NSMC Report 1

A REVIEW OF THE EFFECTIVENESS OF SOCIAL MARKETING PHYSICAL ACTIVITY INTERVENTIONS

Undertaken by the:

ISM Institute for Social Marketing
A collaboration between the University of Stirling and The Open University

Ross Gordon, Laura McDermott, Martine Stead, Kathryn Angus and Gerard Hastings

2006
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**APPENDIX 1:** Record of electronic searches
**APPENDIX 2:** Studies included in the Review
**APPENDIX 3:** Overview of included Studies (summary only, full version omitted from this draft to enable future publication of findings in academic journals)
INTRODUCTION – National Social Marketing Centre review work

Dominic McVey and Clive Blair-Stevens

The aim of the Centre:

to help realise the full potential of effective social marketing
in contributing to national and local efforts
to improve health and reduce health inequalities.

This paper is part of work contributing to the independent National Review of health-related programmes and social marketing campaigns, that was first announced as part of the Public Health White Paper ‘Choosing Health’. The work is being undertaken by the National Social Marketing Centre and will be published summer 2006.

The discussion and consultation that fed into the development of that White Paper had highlighted a number of concerns. Two of particular relevance to this work were:

- A growing realisation that continuing with existing methods and approaches was not going to deliver the type of impact on key health related behaviours that was needed.
- Other comparable countries appeared to be achieving more positive impacts on behaviours by using and integrating a more dynamic customer-focused social marketing approach into their methods.

As a result, it was agreed that a national review should be undertaken to examine the potential of social marketing approaches to contribute to both national and local efforts, and to review current understanding and skills in the area among key professional and practitioner groups.

The National Consumer Council was asked to lead this work as they have been key advocates for a more consumer-focused approach. It was also recognised that an independent aspect to the review would be important so that existing practice across the Department of Health could be considered and recommendations developed to one side of existing responsibilities.

To inform the National Review a range of research methods and approaches have been used

<table>
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<th>Research programme – overarching objectives</th>
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<td>1: To review the growing evidence-base for Social Marketing in some key priority areas.</td>
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<td>2: To examine current government practice and effectiveness in delivering health-related programmes and campaign interventions.</td>
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<td>3: To better understand stakeholder understanding and perceptions of social marketing</td>
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<td>4: To consider key behavioural trends and progress towards government health-related targets.</td>
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<td>5: To consider and assess the costs to society of preventable ill-health and assess the potential of Social Marketing to contribute to reducing that cost.</td>
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<td>6: To map current national capacity to utilise and deliver Social Marketing approaches.</td>
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<td>7: To map key social and market research sources available to those developing health-related programmes or campaigns.</td>
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While the NSM Centre has a small core team a wide number of external associates have been actively contributing to developing work. These have included colleagues from a number of research organisations and individual consultants who have been commissioned to assist with developing aspects of the research programme.

This report is one of a range of research and review reports that are informing our National Review and the recommendations we are developing.

### Summary of NSM Centre papers – currently being developed

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<tr>
<th>NSMC1</th>
<th>Effectiveness Review: Physical Activity and Social Marketing</th>
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<td>NSMC2</td>
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<td>NSMC4</td>
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<td>Social Marketing for Health in the European Union – initial selective review</td>
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<td>NSMC7</td>
<td>National Health-Related Campaigns Review – selective review of 11 campaigns</td>
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<td>NSMC8</td>
<td>National Stakeholder Research Findings – current understanding and views</td>
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<td>NSMC9</td>
<td>Summary review of current use of Social Marketing across Government</td>
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<td>NSMC10</td>
<td>Health economic analysis: Initial look a the societal costs of preventable ill-health</td>
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<td>NSMC11</td>
<td>Social Marketing Research – compendium of social &amp; market research sources</td>
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<tr>
<td>NSMC12</td>
<td>Overview of key behavioural trends and targets re: ‘Choosing Health’ priorities</td>
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</table>
Providing comments and views

Contribution of this work

The research programme overall is revealing invaluable insights into the use and effectiveness of social marketing interventions and is providing a robust platform to inform the 1st National Social Marketing Strategy for Health.

The work however also has a much wider value and interest. Anyone working to achieve positive behavioural impacts on different audiences, whatever the focus or topic, should find these reports of interest. It will be of particular relevance to those working on or contributing to health-related programmes and campaigns, whether in public health, health promotion, communications or as dedicated social marketeers, at a national or local level.

Your experience, views and input

This and other papers we are developing are being made available as drafts at this stage to allow further opportunities for people to provide additional comments and feedback before they are finalised. We therefore consider the following as a ‘live draft’ and would actively invite and welcome comments, ideas and feedback.

In addition we would also invite readers to offer broader views and feedback on any ways they think that health-related programmes and campaigns might be improved and enhanced drawing on core social marketing principles. As other draft work and material is developed it is being made available via the website on: www.nsms.org.uk

All comments and ideas can be emailed to us at: nsmc@ncc.org.uk

Thanks

Finally we would like to particularly thank colleagues Ross Gordon, Laura McDermott, Martine Stead, Kathryn Angus and Gerard Hastings, at the Institute for Social Marketing for undertaking this work and contributing to our national review.

Thanks are also due to our other National Social Marketing Centre colleagues and associates who have all helped ensure this work could be commissioned and contribute to the national review.

We look forward to receiving further comments and views.

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1: WHAT IS SOCIAL MARKETING?

