



TECHNICAL REPORT

A literature review on health communication campaign evaluation with regard to the prevention and control of communicable diseases in Europe

Insights into health communication

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**Clínica
Universidad
de Navarra**



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Abbreviations

ABHR	Alcohol-based hand rub
ACME	Audience, Channel, Message, Evaluation Framework
EEA	European Economic Area
EU	European Union
HCAI	Healthcare-acquired infections
HIV	Human immunodeficiency virus
KAB	Knowledge, attitudes and beliefs questionnaire
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
MRSAB	Meticillin-resistant <i>Staphylococcus aureus</i> bacteraemia
MSM	Men who have sex with men
PLWHAs	people living with HIV/AIDS
RCT	Randomised controlled trial
RE-AIM	Reach, Effectiveness, Adoption, Implementation and Maintenance Framework
STI	Sexually transmitted infection
US CDC	US Centers for Disease Control and Prevention

Executive summary

Introduction

This review collates and summarises the literature on communication campaign evaluation with relevance to the prevention and control of communicable diseases. The purpose of this review is to contribute to the evidence base on health communication evaluation research in order to aid public health professionals and researchers in the development of future evaluation strategies. The review is divided into two sections. In the first section the focus is on reviewing evaluations of campaigns undertaken in European Union (EU) and European Economic Area (EEA) countries, however, examples from the wider European region are also included. The second section, addressing challenges posed by campaign evaluation, draws on broader international literature pertaining to the identification of health communication campaign evaluation tools, frameworks and models. It would appear that there has been very few high quality European evaluation studies carried out in the last decade in relation to communicable disease prevention campaigns. Nevertheless, it is evident in reviewing the literature that there are valuable existing frameworks and guidelines that can help guide and inform evaluation research development.

Methodology

The review examined the international English-language literature published between 2000 and 2011. The search strategy devised included a review of a number of databases of published academic literature using identified key words which included but were not restricted to: "health communication" "public health campaign" and "evaluation/effectiveness" and "communicable" "infectious disease". In addition, specific journals were extensively reviewed for relevant articles.

Results

The reviewers retrieved 160 references of which 35 were examples of evaluations of health communication campaigns carried out in EU/EEA Member States.

A review of examples of campaign evaluations

Interventions labelled health communication campaigns vary greatly in their topic focus, activities, design and exposure and this is demonstrated in the breadth of examples identified. The range of approaches to study design include: systematic and exploratory reviews, experimental and randomised, non-randomised, time-series, multiple method, longitudinal, before-after, cross-sectional, content analysis and cost-effectiveness. The critique of these examples reveals evidence of: weak study designs, small sample sizes, lack of control or comparison groups, lack of theoretical foundation, underuse of formative and process evaluation, lack of reference to capturing unintended effects and evaluation aims and outcome measures that do not correspond with campaign objectives. These limitations are not restricted to the European context and have also been recognised as challenges in the international literature on the evaluation of health communication campaigns.

Addressing the challenges of campaign evaluation

A number of principles, frameworks and guidelines are outlined in the literature that can assist researchers and public health professionals in planning campaign evaluation. Those identified include: Bauman's guidelines for campaign developers [1], Centers for Disease Control and Prevention (US) Framework for Programme Evaluation [2], Audience, Channel, Message, Evaluation (ACME) Framework developed by Noar [3], the US. National Cancer Institute's, Making Health Communications Programs Work [4], and the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) Framework [5].

A number of indicators of success have been consistently cited in the literature as contributing to efficient and effective practice in relation to evaluation of health communication campaigns. Identified indicators of success include: be clear about what is being evaluated, be realistic and explicit about the expected direct and indirect effects, consider potential unintended effects, and use appropriate theory to inform campaign development and evaluation. An important factor identified is that evaluation, including cost effectiveness analysis, should be integrated with formative, process and summative evaluation through campaign planning, development and implementation. Preferred evaluation research designs promoting rigour include: pre-post test, cohort designs, time-series designs and natural experiments. The use of post-test only designs is severely compromised but may be the only option in situations of scarce resources. Acknowledging and documenting the context in which campaigns are implemented will facilitate the transfer of knowledge between the diverse EU/EEA states, and sharing experiences will optimise the use of resources and the development of skills.

Conclusion

The development of a strong evidence base is imperative to drive effective and efficient policy and practice in the use of health communication campaigns for the prevention and control of communicable diseases. The challenge within the context of EU/EEA countries is to develop capacity for evaluation research within countries, while acknowledging and addressing the barriers to the application of this knowledge base to health communication evaluation practice.

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Introduction

Rationale for the review

Health communication campaigns can, if developed in a strategic way and informed by principles and theories of effective communication [1], be successful in conveying health messages to large sections of the population. As such, they are a useful tool in the promotion of health and are increasingly important in the prevention and control of communicable diseases [2].

It is important to note that definitions of health communication campaigns are somewhat unclear and previous researchers have commented on the frequent ambiguity in the use of labels such as 'campaign', 'communication campaign' or 'programme', 'mass media campaign', and 'intervention' [3]. The reality is that no specific definition sufficiently encompasses what exists in practice [3]. Flynn and colleagues propose that the defining feature of mass media campaigns is simply directing standard messages to large populations simultaneously [4]. While Bauman, in the first of his guidelines for campaign development and evaluation, describes media campaigns as organised and purposive activities, separate, although complementary to the use of media for public health advocacy, that utilise a variety of media channels to inform, persuade or motivate populations [5]. Although health communication campaigns can vary greatly, they are likely to share a number of characteristics, as outlined by Rogers and Storey [6]. These include their general aim to produce specific outcomes, commonly a change in behaviour, in a relatively large group of individuals within a pre-determined time-frame and through a specified series of communication activities.

In order to develop the most effective health communication strategies for campaigns, practitioners are not only encouraged to utilise tested theories and methodologies from the existing evidence base [7], but also to plan and employ rigorous evaluation designs that are appropriate to the complexity of the campaign activities [8]. However, many difficulties have been documented when attempting to evaluate health communication campaigns, particularly in relation to the selection of appropriate evaluation designs and indicators to measure the impact of the campaign on public health outcomes [9].

Objectives of the review

The purpose of this review is to contribute to the evidence base on health communication evaluation research in order to aid public health professionals and researchers in the development of future evaluation strategies.

The specific objectives of this review are to:

- Identify and review evaluations of health communication campaigns aimed at the prevention and control of communicable diseases focusing on those implemented in EU/EEA countries, published between 2000 and 2011.
- Outline the principles of best practice for evaluating health communication campaigns through the identification of indicators of success for health communication campaign evaluation.
- Identify gaps in the evidence and outline the implications for the future of research, policy and practice with regard to the evaluation of health communication campaigns aimed at the prevention and control of communicable diseases.

Structure of the review

This review is divided into two main sections. Following an introduction to the evaluation of health communication campaigns, the first section draws on examples of health communication campaign evaluations aimed at the prevention and control of communicable diseases. In order to provide the key arguments succinctly the detailed examples are presented in Appendices 1, 2 and 3. The first section focuses on a review of the approaches adopted and study designs employed with their concomitant strengths and limitations. The challenges identified in the review of campaign evaluation examples, supported by the broader literature on campaign evaluation, are discussed. The second section of the review explores evaluation principles, frameworks and models and identifies indicators for campaign effectiveness. These can be used to address the challenges identified and promote effective and efficient evaluation endeavours, thereby contributing to best practice in evaluation research for health communication campaigns aimed at the prevention and control of communicable diseases. Finally, the review concludes with consideration of the implications for health communication research, insights for policy and practice and identification of gaps and the focus for further research.

Methodology

Search strategy

A number of databases were searched for published academic literature for this review: Embase, MEDLINE, PsycINFO, SAGE Journals Online, Wiley online library, CINAHL, Scopus, The Biomedical & Life Sciences Collection, The Campbell Collaboration, The Cochrane Library and Web of Science. In addition, five journals were extensively reviewed for relevant articles: Journal of Health Communication, Journal of Applied Communications Research, Evaluation and Program Planning, European Journal of Public Health and New Directions for Evaluation. The reference lists of documents retrieved from these sources were consulted to identify additional relevant literature.

Grey literature such as reports, conference presentations or technical documents meeting the inclusion criteria were identified through general Internet searches using Google. Searches of the following websites were also undertaken: European Centre for Disease Prevention and Control, World Health Organization, Health Protection Agency (UK), US Centers for Disease Control and Prevention, The Health Communication Unit (Ottawa, Canada) and Index to Theses website (UK and Irish theses).

