EVIDENCE SUMMARY

A Review of the Effectiveness of Mass Media Interventions which both Encourage Quit Attempts and Reinforce Current and Recent Attempts to Quit Smoking

Background

The aim of this review was to synthesise evidence evaluating the effectiveness of mass media interventions on helping people to quit smoking/tobacco use and/or to prevent relapse. These interventions were considered for both the effectiveness of the channel of communication and also for the effectiveness of message content, and this is reported under six research questions. Particular emphasis was placed on evaluating relevance to the UK setting and effectiveness within population groups such as pregnant smokers and ‘hard to reach’ communities.

The National Institute for Health and Clinical Excellence (NICE) has been asked to produce public health programme guidance on the optimal provision of smoking cessation services to all smokers, but in particular to specific population groups (manual working groups, pregnant smokers and hard to reach communities). The present review of the evidence of the effectiveness of mass media interventions for smoking cessation is a part of this project.

Objective

• To collate, rate and synthesise systematically findings on the effectiveness of interventions to promote smoking cessation and relapse prevention. This includes both primary intervention studies and secondary data via systematic reviews of interventions.

Methods

Data sources
A worldwide search identified relevant systematic reviews from 1995 onwards. A search for RCTs, controlled non-randomised studies, before and after studies, qualitative studies and case study evaluations was conducted from 1990 onwards.

Databases searched included reviews and other studies from the following resources: Cochrane Database of Systematic Reviews; DARE; National Research Register (including CRD ongoing reviews database); Health Technology Assessment Database; SIGN Guidelines; National Guideline Clearinghouse; HSTAT; TRIP; MEDLINE; EMBASE; CENTRAL; British Nursing Index; CINAHL; PsycINFO; King’s Fund; DH-Data; NICE web pages (published appraisals) http://www.nice.org.uk/nice-web/; Sociological Abstracts; ASSIA;

Selection Criteria
The included papers focus on mass media interventions that both encourage quit attempts and reinforce current and recent attempts to quit smoking among all population groups. These interventions include mass media events and community interventions (limited to community interventions which have a mass media component). This review excluded studies with a prevention focus, studies set in developing countries, papers in a language other than English, and mass media
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campaigns whose impact has been assessed only in terms of intermediate outcomes (e.g. intentions to quit, motivation to quit and confidence, attitudes to smoking, and knowledge about smoking).

**Data extraction and quality assessment**
The 19 databases/internet sources searched for systematic reviews and other studies, identified 8226 references. A further 11 references were identified from other sources (e.g. bibliographies). 80 records were selected for full text retrieval, and after assessment, a final total of 44 studies/reviews met the inclusion criteria.

Potentially relevant papers were assessed for quality using a checklist adapted from Appendix A.1 of the NICE ‘Manual’. Papers were graded both for the quality of the review or study (e.g. likelihood of bias; methodological rigour) and for the type of evidence it was reviewing (e.g. RCTs or non-RCTs). Reviews were graded for the likelihood of bias as ++ (high quality, lowest level of bias), + (good quality, low level of bias) or – (variable quality with greater degree of bias). Systematic reviews were categorised according to the study types which they included as follows: RCTs only (1), other study types (2), or a mixture of both (1&2). Following the NICE guidance, studies categorised as ‘level 3’ were not given a quality score, although it is indicated where the study limitations or quality may affect the reliability of results.

**Research questions**
1. What is the effectiveness of non targeted mass media interventions in promoting smoking cessation and relapse prevention?
2. Are there any differences in intervention effects (smoking cessation and relapse prevention) among subgroups of the population?
3. What is the evidence for the effectiveness of targeted interventions?
4. What is the evidence for interventions evaluating the duration, reach, calls to quit lines, dose-response or message style?
5. How acceptable and/or appropriate is the mass media and/or community intervention to the intended recipients?
6. What are the unintended outcomes of the intervention (both adverse and beneficial)?

**Results**

1. **What is the effectiveness of non targeted mass media interventions in promoting smoking cessation and relapse prevention?**

In this section both the content of interventions and the channels of mass media that were used are explored. For instance, the effectiveness of mass media led educational interventions or counter-marketing which are promoted either through interventions that employ a combination of mass media channels (multi-channel) or through single channels, such as television only, computer or internet only and so on.
**Educational Interventions/ Counter Marketing**

Multi-channel (e.g. a combination of two or more of the following: newspapers, billboards, TV, internet, mobile phones, radio etc.)