Social Marketing is a potentially powerful and flexible approach for helping achieve specific and measurable impacts on different behaviours.

It is also currently an under-utilised approach that if applied effectively has the potential to strengthen and enhance our efforts at both national and local levels to improve health and reduce health inequalities.

As formal descriptions and definitions can vary across the literature the National Social Marketing Centre uses the following formal definitions:

**Social Marketing is:**

The systematic application of marketing concepts and techniques to achieve specific behavioural goals relevant to a social good.

**Health-related Social Marketing is:**

The systematic application of marketing concepts and techniques to achieve specific behavioural goals relevant to improving health and reducing health inequalities.

In recent years, increasing attention has been given to realising the potential of effective social marketing approaches to enhance and support efforts to achieve specific behavioural goals in relation to different topics and issues.

It is increasingly being advocated as a core component of public health strategy, particularly for influencing voluntary lifestyle related behaviours, such as smoking, drinking, drug use and diet (CDC 2005). The UK Government 2004 Public Health White Paper ‘Choosing Health’ recommends that social marketing is used to help make behaviours that can harm health less attractive, and to encourage and support behaviours that can improve health (Department of Health 2004).

Although social marketing has been used to inform interventions for around 30 years, there have been few reviews of its effectiveness in general as an approach to achieving positive impacts on specific behaviours. One difficulty has been the lack of an easily operationalised definition of a social marketing intervention.

Generic definitions of social marketing are not precise enough to help in deciding whether a specific intervention does or does not qualify as social marketing. One solution to the difficulty is simply to select interventions that are called social marketing programmes by their managers or evaluators.

However, the Institute for Social Marketing’s (ISM) 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 incorporate social marketing principles. Secondly, it includes interventions which, despite their label, are poor...
examples of social marketing or not social marketing at all. The resulting evidence base, if a
search is restricted only to interventions called ‘Social Marketing’, is likely to be limited and
flawed.

Previous ISM systematic reviews, resolved this challenge by searching instead for
interventions which met all six benchmark criteria for a social marketing intervention as
proposed by Andreasen a leading social marketeer (Andreasen 2001).

Using these criteria eligible interventions had to provide evidence of:

Andreasen’s Social Marketing Benchmark Criteria

<table>
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<tr>
<th>Benchmark</th>
<th>Explanation</th>
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<td>1. Behaviour Change</td>
<td>Intervention seeks to change behaviour and has specific measurable behaviour objectives</td>
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<td>2. Consumer Research</td>
<td>Formative research is conducted to identify target consumer characteristics and needs. Intervention elements are pre-tested with the target group.</td>
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<td>3. Segmentation &amp; Targeting</td>
<td>Different segmentation variables are considered when selecting the intervention target group. Intervention strategy is tailored for the selected segment/s.</td>
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<td>4. Marketing Mix</td>
<td>Intervention consists of promotion (communications) plus at least one other marketing ‘P’ (‘product’, ‘price’, ‘place’). Other Ps might include ‘policy change’ or ‘people’ (e.g. training is provided to intervention delivery agents).</td>
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<td>5. Exchange</td>
<td>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 (e.g. personal satisfaction) or tangible (e.g. rewards for participating in the programme and making behavioural changes).</td>
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<tr>
<td>6. Competition</td>
<td>Intervention considers the appeal of competing behaviours (including current behaviour). Intervention uses strategies that seek to minimise the competition.</td>
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These same criteria have been used in other reviews undertaken for the National Social Marketing Centre.

Further work in progress on Social Marketing Benchmark Criteria

As a result of this work and other on-going feedback the National Social Marketing Centre has done further work to develop a set of criteria and a new 8 point Social Marketing Benchmark Criteria summary is currently being developed and trailed. This can be found on the website: www.nsms.org.uk
2: REVIEW AIM AND METHODS

The aims of the review are:

1. To review how effective social marketing physical interventions have been in changing the behaviour of individuals, groups, organisations and public policy.
2. To map the diversity of social marketing approaches that have been used to address physical inactivity.
3. To describe what, if any, behavioural models/theories are used by campaigners to develop social marketing physical activity interventions.
4. To describe how social marketing physical activity interventions have been evaluated and make recommendations as to how they should be evaluated in the future, including identification of common indicators of short, medium and long-term effectiveness.

Time constraints did not permit us to conduct a systematic search for primary studies. Initially we decided to search 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.

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. 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.

Where information on individual interventions was provided in the papers, this was examined for Andreasen’s 6 social marketing benchmarks (Andreasen 2002) to identify if the intervention could be potentially described as social marketing. If insufficient information was provided then the full text of the study articles was retrieved. Supplementary papers were often required to be retrieved to provide information on, for example, a programme’s development.

From the 17 reviews and 48 articles retrieved initially, a further 62 articles were generated and retrieved, totalling 110 articles assessed against Andreasen’s six criteria.

22 interventions met all six of Andreasen’s criteria for a social marketing intervention, and were included in the review.
3: THE STUDIES

The 22 studies represented a wide range of different types of intervention, and were heterogeneous in aims, intervention approach, methods, and evaluation design. The interventions were concerned with increasing knowledge of benefits of physical activity, dangers of inactivity, and increasing levels of physical activity.