Search terms

Terms used in the literature searches included but were not restricted to:

- "health communication" "public health campaign" and "evaluation/effectiveness" and "communicable" "infectious disease" and "Europe"
- "health communication campaign/intervention" and "evaluation/effectiveness" and "principles/best practice"
- "health communication/public health campaign" and "communicable/infectious disease" and "evaluation/effectiveness" and "Europe/EU".

Exclusion/inclusion criteria

The review was restricted to English language documents published between January 2000 and January 2011.

The working definition of a health communication campaign used for inclusion purposes in this review was informed by that provided by Flynn et al., so that a broad range of evaluation activities pertinent to campaigns could be captured [4]. Therefore activities were included that incorporated directing standard messages relating to the prevention and control of communicable diseases to large populations simultaneously.

The first section of the review concentrates on the application of evaluation methodologies in EU/EEA countries but also draws on examples from the World Health Organization (WHO) European region. Further international evidence contributes to the identification of challenges for campaign evaluation and principles, tools and frameworks for best practice.

References retrieved

The reviewers retrieved 160 references of which 35 were examples of evaluations of health communication campaigns carried out in EU/EEA countries and seven were from the wider WHO European region. These 42 examples included: two systematic literature reviews, one exploratory literature review, 33 individual journal articles, three reports, one research letter, one account of conference proceedings and one PowerPoint presentation. Of the remaining 118 references, eight were exploratory literature reviews, eight were systematic reviews and three were reported meta-analytic studies. The majority of the sources, with the exception of the evaluation examples, were from the North American literature (70 references).

Results

Valente [10] described evaluation as 'the systematic application of research procedures to understand the conceptualisation, design, implementation, and utility of interventions' (p.106). This comprehensive definition is especially relevant as it encompasses the importance of integrating evaluation research throughout the project, a practice which should be inherent to evaluation strategies. Valente [10] suggests conducting campaign evaluation in three phases, namely:

- formative evaluation, which helps to guide campaign development by gaining a deeper understanding of the values, attitudes, and beliefs of the target population [10, 11]
- process evaluation, where campaign exposure and target audience feedback is monitored to inform any necessary mid-point campaign improvements [11, 12]
- summative or outcome evaluation, which aims to assess campaign impact and identify explanations for any achievements observed [10, 13].

Evaluation activities conducted before, throughout, and after campaign implementation are necessary for many reasons, such as to determine if, and to what degree, the campaign was successful, to identify why or how the campaign was successful and to gather reliable data that will inform the development of future campaign activities [10, 14]. Furthermore, evaluation can help researchers to: compare efficiency and cost-effectiveness of a programme, verify its quality and its applicability to various settings or circumstances and replicate or scale up the intervention where feasible [15].

Evaluations have also been classified by their study design, as in many cases it is by this criterion that their quality is determined. It has been proposed that the perceived success or otherwise of health communication campaigns can be relative to the approach taken for its evaluation [16].

Evaluations of health communication campaigns aimed at the prevention and control of communicable diseases

Interventions labelled health communication campaigns vary greatly in their design and exposure, therefore, evaluation of such campaigns has proven to be a complex undertaking [17-20]. This is further exacerbated in the European context by the diverse range of cultures, languages, governing systems and resources available. Nevertheless, a wide range of examples of evaluation research have been identified.

As noted previously, a more detailed and critical appraisal of the studies reviewed is reported separately in both narrative (Appendix 1) and tabulated formats (Appendices 2 and 3).

A range of evaluation research study designs was identified in the literature review including the following:

- Systematic and exploratory reviews [21-26]
- Experimental and randomised studies [27-31]
- Non-randomised study [32]
- Time-series studies [33-42]
- Multiple-method studies [43-47]
- Longitudinal studies [48, 49]
- Before-After studies [50-55]
- Post-test studies [56, 57]
- Cross-sectional studies [57-63]
- Content analysis [64, 65]
- Cost-effectiveness studies [49, 66].

Challenges for campaign evaluation

It is important at this point to acknowledge that there are many theoretical and practical challenges in planning, implementing, and evaluating health communication campaigns [67]. These challenges are especially evident within the studies identified, where there is a broad selection of methodologies employed in evaluation research, applied to various issues relating to both the prevention and control of communicable diseases, in a variety of country contexts. This is reflected in the wide range of activities included as constituting a health communication 'campaign'. The studies reveal a number of methodological weaknesses including: weak study designs, small sample sizes, lack of control or comparison groups, lack of theoretical foundation, underuse of formative and process evaluation, and evaluation aims and outcome measures that do not correspond with campaign objectives (see Appendix 1). While these weaknesses are evident from the studies reviewed, it must also be noted that there is generally a lack of accessible documentation reporting evaluation research activities that would facilitate the sharing of any lessons learnt and the subsequent transfer of knowledge. This includes information on campaign activities, implementation processes and detail of evaluation methodologies used.

Huttner and colleagues report that evaluation research is an inherently weak point of many campaigns and proposed explanations including a lack of funding and/or difficulty in obtaining the necessary data [25]. Likewise, Magiorakos et al., reported on the current state of hand hygiene campaigns in Europe and made it clear with regard to evaluation of their impact, that many European countries are at varying stages, and most would still require routine data on compliance with hand hygiene practices, the use of alcohol-based hand rub (ABHR) and a decrease in healthcare acquired infections (HCAI) [68]. Indeed, barriers to stakeholder commitment and a general lack of resources appear to be the most prevalent issues within the European region [69].

The limited financial resources available for health communication places increasing emphasis on the need for evaluations of cost effectiveness: although in this review only two such studies were identified [49, 66]. The main challenge of carrying out cost-effectiveness evaluations is the difficulties in obtaining detailed documentation or estimates of costs, and measuring the effectiveness of the campaign in achieving its objectives [19]. A recent investigation of cost-effectiveness of disease prevention and health promotion focused on economic evaluation studies published in 2008. The authors found that the majority of these studies focused on the prevention of infectious diseases and used generalised outcome measures such as Quality Adjusted Life Year or Life Years Gained. These results would imply that if similar outcome measures, such as those mentioned above, could be applied to various preventative interventions, results could prove to be more comparable across settings [70]. As with other forms of evaluation research, it has been recommended that cost-effectiveness studies employ more systematic methodologies which are developed alongside campaign planning [71, 72].

Frick suggests that cost-effectiveness experts working alongside health communication researchers will facilitate the evolution of economic evaluation [73].

In relation to outcome evaluation, The National Cancer Institute (USA) outlined a number of potential problems associated with the evaluation of health communication campaigns, such as: the difficulty in isolating the effects of each campaign activity or component, the challenge of controlling external influences and thus attributing cause and effect when the campaign is rolled out in a real-world setting, the task of measuring outcomes directly related to communication objectives because the change in outcome is either too minor to detect with standard methodologies, or too difficult to measure reliably [14]. These challenges are also evident throughout the range of examples of European campaign evaluations included in the present review.

Some researchers advocate the application of rigorous randomised controlled trials for any evaluative research. However, the advantage, or otherwise, of employing a randomised controlled trial study design for health communication evaluation has been a long-standing topic of debate among researchers and policy-makers, despite it being considered the 'gold standard' of research methodologies. The main problem in using randomised controlled trials for campaign evaluations, even in the case of ample funding and resources, is that they fail to provide information as to how or why the campaign was successful or otherwise. Therefore, a campaign that is effective in one country/region/setting may not be applicable to another, thus limiting the benefit of conducting the evaluation [74]. In many cases randomisation is impossible due to a number of reasons, including difficulties with: funding, analysis, contamination of control sites, participant resistance to control group status and external influencing factors [75]. Randomisation has also been criticised as being unethical, particularly in community based designs [76]. These issues, including ethical considerations, are pertinent to the application of randomised control trials for evaluation of health communication campaigns for the prevention and control of communicable diseases.

The findings from a meta-analysis in the USA examining the impact of evaluation design on conclusions made regarding campaign effectiveness suggest that post-test only studies generally report almost twice the effect size of studies utilising more rigorous controlled methods [77]. These findings imply that weaker study designs may be overestimating the actual impact of health communication campaigns [17]. Nevertheless, it is rarely feasible within the European context, to conduct what are generally expensive experimental evaluations, therefore it is necessary to consider ways to address some of the challenges posed.

Due to the lack of consistency in the definition of 'campaign', the variety of issues addressed, the inconsistency in methodologies employed, the limitations identified and the diverse settings and cultural contexts in which the campaigns were developed and implemented, it is not possible to make any conclusive claims from the studies reviewed about the effectiveness of health communication campaigns for the prevention and control of communicable diseases. The literature does, however, provide some solutions in terms of research design and indicators of effectiveness that, if applied, could contribute to the quality of evaluation research endeavours and strengthen the evidence base.

