

# Mass media interventions: effects on health services utilisation (Review)

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[Intervention Review]

# Mass media interventions: effects on health services utilisation

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## ABSTRACT

### Background

The mass media frequently cover health related topics, are the leading source of information about important health issues, and are targeted by those who aim to influence the behaviour of health professionals and patients.

### Objectives

To assess the effects of mass media on the utilisation of health services.

### Search methods

We searched the Cochrane Effective Practice and Organisation of Care Group specialised register (1996 to 1999), MEDLINE, EMBASE, Eric, PsycLit (to 1999), and reference lists of articles. We hand searched the journals *Communication Research* (February 1987 to August 1996), *European Journal of Communication* (1986 to 1994), *Journal of Communication* (winter 1986 to summer 1996), *Communication Theory* (February 1991 to August 1996), *Critical Studies in Mass Communication* (March 1984 to March 1995) and *Journalism Quarterly* (1986 to summer 1996).

### Selection criteria

Randomised trials, controlled clinical trials, controlled before-and-after studies and interrupted time series analyses of mass media interventions. The participants were health care professionals, patients and the general public.

### Data collection and analysis

Two reviewers independently extracted data and assessed study quality.

### Main results

Twenty studies were included. All used interrupted time series designs. Fifteen evaluated the impact of formal mass media campaigns, and five of media coverage of health-related issues. The overall methodological quality was variable. Six studies did not perform any statistical analysis, and nine used inappropriate statistical tests (ie not taking into account the effect of time trend). All of the studies apart from one concluded that mass media was effective. These positive findings were confirmed by our re-analysis in seven studies. The direction of effect was consistent across studies towards the expected change.

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## Authors' conclusions

Despite the limited information about key aspects of mass media interventions and the poor quality of the available primary research there is evidence that these channels of communication may have an important role in influencing the use of health care interventions. Although the findings of this review may be affected by publication bias, those engaged in promoting better uptake of research information in clinical practice should consider mass media as one of the tools that may encourage the use of effective services and discourage those of unproven effectiveness.

## PLAIN LANGUAGE SUMMARY

### Mass media communication can encourage increased utilisation of health services

Mass media information on health-related issues may induce changes in health services utilisation, both through planned campaigns and unplanned coverage. Further research could target how best to compose media messages, and whether they have a different impact on members of the public and health professionals. More information is needed on whether mass media coverage brings about appropriate use of services in those patients who will benefit most.

## BACKGROUND

The current emphasis on consumerism in the delivery of health care highlights the potentially important role of mass media in increasing the public awareness of research findings and promoting the utilisation of effective and efficient health services. The mass media frequently cover health-related topics and are targeted by those who aim to influence the behaviour of health professionals and patients (Freemantle 1994). However, while a systematic review of the impact of printed educational materials (which includes publication of research findings in scientific journals) has already been undertaken (Freemantle 1997), there has been no systematic review of the impact of mass media campaigns that examines effects upon health professional or general public behaviour.

The mass media play several important functions in society, including providing information, entertainment, articulating and creating meaning, setting agendas for individual and societal discourse, and influencing behaviour.

Population surveys show that mass media are the leading source of information about important health issues, such as weight control, HIV/AIDS, drug abuse, asthma, family planning and mammography (Chapman 1995), and have been over a 25-year period (Simpkins 1984).

Citing the 'special authority' (All For Health 1989) or 'unique responsibility' (Pfund 1981) of the media, various actors (industry, government, academia, non governmental organisations) increasingly advance utilitarian views of the mass media as an information 'distribution network' (Klaidman 1990), behaviour-modifying 'set

of tools' (Brown 1990), agenda-setting 'vehicle' (Chapman 1995), or an 'opportunity of the greatest magnitude' (Wallack 1990).

Media advocacy has become an established health promotion strategy, partly due to the influence of the World Health Organisation's 1986 Ottawa Charter for Health Promotion. It has become common to seek a 'partnership' or 'shared agenda' (Atkin 1990) with the mass media in communicating health information to the public, particularly in the area of prevention, risk reduction, and drug information (Razak 1992).

Proponents of 'media advocacy' lobby for health message exposure, accuracy and media responsibility in order to set the media agenda (framing for access), shape the media debate (framing for content), and advance healthy public policies (Wallack 1993). It should be remembered, however, that in the USA, the mass media have been a source of both hope and frustration in promoting social good for over 150 years (Paisley 1990).

Medical news reports may raise expectations (sometimes falsely), may dash hope, or may provoke alarm (sometimes unnecessarily). The mass media may also influence individual health behaviours, health care utilisation, health care practices and health policy (Nelkin 1987; Kristiansen 1984; Mazur 1981; Freimuth 1981; Cronholm 1981; Jones 1980; Domenighetti 1988). For example after extensive media reports on dietary studies relating cholesterol-rich foods with heart disease, consumption of beef, eggs and fatty milk products declined; similarly, reports on the risks of excessive sodium consumption were associated with increased use of salt-free food products; and a decline in the use of birth control pills and IUDs between 1970 and 1975 correlated closely with publicity

about their possible adverse effects. However, the possible impact of the media on health behaviours is difficult to measure (Warner 1987; Sandman 1987; Flay 1987; Winsten 1985; Culbertson 1984; Pfund 1981; Church 1979; McQuail 1977).

This review aims to inform practice and further research for those attempting to help health professionals provide more effective and efficient health care.

## OBJECTIVES

Mass media may influence the use of health services following campaigns by organisations/agencies aimed at promoting the rational use of specific procedures (such as cancer screening) or coverage of health-related issues outside the context of a planned intervention.

In this systematic review, we aim to assess the effect of both of these approaches, which use channels of mass communication (including radio, television, newspapers, magazines, leaflets, posters and pamphlets) on the utilisation of health services by professionals, patients, or the public.

## METHODS

### Criteria for considering studies for this review

#### Types of studies

Randomised controlled trials (RCTs), controlled clinical trials (CCTs), controlled before-and-after studies (CBAs) and interrupted time series analyses (ITSs) meeting explicit entry and quality criteria used by EPOC (see METHODS USED IN REVIEWS under GROUP DETAILS).

#### Types of participants

Health care providers, patients, and the general public.

#### Types of interventions

We considered interventions that:

- were based upon the use of mass media, including radio, television, newspapers, magazines, leaflets, posters and pamphlets (alone or in conjunction with other interventions);
- were targeted at the population level;
- and which aimed to promote or discourage the use of health care interventions/procedures, or to change public lifestyles but providing information on the subsequent changes in health services utilisation.

The following interventions were excluded:

a) interventions based upon scientific media such as professional journals, leaflets, and booklets specifically targeted to health care providers;

b) interventions based upon the use of media such as video, booklets and leaflets in a health care setting for individual patient information purposes.

#### Types of outcome measures

Objective (ie not self-reported) measures of direct impact on health services utilisation by health care providers or patients. In the context of this review, health services utilisation was defined broadly to include initiatives concerning the use of drugs, medical or surgical procedures, and diagnostic tests.

Studies that only reported the impact of mass media on health care professionals', patients' and the public's attitudes, awareness, knowledge, or opinions were excluded.

#### Search methods for identification of studies

With the help of a professional librarian, broad electronic searches were undertaken on MEDLINE and EMBASE without language or time restriction up to 1996. The MEDLINE search was based upon the following terms: health promotion (MeSH descriptor); and communications-media (exploded); or journalism (exploded); or advertising (exploded); or propaganda (exploded); or marketing of health services (exploded). On EMBASE the search was based upon the following terms: health promotion (EMTREE descriptor); plus audiovisual-equipment (exploded); or mass communication (exploded); or commercial-phenomena (exploded); or publication (EMTREE descriptor); or patient information (EMTREE descriptor); or visual information (EMTREE descriptor).

The EPOC specialised register was also searched for relevant studies (see SPECIALISED REGISTER under GROUP DETAILS), as well as Eric and PsycLit, where exploratory searches were undertaken using subject area terms on a limited number of years.

Hand searching was also conducted on the following journals:

Communication Research (52 issues from February 1987 to August 1996);

European Journal of Communication (43 issues from 1986 to 1994);

Journal of Communication (37 issues from Winter 1986 to Summer 1996);

Communication Theory (14 issues from February 1991 to August 1996);

Critical Studies in Mass Communication (20 issues from March 1984 to March 1995);

Journalism Quarterly (from 1986 to summer 1996).