Three non controlled before and after studies (level 3) were identified. However the results of these studies should be interpreted with caution due to their poor methodological quality.

**Evidence Statement 1**

Three level 3 studies, probably relevant to the UK population, found an effect of multi channel mass media on smoking cessation, but there is no evidence about which of the mass media components of the interventions were most effective (or most ineffective) (Korhonen, 1998; Pierce, 1990; Popham, 1993).

**TV only**

One systematic review (level 1&2+) aimed to summarise the effectiveness, applicability, and barriers to the use of selected population-based interventions intended to reduce tobacco use and increase tobacco use cessation.

A non-randomised controlled trial (level 2+) evaluated the effectiveness of the Health Education Authority for England’s anti-smoking television advertising campaign to motivate smokers to give up, and to prevent ex-smokers to relapse.

**Evidence statement 2**

One review (level 1&2+), probably relevant to the UK population, found that there is insufficient evidence to assess the effectiveness of serialized TV cessation programmes in reducing tobacco use (Hopkins, 2001).

There is level 2+ evidence, directly relevant to UK adult populations, that found that TV anti-tobacco advertising is more effective than control for the outcome of not smoking. Such interventions are as effective as interventions which include advertising and a local campaign (McVey, 2000).

**Computer and /or internet only**

A controlled before and after study undertaken in the USA (level 2+) aimed to determine whether an automated email messaging system that sends individually timed educational messages (ITEMs) increased the effectiveness of an internet smoking cessation intervention.

**Evidence statement 3**

There is level 2+ evidence, probably relevant to the UK population, indicating that the addition (to a Web-based self-help style smoking cessation intervention) of an automated email educational messaging system was associated with an increase in the 30-day intent-to-treat quit rates (Lenert et al, 2004).

**Quit Lines for Smoking Cessation**

This section is organised around the channels of mass media that are used to advertise quit lines, although to be included in this section all studies must report outcomes relating to smoking cessation and/or relapse prevention.
Electronic message strips
One controlled study (level 2-) in a USA hospital evaluated electronic message strips advertising a quit line.

**Evidence statement 4**
There is level 2- evidence, probably relevant to the UK population, that there is insufficient evidence of the effectiveness of electronic message strips for advertising a quit line and impacting on quit rates. There is also insufficient evidence from this study that positive messages are less effective than negative messages (Johnson, 1995).

**No Smoking Days**
‘No Smoking Days’ and public awareness days create news stories and events to attract media coverage. A network of people supports the campaign at a local level by running events and helping smokers who want to stop smoking. The campaign supports these activities with the provision of materials and training. As No Smoking Days are generally long standing National public awareness days, it is not usually possible for an experimental design (e.g. RCT) to be used to evaluate effectiveness. Evaluations look at the impact of No Smoking Day retrospectively, unlike some other evaluations that utilise ‘pre’ and ‘post’ measures (Owen and Youdan, 2006). However, it is difficult to isolate the impact of No Smoking Day from other contemporaneous interventions.

**Evidence Statement 5**
There is level 3 evidence, directly relevant to the UK population, that a quit rate at three months in the range of 11% (0.7% of UK smokers) can be achieved following No Smoking Day. Other level 3 evidence reported a quit rate at three months in the range of 0.3 to 1.8 % following No Smoking Day in Wales. Another level 3 study, possibly relevant to the UK population, indicated that the ‘Great American Smokeout’ may reduce smoking on the day, but subsequently return to previous levels (Owen, 2006; Frith, 1997; Etter & Laszlo, 2005).

In addition, there is level 2- evidence, probably relevant to the UK population, that showed no effect of a poster campaign against passive smoking for World No-Tobacco Day on cigarette consumption or intention to quit (Hantula, 1992).

**Competitions & Incentives**

**Quit and win population based contests**
Quit and Win contests were developed in the 1980s and have been widely used since then as a population-based smoking cessation intervention at local, national and international level. The contests are advertised using mass media, posters and brochures distributed to schools, workplaces and medical facilities. A Cochrane review (level 1&2+) evaluated population-based quit and win contests at local, national and international levels.
Evidence Statement 6

There is evidence from one level 1&2+ review, probably relevant to the UK population, that shows a small effect of ‘Quit and Win’ contests on community prevalence of smoking. Less than one smoker in 500 quits because of the contests (Hey, 2005a).

