycINFO; PubMed; the Arts & Humanities Citation, Social Science Citation and Science Citation Indices; the Centre for Reviews and Dissemination's databases; and NICE (the National Institute for Health and Clinical Excellence's) publications database.

Although the database searches described above were for papers including the term "social marketing", as the search process continued, interventions were included for assessment without the term. This yielded 17 reviews (systematic and non-systematic) and 48 articles in total, covering a range of dedicated physical activity interventions or interventions that included a physical activity component. From the 17 reviews (systematic and non-systematic) and 48 articles retrieved initially, a further 62 articles were generated and retrieved, totalling 110 articles assessed against Andreasen's six criteria. Twenty two interventions met all six of Andreasen's criteria for a social marketing intervention, and were included in the review.

FINDINGS

The 54 included studies reported on a wide range of different types of intervention, and were heterogeneous in aims, intervention approach, methods, and evaluation design.

Types of Intervention

Twenty-one of the interventions were school-based programmes. Of the ATD programmes, seven primarily targeted a single substance, and nine adopted a generic approach to substances. Seven school-based programmes targeted physical activity. Classroom education often took place alongside other activities such as mass media campaigns, school-wide and community events.

Twenty-two of the interventions were multi-component community interventions (for the purpose of this review, multi-component and community interventions have been discussed together, as they share many features). Of these, ten were targeted at the general adult population; four addressed smoking cessation only, or smoking cessation within the context of cardiovascular risk disease behaviours, and eight addressed physical activity. Four comprised school-based ATD prevention curricula reinforced by extensive community components (Pentz, 1989; Perry, 1992; Perry, 1996; Vartiainen, 1998), and four comprised community and policy activities designed to reduce youth access to substances as well as activities targeted at youth themselves (Biglan, 2000; Pawtucket, 1995; Puska, 2002; Perry, 1996). Four targeted youth physical activity (Baranowksi, 2003; Beech, 2003; Resnicow, 2000; Story & Sherwood, 2003), one targeted physical activity in older people (Reger, 2002) and one targeted newly married couples (Burke, 2002).

Five interventions were primarily mass media-based. Three were concerned with adult smoking cessation (Egger, 1983; McAlister, 1992; McPhee, 1995), one with youth smoking prevention (Flynn, 1994) and one with physical activity. (Huhman, 2005) All included

activities delivered through other channels in addition to the media element (eg. educational materials, telephone helpline, support in the community). If no channels were used other than mass media, an intervention was judged not to have utilised the marketing mix fully, and was not included in the review.

Two interventions were designed to restrict youth access to substances through increasing retailer/server compliance with existing laws, greater enforcement of the law, or adoption of new policies and legislation (Wildey, 1995; Forster, 1998). The San Diego intervention mostly comprised retailer education backed up with media and community events, while TPOP adopted a direct action, community organisation approach directed both at retailers and local legislators. In addition, three of the multi-component community interventions listed above included community and policy activities designed to reduce youth access to substances as well as activities targeted at youth themselves (Biglan, 2000; Perry, 1996; Wagenaar, 2000).

One smoking cessation intervention was delivered through church coalitions and primarily targeted at African-Americans (Schorling, 1997). Two interventions were delivered in workplaces, one concerned with smoking cessation (Windsor, 1988) and one with promoting physical activity (Neiger, 2001). A family- and child-training programme designed to reduce drug and alcohol use sought to strengthen family protective factors (Spoth, 2001).

Theories and Models Used in the Programmes

As noted above, social marketing is not a theory in itself but rather draws from many bodies of knowledge to understand how to influence people's behaviour (Kotler & Zaltman, 1971). This was reflected in the wide range of theories and models adopted in the programmes (where information was actually provided or could be inferred; not all studies describe the theoretical basis of the programme). Several of the school-based programmes were informed by social influences theory; this emphasises "the importance of social and psychological factors in promoting the onset of drug use" and comprises three major components, "psychological inoculation, normative education and resistance skills training" (Botvin, 2000). The majority of the interventions comprised theory-driven interactive classroom curricula adopting a social influences approach, usually involving practice of resistance skills and other activities designed to address direct and indirect pressures to use substances.

Several of the interventions were 'multi-component'. In the context of drug prevention, 'multi-component' refers to interventions which, using multiple channels and activities, target not only the individual but also their immediate family and peer group and the wider environment which shapes drug use norms. A typical multi-component programme such as Project STAR (Pentz, 1989) comprises a school curriculum, media, parent activities, community organisation and policy activity.

Many studies used social cognitive or social learning theory in their development (eg. Baranowski 2003, Beech 2003, Story & Sherwood 2003). Social cognitive theory explains how people acquire and maintain certain behavioural patterns, while also providing the basis for intervention strategies. (Bandura, 1997). The theory emphasizes the interactions between

a person's cognitions, on the one hand, and his/her behaviour on the other, through processes such as self-efficacy and outcome expectancies (or response efficacy). The trans-theoretical model which was used in several interventions (eg. Matsudo, 2002; Prochaska, 2004; Reger, 2002) hypothesises that behavioural change unfolds through a series of stages. Therefore in this model it is critical to understand and identify the stage an individual is in before a successful change intervention can be designed and applied.

Community interventions sometimes claimed to be underpinned by theories of community organisation and community participation, (eg. Pawtucket, 1995; MHHP, 1994) or the planned approach to community health model (Matsudo, 2002; Brownson, 1996; Goodman, 1995).

Media advocacy was used in some interventions, particularly those concerned with policy and environmental change; for example, in Project TRUST (Wildey, 1995), retailers who complied with the law on underage access to tobacco were ‘rewarded’ with positive newspaper coverage, while those who did not were ‘named and shamed’. Finally, two family-focused alcohol interventions (Spoth, 2001; Perry, 1996) drew on models of problem behaviour protective and risk factors to foster factors which would protect against the development of substance use, such as family cohesion and managing emotions and conflict.

Use of several other theories and models guided the development of the included interventions including the stage theory of innovation (Brownson, 1996), behaviour change theory (O’Loughlin, 1999), and organisational change theory (CATCH, 1996).

Target Groups

All but 46 of the programmes were implemented in North America; two were Dutch (De Vries, 1994; Cuijpers, 2002), three were Australian (Burke, 2002; Egger, 1983; McBride, 2000), 2 were Finnish studies part of a larger programme (Vartiainen, 1998; Puska, 2002), and one was Brazilian (Matsudo, 2002).

Most of the school-based programmes targeted the early secondary school years (11-14); one targeted a younger age group (CATCH, 1996), and one targeted an older age group (Wagenaar, 2000). Although the majority of the school-based programmes were 'universal', that is, designed for the whole student population in specific school years, some were deliberately tailored for high risk or disadvantaged populations. For example two trials of Project Towards No Drug Abuse were targeted at pupils in Californian 'continuation high schools', schools for students who are not able to complete formal high school education because of behavioural or other problems, including drug use (Sussman, 1998, 2002).

Fourteen interventions were targeted at minority ethnic groups. This varied from Native Americans (Caballero, 2003), African-American school girls (Story & Sherwood, 2003), Vietnamese men in the USA (McPhee, 1995) to Hispanic adults in the Texas-Mexican Border area (McAlister, 1992). Two interventions included components targeted at older people (Matsudo, 2002; Reger, 2002) and another two were specifically targeted at low income groups (O'Loughlin, 1999; Brownson, 1996). One intervention was targeted at people with low levels of literacy (Pawtucket, 1995).

How the Interventions were Evaluated

The vast majority of the interventions were evaluated using a randomised controlled trial or quasi-experimental design. The period of follow-up ranged widely in the studies from a month after implementation to several years (Vartiainen, 1998 was unusual in having a 15 year follow-up). The majority of the studies involved one to two year follow-up.

The main outcomes examined in the ATD programmes included overall prevalence of substance use, onset, experimentation, daily/weekly/monthly use, progression from one stage of use to another, and cessation. Some also took attitudinal, knowledge and skills measures. One alcohol-focused intervention also measured alcohol-related behaviours and incidents (drink-driving, drink-related crashes) (Wagenaar, 2000). The main outcomes measured in the youth access interventions were illegal sales to underage minors (usually assessed through test purchasing) and sometimes other measures of retailer behaviour and attitudes, such as frequency of checking ID and perceptions of the risk of prosecution.

In the physical activity interventions the main behavioural outcome examined was level of physical activity. Levels of physical activity were measured in a variety of different ways across the interventions – by frequency, total kcal expended, minutes spent on physical activity, or distance covered – and several studies used more than one measure. Psychosocial measures such as self efficacy for physical activity or social support for physical activity, and physiological outcomes such as blood pressure, cholesterol level and Body Mass Index, were also reported in several of the included studies.

Social Marketing Characteristics of the Interventions

All included interventions had to show evidence of having met all six social marketing criteria. This meant that they had to:

i) Have a specific Behaviour Change goal. Behaviour change goals sought by the included interventions included: to reduce or delay onset of substance use, to increase smoking cessation, to encourage retailers to comply with laws on underage access to substances, to persuade local councils to pass or strengthen legislation on sales of substances.

ii) Have used Consumer Research to inform the intervention. Typical consumer research conducted by the interventions included community needs assessments, focus groups, qualitative interviews, pre-testing of materials, and pilot tests of intervention activities prior to the main trial.

iii) Consider different Segmentation variables and Target interventions appropriately. Interventions demonstrated segmentation and targeting if, for example, activities were designed interventions to be age-appropriate or particularly appropriate to the setting in which they were delivered, or if they tailored activities and materials to specific groups, such as low income or minority ethnic participants.

iv) Demonstrate use of more than one element of the Marketing Mix. We defined the marketing mix as comprising '6 Ps': Product, Price, Place, Promotion / communication, Person and Policy. For example, a school-based intervention might

comprise a curriculum element, teacher training, materials and home activities (place, promotion/communication, person), whereas an access intervention might comprise media advocacy, policy development and community activities (place, promotion / communication, policy).

v) Consider what would motivate people to engage voluntarily with the intervention and offer them something beneficial in return (Exchange). The exchange could be tangible or intangible. Examples include: school-based prevention programmes which emphasised the positive benefits of non-use or offered students the opportunity to participate in appealing alcohol-free activities; smoking cessation programmes which used motivation strategies or provided inspirational role models in the form of testimonials; and access interventions which rewarded responsible retailers with positive publicity and community approval.

vi) Consider the appeal of competing behaviours and use strategies that seek to minimise this Competition. These strategies could address competition at an external or internal level, or both. External competition strategies included adopting or encouraging compliance with policies making it harder for young people to obtain substances. Internal competition strategies included teaching relapse prevention and coping skills. School-based prevention curricula based on a social influences approach, which seeks to 'inoculate' young people against peer, social and advertising pressures to use drugs, addressed competition at several different levels.

Individual social marketing characteristics of the studies are given in Table II and Table III.

TAKE IN TABLES II AND III

RESULTS

1. Individual-level change

Smoking Prevention

Twenty one studies (14 school-based interventions, five multi-component community interventions, one media-based programme and one access intervention) examined whether interventions were effective in preventing smoking among young people. Many measured only short-term impact, although a few took medium and longer term follow-ups. Results are discussed below by length to follow-up.

Eighteen of these 21 studies examined short term impact (up to 1 year), of which 13 reported significant positive effects. Several of the short-term effective interventions were school-based programmes adopting the 'social influences' approach (Maibach & Parrott, 1995). For example, students who received the Project SMART social influences programme had significantly lower smoking onset than control students, equivalent to a 38% reduction, at the end of one year (Hansen, 1988), while a 12-session version of Project Towards No Drug Abuse found lower monthly smoking at 1-year follow-up for students who received the programme led by a health educator, compared with students who learned it through self-instruction and control group students (Sussman, 2002). Four of the short-term effective interventions were multi-component community programmes. For example, Project SixTeen

(Biglan, 2000), designed to reduce both illegal sales of tobacco and youth tobacco use, was associated with lower smoking prevalence (smoking in the past week) at one-year follow-up.

Eleven studies examined medium term impact on smoking prevention (up to 2 years) and seven of these reported significant positive effects. Four of these were multi-component community interventions. Project STAR, or the Midwestern Prevention Project, resulted in a significantly lower increase in smoking in intervention schools compared with controls at both one and two year follow-ups (Pentz, 1989). The other multi-component community interventions with medium term effects were the North Karelia project (Vartiainen, 1998), the Minnesota Heart Health 'Class of 89' study (Perry, 1992) and Project SixTeen. Again, effects were also found for some school-based interventions adopting a social influences approach (eg. Sussman, 1993; Sussman, 2002). One intervention which was effective in both short and medium term combined mass media smoking prevention television programming with a school curriculum (Flay, 1995).

Five studies examined longer term impact (over 2 years), and two of these reported sustained significant positive effects on prevalence. Among students who received the youth component of the North Karelia project, a major community intervention to reduce cardiovascular disease, at 15-year follow-up, when participants were aged 28, meantime lifetime consumption was 22% lower in the intervention community compared with the control area. In the 'Class of 89' study (Perry, 1992) students who received a 3-year school-programme within the 5-year Minnesota Heart Health Program, had significantly lower weekly smoking prevalence than control community students at all follow-ups up to 5 years.