19 of the 22 interventions targeted physical activity within the context of a range of cardiovascular risk factors (e.g. diet, physical activity, blood pressure, and smoking)

Only 3 of the included social marketing physical activity interventions were exclusively focused on physical activity

3.1: Types of Intervention

These comprise the following:
  I: Community Interventions
  II: School-based interventions
  III: Mass media-based intervention
  IV: Interventions in other settings

I: Community Interventions

- 14 interventions were community based interventions. Of these 13 were multi-component community interventions.
- One was a single component (i.e. physical activity) only, community based intervention.
  - (Lewis 1993)

- All 14 interventions targeted levels of physical activity as an outcome.
- 2 of the 14 targeted and reported knowledge outcomes
- 6 of the 14 interventions targeted the general population.
- 10 studies targeted specific sub groups within the community either exclusively or as a component of the community intervention, such as:

  Ethnic minorities (Brownson 1996, Lewis 1993)
  Older people (Matsudo 2002, Reger 2002)
  Young girls (Baranowski 2003, Beech 2003, Story & Sherwood 2003, Resnicow 2000)
  Newly married couples (Burke 2002)
  People with low levels of literacy (Gans 1999).

- 2 of these interventions included efforts to change policy with regards to physical activity
Several of the studies within this group of community interventions are internationally renowned programmes that have been evaluated over a number of years such as

- The Minnesota Heart Health Program (Luepker 1994)
- The North Karelia Project (Puska 2002)
- The Pawtucket Heart Health Program (Gans 1999).

### II: School-based Interventions

- 7 interventions were school-based

- All 7 comprised theory driven classroom curricula involving understanding benefits of physical activity and risks of sedentary behaviour.
- Classroom education took place alongside activities in other channels such as:
  - Mass media campaigns (Huhman 2005)
  - School and community events (Caballero 2003, Nader 1992)
  - Efforts at policy change (Sallis 2003, Neumark-Sztainer 2003).

### III: Mass media-based Interventions

- 1 intervention was primarily mass media based = the VERB project which targeted levels of physical activity and knowledge outcomes. (Huhman 2005)

- The project was targeted at school children aged 9-13 and the intervention included activities delivered through other channels in addition to the media element such as educational materials and community events.

### IV: Interventions in Other Settings

- Although several of the multi-component community based interventions included activities based in the workplace only 1 intervention included in this review was exclusively work based.

**Social Marketing for Public Health Employees study** (Neiger 2001)
- This was exclusively based in the workplace of public health employees of the Utah Department of Health.

**GEMS Pilot Study** (Baranowski 2003)
- Based in summer camps and homes of the targeted children for the Houston, Texas, branch of the intervention, but was primarily a multi component project and primarily community based.
3.2: Theories and Models Used in the Programmes

The majority of the included studies were based on one or more theoretical models used to inform development and design of the interventions.

Social Cognitive or Social Learning Theory
- 13 studies used this, the most common theoretical base for interventions.
- The Social Cognitive theory explains how people acquire and maintain certain behavioural patterns, while also providing the basis for intervention strategies (Bandura, 1997).
- Social Cognitive 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).
- Evaluating behavioural change depends on the factors environment, people and behaviour. Social Cognitive Theory provides a framework for designing, implementing and evaluating programmes.

The Trans-theoretical model
- The trans-theoretical model hypothesises that behavioural change unfolds through a series of stages. That is, individual progress through a series of stages in recognizing the need to change, contemplating a change, making a change, and finally sustaining the new behavior. 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.

Stage theory of innovation
- 1 intervention used this in its design (Brownson 1996).
- This theoretical perspective defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system.
- The four main elements of the model are
  - Innovation, (ideas, practices, objects)
  - Communication channels,
  - Time, and
  - Social system.
- Therefore the model can be applied to the diffusion of health strategy such as physical activity interventions.

Behaviour change theory
- 1 intervention used this in its development (O’Loughlin 1999)

Organisational change theory
- 1 intervention that was based on organisational change theory (Luepker 1996).

Planned approach to community health model
Community participation
• 2 studies were based on community participation (Gans 1999, Luepker 1994).

Community behavioural psychology
• 1 intervention used this in its design (Gans 1999).

The relapse prevention model
• 1 intervention used this (Prochaska 2004).

Theory of planned behaviour
• 1 intervention was informed by the theory of planned behaviour (Reger 2002).

Structural, ecological model of health behaviour
• 1 intervention used this to inform its development and design (Sallis 2003)

Social marketing framework
• 2 interventions used this to inform their development and design (Neiger 2001, Huhman 2005).

Innovation diffusion – communication perception model
• One intervention used innovation diffusion, the communication perception model and the hierarchical communication model (Puska 2002).
3.3: Target Groups

Many of the physical activity interventions were targeted at a particular group.

- 11 interventions were targeted at **young people**

- 2 interventions included components targeted at **older people**

- 2 interventions were targeted at **low income groups**
  - (O’Loughlin 1999, Brownson 1996).

- 8 interventions were targeted at **minority ethnic groups**

- Studies targeted at **low income and minority ethnic groups** drew particular attention to the fact that these groups were more likely to display higher than average levels of sedentary behaviour due to a range of socio-economic factors, and that barriers often prevented access to physical activity.

- 1 intervention was targeted at **people with low levels of literacy**
  - (Gans 1999).
3.4: How the Interventions were Evaluated

The majority of the interventions were evaluated using a randomised controlled trial or quasi-experimental design.

- 10 were randomised controlled trials
- 3 used a randomised cross over design
- 6 were quasi-experiments
- 2 used longitudinal cohort surveys
- 3 were uncontrolled studies.