Competitions and Incentives: Community Level

A Cochrane review of 15 studies evaluated whether competitions and incentives led to higher long-term quit rates. Interventions included contests, competitions, incentive schemes, lotteries, raffles, and contingent payments to reward cessation and continuous abstinence in smoking cessation programmes.

Evidence statement 7

There is evidence from one level 1&2+ review, directly relevant to the UK population, which shows that competitions and incentives in the community (e.g. workplace, clinics) are not effective beyond six months (Hey, 2005b). There is level 3 evidence that they achieve significant effects in the short term, as 35% of the participants self-reported that they had quit two months after the contest (Elder, 1991).

Multicomponent Interventions

Interventions included in this section include a combination of two or more of the following approaches: self help, quit lines, education, advice, counselling etc. This is not to be confused with multi-channel interventions, which use more than one mass media channel such as newspapers, TV, radio and so on – although, as reported below, multi-channel mass media may also be multi-component in approach.

Evidence statement 8

There is evidence from a level 1&2+ review, probably relevant to the UK population, that multi channel mass media campaigns (combined with other interventions) are effective in increasing tobacco use cessation. Cessation rates in the intervention groups ranged from 3.9% (confirmed) to 50% (self-reported), with a median of 7% in follow-up periods of 6 months to 5 years. There is evidence from another review (level 2-), possibly relevant to the UK population, that shows that media campaigns and concurrently implemented tobacco control programmes (or policies) are associated with a reduction in the net smoking prevalence of between 6-12%. Other level 2- and 3 evidence reported either inconclusive results, or estimated the follow-up point prevalence abstinence rate attributable to the campaign was 4.5% after control for test effects and secular trends (Hopkins, 2001; Friend, 2002; McAlister, 2004; Mudd, 1999).

There is level 1+ evidence, probably relevant to UK workplaces, which found that adding peer group support and lottery incentives to mass media-based self help interventions led to abstinence levels of 19.5% in control group compared with 30% in intervention group at 2 years (Salina, 1994).
**TV only**
One non-controlled before and after study (level 3) in the USA evaluated a 6 week community cable television smoking cessation programme ‘CableQuit’.

**Evidence statement 9**
There is level 3 evidence, probably relevant to the UK population, which reported quit rates of 17% at one year following a community cable television smoking cessation programme ‘CableQuit’ (Valois, 1996).

**Computer and/or internet only**
Five studies evaluated whether the use of the internet or computer was effective at delivering multi-component interventions to non targeted populations. However, the three highest quality studies only reported follow-up at 3 months or less, which is too short to reveal any lasting change in smoking behaviour. Other studies evaluated computer or internet interventions for targeted groups (e.g. young people) are reported under question 3.

**Evidence statement 10**
There is level 1++ evidence, probably relevant to the UK population, which found that a web-based smoking cessation programme using more extensive information on coping strategies and health risks is more effective at the contemplation stage than shorter programmes with less health-related information at 3 months. There were statistically significant differences in quit rates in smokers using the more extensive programme (Etter, 2005).

There is level 1+ evidence, probably relevant to the UK population, that a behavioural intervention for smoking cessation delivered via an internet website can achieve a quit rate of 12.3% at 3 months (compared with 5% of controls) (Swartz, 2006).

There is level 2- and 3 evidence, probably relevant to the UK population, which reported that other web-based smoking cessation sites can achieve quit rates of up to 18% (Etter, 2005; Feil, 2003; Thieleke, 2005; Lenert, 2003).

**Mobile phone only**
A New Zealand RCT aimed to determine the effectiveness of a mobile phone text messaging smoking cessation programme.

**Evidence statement 11**
There is level 1++ evidence, probably relevant to the UK population, that a text message based intervention can increase smoking cessation rates at 6 weeks (Rodgers, 2005).

*Community Interventions (with a mass media component)*
A Cochrane review evaluated community interventions for reducing smoking among adults. Community intervention are any co-ordinated, multidimensional programmes
aimed at changing adult smoking behaviour, involving several segments of the community and conducted in a defined geographical area.