Alcohol Prevention and Harm Minimisation

Fifteen studies (10 school-based interventions, four multi-component community interventions, one delivered in a family setting) examined whether interventions were effective in preventing alcohol use or reducing the harm associated with alcohol use (eg. drink-driving). Again, most took only short-term follow-up measures, although some also measured medium and longer term impact.

Thirteen of the 15 studies examined short-term impact on alcohol use (up to 12 months), of which eight reported some significant positive effects. Two were trials of the school-based Life Skills Training programme with minority ethnic inner city student populations (Botvin, 1997; Botvin, 2001), while an Australian school-based alcohol harm minimisation programme found a lower increase in alcohol consumption one month after the intervention (McBride, 2000).

Seven studies examined medium-term impact (one to two years) on alcohol use, and four of these reported some significant effects. One of these was a trial of a three year school-based programme (Cuijpers, 2002), which found a significant impact on daily alcohol use at immediate post-test and at two years after the start of the intervention. There was also a significant decrease in number of drinks consumed per occasion at both follow-ups.

Finally, two out of four interventions which examined effects in the longer term, over two years, reported some significant impacts. Project Northland (Perry, 1996), which comprised a 3-year school curriculum, peer and parent activities and community taskforces, found a significant impact on past month and past week alcohol use ($p<0.05$ for each) in the

intervention group compared with the control group at 2.5 years, although the effect had dissipated at 4 years. Project Northland also found a significant reduction in 'proneness to alcohol, drug and family problems' after 3 years of the programme, suggesting that the family-focused 6th grade component of the programme was effective in influencing wider precursors of problem behaviour. A family-focused intervention (Spoth, 2001), targeting both parents and children, found lower alcohol use onset in the intervention group compared with the control at both one and two year follow-ups; the increase in 'ever use' and 'ever been drunk' was lower in the intervention group than the control group at every follow-up up to 4 years, with increasing effect sizes, suggesting that the intervention intensified in impact over time.

Illicit Drug Use Prevention

Thirteen studies (ten school-based interventions, three multi-component community interventions) examined whether interventions were effective in preventing or reducing illicit drug use.

Twelve of the studies examined short-term impact (up to 12 months), and eight of these reported some significant positive impact on illicit drug use. Nearly all were school-based programmes, including a trial of Life Skills Training with minority ethnic inner city students which found less frequent marijuana use and lower polydrug at three month follow-up (Botvin, 1997), two versions of Project ALERT, both of which found short-term reductions in marijuana use (Ellickson, 1990; Ellickson, 2003) and a Dutch school programme which

found significant reductions in marijuana use immediately after the intervention (Cuijpers, 2002).

Of the six studies which examined medium-term impact (one to two years), two reported some significant effects. These were a version of Project Towards No Drug Abuse (Sussman, 2002) tested with minority ethnic inner city students, which found significantly lower hard drug use at two years among students who received a health-educator led version of the programme, and the multi-component programme Project STAR (Pentz, 1989) which found significant reductions in last month marijuana use in intervention students compared with controls both in the short term and at two year follow-up.

Neither of the two studies which examined longer-term impacts on drug use (over two years) found sustained effects (Ellickson, 1990, Project Northland).

Smoking Cessation

Nine studies examined whether interventions had an impact on smoking cessation (four multi-component community interventions, three media-based interventions, a church-based programme and a worksite programme.

Two of the interventions, both two-year mass media-based programmes (the North Coast Quit for Life programme in NSW, Australia, and a programme for Vietnamese American men in Texas (McPhee, 1995), had significant effects. A further five interventions had weak effects. For example, the Alliance of Black Churches Project (Schorling, 1997), which

adopted a community organisation approach and included the formation of church coalitions as well as individually-focussed activities and community activities, found a higher quit rate in the intervention community than the comparison community, but the differences were not significant, the trend suggested a possible intervention effect. Two interventions had no effect.

Levels of Physical Activity

Twenty one interventions aimed to increase level of physical activity as defined by total time spent or frequency of activity (14 community based interventions, 7 school-based interventions, one mass media intervention and one work-based intervention). Of these, eight of the twenty one reported a significant positive effect on behaviour. For example, the Social Marketing for Public Health Employees Intervention (Neiger, 2001), a workplace-based programme comprising communications and promotions, ongoing activities, one-off events and environmental changes, resulted in pre-test to post-test increases in the primary treatment group on three levels of physical activity. Similarly, the Wheeling Walks intervention (Reger, 2002), a community based campaign to promote walking among sedentary 50 to 65 year old adults underpinned by the Theory of Planned Behaviour, had a positive effect on physical activity levels in terms of total time spent and frequency of walking.

Physical Activity Psychosocial Variables

Eleven studies examined changes in physical activity psychosocial variables such as self efficacy or stage of change for physical activity. Of these, six reported a positive effect for at least one variable. Three of these six were school based interventions, two were community based and one was based in a workplace setting. Pathways (Caballero, 2003), a school based intervention targeting 3rd and 5th grade American-Indian children and comprising a physical activity programme supplemented by a classroom curriculum and family component, significantly increased self efficacy for physical activity in the treatment group. It also found a positive effect on stage of change to physical activity. The New Moves intervention (Neumark-Sztainer, 2003), incorporating a specially designed curriculum, physical activity classes, instruction and education packs, found a mean increase in stage of change for physical activity post-intervention, and at one year follow-up, with around twice as many girls progressing in stage than regressing.

Physical Activity Physiological Outcomes

Fourteen studies measured physiological outcomes following physical activity. Of eleven studies using Body Mass Index (BMI) as a measure, two found a positive effect. These were a community based study targeted at newly co-habiting couples (Burke, 2002) and major seven year community based intervention targeting a general adult population. (Pawtucket, 1995).

Of six studies using cholesterol levels as a measure three found a positive effect, all of which were community based interventions (Burke, 2002; Goodman, 1995; Puska, 2002).

Two interventions used CVD as a measure with both resulting in a reduction in CVD rates (Puska, 2002; Pawtucket, 1995). Finally five of the 14 interventions used blood pressure as a measure but only one of these five interventions showed a positive effect (Burke, 2002).

2. Policy and Environmental Level Change

Several of the interventions sought also to bring about changes at an environmental and/or policy level.

Selling Age-Restricted Substances

Four studies reported changes in retailers' behaviour in relation to selling tobacco and alcohol illegally to underage youth. In two studies this was the main focus of the programme (Forster, 1998; Wildey, 1995), while in the others, the work with retailers was part of a multi-component community intervention also involving school- and youth-targeted activities (Biglan, 2000; Wagenaar, 2000). Project Trust, a one-year retailer education campaign which included personal visits and positive media coverage for law-abiding retailers, reduced illegal sales from 70% to 32% in four out of six intervention communities, compared with a comparison area; the effect was sustained at six-month follow-up (Wildey, 1995). TPOP (Tobacco Policy Options for Prevention) adopted a direct action community organising

approach to encourage adoption of tobacco ordinances and deter illegal underage sales in Minnesota (Forster, 1998). Illegal sales fell from 36.7% to 3.1% in intervention communities, but also by a similar amount in control communities; the difference was not significant.

A multi-component community intervention in Oregon, comprising media advocacy, youth anti-tobacco activities, community mobilisation, and giving retailers feedback on their response during test purchase attempts, showed a reduction in the mean level of illegal sales from 57% to 22% (Biglan, 2000). There was no comparison community in this study which limited the conclusions which could be drawn. The fourth intervention addressed alcohol and included community mobilisation, media advocacy and merchant education (Wagenaar, 2000). Retailers reported more frequent checking of age ID and a higher perceived risk of prosecution following the intervention, while test purchase attempts found lower incidence of selling under-age, but none of the differences were significant.

Substance-Related Policy Change

Three interventions specifically sought to promote the adoption of substance-related policies. One goal of the TPOP (1996) intervention was to “change local ordinances to more effectively restrict youth access to tobacco”. At the end of the intervention period, all seven intervention communities had adopted a comprehensive ordinance, with varying ingredients. Over the same period, three of the seven control communities also adopted modifications to their tobacco ordinances, but the study authors described the control community ordinances as “weaker and much less comprehensive” than the intervention community ordinances.

The CATCH intervention sought to promote the adoption of formal tobacco-free policies in its 56 intervention schools, spread across 3 states (CATCH, 1996). The number of schools adopting policies increased markedly over the three years of the study from a baseline figure of 49.7% to 76.8%. However, because of other events and trends at the time of the intervention, it was difficult to attribute the policy adoption process to the intervention. In Project Northland, the authors note that five alcohol-related ordinances were successfully passed in the first year of the intervention, including requirement of responsible beverage service training to prevent illegal sales to underage youth and intoxicated patrons (Perry, 1996). Although school alcohol education programmes used in the control communities were monitored in the control communities during the intervention, policy developments in the same period were not recorded, and therefore it was not clear to what extent the alcohol policy changes in Project Northland communities were attributable to the intervention.

Physical Activity Related Policy Change

There is somewhat limited evidence of the effectiveness of interventions aimed at changing policy or the environment in relation to physical activity. In the M-Span intervention (Sallis, 2003), key school personnel met regularly with project staff to select and implement policy changes to create healthier school environments, such as allowing students to use activity areas after school and hiring aides to lead activity programmes. Nonetheless it was noted that project support for the groups was probably inadequate to yield more meaningful policy changes.

In the Bootheel Heart Health Project (Brownson, 1996), an evaluation of environmental factors was conducted and walking paths were constructed in low income communities where cost was a barrier to other forms of physical activity. This led to the adoption of a policy to construct a network of such paths throughout the community. In the North Karelia Project (Puska, 2002) policy changes were effected which led to the provision of dedicated walking space and recreational areas assisting in the delivery of the intervention. The Pawtucket Heart Health Program (Pawtucket, 1995) aimed to influence the environment in which risk factor behaviours occurred, leading to efforts to effect policy change within the community. These efforts led to the construction of a series of leisure facilities and a multiple station exercise course. However, in each of these interventions policy developments in the control communities were not recorded and therefore it is unclear to what extent policy changes in the experimental communities were attributable to the interventions.

DISCUSSION

All of the interventions included in this review were judged to have adopted social marketing principles in their design and implementation. That is to say, they all had specific behavioural objectives; used consumer research to understand the target audience, the people whose behaviour they were trying to change (including upstream target groups such as retailers); and considered ways of segmenting the population and tailored the intervention accordingly and appropriately. They all considered what would motivate people to change (‘exchange’), used a combination of the channels and activities that make up ‘the marketing mix’, and addressed competition or barriers to behaviour change.

It was notable that the label 'social marketing' was not a helpful guide in identifying interventions which adopted social marketing principles. Only four of the included interventions were labelled social marketing, and a number of interventions retrieved in the searches which were labelled social marketing were actually excluded from the review as they were not judged to meet all six social marketing criteria. Typically, mislabelled 'social marketing interventions' were ones comprising only advertising or other forms of media communication. This suggests that a better understanding of the principles of social marketing is needed, not only among programme designers and evaluators but also among journal editors and reviewers.

The review was not intended or designed to compare social marketing with some other framework for developing interventions, rather to contribute to the evidence base for the effectiveness of social marketing itself. Overall, the review has found reasonable evidence that interventions developed using social marketing principles can be effective. A majority of the interventions which sought to prevent youth smoking, alcohol use and illicit drug use reported significant positive effects in the short term. Effects tended to dissipate in the medium and longer term, although several of the tobacco and alcohol interventions still displayed some positive effects two years after the intervention. These results are broadly comparable with systematic reviews of other types of substance use prevention interventions (eg. Foxcroft et al, 2002; Thomas, 2002). The evidence is more mixed for adult smoking cessation, although small numbers of programmes were nonetheless effective in this area. There is modest evidence of impact on levels of physical activity and psychosocial outcomes, with an apparently weaker effect on physical activity related physiological outcomes.

The interventions seem also to have had some effects on the behaviour of retailers, and to have encouraged adoption of policies and other environmental-level changes, although the data on these are less robust and it is often difficult to attribute changes to the interventions rather than to other events and trends in the community.

The results should be considered in the light of several potential methodological limitations. In many studies, allocation to intervention or comparison group was carried out at the level of the school, city or community, followed by analysis at the level of the individual, which may lead to spurious findings. Differences at baseline between intervention and comparison communities were found in several studies, which may cause differential rates of change in outcomes between groups, and attrition was also a problem in a number of studies, particularly those with long-term follow-ups. While noting these methodological limitations, however, it should be emphasised that the nature of several of the interventions precluded the use of a strictly randomised controlled design. In complex interventions, it is impossible to control fully for other factors which might influence outcomes, even where matched comparison cities or communities are used; it is also difficult, where effects are found, to identify whether these are attributable to particular intervention components, or to the combination of activities, or to other factors such as secular trends (Wolff, 2000; Fawcett et al, 1997; Morrison, 2001). Furthermore, intervention approaches such as community organisation, direct action and media advocacy do not lend themselves readily to precise statement as independent variables whose effects can be measured (Stead et al, 2002). The quasi-experimental design also tends to neglect effects and changes which may in themselves be deemed worthwhile, such as changes in community empowerment or shifts in the policy formation process. These sorts of changes are noted in some of the studies examined in this review, but it is possible that they are omitted, or were not measured, in many others.