The titles and abstracts of each paper identified through the electronic searches were independently screened for relevance by two assessors; disagreements were resolved by discussion and papers considered potentially relevant retrieved.

The reference lists of related systematic reviews and all articles obtained were also reviewed.

For the purpose of this updated version the process above described (except for hand searching) was repeated for the period 1996-1999.

## Data collection and analysis

### Quality assessment

The quality of individual studies was assessed by two independent assessors using a standardised checklist (see ADDITIONAL INFORMATION, ASSESSMENT OF METHODOLOGICAL QUALITY under GROUP DETAILS).

### Data extraction and synthesis

Data on the effect of mass media were abstracted by two independent assessors.

For time series analyses, when information on the value of individual observation over time was only reported graphically in the original paper, data were derived by scanning the figures into a computer and electronically measuring each data point. This approach has already been used and proved to be reliable (Grilli 1993). Consistency between the data collected by this approach and those explicitly reported on papers (when this information was provided) was always good and discrepancies were never greater than 1%.

Results of time series analyses were reported variably; most studies either did not perform any statistical analysis or analysed their data by comparing means before and after the launch of the intervention. Such an approach is open to substantial bias, as it does not take into account the influence of time trend and the auto-correlation among measurements repeatedly taken over time (Cook 1979). Time series regression analysis is the most appropriate statistical approach for this type of study design, as the estimate of the treatment effect models the underlying time trend, and can account for any auto-correlation between individual observations (Draper 1981). Time series regression was preferred over ARIMA models because the studies in this review tended to have a small number of datapoints.

Therefore, in order to be able to obtain reliable quantitative information from these studies, data from the original papers were collected, standardised, and finally re-analysed. This approach (which has been always feasible, except for one study where graphics made difficult the drawing of the original data) made it possible to estimate regression coefficients corresponding to two standardised effect sizes for each study: a change in level immediately after the introduction of the intervention, and a change in slope. The change in the level was estimated by extrapolating the pre-intervention regression line to the first point post-intervention. The difference

between this extrapolated point and the post-intervention regression estimate for the same point gave the change in level estimate. The change in the slopes of the regression lines was calculated as post-intervention slope minus pre-intervention slope. Both of these effect sizes were necessary for interpreting the results of each study. For example, there could have been no change in the level immediately after the intervention, but there could have been a significant change in slope. Reporting only the change in level in this case would have misled the reader.

The desired direction of change in the use of health services varied, for example the desired effect in one study was an increase in the use of preventive services whereas a decrease in hysterectomy rates was desired in another study. The direction of effect was standardised so that a negative change in level or slope always described a change in the desired direction.

Results from individual studies addressing the same aspect of care were not pooled, due to the substantial heterogeneity in both the setting and subjects between studies.

When the impact of the intervention was assessed in individual studies on more than one outcome measure, the outcome that best reflected the targeted intervention was selected. Where there were multiple appropriate outcomes the median effect was selected. Where there were only two outcomes reported the more conservative result was selected.

## RESULTS

### Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#).

Overall, 749 references were retrieved from MEDLINE searching until 1996, and their titles and abstracts were inspected. Searches on Eric, EMBASE, and PsycLit yielded 18 additional references not previously identified. One hundred and eighty-one additional papers were identified following inspection of the reference lists of individual papers. No additional papers were identified through hand searching.

Four hundred and twenty articles were examined in detail, of which 86 were editorials or reviews and 123 did not concern mass media-based interventions. Among the 211 remaining potentially relevant papers, 69 papers on the impact of mass media on aspects of health services utilisation were identified.

Seven studies (11%) were cross-sectional surveys, 23 (37%) were uncontrolled before-and-after evaluations, while 30 (48%) were time series analyses of variable length. Only two (3%) had a controlled before-and-after design.

Thirty-six studies (58%) reported objective measures of health service utilisation, whereas the other studies focused on indicators

of attitudes, awareness, and self-reported behaviour or use of health services.

Updating the electronic search from 1996 to 1999 yielded 267 additional references, out of which 12 were considered potentially eligible.

Overall, 26 papers published between 1979-1999 reporting 20 time series analyses and one controlled before-and-after study met the inclusion criteria.

Most of the mass media campaigns described in the included studies were planned interventions which aimed to promote the use of specific health services (for example, cancer screening, immunisation programmes, or emergency services for patients with suspected myocardial infarction). Four studies focused on the impact of media coverage of health-related issues. These concerned the excessive use of hysterectomy, the relationship between use of aspirin in children and the incidence of Reye's syndrome, the disclosure of his HIV status by Magic Johnson (the American basketball player), and the effect of Nancy Reagan's radical mastectomy on the choice of women with breast cancer for breast conserving surgery. The length of the campaigns varied widely across the studies, ranging from one week to four years.

All the campaigns relied on the use of a variety of media, including radio, television, newspapers, posters and leaflets. Electronic media, such as the Internet, were not used in any of the studies.

In many circumstances, the campaign was integrated with initiatives specifically targeted at health professionals (usually the distribution of printed educational materials and/or by the organisation of seminars and workshops).

Most of the studies based the assessment of the impact of the campaign on some measure of health care utilisation. Others relied on patient outcome measures which were clearly related to the use of the intervention promoted (or discouraged) by the campaign.

### Risk of bias in included studies

Overall, the quality of individual studies was variable. Most studies were limited to a description of the time series data without any statistical analysis ( $n=6$ ), or based their interpretation of results on a comparison of means before and after the intervention. Only four studies formally assessed time trend in the statistical analysis based upon an adequate number of data points (12 data points). Two studies applied different regression techniques, treating time as a covariate. Only one study used a formal ARIMA model. In 13 of the studies it was not possible from the published report to exclude the possibility that other contextual changes could have occurred concurrently with the campaign.

### Effects of interventions

Results of individual studies (including findings presented in original papers and those obtained from our re-analysis) are sum-

marised in the Results Table. All the studies apart from one (Harris 1979) concluded in their reports that mass media was effective. Our re-analysis, which was feasible for all the studies but one (Paunio 1991) showed that those conclusions were not always confirmed.

Two studies observed a positive effect of mass media campaigns to promote utilisation of immunisations, either by simply describing patterns of utilisation over time (Macdonald 1985), or by formal statistical analysis (Paunio 1991). A statistically significant change in level was observed in the Macdonald study (Macdonald 1985) when re-analysed using time series regression.

The effect of mass media campaigns on promoting cancer screening was less clear. While all of the studies reported statistically significant increases in utilisation based on a before-and-after comparison of means (Brasca 1987; Shelley 1991; Bonerandi 1992; Healsmith 1993; Pehamberger 1993; Herd 1995; Lowe 1994; Del Mar 1997), re-analysis using time series regression observed statistically significant changes in level in only four studies (Brasca 1987; Herd 1995; Lowe 1994; Shelley 1991) and a significant change in slope in only one study (Pehamberger 1993). Most of these studies had a positive estimate for the difference in slope (although not statistically significant). This suggested that the effect of the interventions was decreasing over time.

A mixed pattern was also observed for the two studies on HIV educational campaigns. Both studies reported that mass media had an effect based upon a description of patterns of utilisation over time (Turner 1987) or a before-and-after comparison (Joshi 1988). Both studies described an increase in volume of HIV tests performed; however, this did not appear to be the result of more tests being taken by those at high risk of HIV. However, a statistically significant change in level on the number of HIV tests was only observed in one study (Joshi 1988) when re-analysed using time series regression.

The effects of mass media interventions aimed at reducing delay in admission to hospital for patients with suspected myocardial infarction also appeared mixed. Blohm (Blohm 1994) reported that the observed reduction in delay time to admission was statistically significant based on a before-and-after comparison. However this was not confirmed on re-analysis with time series regression. Likewise, Eppler (Eppler 1994) reported a statistically significant increase in emergency department chest pain visits based on a before-and-after comparison, this remained significant when re-analysed using time series regression. While both studies found that the number of patients seen at the emergency department as a result of the campaigns increased, the proportion of patients seen with suspected myocardial infarction remained relatively stable.

All five studies evaluating the effect of media coverage of health-related topics outside the context of any planned interventions described changes in utilisation (Soumerai 1992; Nattinger 1998 1998) or observed statistically significant changes in utilisation based upon either a before-and-after comparison (Domenighetti 1988; Maclure 1998) or ARIMA analysis (Tesoriero 1992). All of



the studies were found to have significant changes in level following re-analysis with time series regression, and all changes were in the expected direction.