Addressing the challenges of campaign evaluation

While the identified challenges of evaluating health communication campaigns for the prevention and control of communicable diseases are extensive, a lot is known about effective and efficient practice in this regard including indicators for success. This literature is reviewed with a focus on frameworks, tools and models, finishing with a collation of key indicators to inform best practice in evaluation research of health communication campaigns for the prevention and control of communicable diseases.

Indicators for effectiveness of health communication campaigns

In the area of communicable disease prevention and control, the health impact of campaigns is usually measured in the form of a reduction in mortality or morbidity. However, many health communication campaigns may aim to change behaviour or raise awareness and thus use knowledge, attitude and behaviour surveys as a means of evaluation [78, 79]. Short-term outcome measures such as message recall and recognition, attitudinal correlates of targeted behaviour, social norms, intentions to change, and behaviour change [78, 80], are often chosen as they are predictive of longer term behaviour changes as outlined by theories of behaviour change such as the Theory of Planned Behaviour [81]. Other short term measures such as reactions to campaign materials, likeability or perceived message effectiveness are common but less informative in terms of actual campaign effectiveness as they lack a strong theoretical basis [80]. It is also recommended that when choosing outcome measures that they are relevant to both the participants of the study and to the broader health system context, including economic measures [82]. Others would propose that if the campaign aims to generate action (for example, to increase HIV testing) then at least a proxy measure of that action is necessary to convey campaign success [27].

Campaign exposure is a key outcome examined in most outcome evaluation studies as various levels of exposure can be linked with varying levels of effectiveness such as a dose-response relationship. The significance of campaign exposure as an outcome measure, however, is often open to discussion, as quite often it is measured by self-reporting, which may have questionable reliability [78]. Process evaluation may aim to track campaign implementation by examining frequency of message distribution regarding the specific media channel [78]. Newer indicators could complement other outcome measures, for example, establishing whether there is qualitative information regarding the processes of partnership building or community perceptions of the campaign, as they could provide richer data for evaluation reporting [5].

Naranbhai and colleagues, while reviewing studies from the USA, highlight the need for self-reporting of risky sexual behaviour change to be supported by biological indicators such as HIV or STI prevalence and incidence rates [21]. They also recommend future evaluation studies to utilise indicators that are based on a common set of standardised outcome measures such as those laid out by the World Health Organization (programmatic indicators, determinant indicators, behavioural indicators, and impact indicators) [83]. Similarly, a Canadian report recommends exploring communication outcomes on four levels, namely the individual, the network, the organisation and societal [84]. These would also help to reduce difficulties that may arise in attempting to draw cross country comparisons of campaign effectiveness.

Resource allocation for health communication evaluation research is a recurring issue, as mass media campaigns alone are perceived as expensive and high quality evaluation may be viewed as an unnecessary luxury to which the budget simply cannot stretch [85]. However, this may in a way render the campaign itself a futile exercise, as evaluation is necessary to determine effectiveness, and if effectiveness is not established, an expensive campaign may hold little benefit to public health outcomes, or worse, bring unintended harmful effects. Determining the potential unintended effects of a communication campaign is a vital undertaking, particularly for professionals in the area of population health protection. Further examination of the literature regarding communication for the prevention and control of communicable diseases, in terms of considering unintended effects is outlined.

Unintended effects of campaign development and evaluation

The significance of considering the potential for unintended or harmful effects when developing campaign and evaluation strategies has previously been recognised. For example, with regard to campaigns focusing on prudent use of antibiotics in England, an increase in admissions to hospital for pneumonia from 1997–2005 and an increase in mortality associated with community acquired pneumonia between 1993 and 2000 were linked to a decrease in the use of antibiotics over the same periods [86]. Potential adverse or unanticipated effects may be of particular relevance to the area of controlling antibiotic use as reduction in their prescription may, in some cases, lead to an increase in other health problems, such as those which were observed in previous studies [36, 87]. Similar concerns are evident from a study in France which found that single-risk prevention campaigns on AIDS can potentially lead some women to neglect the risk of unwanted pregnancy [48].

As communication campaigns do not, by their very nature, occur in a controlled or isolated setting, they may unintentionally influence social systems indirectly related to the campaign, and thus can potentially affect individuals in various unanticipated ways [88, 89]. Cho and Salmon [89] propose that unintended effects can arise in various aspects of a programme, and offer an evidence-based typology with descriptions of eleven different unintended effects.

Table 1. Typology of Unintended Effects of Health Communication Campaigns

Potential unintended effects	Explanations
Obfuscation	Misunderstanding of the health risk or prevention methods
Dissonance	Psychological discomfort and distress brought on by contrast between the recommended health states and the audiences' actual health state
Boomerang	An audience reaction that is opposite to the intended response of persuasion messages
Epidemic of apprehension	Unnecessarily high health consciousness and concern caused by high frequency of risk messages over a long period
Desensitization	Repeated message exposure about a health risk may over long term render the public apathetic
Culpability	The phenomenon of attributing the causes of public health problems to the individual rather than social conditions
Opportunity cost	The choice of communication campaigns as the solution for a public health problem and the selection of certain health issues over others may lessen probability of improving public health through other choices
Social reproduction	The phenomenon in which campaigns reinforce existing social distributions of knowledge, attitudes, and behaviours
Social norming	Social cohesion usually perceived as positive but may also render individuals vulnerable to shame and lead to marginalisation of unhealthy minorities
Enabling	Campaigns inadvertently enhance the power of individuals and institutions and promote the images and finances of industries
System activation	Campaigns influence various unintended sectors of society, and their actions moderate the effect of campaigns on the intended audience

Adapted from Cho and Salmon, 2007 [89]

This outline could help to guide researchers as to what external and potentially harmful factors should be considered when developing an evaluation strategy, as many studies have made little or no contribution to distinguishing between failure to establish effectiveness and providing good evidence of ineffectiveness [8]. Naturally if the campaign was not effective, questions will arise as to whether it was an inherent fault in the intervention theory or a result of poor implementation practice [8], however, this is a question which cannot be answered without a comprehensive evaluation strategy that encompasses thorough process evaluation and explores all potential outcomes whether desirable or undesirable.

Evaluation research design

Noar and colleagues have outlined a number of measures, summarised below, that may be applied in order to reduce potential threats to the internal validity of an evaluation study [17]. Some of the recommendations given involve the inclusion of one or more of the following elements:

1. Control Groups

Some adaptations of the original randomised control trial (RCT) design have been used for evaluating public health campaigns in that the individual as the unit for randomisation has been replaced with a 'cluster', such as a school, class or a community [8]. A control community can add significant strength to an evaluation study as it can provide a comparable element in conveying the outcome in the absence of a campaign [17, 90]

2. Pre-test

A pre-test provides a baseline measurement of the situation or behaviour before any campaign-related activities take place, which can contribute significantly to proving that a campaign had its intended effects [17, 91]. In the case where a pre-test is not feasible, comparing outcome data to that from general population rates, where possible, may still improve the reporting quality of a study [90, 91].

3. Stimulus-response

Strategies for campaign evaluation may also be designed in a particular way to demonstrate a stimulus-response between the campaign and the behaviour in question, allowing evaluators to show that the behaviours targeted by the campaign changed as expected while the behaviours not targeted by the campaign did not change in a similar trend [17]. This method, however, requires time in order to track the data, which some organisations may not have [85]. Similarly this strategy can be adapted in the form of an interrupted time-series design, in that multiple replications of campaign activities may be implemented before being taken away and then re-implemented again, in order to track and analyse any changes in behaviour over time [17, 14, 91].

4. Statistical methods to control for confounders

Perhaps the most common elements employed to control for confounding variables are statistical methods. The addition of statistical methods for enhancing internal validity can be controversial, however, when the logic for the use of such analysis in this instance is to make up for the less rigorous research designs such as post-test-only, which have been so commonly used in campaign evaluations to date [17].

In addition to those mentioned above, Hornik proposes a number of various examples of evaluation designs which can be applied as alternatives to randomised controlled trials, while emphasising that the utility of these suggestions is dependent on the model of effect (whether individual, social or institutional), as well as potential threats to inferring causality [91]. Study designs put forward by Hornik include: pre-post designs, cohort designs with lagged exposure effects (to capture long term outcomes), interrupted time-series designs, continuous time-series designs and natural or field experiments [91].