Another important consideration is quality of implementation: in several studies, ATD curricula and physical activity interventions were not implemented as intended, or were poorly implemented, meaning that any failure to detect effects may reflect weaknesses in delivery rather than in programme theory and design (eg. Flora et al, 1993; Nutbeam et al, 1993). In other words, it is not sufficient for interventions to use appropriate behavioural theories and to be consumer-oriented; they also need to be capable of good quality implementation in real life settings. All these factors mean that results should be treated with caution. A particular limitation of the physical activity studies is the lack of a universally accepted measure of physical activity levels. Currently, there is no universally accepted "gold standard" method for measuring physical activity (Melanson & Freedson, 1996); consequently the outcome measures used in intervention studies vary widely (Ashenden et al, 1997). This causes problems in comparing across studies. It may be more useful only to compare interventions using identical outcome measures, but this would limit the pool of included studies; for this review, which sought to examine social marketing effectiveness across a wide range of outcomes, a broader and more inclusive approach was judged to be more appropriate, even if the resulting heterogeneity made comparison across studies difficult. Also problematic is the use of self-report measures of physical activity: some studies reported lower fitness levels of participants despite a self-reported increase in physical activity, suggesting that self-reports can generate overestimates of level of activity (Klesges et al, 1990).

Despite these caveats, a number of suggestions for intervention planners emerge from the review. Firstly, the review supports the importance of understanding the consumer in developing interventions. 'Consumer orientation' is a guiding principle of social marketing,

and indeed of marketing generally (Andreasen, 1994). The consumer oriented approach asks not "what is wrong with these people, why won't they understand?", but, "what is wrong with us? What don't we understand about our target audience?" (MacFadyen et al, 2002). In order to be defined as social marketing, all the interventions examined in this review had to have conducted some sort of formative consumer or audience research to gain a deeper understanding of the from the perspective of the consumer, to provide insights into target group attitudes and behaviours, and/or to pre-test or pilot intervention ideas with target participants. Although the review did not set out to compare the amount or type of consumer research conducted with intervention outcomes, it did seem that the more extensive the formative research conducted, the greater the likelihood of impact. For example, extensive qualitative and quantitative needs assessment and pre-testing were conducted for a Dutch school-based programme which was effective in reducing daily smoking and alcohol use (Cuijpers, 2002), and the Pathways physical activity programme with American Indian children was preceded by a 3 year feasibility stage during which intervention components were developed and tested using both quantitative and qualitative methods (Caballero, 2003). However, formative research is not sufficient for effectiveness if an intervention is not properly implemented, as was shown by one media and school programme which involved extensive developmental and pre-testing research but then was implemented to a poor standard (Flay, 1995).

The review also confirmed the potential of social marketing interventions to effect 'upstream' change – to change the behaviour not of individual consumers or patients, but of professionals, organisations and policymakers. One example which illustrates the social marketing approach applied upstream, in this case to retailers is Project TRUST, which attempted to reduce illegal sales of tobacco to minors. Formative research was conducted to

understand retailers' experiences and needs, activities were targeted specifically at different kinds of retailers, a mix of channels and methods was used, and a positive exchange was offered in the form of favourable local media coverage for compliant retailers. Illegal sales reduced from 70% to 32% in the intervention community stores (Wildey, 1995).

Secondly, some interesting learning emerged around the notion of 'competition'. To qualify as social marketing, all the interventions had to demonstrate that they had considered what competing behaviours and forces might hinder consumers from adopting the desired behaviour change, and had tried to minimise this competition. Competition to the behaviour of giving up smoking, for example, is found in the attraction and addictive properties of nicotine as well as in the wide availability of tobacco which serve as a continuing reminder and temptation. Therefore addressing competition to smoking cessation might involve 'internal' competition strategies such as helping people to cope with cravings and withdrawal, and 'external' competition strategies such as restricting the number of outlets in which tobacco can be bought and used. Some of the internal competition strategies which seemed to be particularly associated with effective interventions in this review included teaching families how to handle emotions and conflict (Spoth, 2001), resistance skills (Hansen, 1998), and challenging over-estimates of substance use prevalence which act as a powerful competitor to abstinence and resistance (Perry, 1996). Effective external competition strategies included stronger enforcement of legislation on youth access to age-restricted substances (Forster, 1998) and constructing walking paths in low income communities to overcome cost barriers to physical activity (Brownson, 1996).

Finally, the review supports the use of theory in designing interventions. For example, many of the effective alcohol, tobacco and illicit drug prevention interventions were underpinned

by social influences theory (Botvin, 2000; Pentz, 1989). This suggests that a sound theoretical framework, combined with the use of consumer research to help translate theoretical constructs into acceptable and persuasive interventions, is an important pre-requisite for effectiveness (Stead et al, 2005).

Overall, this paper suggests that social marketing is a promising intervention approach. These reviews of its effectiveness in terms of physical activity and alcohol, tobacco and drug use suggest that it can be effective across a range of behaviours, with a range of target groups, in different settings, and can work upstream as well as with individuals.

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Table I: Andreasen's Benchmark Criteria

Benchmark	Explanation
1. Behaviour Change	Intervention seeks to change behaviour and has specific measurable behavioural objectives.
2. Consumer Research	Intervention is based on an understanding of consumer experiences, values and needs. Formative research is conducted to identify these. Intervention elements are pre-tested with the target group.
3. Segmentation & Targeting	Different segmentation variables are considered when selecting the intervention target group. Intervention strategy is tailored for the selected segment/s.
4. Marketing Mix	Intervention considers the best strategic application of the 'marketing mix'. This consists of the four Ps of 'product', 'price', 'place' and 'promotion'. Other Ps might include 'policy change' or 'people' (eg. training is provided to intervention delivery agents). Interventions which only use the promotion P are social advertising, not social marketing.
5. Exchange	Intervention considers what will motivate people to engage voluntarily with the intervention and offers them something beneficial in return. The offered benefit may be intangible (eg. personal satisfaction) or tangible (eg. rewards for participating in the programme and making behavioural changes).
6. Competition	Competing forces to the behaviour change are analysed. Intervention considers the appeal of competing behaviours (including current behaviour) and uses strategies that seek to remove or minimise this competition.

(adapted from McDermott et al, 2005a)

Table II: Alcohol, Tobacco and Drug Interventions: Social Marketing Characteristics and Results

Intervention Name & Authors	Participants & Setting	Intervention	SM Characteristics	Results
Ary 1990 Project PATH	6^{th}-9^{th} grade pupils in 22 elementary/middle schools and 15 high schools in Oregon.	School-based prevention programme (Project PATH) comprising 5 sessions per year (grades 6-10). Underpinned by social influences approach, lessons used videotapes and were taught by teachers and peer leaders.	1. Behaviour change goal: Prevent smoking, smokeless tobacco use, marijuana and alcohol. 2. Consumer research: Videos were extensively pretested. 3. Segmentation and targeting: Curriculum content changed each year to reflect developmental stage of target group. 4. Marketing mix: Curriculum, videos, teacher training, peers. 5. Exchange: Videotapes and activities modelled positive forms of friend support in substance use situations. 6. Competition: Curriculum taught resistance skills and addressed social influences.	Randomised controlled trial. Outcomes and Method: Self-reported smoking. Baseline survey of 7,837 6^{th}-11^{th} grade students in 37 middle/elementary and high schools. Follow-up at 12 months. Results: No effect on uptake among baseline non-smokers. Baseline smokers reported significantly fewer cigarettes smoked per month ($p<0.05$). No effects on alcohol or marijuana use.
Biglan 2000 Oregon communities [Project PATH & Community Programme]	7^{th}-9^{th} grade students in eight pairs of small Oregon communities. Retailers and community	1. School-based prevention programme (Project PATH) Vs. 2. Community programme comprising: - media advocacy	1. Behaviour change goal: Prevent youth tobacco use. 2. Consumer research: Community mobilisation component previously tested. 3. Segmentation and targeting: Population-wide programme with components designed for different	Matched pairs of communities with random assignment to experimental or control condition. Outcomes and Method: Self-reported smoking and intentions; illegal sales.

	organisations.	- youth anti-tobacco activities - family communications about tobacco - community mobilisation component to reduce sales to minors.	segments in community. 4. Marketing mix: Media, community activities, parent communications, community mobilisation, merchant education. 5. Exchange: Creative anti-tobacco activities for youth; positive reinforcement for responsible retailers. 6. Competition: Reduced availability of tobacco for underage youth.	Baseline survey of 4,400 7th and 9th grade pupils in 16 schools. Cross-sectional follow-up surveys at 1, 2, 3 and 4 years (final follow-up 2 years after the intervention). Two conditions compared: 2-yr school-based programme only vs. 4-yr community programme (Oregon 1995). Results: At 1-year follow-up, amount of intervention activity was correlated with prevalence of tobacco use ($p<0.10$). Correlation between cumulative number of activities over 3-years of intention and smoking prevalence ($p<0.05$). School-only group had significantly higher intentions ($p=0.01$). Prevalence of smoking in school-only condition increased significantly from baseline to each follow-up, but not in community intervention condition ($p<0.001$). Prevalence of weekly alcohol use increased significantly from baseline to each follow-up in the school-only condition, but not in the community intervention condition ($p<0.001$). Marijuana use had increased less markedly

				in the community intervention condition by final follow-up. Illegal sales measured through test purchase attempts, in retail outlets in 8 communities. Measures taken at 2-week intervals over 6 months. Aggregate results showed a significant reduction in mean level of sales, from 57% to 22%.
Botvin 1997 LST (Life Skills Training for Minority Adolescents)	Predominantly minority ethnic 7th grade students in 7 inner city New York schools.	School-based intervention comprising 15 sessions. Programme is underpinned by social influences theory and cognitive behavioural theory, and emphasises personal competence skills. Lessons are interactive. This version modified for minority youth.	1. Behaviour change goal: Prevent cigarette smoking and other forms of drug use. 2. Consumer research: Previous pilots of programme elements with minority youth. 3. Segmentation and targeting: Curriculum designed to be age-appropriate. Materials and activities modified to be understood by and appealing to minority adolescents. 4. Marketing mix: Classroom activities, media materials, homework assignments, teacher training. 5. Exchange: Curriculum taught cognitive-behavioural skills to build self-esteem and assertiveness. Videos feature positive non-drug using minority ethnic same age role models. 6. Competition: Curriculum taught skills to resist advertising and interpersonal	Randomised controlled trial. Outcomes and Method: Self-reported drug use behaviour plus cognitive and attitudinal variables. Baseline survey of 833 7th grade students followed-up at 3 months. Results: Intervention students: lower frequency of marijuana use ($p<0.001$), ever use of multiple drugs ($p<0.0001$) and current use of multiple drugs ($p<0.0001$). Other drug outcomes not significant. Lower frequency of smoking and alcohol use ($p<0.01$ for both).

			pressure to use drugs, and challenged normative perceptions of drug use prevalence and acceptability.	
Botvin 1999 LST (Life Skills Training for Minority Adolescents)	7th and 8th grade girls in 29 inner city junior high schools in New York.	School-based intervention (Life Skills Training) comprising 15 sessions in 7th grade and 10 booster sessions in 8th grade. Programme is underpinned by social influences theory and cognitive behavioural theory, and emphasises personal competence skills. Lessons are interactive. This version modified for minority youth.	1. Behaviour change goal: Prevent cigarette smoking and other forms of drug use. 2. Consumer research: Informed by previous evaluations of LST plus focus group with minority youth. 3. Segmentation and targeting: Curriculum designed to be age-appropriate. Materials and activities modified to be understood by and appealing to minority adolescents. 4. Marketing mix: Classroom activities, media materials, homework assignments, teacher training. 5. Exchange: Curriculum taught cognitive-behavioural skills to build self-esteem and assertiveness. Videos feature positive non-drug using minority ethnic same age role models. 6. Competition: Curriculum taught skills to resist advertising and interpersonal pressure to use drugs, and challenged normative perceptions of drug use prevalence and acceptability.	Randomised controlled trial. Outcomes and Method: Self-reported smoking frequency. Baseline survey of 2,690 7th grade minority ethnic girls followed-up in 8th grade. Results: Significantly lower ever smoking in intervention group (28% vs. 34.5%, $p<0.001$), 30-day smoking (8.8% vs. 12.3%, $p<0.005$), initiation (19.6% vs. 23.9%, $p<0.02$) and escalation from ever to monthly (6.7% vs. 9.9%, $p<0.009$).
Botvin 2001 LST (Life Skills	7th and 8th grade students in	School-based intervention (Life Skills Training) comprising 15	1. Behaviour change goal: Prevent cigarette smoking and other forms of drug use.	Randomised controlled trial. Outcomes and Method:

Training for Minority Adolescents)	predominantly minority ethnic inner city New York schools.	sessions in 7th grade and 10 booster sessions in 8th grade. Programme is underpinned by social influences theory and cognitive behavioural theory, and emphasises personal competence skills. Lessons are interactive. This version modified for minority youth.	2. Consumer research: Focus group with minority youth and key informants to assess modifications needed to original LST. 3. Segmentation and targeting: Curriculum designed to be age-appropriate. Materials and activities modified to be understood by and appealing to minority adolescents. 4. Marketing mix: Classroom activities, media materials, homework assignments. 5. Exchange: Curriculum taught cognitive-behavioural skills to build self-esteem and assertiveness. Videos feature positive non-drug using minority ethnic same age role models. 6. Competition: Curriculum taught skills to resist advertising and interpersonal pressure to use drugs, and challenged normative perceptions of drug use prevalence and acceptability.	Self-reported drug use measured in survey of 5,222 7th grade students at 29 schools pre-intervention, post-intervention and at 1 year follow-up. Carbon monoxide breath samples. Results: Slight decreases post-intervention in frequency of marijuana and inhalant use, and in frequency of 'getting high'; further analysis found that only the decrease in inhalant use was significant. At 1-year follow-up, lower frequency of smoking in intervention group ($p<0.0012$) and lower cigarette consumption ($p<0.0001$). Lower frequency of drinking ($p<0.0001$), getting drunk ($p<0.004$) and amount drunk on each occasion ($p<0.0007$).
Pawtucket 1995 Pawtucket Heart Health Program	Adults in a Rhode Island city with relatively low mean household income.	7-year multi-component community intervention to reduce cardiovascular risk factors. Underpinned by social learning theory, community behavioural psychology and community participation, the intervention comprised formal	1. Behaviour change goal: To reduce smoking. 2. Consumer research: Ongoing formative evaluation was undertaken to feed back into the programme (eg. led to the decision to add a community-wide programme). Some individual programme elements were pilot tested. 3. Segmentation and targeting:	Quasi-experiment, with Pawtucket receiving the intervention and another city acting as comparison. Outcomes and Method: Two cross-sectional baseline surveys, one survey during intervention, and two annual follow-up surveys. Between 1,000-1,900 respondents at each

		behaviour change programmes (including counselling and groups), grass-roots community and worksite activities, volunteer delivery, unpaid publicity, quit contests and a quitline.	Targeting strategy combined individually- and community- / environmental-targeted activities. Materials were culturally relevant and designed for people with low literacy. 4. Marketing mix: Education, counselling, media, community and worksite activities. 5. Exchange: Quit contests, social support for new behaviours. 6. Competition: Components emphasised "ease of adoption" and support for behaviour change in different community settings.	stage. Self-reported smoking. Results: Smoking prevalence declined in both Pawtucket and the comparison community by a similar amount. No significant impact.
COMMIT 1995	Adult smokers in 11 North American communities; community and other organisations.	Community smoking cessation underpinned by community organisation and community participation principles. Components included community organisation and task forces; mass media and media advocacy; cessation groups, contests and resources; and policy advocacy.	1. Behaviour change goal: cessation among heavy smokers 2. Consumer research: community analyses of channels and sectors with potential to address problem, and of facilitating and inhibiting factors. 3. Segmentation and targeting: Activities targeted at different sectors of community including heavy smokers. 4. Marketing mix: Community, media, policy. 5. Exchange: Intervention sought to foster positive smokefree norms; incentives in form of Quit contests. 6. Competition: Self-help materials, cessation support in different	Randomised controlled trial with one of each matched pair of communities being randomly allocated. Outcomes and Method: Smoking (self-report and biochemical measure), attitudes. Baseline telephone survey of approximately 60,000 adults. Cross-sectional follow-up survey 5 years later. Results: Smoking prevalence decreased in both intervention and control communities; the difference was not significant.

			environments.	Quit rate (quit in past 5 years) significantly higher for light/moderate smokers in intervention communities (p=0.004). Other outcomes not significant.
Cuijpers 2002 Netherlands School-based drug prevention	12 year olds in 12 schools in the Netherlands	School-based drug prevention programme comprising 3 lessons per year over 3 years plus home activities. Underpinned by needs identified in needs assessment, plus social influences approach. Curriculum complemented by school policy development work and information for parents.	1. Behaviour change goal: Prevent smoking. 2. Consumer research: Extensive qualitative and quantitative needs assessment and pre-testing. 3. Segmentation and targeting: Tailored to needs and developmental stage of target. 4. Marketing mix: Curriculum, videos, peers, home activities. 5. Exchange: Sought to provide "fun" "attractive" activities, positive peer role models. 6. Competition: Dealt with indirect and direct pressures to use substances.	Quasi-experiment. Outcomes and Method: Reported ever and daily smoking, number of cigarettes per week; alcohol and marijuana use. Baseline survey of 1,930 7th grade students in 12 schools followed-up every year for 3 years after the baseline. Results: Intervention students had significantly lower daily smoking immediately after 1st year of intervention (p<0.05). No differences 3 years after baseline. Intervention students had significantly lower daily alcohol use immediately and 3 years after baseline, and reported significantly fewer drinks per occasion. Intervention group had significantly lower marijuana use immediately after the intervention but this effect disappeared at later follow-ups.

De Vries 1994 Netherlands School-based smoking prevention programme	8th grade students in Dutch vocational and high schools.	School-based smoking prevention programme. Underpinned by social influences approach, the programme comprised 5 lessons, including videos, peer-led content and homework activities.	1. Behaviour change goal: Prevent smoking. 2. Consumer research: Needs assessment survey of young people's motives for smoking and non-smoking. 3. Segmentation and targeting: Tailored in light of needs assessment findings; designed to target age of onset. 4. Marketing mix: Curriculum, peers, video, home activities. 5. Exchange: Offered attractive, fun activities as alternatives to tobacco. 6. Competition: Addressed peer and advertising pressures to smoke.	Randomised controlled trial. Outcomes and Method: Reported ever, weekly and daily smoking. Baseline survey of 1,784 2nd (US 8th) grade students in 6 vocational and 8 high schools followed-up 1 year later. Results: Small but significant impact on experimental smoking at 1 year: onset rate of 42% of baseline non-smokers in intervention group (high schools only) and 52% in control ($p<0.02$). Regular smoking in vocational schools increased less in intervention group (by 7% from 16% to 24%) than in control (by 14% from 16% to 30%). Some short-term non-significant effects on cessation.
Egger 1983 Queensland mass media-based smoking cessation programme	Adults in two communities in New South Wales, Australia	Mass media-based smoking cessation programme. Underpinned by communication theory and "social marketing", comprised mass media (paid and unpaid press, radio, TV), self-help materials, quit line, cessation groups, fun	1. Behaviour change goal: Smoking cessation. 2. Consumer research: Adverts were pretested. 3. Segmentation and targeting: Targeted at adult population in 3 towns. Some elements were universal, others tailored for a specific community. 4. Marketing mix: Mass media, cessation groups, community	Quasi-experiment. Outcomes and Method: Self-reported and biochemical measure of smoking. Baseline survey of knowledge and attitudes followed-up with cross-sectional surveys at 1 and 2 years, approximately 1,600-3,600 adults per wave.

		runs, health professional intervention.	activities. 5. Exchange: Testimonials from successful quitters. 6. Competition: Stress management, self-help.	Results: Significant decline in intervention towns compared to control ($p<0.05$).
CATCH 1996 The Child And Adolescent Trial For Cardiovascular Health	5th grade pupils in 96 elementary schools, USA	School-based intervention to promote cardiovascular health (diet, activity, smoking). Underpinned by social learning theory and organisational change, the programme comprised a 4-session smoking prevention curriculum, home-based parent-child component, and environmental component to promote adoption of tobacco-free school policies.	1. Behaviour change goal: Reduce smoking experimentation. Adoption of school tobacco policies. 2. Consumer research: Pilot and process evaluation of programme elements prior to main trial. 3. Segmentation and targeting: Different health behaviours targeted in different years. Activities designed to be age-appropriate. Elementary school years selected as appropriate period for heart health promotion. 4. Marketing mix: Curriculum, home programme, policy. 5. Exchange: Focused on benefits of not smoking, support for quitting. 6. Competition: Encouraged schools to adopt tobacco-free policies.	Randomised controlled trial. Seven schools at each site randomised to school-based intervention, 7 to school and family intervention, 10 to control. Outcomes and Method: Smoking prevalence. Number of schools adopting smoke-free policies. Baseline survey of 7,827 5th grade students in 96 schools followed-up for 3 years. Results: No significant differences in smoking prevalence between intervention and control group at 3 years. Proportion of schools with policies increased from 45% to 78% in intervention schools, and from 55% to 75% in controls. Significance values not stated.
Ellickson 1990 Project ALERT	Junior high school students (age	School-based intervention comprising 8 lessons in 7th grade and 3	1. Behaviour change goal: Reduce and/or delay use of gateway drugs (alcohol, tobacco, marijuana).	Randomised controlled trial comparing health-educator led group, teen-led group and control.

	12-13) in California and Oregon, USA	lessons in 8th grade. Curriculum is underpinned by 'social influences' approach, highly interactive, and delivered by health educators and teen leaders.	2. Consumer research: Focus groups with students to explore drug use pressures. Pilot test of different delivery methods. 3. Segmentation and targeting: Targeted at optimum age for preventing progression to regular use. Curriculum content designed to be age-appropriate. 4. Marketing mix: Curriculum, teen leaders, media materials. 5. Exchange: Underpinned by Health Belief Model, which emphasises benefits as well of costs of behaviours. Activities designed to elicit students' own beliefs about positive consequences and to personalise benefits of and incentives for non-use. 6. Competition: Drew on Self-Efficacy theory to foster belief that it is possible to resist pro-drug use pressures. Lesson activities include decoding alcohol and tobacco adverts, and practising resistance skills.	Outcomes and Method: Self-reported alcohol, tobacco and marijuana use. Baseline survey of 6257 7th grade pupils in 30 schools, followed up at 3, 12, 15 months, 2 years and 5 years. Results: Slight reductions in alcohol use at 3, 12 and 15 months; no differences at 2 and 6 years. Significant reductions in ever, weekly and daily smoking at 3-month, 12-month and 15-month follow-up for baseline experimenters: weekly smoking decreased significantly at 15 months (by 50% in teen-led group p=0.006) and current smoking decreased by 50% relative to control in teen-led group (p=0.03). However, among baseline regular smokers, smoking increased at 15 months. Baseline regular smokers in intervention reported higher weekly smoking than control. No significant differences at 5 years. Marijuana experimentation was one third lower in intervention compared with control among baseline non-users at 15

				months ($p<0.05$). Baseline non-users in health educator-led group were almost 50% less likely to become current users at 15 months ($p=0.01$).
Ellickson 2003 Revised Project ALERT	7th grade pupils in middle schools in South Dakota, USA	School-based intervention comprising 11 lessons in 7th grade and 3 lessons in 8th grade, plus home learning activities to involve parents in prevention. New material from original Alert focuses on smoking cessation and alcohol use. Underpinned by 'social influences' approach, highly interactive, and delivered by health educators and team leaders.	1. Behaviour change goal: Reduce and/or delay use of gateway drugs (alcohol, tobacco, marijuana); curb alcohol misuse. 2. Consumer research: Original programme developed using focus groups; this version modified in light of previous evaluation (Ellickson 1990). 3. Segmentation and targeting: Curriculum content designed to be age-appropriate; new activities targeted at smokers and users of alcohol, and at parents. 4. Marketing mix: Curriculum, team leaders, media materials, parents. 5. Exchange: Underpinned by Health Belief Model, which emphasises benefits as well of costs of behaviours. Activities designed to elicit students' own beliefs about positive consequences and to personalise benefits of and incentives for non-use. 6. Competition: Drew on Self-Efficacy theory to foster belief that it is	Randomised controlled trial. Outcomes and Method: Alcohol, marijuana and tobacco use. Baseline survey of 4,689 7th grade students from 55 middle schools, follow-up 18 months later. Results: Intervention students had significantly lower uptake of smoking (19% fewer, $p<0.01$) at follow-up compared with control. Past month and weekly smoking were 23% in intervention group compared with control ($p<0.01$). Significant reductions in marijuana use at follow-up. Non-significant reductions in past month alcohol use, alcohol misuse and alcohol-related consequences, for baseline users; no changes for other groups.

			possible to resist pro-drug use pressures. Lesson activities included decoding alcohol and tobacco adverts, and practising resistance skills.	
Flay 1995 TVSFP (Television, School and Family Project)	7th grade pupils in schools in Los Angeles and San Diego	School-based smoking prevention and cessation programme combined with mass media plus parent involvement. Underpinned by social influences approach and with a strong emphasis on resistance skills, the classroom prevention curriculum comprised 10 sessions delivered over 2 weeks, complemented by daily television programming reinforcing content from the curriculum. The cessation programme comprised sequenced workbooks for pupils and parents, again complemented by daily television programming.	1. Behaviour change goal: Reduce smoking. Increase cessation. 2. Consumer research: Interviews, focus groups, extensive pre-testing and pilot-testing. 3. Segmentation and targeting: Curriculum designed for "transition-prone" junior high school students. Television programming tailored for 7th grade students watching with parents and older adolescents. 4. Marketing mix: Curriculum, mass media, homework. 5. Exchange: Curriculum sought to strengthen motivation for not smoking and provided positive non-smoking role models. Cessation programme included rewards and enjoyable alternatives to smoking. 6. Competition: Strong emphasis on resistance skills in prevention curriculum. Cessation programme included coping strategies and relapse prevention.	Randomised controlled trial comparing combined school and TV programming with each separately. Outcomes and Method: Self-reported smoking. Baseline survey of 7,352 grade 7 students in 35 Los Angeles and 12 San Diego schools, with 2 year follow-up. Four conditions were examined: classroom curriculum only, TV only, classroom curriculum and TV, and control. Results: Significant changes in mediating variables, including resistance skills, but no consistent effects on behaviour. TV programme was poorly implemented, and classroom delivery very variable.
Flynn 1994	4th-10th grade	4-year mass media plus	1. Behaviour: Reduce youth smoking.	Quasi-experiment. Compared school and