**Evidence statement 12**

One 1&2+ review, probably relevant to the UK population, found limited evidence of an effect of community interventions for reducing smoking among adults (Secker-Walker, 2002).

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2. Are there any differences in intervention effects (smoking cessation and relapse prevention) among subgroups of the population?

In this section the effectiveness of the interventions reported under the first research question are compared for particular population characteristics such as ethnicity, gender, educational level and so on. This involves comparative work rather than simply being interventions that target particular groups – which are reported in the following section.

**Gender**

**Evidence statement 13**

There is a small amount of evidence from two level 1&2 + reviews that ‘quit and win’ contests, and community interventions may be more effective for women than men (Secker-Walker, 2002; Hey, 2005a).

**Ethnicity**

One New Zealand RCT evaluated whether a smoking cessation service using mobile phone text messaging was as effective for Maori as non-Maori.

**Evidence statement 14**

There is level 1++ evidence, possibly relevant to the UK population, that a culturally specific phone-based cessation programme is successful in recruiting young Maori, and was shown to be as effective for Maori as non-Maori at increasing short-term self-reported quit rates (Bramley, 2005).

**Religious Background**

No studies evaluated differential effectiveness of interventions in groups from different religious backgrounds

**Educational / Occupation Level**

A before and after study (level 3) set in two Australian cities explored whether a national anti-smoking campaign using visual mass media showed differences in effectiveness across educational levels.

**Evidence statement 15**

There is level 3 evidence, probably relevant to the UK population, that presents conflicting results on whether the effectiveness of a nation-wide visual mass media campaigns differs according to educational level (Macaskill, 1992).
Participation and Access

Evidence statement 16

There is evidence from a level 1&2+ systematic review that suggests that people who enter quit and win contests tend to be predominantly female, younger, better educated, smoking more cigarettes per day, in the contemplation or preparation stage of change, and to have made more previous quit attempts than those smokers who do not enter the contests (Hey, 2005a). The picture for socio-economic status was not consistent, but a level 3 study reported a link between participation in smoking cessation interventions and income levels (e.g. higher income was associated with greater participation) (Elder, 1991).

There is level 3 evidence, probably relevant to the UK adult population, that televised smoking cessation programmes are effective in reaching an ethnically diverse population of smokers (Sussman, 1994).

3. What is the evidence for the effectiveness of targeted interventions?

Gender Specific

Pregnant women
A before and after study (level 3) of a UK intervention evaluated a campaign targeting pregnant smokers and their partners.

Women with young children
An RCT (level 1-) undertaken in the USA tested the value of using targeted communications.

Evidence statement 17

There is level 3 evidence, directly relevant to UK pregnant women and their partners from lower socio-economic groups, which shows that multi-channel mass media advertising has no evidence of effect on changing smoking behaviour but calls to quit lines increased by 14% (Campion, 1994).

There is level 1- evidence, possibly relevant to UK women, that interventions designed to encourage women cigarette smokers with young children to call for information on quitting have no significant effect on quit rates, but 29% of calls received from intervention sites were from the target audience compared with 10% from the control sites (Cummings, 1993).
Men only
A study (level 3) evaluated an advertising campaign ‘Ready to Quit Chew?’, which targeted males aged 19 to 34 in rural Nebraska who used smokeless tobacco including chewing tobacco or snuff.

Evidence statement 18
There is level 3 evidence, possibly relevant to the UK population, which show a positive effect of campaigns developed to target rural male oral tobacco users with culturally appropriate materials. The point prevalence quit rate was 11.5% (Boyle, 1999).

Young People
Seven studies were identified that evaluated interventions to increase smoking cessation amongst young people (prevention of smoking in young people did not fall within the remit of this review).

School based programmes with a multimedia component
Evidence statement 19
There is level 1++ evidence, possibly relevant to UK children, that found no consistent programme effects on smoking intentions, or behaviour of a social-influences based, school and media-based project (Flay, 1995).

Multi-channel mass media
Evidence statement 20
There is level 3 evidence, probably relevant to UK teens, that indicates that dissonance arousing messages specifically targeting girls can have positive short term effects on quit rates. 12.1% (7.4% boys and 14.6% girls, p=0.019) of the sample reported quitting smoking (Hafstad, 1996).

There is level 3 evidence, probably relevant to UK teens, that indicates that graphic mass media messages about negative consequences of smoking among adults has a positive effect on quit attempts among young people (18% of smokers attempted to quit (White, 2003).