Overall, the direction of effect was consistent across studies towards the expected change, with a change in level effect size ranging from 0.1 to -13.1. However, in four studies (Bonnerandi 1992; Herd 1995; Blohm 1994; Eppler 1994) where a statistically significant effect of the intervention was reported for a before-and-after comparison of means, the results of our time series regression analyses were statistically non-significant. In contrast, the change in slope effect size was not consistent across the studies (ranging from -0.9 to 2.1), although it was only statistically significant in six studies (Pehamberger 1993; Soumerai 1992; Domenighetti 1988; Blohm 1994; Shelley 1991; Maclure 1998).

## DISCUSSION

This review has examined the effects of mass media campaigns on health services utilisation. Consistent positive effects were observed following planned campaigns and unplanned coverage which differed in several characteristics, including the clinical area, type of behaviour addressed, length and intensity of the intervention, and study setting. Although there were differences in the magnitude of the estimated effects of the interventions, the direction of effect was consistent. The results suggest that the mass media can have an impact on health services utilisation both as the result of planned campaigns and unplanned coverage. However, due to the limitations of primary studies and incompleteness of reporting it is not possible to draw any firm conclusions about the characteristics of successful campaigns or possible differences in the effect of planned campaigns and unplanned coverage based on these studies. For example, whilst there is a growing qualitative literature on media coverage of health-related topics and on how they convey scientific information to the general public (Entwistle 1995; Nelkin 1996; Entwistle 1996; Radford 1996), we still know little about how best to frame messages communicated through planned mass media campaigns in order to achieve the intended change in use of health services. This review provides limited information about this issue; in most of the studies the descriptions of the interventions were insufficient to allow an exploration of whether the characteristics of the message and how the message was framed modified the effectiveness of the intervention.

The results of this review should be interpreted with some caution given the methodological limitations of primary research in this area. Some of these limitations are inherent to the nature of the intervention itself, which limits the possibility of using experimental designs. Moreover, many of the observational studies we identified suffered from major flaws and were likely to provide unreliable estimates of the effect of mass media on health services utilisation. Most of the studies were either uncontrolled before-

and-after evaluations or, when the evaluation was based on time series data, had too few observations (less than three before-and-after the intervention) to allow the use of proper statistical techniques (Cook 1979) to control for underlying trends.

Thus, this review has been based upon the analysis of only 20 sufficiently sound interrupted time series analyses of the impact of mass media. The majority of the included studies were descriptive and did not report a statistical analysis or simply compared mean utilisation rates before-and-after the intervention. In order to overcome, at least partially, these pitfalls in the primary research, we re-analysed the data from each study using time series regression models. This approach made it possible to provide an estimate of intervention effect, taking into account the degree of lack of independence among individual observations and the effect of the underlying time trend. The effect sizes for changes in level and for changes in slope enabled a more informative interpretation of each study's results - the change in level demonstrated the immediate effect of the intervention and the change in slope showed the sustainability of the intervention.

In our analysis the intervention was modeled assuming to have an immediate and constant effect. This is a conservative assumption, as mass media campaigns may have an impact which becomes visible only after a sufficient time from their inception, and our analysis was more likely to fail to detect an effect which was gradual rather than abrupt. Nevertheless, calculating the change in slopes does begin to address the problem of gradual changes.

A further potential bias faced in systematic reviews is that of publication bias (Begg 1988). The extent to which this review could have been affected by publication bias cannot be easily quantified. However, the existence of negative studies of evaluations of mass media campaigns undertaken by government agencies or other organisations published in the grey literature seems likely.

Further research is needed to explore whether the impact of mass media on clinical practice is specific (resulting in more appropriate use of services by patients who can actually benefit from them), or non-specific (resulting in changes in overall rates of use, without affecting the appropriateness of how health services are utilised). Some of the findings from studies on mass media impact on rates of use of HIV blood tests seem to suggest a non-specific impact of the message conveyed by the campaigns resulting in an increase in the overall volume of tests performed across all risk groups.

It is also unclear whether mass media have an equivalent effect on consumers and health professionals. While the importance of lay media in communicating research information to health professionals has already been highlighted (Phillips 1991), it is difficult to determine the extent to which the effects observed in many of the studies included in this review are attributable to changes in the behaviour of health care providers (supply) versus consumers (demand).



The duration of the observed effects is also uncertain due to a lack of studies with adequate follow-up.

The cost-effectiveness of the use of mass media has not been addressed in the papers identified for this review. Assessment of the cost-effectiveness of using mass media-based strategies to influence use of health services should include an analysis of the costs of the interventions, as well as of effects implied by the changes induced in patterns of care.

## AUTHORS' CONCLUSIONS

### Implications for practice

This review supports the view that mass media campaigns may have a positive influence upon the manner in which health services are utilised. Agencies and organisations engaged in promoting a better uptake of research information in clinical practice should consider mass media as one of the tools that may encourage the use of effective services and discourage those of unproved effectiveness.

In addition, these findings support the importance of efforts to ensure that reporting of health-related issues in the lay media correctly represents the best available knowledge on the effectiveness of health care interventions.

### Implications for research

Current primary research in this area has several limitations relating to methodological quality and completeness of reporting of studies.

The use of time series data is a feasible approach in evaluating the impact of mass media campaigns. However, appropriate statistical techniques should be used, preferably time series regression models.

The available literature does not address a number of key issues concerning the characteristics of successful mass media campaigns. In particular, further research in this area should focus on:

- a) identifying contextual and subject characteristics which influence the effectiveness of mass media campaigns;
- b) identifying characteristics of the message which influence the effectiveness of mass media campaigns;
- c) exploring whether the effect of mass media on the rate of use of health services is specific (leading to improvements in appropriate utilisation) or non-specific (having similar impacts on changing both appropriate and inappropriate utilisation);
- d) the cost-effectiveness of the use of mass media to promote or discourage the use of health services;
- e) and the effectiveness of new channels of mass communication (ie the Internet).

## ACKNOWLEDGEMENTS

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## REFERENCES

### References to studies included in this review

#### Blohm 1994 *{published data only}*

Blohm M, Hartford M, Karlson BW, Karlsson T, Herlitz J. A media campaign aiming at reducing delay times and increasing the use of ambulance in AMI. *Am J Emerg Med* 1994;**12**(3):315–8. [MEDLINE: 94235070]

Blohm M, Herlitz J, Hartford M, Karlson BW, Risenfors M, Luepker RV, et al. Consequences of a media campaign focusing on delay in acute myocardial infarction. *Am J Cardiol* 1992;**69**(4):411–3. [MEDLINE: 92133521]

Blohm M, Herlitz J, Schroder U, Hartford M, Karlson BW, Risenfors M, et al. Reaction to a media campaign focusing on delay in acute myocardial infarction. *Heart Lung* 1991;**20**(6):661–6. [MEDLINE: 92071163]

Herlitz J, Blohm M, Hartford M, Karlson BW, Luepker R, Holmberg S, et al. Follow-up of a 1-year media campaign on delay times and ambulance use in suspected acute

myocardial infarction. *Eur Heart J* 1992;**13**(2):171–7. [MEDLINE: 92209571]

Herlitz J, Hartford M, Blohm M, Karlson BW, Risenfors M, Sjolín M. Evaluation of the media campaign Heart-Pain-90, 000: time delay in acute myocardial infarct can be reduced. *Lakartidningen* 1991;**88**(37):2973–7. [MEDLINE: 92016707]

Herlitz J, Hartford M, Karlson BV, Risenfors M, Blohm M, Luepker RV, et al. Effect of a media campaign to reduce delay times for acute myocardial infarction on the burden of chest pain patients in the emergency department. *Cardiology* 1991;**79**(2):127–34. [MEDLINE: 92034848]

#### Bonerandi 1992 *{published data only}*

Bonerandi JJ, Grob JJ, Cnudde N, Enel P, Gouvernet J. Campaign of early detection of melanoma in the Provence-Alpes-Cote-d'Azur area 1989. Lessons of an experience. *Ann Dermatol Venerol* 1992;**119**(2):105–9. [MEDLINE: 92296546]

**Brasca 1987** {published data only}

Brasca A, Pigliacampo J, Pollastri E, Hidalgo A, Ramadan A, Miranda J. An awareness campaign on the diagnosis and prevention of colon and rectal cancer. Planning and evaluation of its results. *Acta Gastroenterol Latinoam* 1987; **17**(4):325-9. [MEDLINE: 89085976]