Vermont mass media plus school intervention	students in two Vermont communities	school intervention. Mass media component comprised 36 television and 17 radio spots, broadcast over 4 years. Ads included: portrayal of positive consequences of non-smoking, modelling of refusal, depictions of coping with stress without cigarettes. School programme was underpinned by social influences approach, and comprised a 22-session curriculum delivered over 6 years (grade 4-10).	2. Consumer research: Extremely extensive diagnostic, formative and pretesting research. 3. Segmentation and targeting: Ads and curriculum designed to be age-appropriate. Some ads tailored for 'conformists' and 'rebels'. 4. Marketing mix: School, mass media. 5. Exchange: Depiction of social support for non-smoking, positive attractive non-smoking role models. 6. Competition: Ads and curriculum modelled refusal skills and addressed pro-smoking norms.	media and school-only conditions. Outcomes and Method: Smoking in past week, daily smoking. Attitudes and norms. Baseline survey of 5,458 4^{th}-6^{th} grade students with repeat waves up to 2 years after end of intervention. Results: School and media group had significantly lower weekly smoking at all follow-ups ($p<0.05$), and significantly lower smokeless tobacco use ($p<0.05$). School and media group had 7.3% lower weekly smoking at 2 years. Significant improvements in attitudes and norms in school and media group ($p<0.05$ each).
Forster 1998 TPOP	Retailers, local officials, media and other stakeholders in Minnesota communities. 8^{th}-10^{th} grade students.	Direct action community organising to encourage adoption of ordinances (local legislation) to curb youth access to tobacco. 3-year intervention included community awareness building, test purchasing, media advocacy, stakeholder	1. Behaviour change goal: Encourage community officials to pass ordinances curbing youth access to tobacco. 2. Consumer research: Stakeholder interviews to assess awareness of issue and motivation/barriers to action. 3. Segmentation and targeting: Power structures were analysed in each	Controlled trial with stratified random allocation. Outcomes and Method: Illegal sales data (obtained through test purchases). Youth smoking behaviour surveys in grades 8-10. Results:

		consultation and lobbying.	community to identify key stakeholders. Activities targeted at key power segments and individuals. 4. Marketing mix: Interpersonal communication, media advocacy, policy development, test purchasing, lobbying. 5. Exchange: Surveys, letters and media coverage were used to show council officials and retailers the benefit (in terms of public approval) of tobacco ordinances. 6. Competition: Establishment and enforcement of legislation to curb under-age access to tobacco.	Illegal sales reduced from 36.7% to 3.1% in intervention communities and 41% to 8% in controlled communities (n.s.). Smoking prevalence increased in intervention and control communities over course of study, but less steeply in intervention community (-4.9%, 95% C1 -9.0 to -0.7). The difference was significant for daily but not weekly or monthly smoking. Other data suggested the difference was not attributable to the intervention.
Fortmann 1993 Stanford Five-City Project	Adults aged 25-74 in five California communities.	Community and mass media programme to reduce smoking and other CVD risk factors. Underpinned by social cognitive theory, "social marketing", and community organisation, the intervention comprised television-based smoking cessation programme, PSAs, radio, newspaper articles, cessation booklets, worksite smoking cessation, cessation groups and quit contests.	1. Behaviour change goal: Smoking cessation. 2. Consumer research: Formative research informed media and other elements. 3. Segmentation and targeting: Components for different segments of community, including Spanish-language and rehab patients. 4. Marketing mix: Media, cessation groups, worksite support. 5. Exchange: Motivating media programmes, contests, testimonials from successful quitters. 6. Competition: Strategies to avoid weight gain; behavioural problem-solving techniques.	Quasi-experiment, with two intervention and two comparison cities. Outcomes and Method: Self-reported and biochemical smoking, knowledge, attitudes and quit attempts. Baseline survey of around 1,800 adults with 4 follow-ups for 6 years throughout intervention. Cross-sectional surveys for 6 years during intervention. Results: Smoking prevalence in cross-sectional surveys declined by similar amounts in

				intervention and comparison communities, but cohort analysis found greater rate of decline in intervention communities (p=0.007). Higher quit rate in intervention cities than control.
Hansen 1988 Project SMART	7th grade students in 44 junior high schools in Los Angeles, USA.	School-based substance abuse prevention programme comparing three conditions: Affective programme focused on decision-making, values clarification and stress management; Social influences programme focused on social pressures and resistance techniques; Control. Both comprised 12 sessions.	1. Behaviour change goal: Prevention of tobacco, alcohol, marijuana use. 2. Consumer research: Pilot testing of programmes. 3. Segmentation: Content designed to be appropriate to age of onset. 4. Marketing mix: Curriculum, teacher training 5. Exchange: Affective programme focused on goal setting and motivation; Social influences programme explored how to keep friends in substance use offer situations. 6. Competition: Affective programme taught stress management; Social influences programme taught resistance skills.	Randomised controlled trial comparing social influences programme with affective programme. Outcomes and Method: Alcohol, marijuana and tobacco use, plus psychosocial variables. Baseline survey of 2,863 7th grade students followed up at 1 and 2 years. Results: Lower smoking onset in social influences group than control (equivalent to a 38% reduction in onset at 1 year p<0.05, and 32% at 2 years n.s.). Lower alcohol use onset in social influences programme group than control at 1 year and 2 years. Lower marijuana use onset in social influences than control group at 1 year; only weak effects at 2nd follow-up. Affective programme was ineffective or

				increased marijuana use.
Hecht et al 1993 USA school-based drug prevention programme	High school students in south-western USA	School-based drug prevention programme testing four conditions: • Film. • Film plus discussion. • Live performance. • Live performance plus discussion. Underpinned by resistance and normative approaches.	1. Behaviour change goal: Reduce drug and alcohol use. 2. Consumer research: Focus groups to test materials and approach. 3. Segmentation and targeting: Programme intended to be developmentally and age - appropriate. 4. Marketing mix: Media, drama, class discussion. 5. Exchange: Films and drama designed to be entertaining and engaging; positive role models. 6. Competition: Films and drama modelled resistance skills and addressed social norms.	Randomised controlled trial comparing 5 conditions. Outcomes and Method: Drug use, attitudes, skills. baseline survey of 465 high school students, follow-up at 1 month. Results: Students in the two interactive groups (film plus discussion, drama plus discussion) had lower generic drug use than control.
MHHP 1994 Minnesota Heart Health Program	Adults in six communities in Minnesota, USA	5-year community intervention to reduce cardiovascular risk factors (smoking, cholesterol, blood pressure, physical activity). Underpinned by social cognitive theory and community participation, the intervention comprised	1. Behaviour change goal: reduce smoking. 2. Consumer research: Intervention components were based on different formative work (eg. telephone survey of parents, needs assessment surveys with students). 3. Segmentation and targeting: Targeting strategy combined individual-, group- and community-targeted activities and activities	Quasi-experiment with two countries allocated to intervention and two to control. Outcomes and Method: Smoking, attitudes, quit attempts. Baseline survey of 6,379 adults, with annual cross-sectional and cohort surveys throughout four years of intervention and for 2 years after.

		community organisation, citizen taskforces, mass media, training of health professionals, risk factor screening, quit and win contests, smoking cessation classes and community efforts to change workplace smoking policies.	designed for delivery agents (eg. training) . Some activities targeted at heavier smokers. 4. Marketing mix: Community organisation, media, training, classes, policies. 5. Exchange: Quit and Win contests, support for quitting. 6. Competition: Encouraged adoption of workplace smoking policies.	Results: Significantly lower prevalence of smoking among women intervention group compared to control ($p<0.04$). Intervention group women smoked significantly fewer cigarettes per day ($p<0.02$). No significant impact on men.
McAlister 1992 US-Mexican border smoking cessation campaign	Adults in low income, high chronic disease communities on US-Mexican border.	Mass media smoking cessation campaign plus intensive and community components. Media elements (which were in English and Spanish) included television stories about healthy role models, newspaper coverage and radio. Community activities included volunteer networking, self-help booklet distribution; intensive support was offered through one-to-one counselling and support.	1. Behaviour change goal: Smoking cessation. 2. Consumer research: Pilot work including focus groups. 3. Segmentation and targeting: Tailored for Hispanic community. 4. Marketing mix: Media, community, interpersonal support. 5. Exchange: Featured positive Hispanic Mexican role models. 6. Competition: Media depicted alternative coping skills. Counselling for problems perceived to limit ability to change (eg. unemployment, finances).	Quasi-experiment with 2 intervention and 1 control communities. Outcomes and Method: Smoking cessation. Baseline survey of 3,200 Mexican Americans age 16-60 with follow-up (of smokers) at 2 years. Results: Significantly higher quit rate in one intervention community compared with control ($p=0.02$), but no difference in the other intervention community.
McBride 2000 Project	13-15 year olds in Western	School curriculum-based programme to reduce alcohol-related harm.	1. Behaviour change goal: Reduce alcohol-related harm. 2. Consumer research: Focus groups,	Randomised controlled trial. Outcomes and Method:

SHAHRP	Australia	Underpinned by social inoculation and normative theory with a strong information and harm minimisation component, curriculum comprised 15 sessions and was highly interactive.	pretesting with students and teachers. 3. Segmentation and targeting: Programme designed to be developmentally-appropriate. 4. Marketing mix: Curriculum, media materials. 5. Exchange: Programme based on a harm minimisation approach (as opposed to prevention/abstinence approach), offering information and skills to enjoy drinking more safely. 6. Competition: Curriculum taught resistance skills and strategies for dealing with high risk situations.	Self-reported alcohol consumption and alcohol-related harm. Baseline survey of 2,343 13 year old pupils in 14 schools with follow-up one month after end of 2-year intervention. Results: Both intervention and control group had increased alcohol consumption at follow-up, but this was significantly greater in control group. Control group also had a greater increase in reported alcohol-related harms (n.s.). Significant increases in knowledge found in intervention students (greater among students with low baseline knowledge).
McPhee 1995 USA Vietnamese men smoking cessation campaign	Vietnamese men in California, USA	Culturally appropriate media-led information and education smoking cessation campaign. Included Vietnamese-language programme on quitting smoking, 35 newspaper feature articles, billboards, PSAs, training for physicians, and translation of smoking ordinances for	1. Behaviour: Smoking cessation. 2. Consumer research: Prior pilot; focus groups. 3. Segmentation: Tailored for Vietnamese men. 4. Marketing mix: Media, distribution of quit kits. 5. Exchange: Media coverage modelled successful quitting in Vietnamese family context. 6. Competition: Media coverage modelled refusal skills; provision of counselling to support quitting.	Quasi-experiment with one intervention and one comparison area. Outcomes and Method: Smoking cessation, attitudes, quit attempts. Baseline telephone survey of 2,900 Vietnamese men, with repeat survey (different respondents) of 2,400 at 2 years. Results: No significant difference in smoking

		Vietnamese businesses.		prevalence, or in number of cigarettes smoked daily, or in quit rate.
Pentz 1989 Project STAR	6^{th}-7^{th} grade pupils in 34 schools in Kansas City, USA	Multi-component 4-year drug prevention programme comprising: paid mass media advertising, school and homework sessions, parents' programme, community organisation, promotion of local health policy change. Underpinned by social learning theory and theory of person-community-environment influences.	1. Behaviour change goal: Substance use prevention. 2. Consumer research: School and community needs assessment. 3. Segmentation and targeting: Components for different segments of community; components for primary target change each year to reflect changes in drug experiences. 4. Marketing mix: Media, school, parents, community, policy. 5. Exchange: Curriculum included assertiveness, peer reinforcement, respected peer role models. 6. Competition: Curriculum taught resistance skills; community policy changes.	Quasi-experiment, with 8 schools randomly assigned to intervention or control, 20 to intervention and 14 to control. Outcomes and Method: Alcohol, marijuana and tobacco use, plus intentions, knowledge, skills, norms. Parent alcohol use. Baseline survey of 1,607 6^{th} grade students with follow-up at 1 and 2 years. 8-school subset follow-up at 3 years. Results: Smoking: significant changes in intentions ($p<0.01$) and some attitudes ($p<0.05$). Increase in smoking was significantly lower in intervention compared with control at 1 year and 2 years ($p<0.05$). Alcohol: increase in last month and last week alcohol use was lower in intervention group than control ($p<0.05$). No effects at 3 years. Some effects on parental drinking. Marijuana: increase in last month use was lower in intervention than control at 1 yr ($p<0.05$) and 2 yrs.