In a discussion from the Robert Wood Johnson Foundation's Research and Evaluation Conference in 2007 [91], Hornik's views on evaluating public health communication programmes were reiterated with an additional recommendation to 'do what is possible and live with uncertainty' [91]. Hornik was implying that although incorporation of additional elements such as control groups or larger sample sizes will improve the quality of the evaluation methodology, a number of educated decisions must still be made by researchers and public health professionals as to their feasibility in terms of the resources available to them [87].

Effective health communication evaluation

In order to maximise the potential of health communication campaigns, as well as issues of evaluation research design, researchers must look to predefined principles, theories, and guidelines for effective campaign evaluation [17, 20]. This is an important prerequisite for success, as in such cases where theoretical constructs are adhered to throughout the campaign development and evaluation, the researcher is enabled in providing a detailed account of how the campaign worked, identifying any positive intermediate outcomes of the intervention, or any weak points should little or no changes in outcome measures be observed [92]. Researchers recommend that evaluation designs should be carefully considered, strategically sequenced to the various stages of a programme's development and appropriate to the available resources [82]. As health communication campaigns can vary in scope and complexity, it is generally acknowledged that theory-based evaluation studies are critical to allow for such variations in capturing the campaign's effectiveness, as they provide guidance for a systematic investigation of processes [93].

There are a number of principles, frameworks and guidelines outlined in the literature that can assist researchers and public health professionals in planning a campaign evaluation study. As the literature indicates, evaluation should not be planned or executed as a separate entity but rather should be incorporated throughout the campaign development stages including formative, process and outcome evaluation. Therefore, frameworks and guidelines to aid researchers in evaluating campaigns should be developed with all stages of campaign development in mind [12]. One of the main advantages of using a phased evaluation framework to guide research in specifying stages and outcome measures is that it allows for more transparent research and thus provides stakeholders with reassurances that the study being conducted is appropriately designed and relevant [91, 82]. Some examples of evaluation and campaign frameworks are reviewed, with reference to broad principles, specified frameworks and models.

Principles, frameworks and models

Broad principles of campaign evaluation have been outlined in the literature and are available to public health professionals and researchers to help guide the development of an evaluation strategy. Hornik [94] condensed these principles into three brief guidelines to keep in mind when planning a campaign evaluation. These guidelines recommend:

- staying true to the theory or model on which the campaign is based
- planning evaluation strategies and study designs carefully
- considering the context in which the evaluation is being conducted and what level of evidence is required from the study.

Bauman also offers a set of guidelines for campaign developers [5] which focus on best practice for campaign design and evaluation with regard to mass media campaigns. The fifteen principles or 'precepts' identified by Bauman outline firstly a definition of media campaigns, followed by precepts 2–6 encompassing best practice approaches to campaign evaluation, and 7–15 outlining further methodological suggestions for campaign evaluation [5].

'Precept 1': A media campaign is an organised and purposive activity. Such campaigns are separate from, although complementary to, the use of media for public health advocacy which utilise a variety of media channels to inform, persuade or motivate populations.

'Precept 2': Message development and pre-testing in participation with a sample of the target population, also referred to as formative evaluation can often be somewhat neglected. Usually conducted with qualitative methods such as focus groups, this phase assists in further refining and tailoring the campaign message to the health and information needs of the specific audience.

'Precept 3': Process evaluation, involving monitoring of the campaign implementation process, is essential for assessing campaign exposure within the target audience. Details are recorded regarding frequency of message distribution or number of resources disseminated, providing an estimate of campaign reach in terms of the target audience, whether campaign activities were conducted as intended, and whether the audience responded to the messages.

'Precept 4': Outcome evaluation, sometimes referred to as impact evaluation (measuring proximal changes such as specific behaviours), or summative evaluation (measuring broader public health impact such as morbidity rates), is essential to measure programme endpoints through reliable and valid methods in order to attribute any observed changes to the campaign rather than measurement error. Deciding on what outcome measures to use will depend on the expected outcomes of the campaign.

'Precept 5': Similar to the previous point, feasible, achievable and measurable indicators should be developed and clearly specified in parallel to the campaign's expected and desired outcomes. Selective resourcing may be required here as funding restrictions may limit the extent to which all possible outcomes can be measured.

'Precept 6': Evaluation study designs should incorporate the best possible mechanisms to assess campaign outcomes. Depending on what level of evaluation is required, the necessary resources should be allocated to at least a quasi-experimental study.

Other points outlined by Bauman in the remaining 'Precepts', include: the role of campaigns in behaviour change in that campaign messages in isolation are unlikely to generate long-term behaviour change, long-term monitoring of outcome measures is useful for establishing long-term effectiveness; evaluation frameworks should be drawn up by government bodies in order to reduce political influence on evaluation; and policy-making and dissemination of evaluation results is necessary to document lessons learned for future campaigns [5]. Similar principles were outlined by Noar [7] when referring to the basis of mass media health campaigns reviewed over a ten-year period. In addition to those mentioned above, Noar emphasises the importance of using theoretical frameworks, defining the target audience and tailoring the campaign towards the specific defined target audience [7].

The USA CDC provides extensive information on media campaign evaluation with reference to their evaluation framework. Milstein and Wetterhall [95] offer a synopsis of the CDC's Framework for Programme Evaluation [96], referring to it as a practical and efficient tool that many practitioners have found applicable to their work. The framework is divided into six steps of evaluation practice and four key standards for effective evaluation, as outlined in Table 2 [95].

Table 2. Synopsis of CDC's Framework for Programme Evaluation

Steps in evaluation practice	Standards for effective evaluation
Engage Stakeholders – those involved, those affected and primary users of the evaluation	Utility – serve information needs of intended users
Describe the program – logic model, need, expected outcomes, activities, resources, development stage and context	
Focus the evaluation design – purpose, users, uses, questions, methods, agreements	Feasibility – be realistic, prudent, diplomatic, and frugal
Gather credible evidence – suitable indicators, appropriate sources, logistics, quality and quantity	
Justify conclusions – standards, interpretation and analysis, judgement and recommendations	Propriety – behave legally, ethically, and with due regard for the welfare of those involved
Ensure use and share lessons learned – design evaluation from initial stages, preparation, feedback, follow-up and dissemination	Accuracy – reveal and convey technically accurate information

Adapted from Milstein and Wetterhall [95] (p.222)

These standards, which have been approved by the American National Standards Institute and endorsed by the American Evaluation Association, provide a reliable decision making guide for evaluation planning and implementation [95]. Milstein and Wetterhall propose that the main challenge in the application of this framework is to achieve optimal evaluation strategies that incorporate all framework steps in a way that is appropriate to the context of the programme but also meet the relevant standards listed above [95].

Although there are many accounts of principles of campaign planning in the literature, there is little discussion regarding the interplay between these principles and their incorporation within an integrated framework [12]. The major principles of communication campaign design, implementation and evaluation, together with their interconnecting relationships, are conveyed in the audience-channel-message-evaluation (ACME) framework presented by Noar [12].