- For the school-based programmes, this typically involved random assignment of classes or schools to an intervention or control condition, while for the multi-component community and media interventions, intervention sites were typically compared with comparison communities matched on key characteristics. The period of follow-up ranged widely in the studies from a month after implementation to several years.

- The majority of the studies involved one to two year follow-up.

- The main outcomes examined in the physical activity programmes included level of physical activity; (by frequency, total kcal expended, minutes spent on physical activity, or distance covered).

- Levels of physical activity were measure in a variety of different ways across the interventions.

- Measures of level of physical activity are not mutually exclusive in interventions and several studies used more than one measure.
  - (Reger 2002) For example used both time spent in and frequency of physical activity sessions to measure behavioural outcomes.
  - 15 interventions used time spent (the most frequently occurring measure of level of physical activity)
  - 9 interventions used frequency of physical activity behaviour as a measure
  - 3 interventions used levels of expended energy in kilocalories to measure levels of physical activity

- Several of the interventions that used both ‘time spent in’, and ‘frequency of’ physical activity used this information to compute physical activity scores such as Metabolic Equivalent (MET) weighted scores.
  - As used in the Go Girls intervention (Resnicow 2000).

- However there was wide variance and a lack of consistency across interventions using such measures.

- Use of an outcome measure based on a commonly accepted physical activity score would be an extremely useful tool for drawing comparisons across interventions as this would allow evaluations to be made on a more like for like basis.
• The lack of a universally accepted measure of level of physical activity poses a problem when conducted a review of this nature as it can be difficult to conduct comparisons across interventions using different measures and therefore extrapolate clear conclusions.

• Another issue surrounds basing measures on self reporting of physical activity as some interventions reported decreased fitness levels of participants despite a self reported increase in physical activity suggesting that self-reports can generate overestimation of level of activity and cause problems with validity.

• Some of the included interventions also took:
  o Knowledge measures
    ▪ knowledge of intervention messages,
    ▪ knowledge of benefits of physical activity / dangers on sedentary lifestyle
  o Psychosocial measures, such as
    ▪ self efficacy to physical activity,
    ▪ social support for physical activity.

• Physiological outcomes were also reported in several of the included studies, including:
  o Blood pressure,
  o Cholesterol level and
  o BMI – Body Mass Index
3.5: Social Marketing Characteristics of the Interventions

All included interventions had to show evidence of having met all 6 Social Marketing benchmarking criteria.

This meant that they had to:

I: Have a specific Behaviour Change goal.
- Behaviour change goals sought by the included interventions comprised increasing actual levels of physical activity, (all of the included studies) and increasing knowledge and awareness of the importance of a recommended level of physical activity or other knowledge related outcomes,

II: Have used Consumer Research to inform the intervention.
- Typical consumer research conducted by the interventions included:
  - Community needs assessments 
    - (Goodman 1995)
  - Focus groups 
    - (Huhman 2005)
  - Pre-testing of materials 
    - (Neiger 2001)
  - Pilot tests of intervention activities 
    - (Gans 1999).

III: Consider different Segmentation variables and Target interventions appropriately
- Interventions demonstrated segmentation and targeting if they
  - Designed interventions to be age-appropriate 
  - Particularly appropriate to the setting in which they were delivered 
    - (Brownson 1996)
  - Tailored activities and materials to specific groups, such as low income 
    - (OLoughlin 1999, Brownson 1996)
  - Minority ethnic participants 
    - (Brownson 1996, Lewis 1993)
- Displaying particularly high levels of physical inactivity.

IV: Demonstrate use of more than one element of the Marketing Mix.
- For example, a typical combination of marketing mix elements in a community based intervention was:
  - Fitness classes held in community halls (product) 
  - Plus media materials (Promotion) such as TV adverts 
    - (Huhman 2005)
  - Pamphlets 
    - (Goodman 1995)
  - Stickers 
    - (Matsudo 2002, Huhman 2005)
  - Training of professional and other staff to give advice and training or coaching on physical activities (people) 
V: Utilise the ‘exchange’ concept’
i.e.: 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:
- Community-based programmes which emphasised the positive benefits of increased physical activity such as feeling healthier, improved appearance and increased confidence  
- Examples of tangible exchange include:
  o Intra or intercommunity competitions  
    ▪ (Lewis 1993, Huhman 2005) and
  o Rewards for continued participation such as certificates  
    ▪ (O’Loughlin 1999)
  o Prizes  
    ▪ (Luepker 1996)
- All of which motivate people to engage with an intervention.

VI: Utilise the ‘competition’ concept
i.e.: Consider the appeal of competing behaviours and use strategies that seek to minimise this Competition.

Competition strategies included
- Providing childcare facilities  
  o (Lewis 1993)
- Travel subsidies, holding fitness classes at suitable and convenient times  
  o (Matsudo 2002, Nader 1992)
- Emphasising the fun nature of forms of activity compared to other leisure pursuits  
  o (Huhman 2005).

More detailed information on the social marketing characteristics and results of each intervention is provided in Appendix 3.
4: RESULTS

- 22 included studies
- 10 showed an overall positive effect
- 8 showed mixed results
- 4 showed no effect on overall outcomes

A breakdown of outcome variable measures and results of the included studies follows:

4.1: Behaviour (Increased Levels of Physical Activity)

- 21 of the 22 included studies targeted at least one behavioural outcome, most commonly an increased level of physical activity based on total time spent or frequency of activity.
- 8 of the 21 reported a significant positive effect on behaviours.