Perry 1992 'Class of 89' study within the Minnesota Heart Health Program	11 year olds in 13 public schools in two Minnesota communities.	Community intervention (Class of 89, implemented as part of Minnesota Heart Health Program) to reduce cardiovascular risk factors. Comprised a school-based intervention underpinned by social influences approach, community organisation, and mass media health education.	1. Behaviour change goal: Reduce smoking and other cardiovascular risk factors. 2. Consumer research: Needs assessment surveys. 3. Segmentation and targeting: Activities targeted at different sectors of population; community activities intended to reinforce impact of youth programme. 4. Marketing mix: School, media, community organisation. 5. Exchange: Depiction of positive healthy role models in mass media programme. 6. Competition: Curriculum addressed social influences and taught resistance skills.	Quasi-experiment invoking schools and communities in 2 matched cities. Outcomes and Method: Smoking. Baseline survey of 2,401 primary school 6th grade students in 13 schools with longitudinal and cross-sectional survey follow-up for 3 years (7 schools). Results: Significantly lower smoking prevalence and intensity in intervention communities at all follow-ups ($p<0.04$ - $p<0.0001$) (eg. 14.6% weekly smokers in intervention group vs. 24.1% control when students at end of high school).
Perry 1996 Project Northland	6th- 9th grade students in NE Minnesota	Multi-component intervention targeting adolescent alcohol use, comprising 3-year school curriculum, parent activities, peer-led activities, theatre, community taskforces, local alcohol ordinances.	1. Behaviour change goal: Prevent or reduce alcohol use. 2. Consumer research: Extensive pilot tests. 3. Segmentation and targeting: Each year of the intervention was tailored to students' developmental level and to school context. Parent-targeted activities were implemented. 4. Marketing mix: Curriculum, peer-led	Randomised controlled trial. Outcomes and Method: Self-reported alcohol, tobacco, marijuana use. Baseline survey of 2,351 6th grate pupils in 24 Minnesota schools, with follow-up 2.5 years later.

			activities, home activities, materials, community and policy-level activities. 5. Exchange: Attractive alcohol-free activities and materials ('Amazing Alternatives! Program, T.E.E.N.S. [The Exciting and Entertaining Northland Students]. Sponsorship of alcohol-free activities and a youth centre. 6. Competition: Curriculum taught skills for resisting alcohol influences, and challenged normative perceptions of prevalence. Community taskforce activities included passing ordinances requiring responsible beverage service training to prevent illegal sales to minors and intoxicated patrons.	Results: Alcohol use increased in both groups by follow-up. Past week and past month alcohol use were significantly lower ($p<0.05$) in intervention group than control. Intervention students also had lower tobacco and marijuana use than control students at follow-up (n.s.). 4 year follow-up found no significant differences.
Schorling 1997 Rural African-American smoking cessation programme	African-American adults in a rural community in Virginia, USA	Smoking cessation programme delivered through church coalitions, comprising one-to-one counselling, self-help materials, community activities.	1. Behaviour change goal: Increase smoking cessation rate and increase progress along cessation stages of change. 2. Consumer research: Community health needs assessments and community resource inventories. 3. Segmentation and targeting: Within the one-to-one counselling programme, interventions were tailored to individuals' stage of change. Activities were developed for and delivered through both church	Quasi-experimental, with one county allocated to receive intervention and one to act as comparison. Outcomes and Method: Self-reported smoking cessation and stage of change. 648 adults interviewed pre-intervention and 18 months after start of intervention. Results: Quit rate post-intervention was 9.6% in

			and non-church channels (eg. "smoking cessation devotional booklets"). 4. Marketing mix: Counselling, materials, community activities. 5. Exchange: Intervention underpinned by community empowerment principles which sought to increase participants' control over issues of importance to them and their community. Counselling emphasised benefits of quitting. Social activities (eg. Gospel Quit Nights) and cessation contests were implemented. 6. Competition: Counselling and self-help materials sought to develop coping skills.	intervention community, 6.2% in comparison community. Among church goers, quit rates were 10.5% vs. 5.8%, and among non-church goers 8.8% vs. 6.4%. None of the differences were significant, but a trend towards greater effectiveness in intervention community compared with comparison, and among church goers in particular, was suggested.
Spoth 2001 Iowa Strengthening Families Program	6th grade pupils and their families in rural schools in a midwestern state	Iowa Strengthening Families Program comprising 7 sessions delivered once per week (parents and children trained separately for first 6 weeks). Underpinned by Bio-psychosocial model and family protective and risk factor models.	1. Behaviour change goal: Reduce drug and alcohol use by enhancing family protective factors. 2. Consumer research: Programme previously piloted; some programme elements informed by consumer research. 3. Segmentation and targeting: Components for children and parents; tailored for each family; high-risk families. 4. Marketing mix: Interpersonal training, parent sessions, child sessions, video 5. Exchange: Intervention encouraged	Randomised controlled trial. Outcomes and Method: Alcohol initiation, ever use, been drunk. Baseline survey of 446 families (6th grade students and parents) with 2 year (293 families) and 4 year (303 families) follow-ups. Results: Lower alcohol initiation in intervention compared with control at 1 and 2 years. Increase in alcohol 'ever use' and 'ever

			activities to increase family cohesion and positive interactions. 6. Competition: Sessions taught peer resistance skills, managing emotions and conflict.	been drunk' lower in intervention group than control at every year at follow-up, with increasing effect sizes over time.
Sussman 1993 Project TNT (Towards No Tobacco Use)	7th grade students in 48 junior high schools in California.	School-based 5-year smoking prevention programme. Compared four curricula, all underpinned by social includes approach: Normative social influence, Information social influence, Physical consequence, and Combined. Each curriculum comprised 10 lessons and was interactive.	1. Behaviour change goal: Prevent smoking. 2. Consumer research: Curriculum building blocks were pretested with same age students. 3. Segmentation and targeting: Targeted at age of onset, designed to address appropriate theoretical determinants. 4. Marketing mix: Curriculum, videos. 5. Exchange: Normative programme – included discussion of how to 'still be liked by their friends' in substance use offer situations. 6. Competition: Addressed direct and indirect influences on tobacco use.	Randomised controlled trial comparing social influences curricula: 1. Normative social influences, 2. Informational social influence, 3. Physical consequences, 4. Combined. Outcomes and Method: Experimental and weekly use of tobacco and smokeless tobacco. Baseline survey of 6716 7th grade students followed up at 2 years. Results: Experimental tobacco use and weekly tobacco use increased significantly less at one year for curricula 2,3 and 4 compared with control ($p<0.05$ for both). For students receiving curriculum 4 (combined), the increase in weekly prevalence was 64% less than in control. Experimental tobacco use increased significantly less at 2 years for all curricula compared with control ($p<0.05$, absolute difference 6-10%.

				Weekly tobacco use was significantly lower at 2 yrs in combined curriculum than all others ($p<0.05$). Combined curriculum reduced the increase in weekly prevalence by 56% compared with control.
Sussman 1998 Project TND (Towards No Drug Abuse)	Continuation high school (high risk) students in California, USA	School-based intervention (Project Towards No Drug Abuse) comprising 9 sessions, reinforced by school-wide events. Curriculum is underpinned by social influences approach, combined with motivational activities and social skills training, and is highly interactive	1. Behaviour change goal: Reduce cigarette, alcohol, marijuana and hard drug use. 2. Consumer research: Focus groups, small scale experiments and piloting used to develop curriculum. 3. Segmentation and targeting: Traditional social influences-type curriculum is modified and tailored to high-risk older adolescents. 4. Marketing mix: Curriculum, school-wide events (eg. sports, job training), workbooks. 5. Exchange: Motivation-type classroom activities helped high-risk students develop more positive self-image. School-wide activities offered drug-free activities (sports, drug-free parties). 6. Competition: Curriculum taught coping and self-control skills and challenged pressures to use drugs.	Randomised controlled trial. Outcomes and Method: Self-reported drug use. Survey of 1,074 students from 21 continuation high schools pre-intervention and 1 year post-intervention. Carbon monoxide breath samples. Results: No significant reduction in smoking in past 30 days or marijuana use. Significant reduction in hard drug use ($p<0.04$ or $p<0.01$?) and in alcohol use ($p<0.01$) among pupils with higher levels of baseline alcohol use.
Sussman 2002	Continuation	School-based	1. Behaviour change goal: Reduce	Randomised controlled trial comparing health

Project TND (Towards No Drug Abuse)	high school students in California, USA	intervention (Project Towards No Drug Abuse) comprising 12 sessions, taught in one version by health educators and in a second version through self-instruction. Curriculum comprised 9 session TND (see above) plus 3 additional sessions on marijuana use prevention, smoking cessation, and self-control for drug abuse and violence prevention.	cigarette, alcohol, marijuana and hard drug use. 2. Consumer research: Focus groups, small scale experiments and piloting used to develop curriculum. 3. Segmentation and targeting: Traditional social influences-type curriculum is modified and tailored to high-risk older adolescents. 4. Marketing mix: Curriculum, school-wide events (eg. sports, job training), workbooks. 5. Exchange: Motivation-type classroom activities helped high-risk students develop more positive self-image. School-wide activities offered drug-free activities (sports, drug-free parties). 6. Competition: Additional sessions dealt with coping with withdrawal.	educator delivery, self-instruction and control. Outcomes and Method: Self-reported drug use. Survey of 1,037 students from 18 continuation high schools pre-intervention and 1 year later. Carbon monoxide breath samples. 2 year follow-up by telephone and mail. Results: Lower monthly use at 2 years for health educator-led group ($p=0.16$) and for hard drug use ($p=0.024$). No significant differences found for self-instruction version. Other effects on drug use found for some subgroups.
Vartiainen 1998 North Karelia Project youth component	12-13 year olds in 6 schools in North Karelia, Finland.	School- and community-based smoking prevention programme implemented during a community-wide cardiovascular disease prevention programme. Comprised 10 classroom sessions underpinned by social influences approach; a second experimental condition	1. Behaviour change goal: Prevent smoking, reduce cardiovascular risk behaviours. 2. Consumer research: Community analyses, surveys, pilot testing. 3. Segmentation and targeting: Activities targeted at different sectors of population; community activities intended to reinforce impact of youth programme. 4. Marketing mix: curriculum, community activities.	Quasi-experiment. Compared health-educator led and teacher-led programmes with control. Outcomes and Method: Smoking prevalence, number of cigarettes smoked. Baseline survey of 903 7th grade students in 6 schools, followed-up for 15 years (until age 28). Results:

		added 5 sessions in the following year.	5. Exchange: Programme principles emphasised importance of individual motivation, and sought to "inspire" a community action ethos 6. Competition: Addressed social influences and pressures to smoke; general programme emphasis on social support and environment modification to support adoption of new behaviours in the community.	One-third fewer reported smoking 'once a month' in intervention than control group at 6 months and 2 years; difference found at 8 years only for teacher-led programme. No significant difference at 15 years. Significantly lower uptake of smoking in intervention than control groups over 15 years: 30.8% health educator-led, 29.3% teacher-led, 41.2% control, p=0.02).
Wagenaar et al 2000 Midwestern community intervention	7 Midwestern communities (Minnesota and Wisconsin); 12th grade students and 18-20 year olds in these communities	Community intervention (over 2.5 years) to reduce youth access to alcohol, youth alcohol use, and alcohol-related car crashes. Comprised: • community mobilisation • adoption of local ordinances and enforcement of existing laws on alcohol access • alcohol-free activities for youth • policies on alcohol promotions • media advocacy • merchant education	1. Behaviour change goal: Reduce youth alcohol access, use and related crashes. 2. Consumer research: Community analysis to map local power structure, assessment of community perceptions and local drinking norms. 3. Segmentation and targeting: Components for different segments of community. 4. Marketing mix: Policy change, community mobilisation, media, youth activities. 5. Exchange: Alcohol-free recreational activities for youth, rewards for responsible retailers/servers. 6. Competition: Intervention sought to foster anti-alcohol community norms.	Randomised controlled trial with time series design. Outcomes and Method: Alcohol use, heaving drinking, number of drinks on last occasion and in last month; drink-driving; drink-related crashes. Self-reported retailer behaviour. Baseline telephone survey of 5,885 12th grade students with 13 year follow-up. Baseline survey of 3,095 18-20 year olds with 3 year follow-up. Alcohol purchase attempts from licensed outlets. Analysis of archival records on alcohol-related injuries and arrests.

				Results: Arrests for drink-driving were significantly lower in intervention than control communities (p=0.05). No difference in drink-related crashes. No differences found in any alcohol use outcomes. Retailers: intervention retailers had higher rates of checking age ID (n.s.), lower incidence of selling underage (n.s.), and higher perceived risk of prosecution (n.s.). 18-20 year olds reported increased difficulty in buying alcohol (n.s.).
Wildey 1995 Project TRUST	Retailers in 6 low income ethnically diverse communities in San Diego county, CA, USA	One-year long retailer educational campaign to promote greater compliance with laws on youth access to tobacco, comprising mass media, educational materials, employee training videos, community events.	1. Behaviour change goal: To increase retailers' compliance with law and reduce sales to minors. 2. Consumer research: Educational materials were pretested with retailers and community stakeholders. 3. Segmentation and targeting: Different educational strategies developed for managers and sales assistants. Activities developed for secondary target groups of community and media. 4. Marketing mix: Face-to-face education, educational materials, media, community events.	Controlled study. Outcomes and Method: Illegal sales data gathered from 260 stores pre-intervention and 1 month post-intervention. 236 stores were followed-up at 6 months. Results: Illegal sales reduced from 70% of stores to 32% post-intervention (p<0.001). Illegal sales in control stores reduced from 65% to 59% (n.s.).