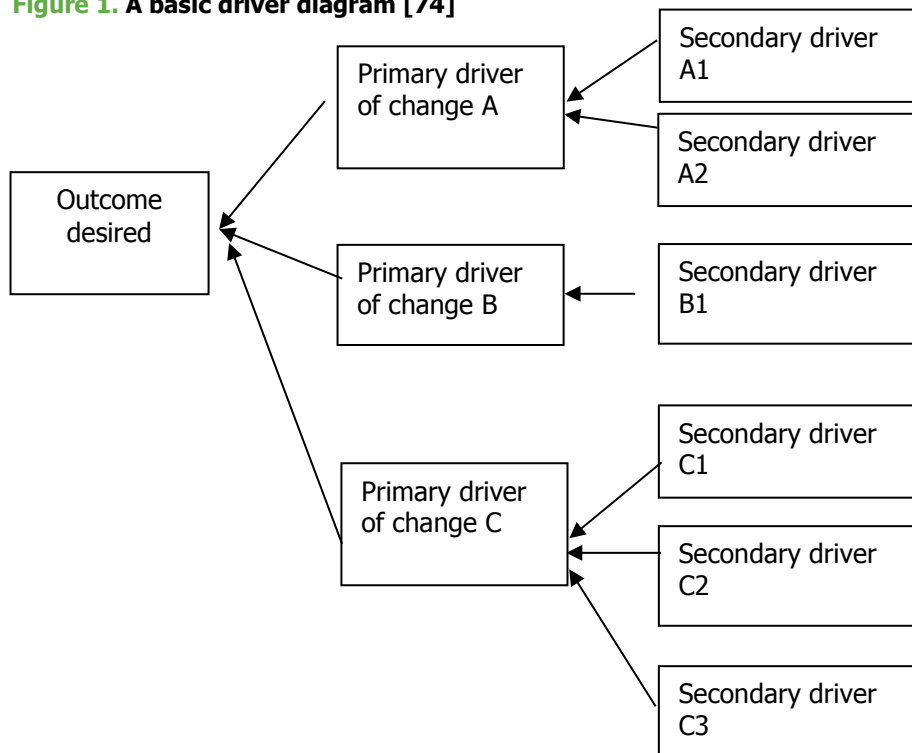
- **Audience:** the significance of this aspect of campaign design is often under-estimated, however, the approach to audience segmentation will have considerable influence on subsequent decisions regarding message development, channel selection and evaluation.
- **Channel:** the key question here is which channels and components have the greatest potential for reaching the target audience with multiple exposures.
- **Message:** campaign message development can be informed by various types of theories, some of which examine pathways of behaviour change thus helping to identify which key factors contribute to the behaviour in question. This stage should also include message pre-testing with the target audience in order to obtain feedback regarding acceptability and potential effectiveness.
- **Evaluation:** this should be viewed as a set of activities incorporated throughout campaign planning, development and implementation which involves formative, process and outcome evaluation as described earlier. The outcome evaluation of campaigns is often the most problematic undertaking as their broad, often national, scope does not easily lend itself to high quality randomised controlled trial effectiveness studies [12]. It is also vital here that outcome measures link up with campaign aims, for example, if a campaign is developed on the hypothesis that changing target audience' beliefs would lead to a change in their behaviour then the outcome evaluation must explore the following elements: change in beliefs, behaviour change and the causal pathways between the two [12].

The main contribution of the ACME framework is its depiction of the interplay between the principles of campaign evaluation and clarification of the importance of incorporating and connecting all phases in order to conduct a comprehensive evaluation [12].

The National Cancer Institute (USA), in their depiction of the cyclical stages of the Health Communication Process, also emphasise the importance of integrating evaluation processes throughout the campaign planning, development and implementation stages. They propose that in doing this the relevant stakeholders can ensure that: the campaign materials and activities have been tailored to meet the needs of the target audience, evaluation tools have been incorporated and meaningful, achievable and time-specific objectives have been defined [14]. They also stress that the communication campaign process is not linear and likewise neither is campaign development and implementation, but rather should be thought of as a continuous iterative process. In addition to this, a number of helpful tips are presented for researchers to keep in mind when planning outcome evaluation strategies, such as: ensuring evaluation design is appropriate to the particular communication activity, ensuring adequate timing is given between communication exposures and outcome evaluation, considering what level of evidence is required to convey success, considering what baseline measures are available to monitor changes over time, ensuring outcome measures focus on specific communication objectives and not necessarily campaign goals, and finally ensuring that any progress towards positive outcomes is identified by the evaluation study [14].

The Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) framework is one which examines complex and multidimensional outcomes of health promotion programmes in order to assess their impact on public health [97, 98]. What separates this framework from others is its attention to essential programme elements, internal and external validity, which helps to determine which interventions would prove most effective in 'real world' settings and thus warrant sustained investment [99]. Glasgow and colleagues proposed that the potential public health impact of an intervention can be assessed by examining the following five dimensions: Reach (percentage of willing participants), Effectiveness (impact of intervention on specific outcomes), Adoption (percentage of settings and staff willing to participate), Implementation (consistency with which intervention elements are delivered), Maintenance (sustainability as regards long term intervention delivery and individual behaviour change) [97]. Brug et al, applied this framework when examining evaluation practice in relation to general health campaigns in the Netherlands [100]. The qualitative study showed that in most cases only data regarding Reach and Effectiveness were being gathered, and the remaining important aspects were being neglected due to lack of resources [100].

Svoronos and Mate propose a set of principles that can help to establish information on context and a tool entitled 'driver diagram', which could allow evaluators to systematically monitor changes in implementation dynamics and identify contextual variation across settings [74]. They proposed that if applied to various settings and projects, the resulting data could be pooled in order to gain a clearer understanding of when, how and why the intervention is effective. The authors emphasise the need for application of similar tools to existing evaluations of large-scale interventions, as well as the importance of incorporating a number of principles to help guide context-specific evaluation efforts, namely: flexibility in the approach taken, an evaluator not involved in the everyday activities of the implementation process and validation of data collected.

Figure 1. A basic driver diagram [74]

Reproduced, with the permission of the publisher, from Svoronos T, Mate KS, Evaluating large scale health programmes at a district level in resource limited countries. Geneva, World Health Organization, 2011.

The driver diagram tool, as shown above, allows a greater understanding of key elements in the intervention and whether adaption of these elements is required for a greater level of effectiveness. The diagram begins with the main aim of the programme and from there, a team would work backwards to identify the primary 'drivers' as well as the secondary activities needed in order to achieve the pre-defined outcome [74]. Although this tool can serve as a useful template within which to organise complex context-specific data, and share it across various settings, it may also be viewed as an over-simplification of the process [74].

Although there are many accounts of guiding principles for communication evaluation practice, it is not apparent from the literature that they are being applied in the European setting. Taut wrote in the past about the transferability of evaluation principles across countries and proposed that standards are based on values and that values are context specific and can vary greatly between cultures. For this reason, transferring standards from one culture to another may bring additional challenges within the European context [101].

Hornik has argued that communication is a social process, not a pill, and should be evaluated as such [102]. This is an important concept to keep in mind when developing evaluation strategies for health communication campaigns. It emphasises the challenges encountered in attempting to explore causal pathways and disentangling the effects of multiple campaign activities from external influences. By acknowledging the complexity of the communication process on the public health campaign level, we must also acknowledge the need to develop and implement sophisticated strategies to reflect the complexity of measuring the hows and whys of campaign contribution to the process of health improvement.

According to the review undertaken (see Appendix 1), there appear to be very few high quality European evaluation studies carried out in the last decade in relation to campaigns targeting the prevention and control of communicable diseases. It is evident from the literature reviewed that there are valuable existing frameworks and guidelines that can help guide evaluation study development. The challenge remaining within the European context is to build capacity for evaluation research within each country, while acknowledging the multiple barriers and challenges to the application of this knowledge base to health communication evaluation practice.

Summary of findings

Implications for evaluation research of health communication campaigns in Europe

A wide range of evaluation approaches and research designs have been identified in studies evaluating campaigns for the prevention and control of communicable diseases in Europe. Nevertheless, it is evident that there are inherent weaknesses both in the approaches themselves and in their application. Researchers in the past have highlighted the public health paradox of macro-level interventions being evaluated using micro-level analysis, and the need for building capacity for conducting evaluations which incorporates complex programme objectives and interconnecting causal pathways [103, 104]. From the gaps identified in this review, it is evident that such capacity development is also required within and across EU/EEA countries.

There is a need for researchers and public health professionals to recognise the importance of utilising existing theories, principles and frameworks and to apply this knowledge in a systematic manner to the processes of campaign planning, development, implementation and evaluation. Rice and Atkin argue that what is needed is a deeper understanding of the fundamental principles of communication, persuasion, and social change, as well as an appreciation of the interplay between campaign components, before appropriate and efficient campaign design and evaluation can be carried out [67]. Similarly, McCoy and Hargie echo this when referring to the prerequisite of effective evaluation as the deep understanding of its 'nature, purposes and concepts' [105 p.317].

Researchers and practitioners should work in partnership in applying tested theories and frameworks to the development of communication campaigns and their evaluation strategies. In doing so, public health professionals will be better equipped to efficiently assess campaign effectiveness, which, in turn, may encourage the timely translation of findings into practice [106]. Likewise, in applying such measures, the prospect of clearer communication strategies, comparable cross-country data sets, stronger collaborative efforts, and greater learning from others becomes more feasible. Enhancing the strength of campaign evaluation studies in Europe will also be useful to inform health communication policy within Europe, as to whether certain campaign approaches are worthy of further support. In parallel to this, however, researchers should acknowledge the limitations of their evaluation studies and strive for transparency in an effort to not only enhance their credibility if confronted with contradictory data but also to aid policy-makers in weighing up the available evidence in the process of decision making [92].