**Del Mar 1997** {published data only}

Del Mar CB, Green AC, Battistutta D. Do public media campaigns designed to increase skin cancer awareness result in increased skin excision rates?. *Aust N Z J Public Health* 1997; **21**(7):751-4. [MEDLINE: 98150452]

**Domenighetti 1988** {published data only}

Domenighetti G, Luraschi P, Casabianca A, Gutzwiller F, Spinelli A, Pedrinis E, et al. Effect of information campaign by the mass media on hysterectomy rates. *Lancet* 1988; **2**(8626-7):1470-3. [MEDLINE: 89070032]

**Eppler 1994** {published data only}

Eppler E, Eisenberg MS, Schaeffer S, Meischke H, Larson MP. 911 and emergency department use for chest pain: results of a media campaign. *Ann Emerg Med* 1994; **24**(2): 202-8. [MEDLINE: 94311509]

**Harris 1979** {published data only}

Harris DW, Karandikar DS, Spencer MG, Leach RH, Bower AC, Mander GA. Returned-medicines campaign in Birmingham, 1977. *Lancet* 1979; **1**(8116):599-601. [MEDLINE: 79133915]

**Healsmith 1993** {published data only}

Healsmith ME, Graham-Brown RA, Osborne JE, London SP, Fletcher A. Further experience of public education for the early diagnosis of malignant melanoma in Leicestershire. *Clin Exp Dermatol* 1993; **18**(5):396-400. [MEDLINE: 94074160]

**Herd 1995** {published data only}

Herd RM, Cooper EJ, Hunter JA, McLaren K, Chetty U, Watson AC, et al. Cutaneous malignant melanoma. Publicity, screening clinics and survival - the Edinburgh experience 1982-90. *Br J Dermatol* 1995; **132**(4):563-70. [MEDLINE: 95267651]

**Joshi 1988** {published data only}

Joshi UY, Cameron SO, Sommerville JM, Sommerville RG. HIV testing in Glasgow Genito-Urinary Medicine Clinics 1985-1987. *Scott Med J* 1988; **33**(4):294-5. [MEDLINE: 89043909]

**Lowe 1994** {published data only}

Lowe JB, Balanda KP, Del Mar CB, Purdie D, Hilsdon AM. General practitioner and patient response during a public education program to encourage skin examinations. *Med J Aust* 1994; **161**(3):195-8. [MEDLINE: 94309432]

**Macdonald 1985** {published data only}

Macdonald H, Roder D. The planning, implementation and evaluation of an immunization promotion campaign in South Australia. *Hygie* 1985; **4**(2):13-7. [MEDLINE: 85232919]

**Maclure 1998** {published data only}

Maclure M, Dormuth C, Naumann T, McCormack J, Rangno R, Whiteside C, Wright JM. Influences of

educational interventions and adverse news about calcium-channel blockers on first-line prescribing of antihypertensive drugs to elderly people in British Columbia. *Lancet* 1998; **352**(9132):943-948. [MEDLINE: 98423738]

**Nattinger 1998** {published data only}

\* Nattinger AB, Hoffmann RG, Howell-Pelz A, Goodwin JS. Effect of Nancy Reagan's mastectomy on choice of surgery for breast cancer by US women. *JAMA* 1998; **279**(10):762-6. [MEDLINE: 98167577]

**Paunio 1991** {published data only}

Paunio M, Virtanen M, Peltola H, Cantell K, Paunio P, Valle M, et al. Increase of vaccination coverage by mass media and individual approach: intensified measles, mumps, and rubella prevention program in Finland. *Am J Epidemiol* 1991; **133**(11):1152-60. [MEDLINE: 91241110]

**Pehamberger 1993** {published data only}

Pehamberger H, Binder M, Knollmayer S, Wolff K. Immediate effects of a public education campaign on prognostic features of melanoma. *J Am Acad Dermatol* 1993; **29**(1):106-9. [MEDLINE: 93301198]

**Shelley 1991** {published data only}

Shelley JM, Irwig LM, Simpson JM, Macaskill P. Evaluation of a mass-media-led campaign to increase Pap smear screening. *Health Educ Res* 1991; **6**(3):267-77. [MEDLINE: 93904714]

**Soumerai 1992** {published data only}

Soumerai SB, Ross-Degnan D, Kahn JS. Effects of professional and media warnings about the association between aspirin use in children and Reye's syndrome. *Milbank Q* 1992; **70**(1):155-82. [MEDLINE: 92269709]

**Tesoriero 1992** {published data only}

Tesoriero JM, Sorin MD. The effect of 'Magic' Johnson's HIV disclosure on anonymous HIV counselling and testing services in New York State. *AIDS & Public Policy Journal* 1992; **7**:216-24.

**Turner 1987** {published data only}

Turner GC, Mutton KJ. HIV testing: changing trends. *Br Med J (Clin Res Ed)* 1987; **295**(6596):502. [MEDLINE: 88026154]

## References to studies excluded from this review

**Bach 1996** {published data only}

Bach JF, Chalons S, Forier E, Elana G, Jouanelle J, Kayemba S, et al. 10-year educational programme aimed at rheumatic fever in two French Caribbean islands. *Lancet* 1996; **347**(9002):644-8. [MEDLINE: 96175899]

**Bakdash 1983** {published data only}

Bakdash MB, Lange AL, McMillan DG. The effect of a televised periodontal campaign on public periodontal awareness. *J Periodontol* 1983; **54**(11):666-70. [MEDLINE: 84064213]

Bakdash MB, McMillan DG, Lange AL. Minnesota periodontal awareness television campaign. *Northwest Dentistry* 1984; **63**(6):12-7. [MEDLINE: 85112568]