			5. Exchange: Compliant retailers were rewarded with positive newspaper coverage and letters of approval. 6. Competition: Education materials sought to provide retailers with skills to refuse underage customers, backed up by free POS materials.	Similar results at 6 month follow-up.
Windsor & Lowe 1988 (also 1989) Alabama workplace quit smoking programme	University of Alabama employees	Voluntary workplace quit smoking programme comprising 4 interventions: a) brief advice and self help manuals. b) as (a) plus counselling, skills training and buddy support. c) as (a) plus monetary awards for cessation. d) as (b) plus monetary awards for cessation.	1. Behaviour change goal: Smoking cessation. 2. Consumer research: Employee Working Group had input into programme design. 3. Segmentation and targeting: Designed for worksite; some components individually tailored. 4. Marketing mix: One-to-one advice, manuals, incentives. 5. Exchange: Incentives, buddy support, motivation. 6. Competition: Skills counselling and methods to increase social support.	Randomised pre- and post-test comparing (i) cessation manual, (ii) manual plus skills training and buddying, (iii) manual plus financial incentives, (iv) all. Outcomes and Method: Smoking cessation. Baseline survey of 378 smokers in a university workplace with follow-up at 6 weeks, 6 months and 1 year. Results: Unclear. Continuous quitting was higher in combined group (ii) and (iv), and lower in combined group (1) and (iii) (14.4% vs. 5.8%).

Table III: Physical Activity Interventions: Social Marketing Characteristics and Result

Intervention Name & Authors	Participants & Setting	Intervention	SM Characteristics	Results
Baranowski 2003 (GEMS) The Girls Health Enrichment Multi-Site Studies	35 African American girls aged 8-10, 35 and their parents in summer day camp and homes in Houston, Texas, USA.	Community based, also summer camp setting. 12 week two arm parallel group randomised controlled pilot study design. Girls in the intervention group attended a 4 week summer camp, followed by an 8 week home internet intervention for girls and their parents. Based on social cognitive theory.	1. Behaviour change goal: To prevent obesity by increasing levels of physical activity. 2. Consumer research: Extensive formative assessment including focus groups. 3. Segmentation and targeting: African American girls aged 8-10 with a certain range of Body Mass Index. 4. Marketing mix: Child targeted programmes (group sessions and activities), parent programmes, events, summer camp, internet based intervention. 5. Exchange: Small gifts and incentives offered for continued participation, goal setting. 6. Competition: Recognised potential influence of family members, social support to address barriers through buddy system.	Mixed results: Physical activity levels: No significant differences between treatment and control group. Measures: Time. Physiological: No significant effect on BMI.

Beech 2003 (GEMS) The Girls Health Enrichment Multi-Site Studies	60 African American girls with specific BMI range, along with their parents/caregivers in community centres in Memphis, Tennessee, USA.	Community based, 12 week parallel group randomised controlled pilot study design. Active interventions held in community centres involved highly interactive weekly group sessions with either girls (child-targeted programme) or parents/caregivers (parent-targeted programme). Content focused on knowledge & behaviour change skills to promote healthy eating and increased physical activity. Based on social cognitive theory.	1. Behaviour change goal: To prevent obesity by increasing levels of physical activity. 2. Consumer research: Extensive formative assessment including focus groups. 3. Segmentation and targeting: African American girls aged 8-10 with a certain range of Body Mass Index. 4. Marketing mix: Child targeted programmes (group sessions and activities), parent programmes, events, summer camp, internet based intervention. 5. Exchange: Small gifts and incentives offered for continued participation, goal setting. 6. Competition: Recognised potential influence of family members, social support to address barriers through buddy system.	Mixed results: Physical activity levels: Girls in the intervention group increased their level of moderate to vigorous activity by 12%. Measures: Time. Psychosocial: showed no significant improvement in self efficacy for Physical activity scores in treatment group. Physiological: Trend towards reduced BMI.

Brownson 1996 Bootheel Heart Health Project	Adults in six south-eastern counties of Missouri, USA.	Communities based activities such as exercise groups, blood pressure and cholesterol screenings, and cardiovascular disease education were conducted in six south eastern. Missouri counties. Uncontrolled, cross sectional sample design. Intervention conducted over 4 years. Based on the planned approach to community health model, social learning theory and the stage theory of innovation.	1. Behaviour change goal: To reduce behavioural risk factors for cardiovascular disease including physical inactivity. 2. Consumer research: Community leaders planned and tailored interventions to the needs of their community. Coalition development incorporated needs assessment. 3. Segmentation and targeting: Intervention was targeted in low income and ethnic minority region following analysis of mortality data. 4. Marketing mix: Education programmes, media, exercise classes, walking clubs. 5. Exchange: Poster contests were held in schools, education programmes highlighted the benefits of physical activity such as better fitness levels. 6. Competition: Evaluation of environmental factors was conducted, walking paths were constructed in low income communities where cost was a barrier to physical activity.	Positive effect. Physical activity: Physical inactivity decreased within the intervention region, that is, in communities where heart health coalitions were developed and among respondents who were aware of these coalitions. Measure: time.

Burke 2002 An Innovative Program For Changing Health Behaviours	78 couples cohabiting for less than 2 years in Perth, Western Australia.	Community based, randomised control trial design. The intervention consisted of interactive group sessions and mail outs.	1. Behaviour change goal: To increase levels of physical activity. 2. Consumer research: Formative research in the form of focus groups was carried out. Pilot testing was carried out prior to intervention. 3. Segmentation and targeting: Couples cohabiting for less than 2 years in Perth, Western Australia. 4. Marketing mix: Mail outs, interactive group sessions. 5. Exchange: Goal setting formed an important part of the intervention, 6. Competition: Incorporated strategies to tackle barriers to behavioural change were a feature of the intervention. Focus was put on social support and recognition of risk behaviours.	Mixed results. Physical activity levels: Physical activity levels increased, however between group differences were not significant. Measure: Time. Psychosocial: changes for self efficacy and stage of change to physical activity were not significant. Physiological: Reduction in BMI, blood pressure and cholesterol levels.

Caballero 2003 Pathways	1704 American-Indian children in 3rd-5th grades in 41 schools in Arizona, New Mexico and South Dakota, USA.	The school-based intervention comprised a physical activity programme supplemented by a classroom curriculum and family component. Randomised controlled trial study design. Based on social learning theory.	1. Behaviour change goal: The intervention sought to promote and increase energy expenditure through physical activity. 2. Consumer research: The study included a 3 year feasibility stage during which intervention components were developed and tested. Formative research was undertaken using both quantitative and qualitative methods. 3. Segmentation and targeting: American Indian children, cultural heritage was considered during programme development. 4. Marketing mix: Classroom curriculum, family component, physical activity classes. 5. Exchange: Goal setting, achievement recognition. 6. Competition: Risk behaviours (ie. sedentary lifestyle) were identified in formative research and the intervention strategy sought to target such behaviours.	Positive effect. Significant increase in self reported levels of physical activity. Measure: kcal, time. Psychosocial: self efficacy for physical activity was significantly higher in treatment group than control group. Positive effect on stage of change for physical activity. Physiological: No significant reduction in BMI.

CATCH 1996 The Child And Adolescent Trial For Cardiovascular Health	A total of 5106 third grade students from 56 intervention and 40 control elementary schools located in California, Louisiana, Minnesota and Texas, USA.	Intervention to improve diet and physical activity among school students. Multi centre field trial with cluster units, randomised controlled trial design. The 2 year intervention included both school based and family based components, including class curricula, physical activity classes, home activities programme, family fun night. Based on organisational change and social cognitive theory.	1. Behaviour change goal: To increase daily vigorous physical activity. 2. Consumer research: The overall programme was developed from a body of research that tested theory based methods. Limited empirical data informed the development of the intervention. 3. Segmentation and targeting: Multi-ethnic: Caucasian, African American and Hispanic school children of all ages. 4. Marketing mix: School environment and classroom curricula components. Teachers provided with training. 5. Exchange: Rewards, prizes and incentives formed a part of intervention activities. The programme included motivation by targeting anticipated outcomes of behaviour. 6. Competition: Children received training in perceptions of threats and coping procedures. The intervention addressed self regulatory processes including self monitoring as part of the education programme.	Positive effect. Intensity of physical activity in PE classes increased significantly in intervention compared to control. Intervention students reported significantly more daily vigorous activity than controls (58.6 vs. 46.5 minutes) Measure: Time. Psychosocial: Positive social support for physical activity did not differ significantly between groups. Physiological: No significant differences in BMI, blood pressure and cholesterol.

Goodman 1995 Heart To Heart Project	Randomly selected residents of the city of Florence, South Carolina, USA.	A 5 year community based chronic disease prevention programme. Quasi experimental, randomised controlled design. Intervention included media campaign, walk a thons and a speaker's bureau. Based on an organised approach to health promotion/disease prevention.	1. Behaviour change goal: Increase levels of physical activity. 2. Consumer research: Co-ordinating council, surveillance system and inventory of resources conducted needs analysis. 3. Segmentation and targeting: Intervention area targeted based on health data. 4. Marketing mix: Walk-a-thons, media campaign, speaker's bureau, pamphlets. 5. Exchange: Walking challenges, competitions. 6. Competition: Walking lanes introduced to encourage activity, targeted interventions to overcome barriers to low income participants.	No effect. No effect on physical activity levels. Measure: frequency. Physiological: The project had a slightly favourable intervention effect on cholesterol and smoking, but failed to have an effect on other risk factors for cardiovascular disease.

Huhman et al 2005 VERB	Targeted at children aged 9-13. National campaign in the USA with 9 communities selected for intervention, 6 of which received high dose activities: Los Angeles, Houston, Miami, Greenville, Columbus and Green Bay.	A Multiethnic media campaign combining paid advertisements with school and community promotions and internet activities to encourage children aged 9-13 to be physically active every day. Schools based, underpinned by a social marketing framework. Quasi-experimental, longitudinal design was used.	1. Behaviour change goal: To encourage children aged 9-13 to be physically active every day. 2. Consumer research: Extensive formative research carried out on target group and parents including focus groups, interviews and ethnographic inquiries. 3. Segmentation and targeting: Children aged 9 to 13. 4. Marketing mix: Media, community events, promotions, educational materials in schools. 5. Exchange: VERB sales package included benefits of physical activity such as enjoyment, spending time with friends and gaining recognition. Various events offering competitions and prizes for participation. 6. Competition: VERB campaign's goal was to win or gain a greater market share of time tweens spend on sedentary activities by creating an effective brand and utilising a design acknowledging competing behaviours such as watching TV, lack of transportation, cost and perceived lack of time.	Positive effect. Positive effect on physical activity levels of children who were aware of and took part in interventions. Measure: frequency. Knowledge: Positive effect on knowledge outcomes.

Lewis 1993 (PARR) The Physical Activity For Risk Reduction Project	Low income residents in rental communities of the Housing Authority of the Birmingham District in Birmingham, Alabama, USA	A randomised controlled study, 3 year constituency based physical activity promotion programme. Used community based exercise programmes, walking and aerobic dance classes, videos, pamphlets and behaviour interventions.	1. Behaviour change goal: 2. Consumer research: Focus group meetings in communities, needs assessment. 3. Segmentation and targeting: Ethnic minority communities. 4. Marketing mix: Walking, aerobic classes, videos and pamphlets, group and individual instruction. 5. Exchange: Intra and inter community competitions for structured participation. Participants taught advantages of health and job related fitness. 6. Competition: Intervention designed by taking into account barriers to physical activity identified in formative research, for example arranging group childcare.	Mixed Results: Physical activity levels: The pre and post intervention physical activity scores were not significantly different in intervention communities. However physical activity levels did increase in intervention communities, with higher increases among young people and women.

MHHP 1994 Minnesota Heart Health Program	Adults in six communities in Minnesota, USA	5-year community intervention to reduce cardiovascular risk factors (smoking, cholesterol, blood pressure, physical activity). Controlled, quasi experimental, cross sectional and cohort survey design. Underpinned by social cognitive theory and community participation, the intervention comprised community organisation, citizen taskforces, mass media, educational programme delivered through health centres, professional education (eg. of physicians, nutritionists and other health professionals) and youth education through schools, youth clubs and children's events and community-based activities.	1. Behaviour change goal: The intervention sought to reduce the risk of cardiovascular disease by improving exercise behaviours (along side other components). Aimed to increase physical activity and reduce sedentary behaviour. 2. Consumer research: Intervention components were based on different formative work such as telephone surveys and needs assessment surveys. 3. Segmentation and targeting: Targeting strategy combined individual-, group- and community-targeted activities. Activities designed for delivery agents (eg. training). 4. Marketing mix: Community organisation, media, training, classes, policies. 5. Exchange: The intervention included economic incentives and the school programme employed goal setting. 6. Competition: The school programme included teaching children to resist health compromising behaviours and taught skills to resist pressures.	Mixed results. Physical activity levels: Steady increase in self reported physical activity levels over duration of intervention. Small increase in kcal per day expended in physical activity in early years, small decrease in later years. Measure: frequency and kcal expended. Physiological: No significant changes in blood pressure, BMI or Cholesterol level.