There is level 3 evidence, probably relevant to UK teens, that indicates that media campaigns advertising internet websites can increase quit attempts (Klein, 2005).

Internet and/or computer
Evidence statement 21
There is level 2- evidence, probably relevant to UK college and university students, which shows a positive effect of an internet based smoking cessation intervention on smoking cessation (Escoffery, 2005).

There is level 3 evidence, possibly relevant to young people in the UK, that reports reductions in smoking and quit attempts in rural teens after using an internet-based virtual reality “world” for smoking cessation (Woodruff, 2001).
There is level 3 evidence, probably relevant to young people in the UK that an integrated Web and text-messaging programme may result in quit rates of 17% (Obermayer, 2004).

Ethnicity / Culturally Specific

Maori

Evidence statement 22

There level 1++ evidence, possibly relevant to the UK setting, that a phone-based cessation programme is successful in increasing quit rates in Maoris at 6 weeks. It was also shown to be as effective for Maori as non-Maori at increasing short-term self-reported quit rates (Bramely, 2005).

Vietnamese American

Evidence statement 23

There is level 2+ evidence that multi-component interventions including mass media materials in the Vietnamese language are effective (the odds of being a quitter were significantly higher for intervention participants) in achieving smoking cessation in Vietnamese American men (Jenkins, 1997).

Religious Background

No studies were identified

Educational/ Occupational Level

No studies were identified

4. What is the evidence for interventions evaluating the duration, reach, calls to quit lines, dose-response or message style?

Duration And/Or Reach Of Advertising

Awareness and penetration of different types of mass media

Evidence statement 24

There is level 2- and 3 evidence, probably relevant to the UK population, that posters or printed media can be an effective way of increasing awareness of campaigns. No studies were identified which evaluated the effectiveness of interventions of different duration (Hafstad, 1996; Etter & Laszlo, 2005).

Relationship between Exposure to Mass Media and Calls to Quit Lines or Information Services
Three studies reported on the effectiveness of mass media on getting people to call quit lines or information services.

**Evidence statement 25**

There is level 1- evidence, possibly relevant to the UK, that advertising campaigns targeting mothers of small children are effective in increasing their calls to a quit line (adverts increased calls in general fivefold in the intervention markets, and 29% of these calls were from the target audience) (Cummings, 1993).

There is level 2+ evidence, possibly relevant to UK populations (particularly disadvantaged groups), that targeted advertising using culturally appropriate material, with radio as the primary channel, has a significant positive effect on increasing calls to information services (Boyd, 1998).

In addition, there is level 3 evidence that calls to national smokers’ help lines on No Smoking Day are typically four times those received on an average day (Owen, 2006).

**Relationship between exposure and smoking behaviour (dose-response)**

Five studies evaluated the relationship between exposure and smoking behaviour.

**Evidence statement 26**

There is level 1+ evidence, probably relevant to UK workplaces, that television message recall is associated with increased smoking cessation rates (Salina, 1994). There is level 3 evidence, probably relevant to the UK, which indicates that the more TV episodes watched or recalled the higher the incidence of self reported quitting or abstinence from smoking (Mudde, 1999).

There is level 3 evidence, probably relevant to the UK, which indicates that the effectiveness of a web-based cessation programme is increased according to the amount of exposure to educational materials (Lennert, 2003).

There is level 3 evidence, probably relevant to the UK adult population, that the relative risk for quitting was estimated to be 10% higher for every 5000 units of exposure to state anti-tobacco television advertising over a 2-year period. However, these results did not achieve statistical significance (Hyland, 2006).

There is level 2+ evidence, directly relevant to the UK population that varying the intensity of TV adverts does not have an effect on smoking cessation (McVey, 2000).
Message Style (Supportive, Fear Arousing, ‘Holistic’ Etc.)

Some mass media campaigns adopt a particular message or theme intended to produce a desired response among the target audience. The content of the messages can range from the negative health consequences of smoking; health benefits of quitting; social and peer norms messages which challenge perceptions of the normality and acceptability of smoking; and predatory practices of the tobacco industry. The messages can be presented in a way that evokes fear or humour. Four studies evaluated the effectiveness of different types of messages.