Evaluation research in Europe should expand its focus to include formative and process evaluation, incorporating more systematic implementation research in an effort to gain a deeper understanding of the variety of influencing factors which may impact on the effectiveness of the campaign. Applying frameworks which are iterative in nature and integrated within a broader campaign strategy, such as the ACME framework [12], will maximise the potential for conducting a comprehensive evaluation. Likewise, there is a need for further exploration of unintended or adverse campaign effects, not only for ethical reasons but also for a deeper understanding of the role of health communication campaigns within a process of social change [89].

As regards the limited methodological rigour evident in existing studies, it is vital that evaluation researchers in Europe become more aware of potential sources of bias within various study designs, and apply this understanding to their practice when developing evaluation strategies during the initial planning stages of a campaign. In addition to strengthening campaign evaluation methodology, it is also vital that the methods and activities carried out are clearly documented and reported in order to maximise the potential for future learning from previous studies.

As discussed earlier, many issues contribute to making evaluation of health communication within the European context an even more complex undertaking. Due to a variety of influencing factors such as diverse levels of funding, managerial support, culture, health systems and policies, the need for evaluation study designs (including cost-effectiveness analyses), which take into account the contexts in which the studies are being conducted, has been recognised in the literature [5, 74, 82, 107]. The building of capacity for evaluation research within European countries could also contribute to standardising the use of study designs and outcome measures across countries, thus making the pooling of data for thorough analysis more achievable [108]. This is a task which has proven difficult to date, due to the diversity of evaluation methodologies currently in use in Europe [85].

Dialogue on the challenges posed by the evaluation of health communication campaigns and possible solutions have been conducted and documented in the USA [17, 75]. However, public health practitioners, programme managers and researchers in Europe may also benefit from initiating such discussion in order to share and develop appropriate solutions to problems that are specific to the European context when conducting campaign evaluations. Overall, there is a need for applied evaluation expertise within and across European countries with regard to health communication campaigns aiming to prevent and control the spread of communicable disease. In due course, it will be necessary for public health practitioners and researchers alike, to strive for a balance between undertaking rigorous quantitative studies sufficient to ensure future funding, and gathering rich qualitative process data to further inform campaign development and efficiency, while also bearing in mind that financial resources and research expertise may be limited.

Insights for health communication policy and practice

A number of factors have been consistently cited in the literature as contributing to efficient and effective practice in relation to the evaluation of health communication campaigns. These factors, which are pertinent to the evaluation of campaigns aimed at the prevention and control of communicable diseases, are listed below.

- Be clear about what is being evaluated.
Describe the campaign [96] with specific, meaningful, achievable, relevant and time-specific objectives [14]. Be realistic and explicit about the expected direct and indirect effects [5] and consider potential unintended effects.
- Use appropriate theory to inform campaign development and evaluation.
The application of theory is a useful tool to promote conceptual cohesion through planning, implementation and evaluation [93] and should be adhered to before, during and after campaign dissemination [94].
- Evaluation should be integrated through campaign planning, development and implementation [44, 7, 94, 14].
This integration does not represent a linear relationship [14] but an interplay between all phases [12]. The synergistic interaction of campaign planning and evaluation as described has the potential to improve campaign planning, development and implementation as well as evaluation. Planning evaluation research design must be incorporated into this process [94] including evaluations of cost effectiveness.
- Research design should be focused on: purpose, users, uses, questions, methods and agreements [96].
Preferred evaluation research designs promoting rigour include: pre-post test [7, 17, 90, 91], cohort designs [91], time-series designs [7, 17, 14, 91] and natural experiments [95]. The use of post-test only designs is severely compromised but may be the only option in situations of scarce resources [92].
- Formative research should be undertaken [10, 11].
This should include: message development [5, 7], audience segmentation [7] and channel selection [7] to ensure messages are tailored to the target audience [14].
- Process evaluation should be undertaken [11, 12].
This is to monitor and document campaign implementation [5]
- Impact and outcome evaluations should be undertaken [10, 13].
Pre-defined [74] suitable [96], feasible, achievable and measurable indicators [5] that link with campaign aims and objectives [12, 14] should be identified and used.
- Recognise the context.
The diversity of EU/EEA Member States means that in order to facilitate transfer of knowledge it is especially important to record and monitor the context in which campaigns and evaluations are undertaken [94, 95, 74].
- Share lessons learned [5, 96].
Given the diversity of contexts across the EU/EEA countries, it may be that specific campaigns and evaluation designs cannot be transferred outright. Nevertheless, lessons learned, both positive and negative, can be shared and will help inform and advance the application of evaluation approaches across countries.

A number of challenges and limitations have been identified for evaluation research in this area. However, the range of studies, topic areas and methodologies used in various country contexts with different population groups aimed at both prevention and control of communicable diseases demonstrates a range of skills and expertise in the use of multiple methods across EU/EEA countries. Sharing of experiences and knowledge in relation to the evaluation of health communication campaigns between countries can contribute to the development of capacity for such activities in a relatively cost effective manner. This should be explored further through the facilitation of open dialogue between practitioners to exploit lessons learned, as it is likely that knowledge gained through experience is greater than the documentary evidence suggests.

Identification of gaps and focus for further research

The main findings of this review of the evaluation of communication campaigns relating to communicable disease prevention and control in Europe, indicate that research is generally limited as regards:

- agreed definition of 'health communication campaign'
- theoretical underpinning
- methodological rigour
- rich formative and process data collection
- utilisation of guiding evaluation principles
- exploration of unintended campaign effects
- exploration of cost-effectiveness
- detailed reporting of methodologies used.

Shared definition of a health communication campaign

There is a lack of a shared clear definition of what constitutes a health communication campaign in the existing literature. What is described as a campaign encompasses many forms, and campaigns are implemented at various intensities internationally [3]. In the absence of a shared definition of a health communication campaign evaluators should clearly identify and document exactly what is being evaluated.

Application of theoretical underpinning

Previous reviews suggest that campaigns with theoretical underpinnings, which clearly lay out a number of determinants that influence cognitions and in turn behaviours, are more successful in achieving their aims [109]. Likewise, theory-based evaluations can greatly assist public health professionals in developing a systematic evaluation strategy while allowing for complexities inherent to public health campaigns [93]. However, despite its obvious utility, very few of the reviewed studies reported a theoretical underpinning which informed their work. Underuse of theory-based campaign development is reflected in another review of campaign characteristics and outputs [25]. Campaign planners should be actively encouraged to identify appropriate theory on which to base campaign development and evaluation.

Methodological rigour

Due to a variety of contributing factors, including time restrictions, limited funding, or ethical reasons, rigorously applied randomised controlled trials in campaign evaluation may not be feasible. As a result, studies more commonly employ quasi-experimental or pre-experimental methodologies, which are weaker in determining causal links between campaign activities and outcome measures [3, 110]. While taking the above challenges into account, it remains vital that evaluation studies make a notable effort to control for potential external influences to outcome measures.

Utilisation of guiding evaluation principles

There is a plethora of useful frameworks, guidelines and principles for communication evaluation in the literature [6, 14, 109], however these do not appear to be applied within the European setting based on the studies examined in this review. What also appears to be lacking, as supported by Noar, is an understanding of the interplay between evaluation principles and an appreciation of the significance of this interplay within an integrated framework [12], as well as specific tools to assist researchers in the process of conducting an evaluation [74]. Nevertheless, programme planners and evaluators should be made aware of the frameworks, guidelines and principles already available and be encouraged to systematically apply them to campaign development, planning, implementation, and evaluation activities.

Incorporation of formative and process data collection

Although the benefits of conducting formative research for understanding knowledge, attitudes and behaviours in target audiences and establishing message efficacy, are well documented in the international literature [5, 10, 12, 111], very few of the studies examined in the present review included formative research in their evaluation strategy, with the exception of those which documented whole studies on formative and pre-testing research alone. Likewise, process evaluation, which can improve the campaign execution, monitor the fidelity of the implementation and can help public health practitioners to determine why certain outcomes were or were not achieved [10], is used infrequently in the studies reviewed here. Rich qualitative data regarding the implementation process was limited and although some process data is gathered in various studies with regard to monitoring campaign exposure, message frequency, or extent of campaign implementation, it is rarely made explicit that process evaluation was conducted. Perhaps due to a restriction in time [7], the majority of studies appeared to focus solely on impact and outcome evaluation, with little consideration given to the process. The relationship between process and outcome evaluation needs to be explored as a focus for further research. The role of process evaluation is integral to evaluation of health communication campaign evaluation and as such its use should be promoted.