Positive results:
For example:
Social Marketing for Public Health Employees (Neiger 2001)
- A quasi-experimental design, pre-test post-test format study with primary and secondary treatment groups, had a positive effect on behavioural outcomes. This workplace-based, ten week intervention comprised communications and promotions, ongoing activities, one-off events and environmental changes.
- Pre-test to post-test differences were noted in primary treatment group on three levels of physical activity, and the application of the intervention was generally effective at increasing physical activity levels measured by frequency.

The Wheeling Walks intervention (Reger 2002)
- This was also successful at affecting behavioural outcomes. This was a community based campaign to promote walking among sedentary 50 to 65 year old adults in the city of Wheeling, West Virginia, USA.
- The study was of a quasi-experimental design with control group. The intervention used the theory of planned behaviour and transtheoretical model constructs to change behaviour by promoting daily walking through paid media, public relations and public health activities. Wheeling Walks had a positive effect on physical activity levels with behaviour observation and self reporting showing a small positive effect.

No effect:
- 6 studies reported a non-significant change in behaviour.

For example
Coeur en sante St-Henri programme.
A study targeted at adults in a low income inner city neighbourhood in Montreal, Quebec, Canada. The 4-year community programme aimed to reduce cardiovascular risk factors (smoking, diet, blood pressure, physical activity). The study was of randomised, controlled design and was underpinned by social learning theory, the behaviour change theory and community participation.

The intervention included, direct mail, a walking club, distribution of videos, mass media, and workplace workshops. No statistically significant programme effects were detected, and physical inactivity increased in both intervention and control communities.

Mixed results:
- 7 of these studies reported mixed results.

For example

**Perth – cohabiting couples**
- (Burke 2002)
  - This intervention was aimed at 78 couples cohabiting for less than 2 years in Perth, Western Australia. The study was community based, and of randomised control trial design. The intervention consisted of interactive group sessions and mail outs. It was found that activity levels increased, but between group differences were not significant.

**Physical Activity for Risk Reduction Project (PARR) intervention**
- (Lewis 1993)
  - Was aimed at low income residents in rental communities of the Housing Authority of the Birmingham District in Birmingham, Alabama, USA produced mixed results. The study was of randomised controlled design, and incorporated a 3 year constituency based physical activity promotion programme. The intervention used community based exercise programmes, walking and aerobic dance classes, videos, pamphlets and behaviour interventions.
  - The pre and post intervention physical activity scores for physical activity levels were not significantly different in intervention communities. However physical activity levels did increase in intervention communities among young people and women.
4.2: Knowledge

- 4 studies measured knowledge outcomes

- All 4 reported a positive effect.
- All measured knowledge of behaviour risks
- 3 measured knowledge of recommended levels of physical activity.

For example

The Agita Sao Paolo Program (Matsudo 2002)
- Aimed at the residents of the city of Sao Paolo, Brazil, was a multi-level community wide intervention designed to promote physical activity. Activities were encouraged in three settings: home, transport and leisure time.
- The intervention had a positive effect on knowledge of physical activity benefits and risk behaviours, achieved through the communication strategy of the programme.

4.3: Psychosocial Variables

- 11 studies attempted to influence physical activity related psychosocial variables

- 6 or the 11 reported a positive effect for at least one variable.

- This suggests that although increased level of physical activity can be difficult to achieve, interventions can be successful at changing attitudes and perceptions towards physical activity and that perhaps continued or follow up interventions could build upon this to effect behavioural change.

Positive results:

For example:
Pathways (Caballero 2003)
- Was a school based intervention aimed at 1704 American-Indian children in 3rd-5th grades in 41 schools in Arizona, New Mexico and South Dakota, USA.
- The programme comprised a physical activity programme supplemented by a classroom curriculum and family component.
- Outcome evaluation found that self efficacy to physical activity was significantly higher in the treatment group than the control group.
- It was also found that there was a positive effect on stage of change to physical activity.

The New Moves intervention (Neumark-Sztainer 2003)
- Targeted school girls in the Twin Cities (Minneapolis-St Paul) district of Minnesota, USA and was successful at producing a positive effect on psychosocial outcomes.
- The programme was a multi-component, school based obesity prevention programme, of randomised controlled study design.
- The intervention incorporated a class based curriculum, physical activity classes, instruction and education packs.
• It was found that in terms of psychosocial outcomes there was a progression in state of behavioural change.

No effect:
• 5 interventions showed no effect on psychosocial outcomes.

For example:
The CATCH programme (Luepker 1996)
• Aimed at third grade students from 28 schools located in California, Louisiana, Minnesota and Texas, USA was one such study. The intervention intended to improve diet and physical activity among school students.
• The 2 year intervention included both school based and family based components, including class curricula, physical activity classes, home activities programme, family fun night.
• However in terms of psychosocial outcomes, positive social support for physical activity did not differ significantly between intervention and control groups.

Self efficacy as outcome measure:
• 7 studies measured levels of self efficacy to physical activity as an outcome measure.
• 2 of the 7 studies significantly improved self efficacy in relation to physical activity.
  o (Caballero 2003, Neiger 2001)

• A range of other psychosocial outcomes were also successfully influenced across many interventions.