- Balraj 1986** *{published data only}*  
Balraj V, John TJ. Evaluation of a poliomyelitis immunization campaign in Madras city. *Bull World Health Organ* 1986;**64**(6):861–5. [MEDLINE: 87159851]
- Beck 1987** *{published data only}*  
Beck EJ, Cunningham DG, Moss VW, Harris JR, Pinching AJ, Jeffries DJ. HIV testing: changing trends at a clinic for sexually transmitted diseases in London. *Br Med J (Clin Res Ed)* 1987;**295**(6591):191–3. [MEDLINE: 88001338]
- Bett 1993** *{published data only}*  
Bett N, Aroney G, Thompson P. Impact of a national educational campaign to reduce patient delay in possible heart attack. *Aust N Z J Med* 1993;**23**(2):157–61. [MEDLINE: 93298107]
- Bortolotti 1988** *{published data only}*  
Bortolotti F, Stivanello A, Dall'Armi A, Rinaldi R, La Grasta F. AIDS information campaign has significantly reduced risk factors for HIV infection in Italian drug abusers. *J Acquir Immune Defic Syndr* 1988;**1**(4):412–3. [MEDLINE: 89110749]
- Brown 1996** *{published data only}*  
Brown EM, Goel V. Reducing demand for physician visits through public education: a look at the pilot cold-and-flu campaign in London, Ontario. *CMAJ* 1996;**154**(6):835–40. [MEDLINE: 96258160]
- Carter 1985** *{published data only}*  
Carter H, Jones IG. Measles immunisation: results of a local programme to increase vaccine uptake. *Br Med J (Clin Res Ed)* 1985;**290**(6483):1717–9. [MEDLINE: 85227174]
- Del Beccaro 1995** *{published data only}*  
Del Beccaro MA, Brownstein DR, Cummings P, Goldoft MJ, Quan L. Outbreak of Escherichia coli 0157:H7 hemorrhagic colitis and hemolytic uremic syndrome: effect on use of a pediatric emergency department. *Ann Emerg Med* 1995;**26**(5):598–603. [MEDLINE: 96060811]
- Dignan 1994** *{published data only}*  
Dignan M, Michielutte R, Wells HB, Bahnson J. The Forsyth County Cervical Cancer Prevention Project - I. Cervical cancer screening for black women. *Health Educ Res* 1994;**9**(4):411–20. [MEDLINE: 95330045]
- Doherty 1988** *{published data only}*  
Doherty VR, MacKie RM. Experience of a public education programme on early detection of cutaneous malignant melanoma. *BMJ* 1988;**297**(6645):388–91. [MEDLINE: 88310267]
- Fulton 1992** *{published data only}*  
Fulton JP, Feldman JP, Donnelly EF, Buechner JS, DiOrio D, DeBuono BA, et al. Evaluating a mass media campaign to promote screening mammography in Rhode Island. *Rhode Island Medicine* 1992;**75**(1):9–15. [MEDLINE: 92182341]
- Gooch 1970** *{published data only}*  
Gooch WM 3rd. Acceptance of rubella vaccination in a military dependent population. *Mil Med* 1970;**135**(11):998–1000. [MEDLINE: 71029991]
- Gregorio 1990** *{published data only}*  
Gregorio DI, Kegeles S, Parker C, Benn S. Encouraging screening mammograms. Results of the 1988 Connecticut Breast Cancer Detection Awareness Campaign. *Conn Med* 1990;**54**(7):370–3. [MEDLINE: 90367469]
- Gresham 1988** *{published data only}*  
Gresham LS, Molgaard CA, Elder JP, Robin HS. Breast cancer and mammography: summary of the educational impact of a low-cost mammography program. *Health Educ* 1988;**19**(3):32–5. [MEDLINE: 90170649]
- Hastings 1990** *{published data only}*  
Hastings GB, Eadie DR, Scott AC. Two years of AIDS publicity: a review of progress in Scotland. *Health Education Research* 1990;**5**:17–25.
- Hill 1993** *{published data only}*  
Hill D, White V, Marks R, Borland R. Changes in sun-related attitudes and behaviours, and reduced sunburn prevalence in a population at high risk of melanoma. *Eur J Cancer Prev* 1993;**2**(6):447–56. [MEDLINE: 94115276]
- Hirst 1990** *{published data only}*  
Hirst S, Mitchell H, Medley G. An evaluation of a campaign to increase cervical cancer screening in rural Victoria. *Community Health Stud* 1990;**14**(3):263–8. [MEDLINE: 91070945]
- Ho 1989** *{published data only}*  
Ho MT, Eisenberg MS, Litwin PE, Schaeffer SM, Damon SK. Delay between onset of chest pain and seeking medical care: the effect of public education. *Ann Emerg Med* 1989;**18**(7):727–31. [MEDLINE: 89285713]
- Illig 1989** *{published data only}*  
Illig L, McCann-Roos U, Klaubert EW, Kunze J, Lacner K, Muller H, et al. Public education in recognizing melanoma. *Zeitschrift für Hautkrankheiten* 1989;**64**(7):537–8, 543–6, 551–63. [MEDLINE: 89370710]
- Jones 1980** *{published data only}*  
Jones EF, Beniger JR, Westoff CF. Pill and IUD discontinuation in the United States, 1970–1975: the influence of the media. *Fam Plann Perspect* 1980;**12**(6):293–300. [MEDLINE: 81138792]
- Kelly 1991** *{published data only}*  
Kelly PP. Skin cancer and melanoma awareness campaign. *Oncol Nurs Forum* 1991;**18**(5):927–31. [MEDLINE: 91367756]
- Langer 1992** *{published data only}*  
Langer LM, Zimmermann RS, Hendershot EF, Singh M. Effect of Magic Johnson's HIV status on HIV-related attitudes and behaviors of an STD clinic population. *AIDS Educ Prev* 1992;**4**(4):295–307. [MEDLINE: 93112498]
- Lee 1994** *{published data only}*  
Lee PP, Linton K, Ober RR, Glanville J. The efficacy of a multimedia educational campaign to increase the use of eye care services. *Ophthalmology* 1994;**101**(8):1465–9. [MEDLINE: 94336181]
- Lin 1971** *{published data only}*  
Lin N, Hingson R, Allwood-Paredes J. Mass immunization campaign in El Salvador, 1969. Evaluation of receptivity

- and recommendation for future campaigns. *HSMHA Health Reports* 1971;**86**(12):1112–21. [MEDLINE: 72106625]
- Marquart 1993** *{published data only}*  
Marquart K, Muller I, Fisher D. HIV infection and AIDS in Stuttgart: epidemiological data of the Municipal Health Department, 1985–1992. *AIDS-Forschung* 1993;**1**:17–23.
- Mayer 1992** *{published data only}*  
Mayer JA, Kossman MK, Miller LC, Crooks CE, Slymen DJ, Lee CD Jr. Evaluation of a media-based mammography program. *Am J Prev Med* 1992;**8**(1):23–9. [MEDLINE: 92247516]
- McKinnon 1978** *{published data only}*  
McKinnon JA. The impact of the media on whooping cough immunization. *Health Educ J* 1978;**37**:198–202.
- Melia 1995** *{published data only}*  
Melia J, Cooper EJ, Frost T, Graham-Brown R, Hunter J, Marsden A, et al. Cancer Research Campaign health education programme to promote the early detection of cutaneous malignant melanoma. I. Work-load and referral patterns. *Br J Dermatol* 1995;**132**(3):405–13. [MEDLINE: 95234548]  
Melia J, Cooper EJ, Frost T, Graham-Brown R, Hunter J, Marsden A, et al. Cancer Research Campaign health education programme to promote the early detection of cutaneous malignant melanoma. II. Characteristics and incidence of melanoma. *Br J Dermatol* 1995;**132**(3):414–21. [MEDLINE: 95234549]
- Mitic 1984** *{published data only}*  
Mitic WR, Perkins J. The effect of a media campaign on heart attack delay and decision times. *Can J Public Health* 1984;**75**(6):414–8. [MEDLINE: 85124222]
- Mukherji 1982** *{published data only}*  
Mukherji PS, Ryan MP, Howie JG, Stevenson JS. Consultation behaviour and the influence of the media. *J R Coll Gen Pract* 1982;**32**(237):242–4. [MEDLINE: 82216574]
- Murtomaa 1984** *{published data only}*  
Murtomaa H, Masalin K. Effects of a national dental health campaign in Finland. *Acta Odontol Scand* 1984;**42**(5):297–303. [MEDLINE: 85171064]
- Odumosu 1982** *{published data only}*  
Odumosu MO. Mass media and immunization awareness of pregnant women in a Nigerian community. *Can J Public Health* 1982;**73**(2):105–8. [MEDLINE: 82258773]
- Olivarius 1992** *{published data only}*  
Olivarius F De F, Worm AM, Petersen CS, Kroon S, Lynge E. Sexual behavior of women attending an inner-city STD clinic before and after a general campaign for safer sex in Denmark. *Genitourin Med* 1992;**68**(5):296–9. [MEDLINE: 93052257]
- Olsen 1987** *{published data only}*  
Olsen TG, Feeser TA, Conte ET, Schroeter AL. Skin cancer screening - a local experience. *J Am Acad Dermatol* 1987;**16**:637–41.
- Pape 1993** *{published data only}*  
Pape JW. AIDS: results of current prevention efforts in Haiti. *AIDS Research and Human Retroviruses* 1993;**9**(suppl 1):S143–5.
- Penna 1991** *{published data only}*  
Penna J, Rosenthal DR. General practitioners in preventive health screenings. *Aust Fam Physician* 1991;**20**(1):37–9. [MEDLINE: 91166482]
- Ross 1993** *{published data only}*  
Ross JD, Scott GR. The association between HIV media campaigns and number of patients coming forward for HIV antibody testing. *Genitourin Med* 1993;**69**(3):193–5. [MEDLINE: 93328211]
- Sherr 1987** *{published data only}*  
Sherr L. An evaluation of the UK government health education campaign on AIDS. *Psychology and Health* 1987;**1**:61–72.
- Singh 1994** *{published data only}*  
Singh BM, Prescott JJ, Guy R, Walford S, Murphy M, Wise PH. Effect of advertising on awareness of symptoms of diabetes among the general public: the British Diabetic Association Study. *BMJ* 1994;**308**:632–6.
- Trandel-Korenchuk 19** *{published data only}*
- Waters 1983** *{published data only}*  
Waters WE, Wheeler MJ, Fraser JD, Hayes AJ, Nichols S. Evaluation of a health education campaign to reduce the delay in women presenting with breast symptoms. *Community Med* 1983;**5**:104–8.
- Weller 1984** *{published data only}*  
Weller IV, Hindley DJ, Adler MW, Meldrum JT. Gonorrhoea in homosexual men and media coverage of the acquired immune deficiency syndrome in London 1982–3. *Br Med J (Clin Res Ed)* 1984;**289**:1041.
- Winchester 1988** *{published data only}*  
Winchester DP, Lasky HJ, Sylvester J, Maher ML. A television-promoted mammography screening pilot project in the Chicago metropolitan area. *CA Cancer J Clin* 1988;**38**:291–309.
- Young 1990** *{published data only}*  
Young M, Trevan E. Pap smear usage in New South Wales - impact of active promotion. *Community Health Stud* 1990;**14**:255–62.
- Zimicki 1994** *{published data only}*  
Zimicki S, Hornik RC, Verzosa CC, Hernandez JR, de Guzman E, Dayrit M, et al. Improving vaccination coverage in urban areas through a health communication campaign: the 1990 Philippine experience. *Bull World Health Organ* 1994;**72**:409–22.