Exploration of unintended campaign effects

Unintended campaign effects were not explicitly considered prior to campaign implementation by any of the evaluation studies reviewed. However, Gopal Rao and colleagues documented their experiences of unintended effects during the implementation process [46], which helped to identify problems or issues that needed attention. This gap in the research is also noted by Huttner et al., when reviewing campaigns aimed towards controlling antibiotic use, noting that possible unintended adverse effects or potential indicators for under-prescribing of antibiotics were not monitored by any of the campaigns reviewed [25]. The identification of potential unintended campaign effects should be explicitly included in formative evaluation.

Exploration of cost-effectiveness

Previous reviews concluded that there is a clear need for greater incorporation of cost-effectiveness analysis within health communication campaign evaluations [112], in particular within the context of competing public health issues [25]. This issue is reflected in the studies examined in this review as very few explored, even superficially, the cost-effectiveness aspect of campaigns. Those that did, often used estimated measures and varied in their ideas of what costs should be counted. For example, if television time was donated, should it be counted as a cost [25, 105] and if so, what implications does this have for future replications of the campaign? Hutchinson and Wheeler also note the limited methodological rigour observed in the majority of cost-effectiveness studies within their review [112], findings which are also reflected in a review which examined cost-effectiveness studies of HIV/AIDS prevention in developing countries [113]. As with other evaluation activities, evaluation of cost-effectiveness must be integrated into the planning of health communication campaigns.

Detailed reporting of methodologies used

The present review found that there was a limited documentation of campaign activities, implementation processes and evaluation methods across the studies identified. A similar lack of transparency has been noted by those reviewing antibiotic control campaigns [25] and international campaign cost-effectiveness studies [112]. This may be a result of limited allocation of funding for health communication evaluation within the already substantial campaign budgets, however this can, in turn, lead to limitations in attempts to reproduce the results and to extend analyses so as to make them comparable with other studies. In order to facilitate sharing of lessons learnt the clear documentation of evaluation research and processes should be undertaken and made accessible.

Conclusion

It is clear from this review of European studies that there are multiple methodological and practical challenges in evaluating health communication campaigns aimed at the prevention and control of communicable diseases. These challenges generally appear no different from those identified in other jurisdictions, however, the European context with its diversity of languages, cultures, governing systems and resource availability adds to the difficulty of evaluating health communication campaigns. A range of frameworks, guidelines and principles have been identified in this review, which can address the challenges documented and facilitate more systematic and rigorous evaluation research. However, it appears that a further challenge is the application into practice of these frameworks and principles. The challenges notwithstanding, the development of a strong evidence base is imperative to drive effective and efficient policy and practice in the use of health communication campaigns for the prevention and control of communicable diseases.

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Appendix 1. Examples of evaluated health communication campaigns for communicable diseases

Systematic and exploratory reviews

Four Cochrane reviews were identified relating to evaluation of health communication interventions or campaigns for communicable diseases [1-4], however, few European studies met the required criteria for inclusion, possibly due to their poor methodological quality. Of these four, two reviews included studies from Europe [3, 4]. Wei and colleagues examined the impact of social marketing interventions on HIV/STI testing uptake among men who have sex with men (MSM) and transgender women, compared to pre-intervention or control group testing uptake in the same population [3]. Three serial, cross-sectional pre-test post-test study designs were included in the analysis, only one of which was European and had a control group [5]. No significant increase in STI testing was found among the studies, however, statistical pooling of two of the studies revealed that multi-media social marketing campaigns had a significant impact on HIV testing uptake, when compared to pre-intervention levels [3]. The authors concluded that overall the risk of bias was high, the quality of evidence was low, and that more rigorous study designs, including long-term impact assessment, implementation and process research, should be applied to future evaluations of social marketing interventions [3].

Mass media campaigns have often been used in relation to HIV prevention in order to improve rates of testing and knowledge as is evident from a Cochrane review synthesising: nine interrupted time-series, two randomised controlled trials and three non-randomised controlled studies seeking to evaluate the effectiveness of such mass media campaigns [4]. Seven of the studies were from the UK, however, only one of those was post 2000 [5]. All individual studies had found mass media interventions to be effective for increasing HIV testing and when the nine interrupted time-series studies were reanalysed, the results also revealed a positive immediate and overall impact [4]. Comparison between different types of mass media employed could not be performed due to insufficient data and no evidence was found regarding long-term effects from the studies analysed. It was concluded that additional research was necessary to determine the effectiveness and cost-effectiveness of various types of mass media interventions [4].

An exploratory literature review also incorporated structured interviews, while identifying and reviewing characteristics and outcomes of campaigns aimed at improving antibiotic use in high-income countries (including 16 European campaigns) [6]. Most campaigns distributed some form of guidelines to physicians to aid in decision making. Two French campaigns incorporated intense academic detailing into their intervention, while audit and feedback was also utilised in both Belgian and French campaigns. However, although positive characteristics were found, there is little known as to their contribution to campaign effectiveness, as the authors found that very little formal evaluation had taken place, and within that which existed, methodological quality and detailed reporting was limited. The most consistent evidence for a reduction effect of antibiotic prescribing was obtained from campaigns in Belgium and France, reporting a 36% and 26.5% reduction respectively over several years of seasonal campaigns. Although television spots appeared to have the highest level of recall among the Belgian population [7], establishing cause and effect is difficult due to methodological limitations and varying timeframes. Furthermore, the confounding effect of seasonal variation, adverse effects, as well as reasons for reductions in antibiotic use were only rarely accounted for. The authors commented on the broad variation in campaign activities observed and costs accounted for and an overall lack of available data [6].

Experimental and randomised studies

A randomised controlled trial carried out by Mevissen and colleagues examined the effects of a Dutch online STI risk communication intervention on psychosocial determinants of condom use and STI-testing among young heterosexual adults, aged 18–25 years [8]. A computer-tailored programme was compared to a non-tailored version and a no-intervention control group. Although participants were given a monetary incentive and self-reported data can have questionable reliability, comparisons drawn between the three study groups showed positive influence on risk perceptions, STI-testing intentions and reported condom use. This intervention is a useful example of how high quality experimental study designs can be applied to efficacy testing of campaign materials before rolling them out at national level. However it is probable that the online nature of this intervention made it somewhat easier to randomise participants into three groups and control exposure to communication materials. The use of experimental methods for initial feasibility or efficacy testing, has been proposed by experts [9, 10].

Two studies assessing the effectiveness of campaigns promoting influenza vaccination among healthcare workers in the Netherlands [11] and the UK [12] employed cluster randomised controlled trials, using nursing homes as the clustered variable. The Dutch study included sixteen nursing homes where a multi-faceted campaign was implemented and monitored and seventeen homes where usual programmes remained unmodified. A 9% difference, between intervention and control groups, was observed in vaccination uptake, even though only one home had complied with all three recommended programme components. Process compliance data was gathered which contributed to revealing a non-significant trend towards higher vaccination rates if compliance was higher [11]. The UK study, which found no significant difference between groups two months post-intervention, appeared limited in its reporting. Although claiming to have raised awareness, details of this outcome measurement were unclear, while authors focused only on measurement of vaccination uptake [12].

Other studies reviewed were found to have employed experimental study designs as a means of formative research or efficacy testing. An example of an experimental pre-test study design is provided by Whittingham et al., where the storyline of a television commercial intended to be used in a national campaign for the Dutch National Institute for STI and AIDS Control, was pre-tested with a sample of 185 young people from the intended target audience from two schools in the Netherlands [10]. Classes within the two schools were randomised into control and experimental groups and a pre-test post-test element was also incorporated in that the questionnaire was given to the experimental group before and after they were exposed to the campaign material, whereas the control group completed the questionnaire only once, without exposure. Results showed a positive effect on: risk perception for females only, intention to buy and carry condoms and intention to initiate discussion of condom use before sex. However, the intervention failed to positively affect the following: perceived personal responsibility, intentions to use condoms with new partners and anticipated regret [13]. These results may be limited in their generalisability due to the small sample size (n=185), unfinished campaign materials, and lack of theoretical foundation. Theories to inform campaign message development have been underutilised to date [14, 15], however, an experimental pre-test study using outcome measures derived from explicit campaign objectives can help toward determining causal links between campaign materials and outcome variables [10].

The evaluation study of '*gimme 5 minutes*' [5], a twelve week multimedia health campaign aimed at increasing HIV testing among gay and bisexual men in London, appeared to be one of the most methodologically sound quasi-experimental campaign evaluation studies that was found in the literature. Employing a serial cross-sectional pre-test post-test design with a control group, the evaluators used data from central laboratory records for three clinics to compare the campaign clinic with pooled data from two other clinics in the area [5]. Results showed a significant increase in HIV testing uptake among the target group compared to no changes observed in the control groups. Data from the evaluation period was also compared with the same period of the previous year in order to avoid seasonal variation in the rate of HIV testing. The significance of this design lies in its efforts to control for confounders and use reliable data from pre-existing laboratory sources. However, it remains limited in that: participants were not randomly allocated, it is unclear whether comparison groups were equivalent at baseline with regard to outcome measures, and it does not allow for exploration of the causal pathway or why the campaign was effective [5]. For these reasons, limited inferences can be made from the study.