Social support as outcome measure:
• 4 studies used measures of social support from family and friends for physical activity as a psychosocial outcome measure.
• 2 of this 4 reported a positive effect.
  o (Resnicow 2000, Nader 1992)
• 4 studies reported stage of change outcomes
  o (Burke 2002, Neumark-Sztainer 2003, Caballero 2003, Reger 2002)
• 3 of this 4 had a positive effect.
  o (Neumark-Sztainer 2003, Caballero 2003, Reger 2002)
4.4: Physiological Outcomes

- 14 studies measured physiological outcomes

- Physiological outcome measures such as Body Mass Index (BMI), cholesterol level and blood pressure were also used in several of the included interventions. The majority of these interventions used more than one physiological outcome measure when publishing results.

- 11 of the 14 studies used Body Mass Index (BMI) as a measure.

- 2 of these 11 showed a positive effect
  - (Burke 2002, Gans 1999)

- 6 showed no effect

- 3 showed mixed results

- 6 of the included studies that measured physiological outcomes used cholesterol levels as a measure.

- 3 of these 6 showed a positive effect

- 3 of these 6 showed no effect

- 2 of the interventions used CVD as a measure
- Both interventions seeing a reduction in CVD rates.
  - (Puska 2002, Gans 1999)

- 5 of the interventions measuring physiological outcomes used blood pressure as a measure.

- 1 of these 5 interventions showed a positive effect
  - (Burke 2002)

- 4 studies showed no effect.

- However improvement in physiological outcome measures does not automatically suggest improvement in levels of physical activity as the multi-component nature of several of the interventions reporting improved physiological outcomes make it difficult to disaggregate the strength of the effect individual components have on outcome results.
Positive results:
- 4 of the 14 studies showed positive effects.

For example:
The North Karelia Project (Puska 2002)
- This was successful at reducing the level of Cardiovascular Disease (CVD) in the intervention region.
- The project was a long term (25 year) multi-component community intervention designed to reduce CVD rates in a high risk population region.
- The programme incorporated a media campaign, professional training, organised activities and efforts at policy change. In terms of physiological outcomes there was an overall 75% reduction in annual mortality rate of coronary heart disease in the working population of the region and there was a significant reduction in cholesterol levels.

The Pawtucket Heart Health Program (Gans 1999)
- This was aimed at Adults in a Rhode Island city with relatively low mean household income.
- The 7-year multi-component community intervention was designed to reduce cardiovascular risk factors and comprised formal behaviour change programmes (including counselling and groups), grass-roots community and worksite activities, volunteer delivery, unpaid publicity and weight loss contests.
- There was a reduction in CVD rates by 16% compared to control, and no increase in BMI compared to increase in control to a significant level.

Mixed results:
- 4 studies showed mixed results.

For example:
The GEMS Pilot Study (Baranowski 2003)
- This was aimed at 35 African American girls aged 8-10, 35 and their parents in a summer day camp and homes in Houston, Texas, USA.
- The project was community based and also utilised a summer camp setting. Girls in the intervention group attended a 4 week summer camp, followed by an 8 week home internet intervention for girls and their parents.
- However the programme produced no significant effect on Body Mass Index (BMI) amongst the participants.

No effect:
- 6 studies showed no effect.

For example:
The San Diego Family Health Project (Nader 1992)
- Aimed at Anglo, Black and Mexican-American families of young elementary school children, in the city of San Diego, California, USA failed to produce a positive effect.
- The intervention comprised a 3 month cardiovascular disease risk reduction education project to increase frequency of aerobic exercise.
- However the intervention produced no significant effect on blood pressure levels in the intervention population.
4.5: Environmental / Policy Effects

- 6 interventions were designed to directly effect policy change with regard to physical activity

- However, several of the multi-component interventions aimed to effect policy in other areas such as nutrition, for example new food policy in school canteens within a region.
- Policy change in the realm of physical activity includes adoption of physical activity programme by schools, construction of a network of leisure space or facilities within a community (Prochaska 2004), or even formal adoption as part of national chronic disease prevention and health promotion policy (Puska 2002).

For example:

**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.

**The CATCH intervention** *(Luepker 1996)*
- This took an environmental and policy approach to enrich physical activity classes, leading to increased student's physical activity in class and out of school, policy changes that were maintained following the intervention.

**The M-Span intervention** *(Sallis 2003)*
- In this intervention key school personnel met regularly with project staff to select and implement policy changes to create healthier school environments. Participants in the meetings included administrators, physical educators, staff, student body organisations, parents and students. Policy goals were identified and action plans rolled out to effect policy change, for example ‘Provide supervision and transportation for student physical activity after school’ and ‘upgrade of PE facilities and equipment.’ Policy goals such as these examples were printed in school newsletters and distributed widely throughout the school and local community.
- The progress on policy goals was monitored in subsequent meetings. However the outcome paper of the M-Span intervention reports that although there were examples of successful policy change such as allowing students to use activity areas after school, ‘the effectiveness of policy change committees varied widely, and project support for the groups was probably inadequate to yield meaningful policy changes in most schools.’
- This demonstrates that for social marketing physical activity interventions to be successful at effecting policy change their needs to advocacy and political support for change.

**The North Karelia Project** *(Puska 2002)*
- Policy changes were effected which led to the provision of dedicated walking space (Prochaska 2004) and recreational areas assisted in the delivery of the intervention.
- The success of the name North Karelia Project led the intervention being rolled out nationally to cover the whole of Finland.
- The North Karelia Project proved that a major national demonstration programme can be a strong tool for favourable national development in chronic disease prevention and health promotion that can be adopted as national policy.
The New Moves study (Neumark-Sztainer 2003)
- Qualitative research indicated that feasibility of implementing the New Moves schools programme was high, as indicated by strong satisfaction among participants, parents and school staff and by programme sustainability.
- Following the end of the intervention period the New Moves programme was formally adopted to physical activity policy at the three intervention schools.