## References to studies awaiting assessment

**Bayles 1994** *{published data only}*

## Additional references

**All For Health 1989**

All For Health. New York: UNICEF, 1989.

**Atkin 1990**

Atkin CK, Atkin EB. Communicating health information. In: Atkin C, Wallack L editor(s). *Mass communication and public health*. London: SAGE, 1990:38.

**Begg 1988**

Begg CB, Berlin JA. Publication bias: a problem in interpreting medical data. *J R Statist Soc* 1988;**151**:419–63.

**Brown 1990**

Brown JD, Einsiedel EF. Public health campaigns: mass media strategies. In: Ray EB, Donohew L editor(s). *Communication and health*. NJ: Erlbaum, 1990:153.

**Chapman 1995**

Chapman S, Lupton D. *The fight for public health*. London: BMJ, 1995.

**Church 1979**

Church M. Return of whooping cough. *Br Med J* 1979;**1**: 195.

**Cook 1979**

Cook TD, Campbell DT. *Quasi-experimentation. Design and analysis issues for field settings*. Boston: Houghton Mifflin Company, 1979.

**Cronholm 1981**

Cronholm M, Sandell R. Scientific information: a review of the research. *J Communication* 1981;**31**:85–96.

**Culbertson 1984**

Culbertson HM, Stempel GH. Possible barriers to agenda setting in medical news. *Newspaper Research J* 1984;**5**(3): 53–60.

**DerSimonian 1986**

DerSimonian R, Laird N. Meta-analysis in clinical trials. *Control Clin Trials* 1986;**7**:177–88.

**Domenighetti 1988**

Domenighetti G, Luraschi P, Casabianca A, Gutzwiller F, Spinelli A, Pedrinis E, et al. Effect of information campaign by the mass media on hysterectomy rates. *Lancet* 1988;**2**: 1470–3.

**Draper 1981**

Draper N, Smith H. *Applied regression Analysis*. 2nd Edition. USA: Wiley, 1981.

**Entwistle 1995**

Entwistle V. Reporting research in medical journals and newspapers. *BMJ* 1995;**310**:920–3.

**Entwistle 1996**

Entwistle VA, Watt IS, Bradbury R, Pehl LJ. Media coverage of the Child B case. *BMJ* 1996;**312**:1587–91.

**Flay 1987**

Flay BR. Mass media and smoking cessation: a critical review. *Am J Public Health* 1987;**77**:153–60.

**Freemantle 1994**

Freemantle N, Watt I, Mason J. Development in the purchasing process in the NHS: towards an explicit politics of rationing. *Public Administration* 1994;**71**:535–48.

**Freemantle 1997**

Freemantle N, Harvey EL, Wolf F, Grimshaw JM, Grilli R, Bero LA. Printed educational materials to improve the behaviour of health care professionals and patient outcomes. *The Cochrane Library, [database on CD-ROM and online]* 1998, Issue 2.

**Freimuth 1981**

Freimuth VS, Van Nevel JP. Reaching the public: the asbestos awareness campaign. *J Communication* 1981;**31**: 154–67.

**Grilli 1993**

Grilli R, Oxman AD, Julian JA. Chemotherapy for advanced non-small-cell lung cancer: how much benefit is enough?. *J Clin Oncol* 1993;**11**:1866–72.

**Hedges 1985**

Hedges LV, Olkin I. *Statistical method for Meta-Analysis*. London: Academic Press, 1985.

**Jones 1980**

Jones EF, Beniger JR, Westoff CF. Pill and IUD discontinuation in the United States, 1970-1975: the influence of the media. *Fam Plann Perspect* 1980;**12**: 293–300.

**Klaidman 1990**

Klaidman S. Roles and responsibilities of journalists. In: Atkin C, Wallack L editor(s). *Mass communication and public health*. London: SAGE, 1990:69.

**Kristiansen 1984**

Kristiansen CM, Harding CM. Mobilization of health behaviour by the press in Britain. *Journalism Quarterly* 1984;**61**:364-70, 398.

**Mazur 1981**

Mazur A. Media coverage and public opinion on scientific controversies. *J Communication* 1981;**31**:106–15.

**McQuail 1977**

McQuail D. The influence and effects of mass media. In: Curran J, Gurevitch M, Woolcott J editor(s). *Mass communication and society*. London: Edward Arnold, 1977: 70–94.

**Nelkin 1987**

Nelkin D. *Selling science*. New York: WH Freeman and Co, 1987.

**Nelkin 1996**

Nelkin D. An uneasy relationship: the tensions between medicine and the media. *Lancet* 1996;**347**:1600–3.

**Paisley 1990**

Paisley W. Public communication campaigns. The American experience. In: Rice RE, Atkin CK editor(s). *Public communication campaigns*. London: SAGE, 1990: 15–38.

**Pfund 1981**

Pfund N, Hofstadter LK. Biomedical innovation and the press. *J Communication* 1981;**31**:138–54.

**Phillips 1991**

Phillips DP, Kanter EJ, Bednarczyk B, Tastad PL. Importance of the lay press in the transmission of medical

- knowledge to the scientific community. *N Engl J Med* 1991; **325**:1180–3.
- Radford 1996**  
Radford T. Influence and power of the media. *Lancet* 1996; **347**:1533–5.
- Razak 1992**  
Razak DA. Communicating drug information. In: Robles A, Mangahas M, Coronel SS, Gamalinda E editor(s). *Prescription for change. National drug policies, social transformation and the Media*. Manila: Philippine Centre for Investigative Journalism/Dag Hammarskjöld Foundation, 1992:23–7.
- Sandman 1987**  
Sandman PM, Weinstein ND, Klotz ML. Public response to the risk from geological radion. *J Communication* 1987; **37**(3):93–108.
- Simpkins 1984**  
Simpkins, Brenner. Mass media communication and health. In: Dervin B, Voigt MJ editor(s). *Progress in communication sciences*. Norwood, NJ: Ablex, 1984:275–97.
- Wallack 1990**  
Wallack L. Mass media and health promotion. In: Atkin C, Wallack L editor(s). *Mass communication and public health*. London: SAGE, 1990:41–51.
- Wallack 1993**  
Wallack L, Dorfman L, Jernigan D, Themba M. *Media advocacy and public health. Power for prevention*. London: SAGE, 1993:79.
- Warner 1987**  
Warner KE. Television and health education: stay tuned. *Am J Public Health* 1987;**77**:140–2.
- Winsten 1985**  
Winsten JA. Science and the media: the boundaries of truth. *Health Aff (Milwood)* 1985;**4**:5–23.
- \* Indicates the major publication for the study

## CHARACTERISTICS OF STUDIES

### Characteristics of included studies *[ordered by study ID]*

#### Blohm 1994

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: NOT DONE<br>Completeness of data set: NOT CLEAR<br>Reliability of primary outcome: DONE   |
| Participants  | General public   |
| Interventions | Media campaign conducted in Goteborg (Sweden) in 1987, aimed at reducing delay in hospital admissions for patients with suspected myocardial infarction, and launched by a team of doctors and nurses. The campaign relied on a local radio station and on local newspaper articles and advertisements. Leaflets were distributed to patients admitted at medicine departments and to all households in Goteborg. They were also made available at local district clinics, pharmacies, post offices, and banks in the city. Advertisements were placed on buses and trams. Doctors made visits to local district clinics to explain the rationale for the campaign. Duration of the campaign: 1 year |
| Outcomes      | Delay time of hospital admission in patients with suspected myocardial infarction, and number of hospital admissions for chest pain  |
| Notes         | ITS based upon 11 observations before and 7 after the intervention for delay time, 20 observations before and 14 after for chest pain hospital admissions; monthly data  |