Matsudo 2002 Agita Sao Paolo Program	Residents of the city of Sao Paolo, Brazil.	A multi-level community wide intervention designed to promote physical activity in the Brazilian city of Sao Paolo. Activities were encouraged in three settings: home, transport and leisure time. Based on the Trans-theoretical model, Social Cognitive Theory and community planning for partnership and health promotion. Uncontrolled.	1. Behaviour change goal: To promote physical activity by increasing knowledge about the benefits and the level of physical activity. 2. Consumer research: Needs analysis, formative research, and use of baseline data. 3. Segmentation and targeting: Students, the elderly and workers. 4. Marketing mix: Educational materials, media exposure, mega events, gala days, active worker days. 5. Exchange: Events and Gala days offered rewards for participation, emphasis on benefits of physical activity outlined in materials, pyramid system of desirable behaviours circulated. 6. Competition: Intervention design accounted for lack of time by encouraging brief sessions, moderate intensity physical activity was recommended to account for climate.	Positive effect. Physical activity levels: Positive effect. Measure: time. Positive effect on knowledge levels: positive effect on knowledge of physical activity benefits and risk behaviours.

Nader 1992 San Diego Family Health Project	24 Anglo, Black and Mexican-American families of young elementary school children, in the city of San Diego, California, USA.	School based randomised controlled field trial. Intervention comprised a 3 month cardiovascular disease risk reduction education project to increase frequency of aerobic exercise. Based on cognitive social learning theory.	1. Behaviour change goal: Increase frequency of aerobic exercise. 2. Consumer research: Formative research was undertaken. 3. Segmentation and targeting: Mexican American, Black and Anglo American families. The intervention was culturally sensitive (eg. use of bilingual speakers) 4. Marketing mix: Educational programme, group sessions, training for graduate students running the intervention 5. Exchange: Extrinsic rewards such as tickets to events were offered for full participation and self monitoring; contests ran in newsletters, emphasis made of benefits such as physical well being, improved appearance, pride in achievement, increased confidence. 6. Competition: Potential barriers to achieving goals were identified and ways were identified which minimised changes in person's usual habits.	Mixed Results No effect on levels of physical activity: ANOVA analysis showed no main effects in reported minutes of exercise. Measure: Time. Positive effect on knowledge: Experimental group exceeded control group for knowledge scores at post test. Physiological: No significant effect on blood pressure. Psychosocial: Significant change in social support for physical activity.

Neiger 2001 Social Marketing For Public Health Employees	205 Public health employees in Utah, USA.	Quasi experimental design, with a pre-test post-test format with primary and secondary treatment groups. Ten week social marketing intervention comprising the following communications and promotions, ongoing activities, one off events and environmental changes.	1. Behaviour change goal: The intervention sought to increase physical activity levels. 2. Consumer research: Comprehensive formative research was undertaken, including an interest survey, focus groups, in depth interviews and pre-testing. 3. Segmentation and targeting: Public health employees 4. Marketing mix: The intervention comprised communications and promotions including posters, public announcements, events, and ongoing activities. 5. Exchange: Challenges, leave granted for successful groups, recognition: pat on the back ceremony. 6. Competition: Activities were designed from formative research data to reduce reported barriers.	Positive effect. Pre-test to post-test differences were noted in primary treatment group on three levels of physical activity. Application of the intervention was generally effective at increasing physical activity levels. Measure: frequency. Psychosocial: Self efficacy scores on physical activity showed significant differences between primary and secondary groups. Support from friends and family also showed significant differences.

Neumark-Sztainer 2003 New Moves	89 girls in the intervention group and 122 in control group taken from six schools in the Twin Cities (Minneapolis-St Paul) district of Minnesota, USA.	Multi-component, school based obesity prevention programme, randomised controlled study design. Based on social cognitive theory. The intervention incorporated a class based curriculum, physical activity classes, instruction and education packs.	1. Behaviour change goal: Increase levels and awareness of physical activity. 2. Consumer research: Needs assessment was conducted and formative research including a survey and focus groups were conducted. 3. Segmentation and targeting: High school girls. 4. Marketing mix: Classroom curriculum, physical activity classes, exercise logs, guest instructors, information packs, policy change. 5. Exchange: Participants. offered school credits for completing programmes 6. Competition: Formative research identified barriers to change such as discomfort with physical education classes. Addressed barriers such as transportation costs and lack of time by incorporating intervention components into school day activities.	Mixed Results Level of Physical activity: No significant difference. Measure: time Psychosocial outcomes: Progression in state of behavioural change. Physiological outcomes: BMI no significant differences.

O'Loughlin 1999 Coeur En Santé St-Henri Programme	Adults in a low income inner city neighbourhood in Montreal, Quebec, Canada.	4-year community programme to reduce cardiovascular risk factors (smoking, diet, blood pressure, physical activity). Randomised, controlled design. Underpinned by social learning theory and behaviour change theory and community participation, the intervention included, direct mail, a walking club, distribution of videos, mass media, workplace workshops	1. Behaviour change goal: To promote heart-healthy behaviours including physical activity. 2. Consumer research: Needs analysis, focus groups, in-depth interviews, pilot testing. 3. Segmentation and targeting: Components tailored to low income population. Some activities specifically targeted at women. 4. Marketing mix: Walking clubs, workplace workshops, direct mail, and media. 5. Exchange: The intervention included workplace workshops using a motivational approach, walking club included provision of t-shirts and a certificate for participation 6. Competition: Workshops aimed to help people identify the social and commercial pressures to lose weight and to develop a long term commitment to physical activity. Walking club was developed in response to concerns that few low cost opportunities for physical activity were available to women.	No effect: Physical Activity Levels: No statistically significant program effects detected, physical inactivity increased in both intervention and control communities. However physical inactivity increased more in comparison community than in St-Henri. Measure: frequency.

Pawtucket 1995 Pawtucket Heart Health Program	Adults in a Rhode Island city with relatively low mean household income.	7-year multi-component community intervention to reduce cardiovascular risk factors. Quasi experimental design with one intervention and one comparison community. Underpinned by social learning theory, community behavioural psychology and community participation, the intervention comprised formal behaviour change programmes (including counselling and groups), grass-roots community and worksite activities, volunteer delivery, unpaid publicity, weight loss contests.	1. Behaviour change goal: Increase levels of physical activity. 2. Consumer research: Formative evaluation and an ongoing computer based process evaluation system feeding back into the programme. Individual programmes were pilot tested. 3. Segmentation and targeting: Targeting strategy combined individually- and community- / environmental-targeted activities. Materials were culturally relevant and designed for people with low literacy. 4. Marketing mix: Education, counselling, media, community and worksite activities, policy change. 5. Exchange: Weight loss contests including monetary incentives. 6. Competition: Programmes were designed to influence the environment in which risk factor behaviours occurred for example instillation of a multiple station exercise course.	Positive effect: Physical activity: Not measured. Knowledge: Increased knowledge, identification of physical activity as a cardiovascular disease risk factor. Physiological: Reduction in CVD rates by 16% compared to control, no increase in BMI compared to increase in control to a significant level.

Prochaska 2004 (PACE +) The Patient Centered Assessment And Counselling For Exercise Plus Nutrition Program	138 teenagers from a middle school in San Diego, California, USA.	4 month intervention. The intervention comprised an interactive computer program that was completed before a meeting with a health professional. Randomised control trial design. Based on social cognitive theory, trans-theoretical model and relapse prevention model.	1. Behaviour change goal: The intervention sought to increase levels of physical activity. 2. Consumer research: Prototypes of the programme were tested for usability. Focus groups were held with teenagers and other audiences. 3. Segmentation and targeting: Teenagers, the programme also used individual tailoring. 4. Marketing mix: Interactive computer programme and encounter with health professional, telephone calls and mail out information packs. 5. Exchange: Action plans identified the benefits of making changes such as increased fitness levels. 6. Competition: Relapse prevention plans were included that included strategies for reducing barriers to behaviour change.	No effect. No self reported improvement in levels of rigorous physical activity. Measure: time.

Puska 2002 North Karelia Project	Residents of the North Karelia region of Finland.	A 25 year community based project to prevent cardiovascular disease, physical activity element introduced after 10 years on project. Based on social learning theory, innovation diffusion theory, communication perception model, hierarchical communication model and trans-theoretical need. No control, non randomised design.	1. Behaviour change goal: Increase levels of leisure time physical activity as part of overall target to reduce levels of cardiovascular disease. 2. Consumer research: - Population and health personnel surveyed about problems and about the possibilities of solving them. Information was gathered 'about the community leadership and social interaction structure in the community. Some pre-testing in small communities prior to regional roll out. 3. Segmentation and targeting: Targeted at high risk region based on health data, various interventions targeted specific groups such as middle aged men and youth groups. 4. Marketing mix: Media campaigns, fitness classes, training of health and other professionals, policy change. 5. Exchange: Messages about benefits of improved fitness communicated to participants, physical activity competitions held. 6. Competition: Formative research addressed barriers to participation, interventions designed to address these barriers.	Positive effect. Positive effect on physical activity levels. Over the intervention period leisure time physical activity levels increased. Physiological: Overall 75% reduction in annual mortality rate of coronary heart disease in working population of region. Significant reduction in cholesterol levels.

Reger 2002 Wheeling Walks	50-65 year old adults in the city of Wheeling, West Virginia, USA	A community based campaign to promote walking among sedentary 50 to 65 year old adults. Quasi-experimental design with control group. Communication intervention used theory of planned behaviour and trans-theoretical model constructs to change behaviour by promoting daily walking through paid media, public relations and public health activities.	1. Behaviour change goal: To promote 30 minutes of daily walking. 2. Consumer research: Pre-testing, formative qualitative and quantitative research. 3. Segmentation and targeting: Targeted at sedentary 50 to 65 year old adults. 4. Marketing mix: Media, public relations activities, a campaign website, public health education programmes, work site programmes. 5. Exchange: A worksite wellness walking challenge was held in the intervention community with incentives for participation. 6. Competition: Intervention design addressed barriers to physical activity such as perceived lack of time and scheduling.	Positive effect on physical activity levels. Physical activity levels: Behaviour observation and self reporting showed small positive effect. Measure: frequency and time. Psychosocial: positive effect on stage of change for physical activity.

Resnicow 2000 GO GIRLS!	57 low income overweight African American girls aged 11-17 in USA.	Community based. Uncontrolled before and after study design, comparing outcomes for high and low attendees. Based on social cognitive theory. The intervention comprised of sessions of interactive educational/behavioural activity, information packs and physical activity classes.	1. Behaviour change goal: Intervention sought to increase levels of physical activity. 2. Consumer research: Focus groups were conducted with the target audience. 3. Segmentation and targeting: Female, low income overweight African American teenagers. 4. Marketing mix: Posters and flyers, educational component, physical activity classes, information packs. 5. Exchange: Incentives such as t-shirts and financial rewards offered for full participation. Points system used in which points could be exchanged for rewards. Groups taken on outdoor retreat days. 6. Competition: Wide range of physical activities was used to allow participants to choose something that they enjoyed and could fit in to their lifestyles. Participants also taught relapse strategies and risks of sedentary behaviours.	No effect. Physical activity levels: No significant differences were found for levels of physical activity between high and low attendees (no control group). Measure: frequency, time, kcal. Psychosocial: Reported more social support from friends and family for making exercise changes. No significant difference in self efficacy for physical activity scores. Physiological: no positive effect on BMI and other measures.

Sallis 2003 (M-SPAN) The Middle School Physical Activity And Nutrition Study	Pupils of 24 public middle schools in San Diego County, California, USA.	School based physical activity interventions over 2 years, designed to increase physical activity in physical education classes and throughout the school day. Randomised control trial design. Based on a structural, ecologic model of health behaviour.	1. Behaviour change goal: Increase the total energy expenditure from physical activity by the student population at school. 2. Consumer research: Baseline data was used to inform the development of the intervention. 3. Segmentation and targeting: Middle school children. 4. Marketing mix: The intervention comprised monthly peer led educational sessions, reminder telephone calls and pamphlets, policy change. 5. Exchange: Behaviour reinforcing incentives were used. Key reasons to attend sessions were emphasised in mail outs. Activity equipment was made available to students. 6. Competition: Intervention components were designed to increase physical activity during leisure periods throughout the school day giving pupils choices. Policy changes were made to make more activity areas accessible.	Positive effect. Physical activity levels: Randomised regression models revealed a significant intervention effect for physical activity for the total group and boys but not girls. Measure: time, kcal. Physiological: Survey data indicated that the interventions reduced reported body mass index for boys.

Story & Sherwood 2003 (GEMS) The Girls Health Enrichment Multi-Site Studies	54 African American girls aged 8-10 in after school community program in Minnesota, USA.	Community Based after school obesity prevention programme. 12 week two arm parallel group randomised controlled pilot study design. The after school intervention was conducted twice a week for 12 weeks and focused on increasing physical activity and healthy eating. A family component was also included. Based on social cognitive theory.	1. Behaviour change goal: To prevent obesity by increasing levels of physical activity. 2. Consumer research: Extensive formative assessment including focus groups. 3. Segmentation and targeting: African American girls aged 8-10 with a certain range of Body Mass Index. 4. Marketing mix: Child targeted programmes (group sessions and activities), parent programmes, events, summer camp, internet based intervention. 5. Exchange: Small gifts and incentives offered for continued participation, goal setting. 6. Competition: Recognised potential influence of family members, social support to address barriers through buddy system.	Mixed results: Physical activity levels: Physical activity measures demonstrated consistently greater activity levels in the intervention than the control. Measures: Time. Psychosocial: showed no significant improvement in self efficacy for Physical activity scores in treatment group. Physiological: No significant effect on BMI.