Evidence statement 27

There is level 2- evidence, which is probably relevant to the UK population, which suggests that advertisements depicting suffering as a result of tobacco use may be instrumental in promoting cessation or reinforcing the decision to quit.

There is level 3 evidence, probably relevant to UK teens, that indicates that dissonance arousing messages specifically targeting girls can have positive short term effects on quit rates (Hafstad, 1996). There is also level 3 evidence that shows that graphic mass media messages about negative consequences of smoking among adults has a positive effect on quit attempts among young people (18% of smokers in the sample attempted to quit (White, 2003)). Finally, there is level 2- evidence providing insufficient evidence that longer positive messages are less effective than short, negative messages (Johnson, 1995).

5. How acceptable and/or appropriate is the mass media and/or community intervention to the intended recipients?

Four studies undertook some process evaluation and assessed usage and acceptability of the interventions. All of these evaluations were of web based interventions.

Evidence statement 28

Four studies (both qualitative and quantitative) evaluated outcomes such as the acceptability and usage of web based interventions. One qualitative study reported that participants sought online smoking cessation resources for reasons of convenience, timeliness, anonymity and because their current information needs were unmet (Frisby, 2002). Another level 1+ study, probably relevant to the UK population, found that the optional sections of an intervention most used/viewed were setting a quit date, and the descriptions of pharmacological aids (Swartz, 2006). A level 2- study reported that the Ask-an-Expert section was rated most highly (Feil, 2003). The fourth study (level 2-) reported that the intervention helped to raise consciousness about quitting, encouraged behavioural goals, provided stages of change feedback, and offered interactivity in presenting information and strategies about quitting (Escoffery, 2004).
6. What are the unintended outcomes of the intervention (both adverse and beneficial)?

While the effectiveness of interventions is an important consideration, it is also necessary to consider the unintended consequences or potential adverse effects of any intervention and we report this where data is available. Adverse effects might include for instance: Social consequences such as stigmatisation of smokers or increased conflict between smokers and non-smokers; Increase in awareness of the effects of involuntary smoking; Increases in smoking experimentation among children and young people.

The review of interventions including mass media (Hopkins et al, 2001) found no reports of adverse effects in the twelve included studies.

Conclusions

Overall, there appears to be evidence that mass media interventions can have a positive effect on quit rates. However the size of effect is difficult to determine given the lack of a control group in many of the studies. In addition, many of the studies used multiple types of media combined with other interventions, which makes it difficult to evaluate which particular component is effective or ineffective. There is evidence that mass media can increase the number of calls to quitlines, but whether this translates into an increase in cessation rates is less clear.

There is also some good quality evidence that the use of technology such as mobile phones can be effective, and offers the potential to deliver culturally specific materials to targeted groups. There is also evidence that internet can be an effective way of delivering interventions, and may be a particularly appealing channel of communication for young people.

Developing culturally appropriate advertising materials, which target particular ethnicities of communities, has been shown to be effective by a number of studies. These generally drew on a combination of previous research in the field to determine barriers to successful quit attempts and then used focus groups to test message style and content for advertisements. These ranged from targeting rural Nebraskan oral tobacco users with cowboy images, using gospel, jazz music and images appropriate to African American communities, or targeting the community with own language materials in the case of Vietnamese Americans.

Having some control over when advertising might be aired could also have an important role to play in addressing the needs of consumers. For instance, a study in the USA found that the take up of the advertising message was much higher when media time was paid for rather than relying on public service announcements. Although this might not apply in the UK, where there is access to publicly funded television and radio, another take home message we might infer from this is that if there were some control over when a message was aired, it might better target the intended audience. For instance, by airing smoking cessation or prevention messages at appropriate times of day/evening to suit the lifestyles of the target market.

Despite the overall decline in cigarette smoking prevalence, social class inequalities in smoking are likely to persist, or even to widen. Few of the studies in the review evaluated the differential effectiveness in subgroups of the sample (e.g. different age
groups and educational level), or assessed the characteristics of those people who participated in the intervention. Therefore, at the present time, little is known about the effect such interventions have on health inequalities. The few studies that did look at differential effects or characteristics of participants did indicate that there are likely to be differences in both these areas. For example there is some evidence that interventions may be more effective for women than men. Although some interventions did target women, further mass media studies may need to be developed which target particular sub groups such as heavy male smokers, or lower income groups.

References to Included Studies