#### Bonerandi 1992

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Formal test for trend: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcomes: DONE<br>Completeness of data set: NOT CLEAR<br>Reliability of primary outcomes: DONE   |
| Participants  | General public, health professionals   |
| Interventions | Educational intervention alerting the general public to early diagnosis of malignant melanoma in Provence, Alps, Cote d'Azur and Corse Regions (France) in 1989. Television spots, radio programmes and interviews, newspaper articles, posters displayed in physician's office. Physicians given information through courses, meetings, videotapes and printed educational material mailed to physicians' offices. Duration of the campaign: 2 months |
| Outcomes      | Number of diagnosed malignant melanomas  |
| Notes         | ITS based upon 6 observations before and 6 after the intervention; 2-monthly data  |



**Brasca 1987**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE   |
| Participants  | General public, health professionals  |
| Interventions | Educational campaign on colorectal cancer, endorsed by the Sociedades de Gastroenterologia, Cancerologia and Colonproctologia of the city of Rosario (Argentina). TV and radio campaign. 10, 000 printed educational materials targeted at physicians in the area; 25,000 printed educational materials distributed to the general population in hospitals, pharmacies, hotels, supermarkets. International meeting on colorectal cancer organised for health professionals in general, and primary care physicians in particular. Duration of the campaign: 3 months |
| Outcomes      | Number of colorectal cancers diagnosed  |
| Notes         | ITS based upon 9 observations before and 7 after the intervention; monthly data   |

**Del Mar 1997**

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE                  |
| Participants  | General public, health professionals   |
| Interventions | Two educational campaigns (delivered twice over two and a half years) aimed at increasing public awareness of the risk of melanoma. The messages were delivered mainly (but not only) through TV advertisements to coastal Queensland (Australia).<br>Duration of the campaigns: 5 and 2 months, respectively. |
| Outcomes      | Number of malignant or potentially malignant skin lesions excised  |
| Notes         | ITS based upon 14 observations before and 17 after the intervention; monthly data  |

### Domenighetti 1988

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE |
| Participants  | General public   |
| Interventions | Mass media publicity in Canton Ticino (Switzerland) of hysterectomy rates higher than in other areas. From February to October 1984, 6 local newspapers, radio and TV gave wide publicity to the issue   |
| Outcomes      | Hysterectomy rates   |
| Notes         | ITS based upon 7 observations before and 3 after the intervention in Canton Ticino as compared to an unexposed control area; 2-monthly data  |

### Eppler 1994

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE  |
| Participants  | General public   |
| Interventions | 'Call fast, call 9-1-1' campaign aimed at increasing the use of 911 emergency service and reducing hospital admission delay for patients with suspected myocardial infarction, in the community of King County, Washington (USA). TV and radio advertisements were targeted to individuals aged >50 in a community of about 1.5 million. Mailing of educational materials to households with persons over the age of 50. Duration of the campaign: 6 weeks |
| Outcomes      | Number of emergency department chest pain visits and number of coronary care unit admissions   |
| Notes         | ITS based upon 20 observations before and 5 after the intervention; monthly data   |

### Harris 1979

|              |  |
|--------------|--|
| Methods      | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE |
| Participants | General public   |

**Harris 1979** (Continued)

|               |   |
|---------------|---|
| Interventions | Three week educational campaign held in Birmingham (UK) for returning medicines. One of the aims was to reduce the incidence of poisoning incidents in children. Extensive coverage provided by local press, radio and TV, plus display of posters, leaflets. Duration of the campaign: 3 weeks |
| Outcomes      | Number of admissions of children under 15 to Birmingham hospitals after poisoning incidents   |
| Notes         | ITS based upon 32 observations before and 4 after the intervention; monthly data  |

**HealSmith 1993**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT CLEAR<br>Reliability of primary outcome: DONE   |
| Participants  | General public  |
| Interventions | Campaign on early diagnosis of malignant melanoma, promoted in Leicestershire (UK) and funded by the Cancer Research Campaign (CRC). Press releases were issued to local media (newspapers, radio, TV) in the first week of July 1987. This was repeated in the same week of 1988 and 1989. CRC posters and leaflets were distributed. Duration of the campaign: 1 week |
| Outcomes      | Number of patients with good prognosis melanoma (ie thickness of the lesion <1.49 mm)   |
| Notes         | ITS based upon 4 observations before and 10 after the intervention; yearly data   |

**Herd 1995**

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT CLEAR<br>Reliability of primary outcome: DONE   |
| Participants  | General public, health professionals   |
| Interventions | Campaign for early diagnosis of malignant melanoma, promoted in Edinburgh (UK) in 1987 and funded by the Cancer Research Campaign (CRC). This initiative overlapped a similar campaign launched in Glasgow in 1985. Seminars were held for general practitioners and educational materials were also provided. The general public was targeted with a publicity campaign, plus pamphlets, posters, articles in local newspapers and radio programmes. Duration of the campaign: about 3 months per year for a 3 year period (1987,1988,1989) |
| Outcomes      | Proportion of patients with malignant melanoma with good prognosis (ie: thin lesion, <=1.5mm)  |

**Herd 1995** (Continued)

|       |  |
|-------|--|
| Notes | ITS based upon 3 observations before and 6 after the intervention; yearly data |
|-------|--|

**Joshi 1988**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: NOT CLEAR<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT CLEAR<br>Reliability of primary outcome: DONE |
| Participants  | General public  |
| Interventions | Nationwide mass media campaign in the UK on HIV   |
| Outcomes      | Number of HIV tests performed   |
| Notes         | ITS based upon 20 observations before and 7 after the intervention; monthly data  |

**Lowe 1994**

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT DONE<br>Blinded assessment of primary outcome: NOT DONE<br>Completeness of data set: NOT DONE<br>Reliability of primary outcome: NOT CLEAR                                  |
| Participants  | General public, health professionals   |
| Interventions | 1991 National Skin Cancer Awareness Week campaign, promoted by the Australian Cancer Society, aimed at increasing awareness of the need for skin examination. Intensive multimedia information on danger of skin cancer. General practitioners supported with educational materials on skin cancer diagnosis. Duration of the campaign: 1 week |
| Outcomes      | Number of patient initiated consultations  |
| Notes         | ITS based upon 4 observations before and 6 after the intervention; weekly data   |

**Macdonald 1985**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE  |
| Participants  | General public, health professionals  |
| Interventions | Four week immunisation campaign by the South Australian Health Commission aimed at increasing immunisation rates for measles and rubella. The campaign included TV and radio commercials, posters, leaflets, coverage in newspapers, radio and TV programmes. Professional journals were also involved, and seminars were organised for health care providers |
| Outcomes      | Number of clinic attendances for measles and rubella immunisation   |
| Notes         | ITS based upon 8 observations before and 4 after the intervention; 2-monthly data   |

**Maclure 1998**

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE |
| Participants  | General public, health professionals   |
| Interventions | Mass media coverage of the effect of calcium-channel blockers in Canada, during the period 1994-96. During the same period educational interventions targeted at physicians were carried out, aimed at favouring the use of thiazides and beta-blockers over calcium-channel blockers        |
| Outcomes      | Proportion of patients >66 years receiving different type of drugs   |
| Notes         | ITS based upon 11 observations before and 25 after the intervention; monthly data  |

**Nattinger 1998**

|              |  |
|--------------|--|
| Methods      | Data analysed appropriately: DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT DONE<br>Reliability of primary outcome: DONE |
| Participants | Women undergoing surgery for breast cancer   |

**Nattinger 1998** (Continued)

|               |  |
|---------------|--|
| Interventions | Mass media report in the U.S.A. of Nancy Reagan's mastectomy for breast cancer in 1987 |
| Outcomes      | Percentage of use of breast conserving surgery over time                               |
| Notes         | ITS based upon 19 observations before and 13 after the intervention; 3-monthly data    |

**Paunio 1991**

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE   |
| Participants  | General public, health professionals   |
| Interventions | Nationwide vaccination programme in Finland for measles, mumps, and rubella, launched in November 1982, and including a one week mass media campaign (started in the third year of the programme), a notification of non-vaccinated children sent to health professionals (in the third year of the programme), and a similar notification sent to parents of non-vaccinated children (in the fourth year of the programme). Duration of the campaign: 4 years |
| Outcomes      | Vaccination coverage rates   |
| Notes         | ITS based upon 14 observations before and 8 after the intervention; weekly data  |