The Pawtucket Heart Health Program (Gans 1999)
- This 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.

Outcome measures
- No specific outcome measures on policy change were described in these interventions, and it is often difficult to measure whether policy change has occurred and what the drivers of policy change are.
- Also several of the other included interventions by their nature may have aimed to influence policy but did not report this.
- For social marketing physical activity interventions to be successful at influencing policy and effecting policy change there is a requirement for commitment to change and political support for this.
- Furthermore formal efforts need to be made as part of the intervention to network and become a part of the policy process through meetings and organisational links.
- It is apparent however that social marketing physical activity interventions can feed into the policy process and help to influence changes in policy on physical activity.
5: DISCUSSION

Overall the findings demonstrate that social marketing interventions can increase levels of physical activity and knowledge of the benefits, and dangers of inactivity.

The majority of studies (n=13) reported at least one significant behavioural change in a desired direction. The studies were of a reasonable quality although five did not use control or comparison groups (Matsudo 2002, Brownson 1996, Resnicow 2000, Puska 2002, Huhman 2005).

Randomisation was used in eleven studies, although this was often undertaken at a unit level (e.g. school or even county) as opposed to an individual level. Many of the study populations (and samples taken from them) were focused on minority groups, limiting the generalisability of findings to wider populations.

In addition, in cases where interventions comprised several components, overall results were reported, making it difficult to assess the relative contribution of different intervention elements.

One limitation of studies in this area is the lack of a universally used and accepted measure of levels of physical activity. This causes problems in comparing across interventions and extrapolating conclusions. It may be more useful to compare exact like for like interventions using the same outcome measures for level of physical activity but for a review of this nature this would not be appropriate.

Nonetheless conducting a review of this nature of social marketing physical activity interventions does provide a useful information source and gives a useful overall analysis on their general effectiveness.

Despite these weaknesses, there was evidence that social marketing physical activity interventions were effective at influencing behaviour, knowledge of the benefits of physical activity and psychosocial variables such as self-efficacy and social support, and physiological measures such as BMI, cholesterol and blood pressure.

Although some of the interventions showed only a moderate or no significant improvement in behavioural outcomes, namely levels of physical activity, these studies often displayed positive psychosocial outcomes such as state of behavioural change, self efficacy to physical activity or social support for physical activity.

This suggests that although increased level of physical activity can be difficult to achieve interventions are successful at changing attitudes and perceptions towards physical activity and that perhaps continued or follow up interventions could build upon this to effect behavioural change.

They also appear to have a more limited effect on physiological outcomes such as blood pressure, body mass index and cholesterol. This latter finding might be expected, as these kinds of outcomes are arguably more difficult to influence, and changes are likely to take a much longer time to occur and be detected. In addition, physiological outcomes are influenced by other factors in addition to physical activity, including diet and smoking.
Interventions were implemented in a range of settings - schools, workplaces, the family, youth centres, ‘the community’ - and there was evidence that social marketing interventions could be effective in all these settings. The small number of interventions in some settings meant that it was not possible to explore any relationship between setting type and effectiveness. Future reviews with larger numbers of less heterogeneous studies could perhaps examine the relationship between setting and effectiveness more closely. However, a more helpful question than ‘are workplaces better settings than schools?’ perhaps concerns how features of the setting are utilised and positively exploited in the overall social marketing strategy.

For example, in the Bootheel Heart Health Project (Brownson 1996), which had a positive effect on physical activity, the community setting itself played an integral part in the delivery of the intervention. Walking paths were constructed in communities linking them in with local community venues were intervention components were carried out.

In other studies, the intervention setting seemed to have been selected primarily for convenience reasons and was not particularly exploited in the intervention strategy. For example, in the San Diego Family Health Project (Nader 1992), families attended group educational meetings at the local school, but no information is given as to whether this setting was judged to be particularly appropriate for the targeted families or how it was harnessed in support of the programme goals.

The tendency for physical activity interventions to be part of wider studies targeting a reduction in cardiovascular disease risk reduction can dilute the effectiveness of the physical activity element. In many such interventions there is a prioritisation towards smoking cessation or improving diet, and often physical activity elements are added at a later date (Puska 2002) and/or given less weight in the strategy of the overall programme. This can impact on outcomes, for example in the Heart to Heart Project (Goodman 1995) the project had a slightly favourable effect on cholesterol and smoking, but failed to have an effect on levels of physical activity.

Although there is no strong evidence to suggest that multi-component interventions are any less effective there may be a danger that interventions on physical activity can lose priority or messages are lost when competing with other components.

If an intervention is based on a sound theoretical framework and incorporates extensive formative research there is a greater likelihood of success. However this needs to be properly implemented on the ground and often problems with support on the frontline can cause a well designed intervention to fail.

Another issue regards the length of intervention as with short term physical activity interventions it can be very difficult to gain quick results. Interventions that were implemented over a longer period of time such as the North Karelia Project (Puska 2002) have proved very successful at increasing levels of physical activity and overall reductions in CVD rates and levels of risk behaviours and it should be recognised that the longer time period for an intervention brings a greater change of seeing a positive effect.