**Pehamberger 1993**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT DONE<br>Reliability of primary outcome: NOT CLEAR  |
| Participants  | General public, health professionals  |
| Interventions | Nationwide campaign in Austria on skin cancer prevention, run under the aegis of the Austrian Society of Dermatology and Venereology, and supported by the Austrian Society of Surgery, Austrian Cancer Society, Austrian Medical Association, and Austrian Broadcasting and TV Corporation (ORF). Printed educational materials provided to all Austrian dermatologists, surgeons, and general practitioners. Regular broadcasts and television spots, articles and interviews in newspapers, posters displayed in physicians' offices, schools, and public places. Duration of the campaign: 4 months |
| Outcomes      | Number of patients with good prognosis melanoma (ie thickness of the lesion <1.50 mm)   |

**Pehamberger 1993** (Continued)

|       |  |
|-------|--|
| Notes | ITS based upon 3 observations before and 4 after the intervention; yearly data |
|-------|--|

**Shelley 1991**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT DONE<br>Reliability of primary outcome: DONE   |
| Participants  | General public, health professionals  |
| Interventions | Mass media campaign aimed at increasing Pap smear screening, launched in New South Wales (Australia), sponsored by the Department of Health and by the State Cancer Council and launched in February 1988. The intervention was based upon a 30 second TV commercial, (screened 34 times), plus 2 radio commercials, an advertisement in two women's magazines, 2 posters and a pamphlet distributed to GPs. Duration of the campaign: 2 months |
| Outcomes      | Number of Pap smears performed  |
| Notes         | ITS based upon 35 observations before and 4 after the intervention; monthly data  |

**Soumerai 1992**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: NOT CLEAR<br>Blinded assessment of primary outcome: NOT DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE |
| Participants  | General public  |
| Interventions | Mass media coverage in the USA of the relationship between Reye's syndrome and aspirin use in children, taking place in the framework of other activities, including those of government agencies (FDA), consumer advocacy organisations, and pharmaceutical companies                                |
| Outcomes      | Incidence of Reye's syndrome  |
| Notes         | ITS based upon 6 observations before and 8 after the intervention; yearly data  |



**Tesoriero 1992**

|               |  |
|---------------|--|
| Methods       | Data analysed appropriately: DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: DONE<br>Reliability of primary outcome: DONE |
| Participants  | General public   |
| Interventions | Mass media report in the USA of 'Magic' Johnson's HIV disclosure   |
| Outcomes      | Number of counselling hours and number of blood submissions for HIV test in New York State   |
| Notes         | ITS based upon 36 observations before and 19 after the intervention; weekly data   |

**Turner 1987**

|               |   |
|---------------|---|
| Methods       | Data analysed appropriately: NOT DONE<br>Data collection identical before and after the intervention: DONE<br>Intervention unlikely to affect data collection: DONE<br>Blinded assessment of primary outcome: DONE<br>Completeness of data set: NOT CLEAR<br>Reliability of primary outcome: DONE |
| Participants  | General public  |
| Interventions | AIDS publicity campaign and government educational programme, taking place in October, November 1986 and March 1987 in the UK   |
| Outcomes      | Number of specimens for HIV antibody tests at Liverpool Public Health Laboratory  |
| Notes         | ITS based upon 7 observations before and 3 after the first campaign; monthly data   |

**Characteristics of excluded studies [ordered by study ID]**

| Study        | Reason for exclusion                               |
|--------------|--|
| Bach 1996    | ITS<br>Insufficient number of observations         |
| Bakdash 1983 | Uncontrolled before-after, self-reported data only |
| Balraj 1986  | Uncontrolled before-after                          |

(Continued)

|                  |  |
|------------------|--|
| Beck 1987        | ITS<br>Insufficient number of observations   |
| Bett 1993        | Uncontrolled before-after  |
| Bortolotti 1988  | Uncontrolled before-after, self-reported data only   |
| Brown 1996       | CBA<br>Questionable appropriateness of control   |
| Carter 1985      | ITS<br>Insufficient number of observations   |
| Del Beccaro 1995 | ITS<br>Insufficient number of observations before/after the intervention                       |
| Dignan 1994      | CBA<br>No objective measure of health services utilisation                                     |
| Doherty 1988     | ITS<br>Insufficient number of observations   |
| Fulton 1992      | Cross-sectional study, no data on actual behaviour   |
| Gooch 1970       | ITS<br>Insufficient number of observations before/after the intervention                       |
| Gregorio 1990    | Cross-sectional study  |
| Gresham 1988     | Uncontrolled before-after, self-reported data on awareness, no information on actual behaviour |
| Hastings 1990    | Uncontrolled before-after, self-reported data only   |
| Hill 1993        | Uncontrolled before-after  |
| Hirst 1990       | Uncontrolled before-after  |
| Ho 1989          | Uncontrolled before-after, self-reported data only   |
| Illig 1989       | Cross-sectional study  |
| Jones 1980       | ITS<br>Self-reported data only   |
| Kelly 1991       | Uncontrolled before-after, self-reported data only   |
| Langer 1992      | Uncontrolled before-after, self-reported data only   |

(Continued)

|                      |  |
|----------------------|--|
| Lee 1994             | Cross-sectional study, self-reported data only   |
| Lin 1971             | Cross-sectional study, self-reported data only   |
| Marquart 1993        | ITS<br>Insufficient number of observations before/after the intervention                       |
| Mayer 1992           | Uncontrolled before-after, self-reported data only   |
| McKinnon 1978        | ITS<br>Insufficient number of observations before/after the intervention                       |
| Melia 1995           | ITS<br>Insufficient number of observations before/after the intervention                       |
| Mitic 1984           | Uncontrolled before-after, self-reported data only   |
| Mukherji 1982        | Uncontrolled before-after  |
| Murtomaa 1984        | Uncontrolled before-after, self-reported data only   |
| Odumosu 1982         | Cross-sectional study, no data on actual behaviour   |
| Olivarius 1992       | Uncontrolled before-after, self-reported data only   |
| Olsen 1987           | Uncontrolled before-after  |
| Pape 1993            | Cross-sectional study  |
| Penna 1991           | ITS<br>Insufficient number of observations   |
| Ross 1993            | ITS<br>Insufficient number of observations   |
| Sherr 1987           | Uncontrolled before-after, self-reported data on attitudes, no information on actual behaviour |
| Singh 1994           | Uncontrolled before-after, no data on actual behaviour   |
| Trandel-Korenchuk 19 | Cross-sectional  |
| Waters 1983          | ITS<br>Insufficient number of observations   |
| Weller 1984          | ITS<br>Insufficient number of observations   |
| Winchester 1988      | Uncontrolled before-after, self-reported data only   |

(Continued)

|              |  |
|--------------|--|
| Young 1990   | ITS<br>Insufficient number of observations before/after the intervention |
| Zimicki 1994 | Uncontrolled before-after, self-reported data only                       |

## DATA AND ANALYSES

### Comparison 1. Mass media vs control

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| Outcome or subgroup title     | No. of studies | No. of participants | Statistical method | Effect size     |
|-------------------------------|----------------|---------------------|--------------------|-----------------|
| 1 Health services utilisation |                |                     | Other data         | No numeric data |

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## FEEDBACK

### PsycLIT incorrectly spelt

#### Summary

The reviewers incorrectly spelt the database PsycLIT.

#### Reply

This has now been corrected.

#### Contributors

Lorna Duggan

## WHAT'S NEW

Last assessed as up-to-date: 15 November 2001.

| Date             | Event   | Description                     |
|------------------|---------|---------------------------------|
| 12 November 2008 | Amended | Converted to new review format. |

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## HISTORY

Protocol first published: Issue 2, 1997

Review first published: Issue 3, 1998

| Date             | Event  | Description           |
|------------------|--|-----------------------|
| 16 November 2001 | New citation required and conclusions have changed | Substantive amendment |

## DECLARATIONS OF INTEREST

None known.

## SOURCES OF SUPPORT

### Internal sources

- Agenzia Sanitaria Regionale Emilia-Romagna, Bologna, Italy.
- Health Services Research Unit, University of Aberdeen, UK.

### External sources

- NHS Research & Development Programme, UK.

## INDEX TERMS

### Medical Subject Headings (MeSH)

\*Health Education; \*Mass Media; Health Services [\*utilization]; Health Services Research

### MeSH check words

Humans