An example of a social marketing physical activity intervention that featured the desired components of formative research, a sound theoretical framework and a longer term implementation period is the M-Span intervention (Sallis 2002, a School based physical activity interventions carried out over 2 years, designed to increase physical activity in physical education classes and throughout the school day.

The project was of randomised control trial design and was based on a structural, ecologic model of health behaviour. Formative research was carried out and baseline data was used
to inform the development of the intervention. The intervention comprised monthly peer led educational sessions, reminder telephone calls, issuing of materials such as pamphlets, and measured efforts to effect policy change including policy goal setting and regular stakeholder meetings.

The strong overall design of the intervention may have played a large part in the successful outcomes with randomised regression models revealing a significant intervention effect for physical activity for the total group and boys and physiological survey data indicating that the interventions reduced reported body mass index (BMI) for boys.

The M-Span intervention is a good example of a social marketing intervention in which the structure, design and implementation of the study was sound and well executed and future interventions should aim to incorporate the characteristics displayed by interventions such as this.
REFERENCES


Bauman A. Commentary on the VERB campaign - perspectives on social marketing to encourage physical activity among youth. Prev Chronic Dis 2004;1:A02


Kotler P, Zaltman G. Social marketing: an approach to planned social change. *J Mark* 1971;**35**:3-12


APPENDIX 1

Physical Activity Review
Record of Electronic Searches

1. The Cochrane Library
   1. “physical activity” in All Fields and “social marketing” in All Fields
   2. “physical activity” OR exercise in Record Title and “social marketing” in All Fields

2. PsycINFO
   1. ( social marketing ) and ( physical activity)
   2. ( social marketing ) and ( exercise )
   3. (Social marketing) and (physical)

3. Arts & Humanities Citation, Social Science Citation and Science Citation Indices (combined at Web of Knowledge)
   1. Combined searches:
      TS=(physical activity)
      DocType=All document types; Language=All languages; Database(s)=SCI-EXPANDED, SSCI, A&HCI; Timespan=1945-2005
      TS=(“social marketing”)
      DocType=All document types; Language=All languages; Database(s)=SCI-EXPANDED, SSCI, A&HCI; Timespan=1945-2005
   2. Combined searches:
      TS=(“social marketing”)
      DocType=All document types; Language=All languages; Database(s)=SCI-EXPANDED, SSCI, A&HCI; Timespan=1945-2005
      TS=(“systematic review”)
      DocType=All document types; Language=All languages; Database(s)=SCI-EXPANDED, SSCI, A&HCI; Timespan=1945-2005
   3. Search:
      TS=(“social marketing” AND exercise)
      DocType=All document types; Language=All languages; Databases=SCI-EXPANDED, SSCI, A&HCI; Timespan=1900-2005
   4. Search:
      TS=(“social marketing” AND physical)
      DocType=All document types; Language=All languages; Databases=SCI-EXPANDED, SSCI, A&HCI; Timespan=1900-2005

CRD (Centre for Reviews and Dissemination)
   1. “social marketing” AND “physical activity”
   2. “social marketing” AND exercise
   3. “social marketing”

PubMed
   1. "social marketing" AND (physical OR exercise)

NICE (the National Institute for Health and Clinical Excellence)
Browsed Physical Activity Health Topics.
APPENDIX 2

Physical Activity Review
Studies included

Baranowski 2003

Beech 2003

Brownson 1996

Burke 2002


Caballero 2003


Gans 1999


Goodman 1995

Huhman 2005


**Lewis 1993**

**Luepker 1994**


**Luepker 1996**


**Matsudo 2002**

**Nader 1992**


Neiger 2001

Neumark-Sztainer 2003

O'Loughlin 1999


Prochaska 2004


Puska 2002


Reger 2002

Resnicow 2000

Sallis 2003
Story & Sherwood 2003
APPENDIX 3

Physical Activity
Overview of included Studies

SUMMARY:

POSITIVE RESULTS
Bootheel Heart Health Project
Pathways
Pawtucket Heart Health Program
VERB
CATCH: Child And Adolescent Trial For Cardiovascular Health
Agita Sao Paolo Program
Social Marketing For Public Health Employees
Wheeling Walks
M-SPAN: Middle School Physical Activity & Nutrition Study

MIXED RESULTS
GEMS: Girls Health Enrichment Multi-Site Studies
An Innovative Program For Changing Health Behaviours
PARR: The Physical Activity For Risk Reduction Project
Minnesota Heart Health Program
San Diego Family Health Project
New Moves
North Karelia Project
GEMS: Girls Health Enrichment Multi-Site Studies

NO EFFECT
Heart To Heart Project
Coeur En Santé St-Henri Programme
PACE +: Patient Centered Assessment & Counselling for Exercise plus Nutrition Program
GO GIRLS!

Brownson 1996
Gans 1999 / Carleton et al 1995
Huhman et al 2005 / Wong et al 2004 / Bauman 2004
Matsudo 2002
Neiger 2001
Reger 2002
Sallis 2003
Baranowski 2003
Beech 2003
Burke 2002 / Burke et al 2004
Lewis 1993
Neumark-Sztainer 2003 / Neumark-Sztainer et al 2003
Puska 2002 / Puska et al 1983 / Puska et al 1995
Story & Sherwood 2003
Goodman 1995
Prochaska 2004 / Prochaska et al 2000 / Patrick et al 2001
Resnicow 2000