Non-randomised studies

With regard to non-randomised evaluation studies, Bonell and colleagues have recommended that researchers, in an attempt to improve the reporting quality of their findings, strive to understand, measure and control for confounders, explore causal pathways between outcomes and intervention or possible alternatives, and produce large effect sizes [16]. An example of these efforts can be seen from another Dutch study evaluating the effectiveness of three safer sex campaigns conducted over three consecutive years [17]. Campaign development was based on the Theory of Planned Behaviour [18]. The Theory of Planned Behaviour is a theory of social cognition which posits that the main predictor of volitional behaviour is behavioural intention. In this application of the theory, researchers adopted a comprehensive study design which included a baseline-pre-test and post-test-only group design and a longitudinal or multiple assessment group in order to assess variables derived from the campaign objectives and to exclude four possible alternative explanations for campaign success. Results showed that despite high outcome measures at baseline, campaigns affected all relevant variables positively. The significance of this study lies in the researchers' great efforts to control for four alternative external explanations, namely: testing effects (by comparing participants of both baseline and post-test assessments to a post-test only control group), history effects (by comparing effects of three campaigns over time), cultural effects (by testing for negative change in outcome variables when no campaign was conducted), and sample differences (by use of multiple assessment design as when different procedures yield a similar pattern, sample differences could also be excluded as an alternative explanation for campaign success) [17]. Despite these efforts, limitations are still present as self-reported campaign exposure is limited in its reliability and the methodology chosen does not control for differences between the multiple study samples. The authors suggested improving the design for future studies by employing a more reliable measure of campaign exposure in order to facilitate adoption of a quasi-experimental methodology with an exposed and non-exposed (control) group.

Time-series studies

An interrupted time-series analysis based on a prospective observational study design was utilised by Stone and colleagues when evaluating the national implementation, effectiveness, and sustainability of the 'Cleanyourhands' hand hygiene campaign aimed at healthcare workers, which had been rolled out in 187 hospitals in England and Wales, from 2004-2008 [19]. Questionnaires assessed campaign implementation and sustainability every six months and quarterly data were also gathered regarding infection rates, soap and alcohol hand rub procurement, and additional national infection control interventions that may impact findings. Results showed campaign implementation was still top priority in 92% of the hospitals after three years, combined soap and alcohol rub procurement tripled over the study period, rates of methicillin-resistant *Staphylococcus aureus* bacteraemia (MRSAB) were halved, and the campaign overall was associated with sustained improvement in hand hygiene behaviour nationally. Previously, experts have recommended this study design as a way of strengthening pre-post evidence by gathering data prior to campaign implementation and thereafter in multiple waves, thus revealing a gradient of changes over time [20].

Two smaller Swiss campaigns were evaluated using a similar study design [21, 22]. The first, a poster campaign with increased availability of alcohol-based hand rub, employed seven hospital-wide observational surveys conducted twice annually from 1994-1997 and found an increase in hand hygiene compliance from 48% to 66% [21]. Unfortunately, it is unclear from the analysis, which campaign activities were most effective. Similarly, Vernaz and colleagues employed a time-series analysis design when assessing the impact of two promotional campaigns on the use of alcohol hand rub and incidence of methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile*. An immediate positive effect was observed after implementation of the second hand hygiene campaign however, detail on the differences between the two campaigns is lacking [22].

A Belgian study assessing the effectiveness of two public campaigns that ran for three months at a time in 2000-2001 and again in 2001-2002 and aimed to improve rational use of antibiotics among the general public utilised a time-series analysis [23]. Although poorly detailed, the outcomes for the study were assessed from 1996-2002 in order to gather data representing before, during and after campaign implementation. The study accounted for seasonal variation of influenza-like illnesses and revealed that antibiotic sales were strongly linked to incidence of such illnesses. It was unclear, however, whether specific 'overuse' and 'misuse' of antibiotics was reduced and not just an overall reduction in sales. Likewise, a French campaign aiming to reduce antibiotic use in the community was evaluated using a time-series analysis [24]. The total number of antibiotic prescriptions per 100 inhabitants fell by 26.5% over five years and by 30.1% in children under six years, revealing that the overall campaign aim was achieved. Time-series analysis with a significant body of data including nearly half a billion data entries, as well as accounting for seasonal variations in influenza-like symptoms is appropriate for this type of large scale, long-term study, however due to the lack of a control group, a causal pathway cannot be proven.

A number of campaigns aiming to increase influenza vaccination uptake among various populations, such as healthcare workers or older adults, also utilised interrupted time-series analysis in order to assess effectiveness [25-29]. Most of these campaigns were multifaceted and all incorporated health communication activities, however, the primary outcome measure of all the evaluations was vaccination uptake which was self-reported in many cases [25, 27, 29]. Only one study examined campaign exposure as an outcome measure [28], while others made efforts to explore attitudes, beliefs, reasons for non-vaccination or motivations for vaccination uptake [25, 27, 29]. Although positive improvements in vaccination uptake were observed in all the above studies, due to the varied intensity of the campaigns as well as their multifaceted nature, it is impossible to attribute causality to the communication elements within them.

Multiple-method studies

Corrigan (2006) documented national evaluation reports and other forms of feedback obtained from six countries in the WHO European region, during the planning, implementation and evaluation stages of European Immunisation Week (EIW), a World Health Organisation initiative [30]. A variety of methods were employed by the different countries, the choice of which was largely dependent on the resources available. The significance of this report is that each country was encouraged to follow the same evaluation framework, incorporating formative, process and impact evaluation as well as, what is referred to in the report as, a post-mortem analysis. Although only four countries completed the impact evaluation (Tajikistan, Italy, Serbia and Belarus) due to funding restrictions, only one of these four included both pre and post-test data (Belarus). Results from Belarus showed a 33% increase in general vaccination awareness and 41% increase in rubella vaccination awareness. High levels of awareness were observed in Serbia and Tajikistan and although penetration was lower in South Tyrol (Italy), raised awareness was also observed [30]. Although the data collection is not consistent between the countries involved, this pilot study shows the scope of the campaign, the application of an evaluation framework within and between countries, as well as the many challenges that can occur when attempting to coordinate evaluation across cultures. A similar study outlined the evaluation of a Russian diphtheria communication intervention [31]. Porter and colleagues reported the examination of a range of outcome measures, including vaccination uptake, campaign exposure, attitudes, social norms, and reasons for and against vaccination. In order to examine these measures they applied various methodologies, including a systematic review of vaccination records, household surveys, exploratory focus groups, qualitative communication tracking studies, semi-quantitative consumer surveys and selective sampling. According to the authors, vaccination coverage increased, however, the level of significance was not reported. Findings of a case-control element of the evaluation revealed that individuals who had the second and third vaccine doses during the intervention period were significantly more likely to have been exposed to the campaign than those who did not [31].

A UK study, conducted by the National Patient Safety Agency (UK) [32], aimed to evaluate the pilot implementation of the '*Cleanyourhands*' campaign, the evaluation of subsequent programme implementation and sustainability was reported earlier [19]. A multi-method approach was used in the pilot implementation evaluation which targeted healthcare workers, patients and hospital visitors. Results showed a positive impact on key stakeholders and an increase in use of alcohol hand rub and staff hand washing between patients. Perhaps most importantly, it was observed that pilot sites with the strongest managerial commitment appeared to be more successful in campaign implementation. Although the response rate was low across the two staff surveys, and self-reporting of questionable reliability, this study incorporated process evaluation as well as impact and contributed to the campaign toolkit being altered prior to national roll-out. A similar, smaller scale case study, which assessed the effectiveness of applying, what the authors refer to as societal marketing principles to hand hygiene promotion within a UK hospital, also incorporated informal formative research and SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) in order to identify contextual influencing factors to current or potential campaign success [33]. A significant reduction in the rate of hospital acquired MRSA from 50% to 39% was observed over the study period, although effectiveness of individual communication components could not be determined [33].

Longitudinal studies

A longitudinal approach was taken in a French study examining the validity and potential unanticipated effects of AIDS prevention campaigns [34]. Researchers compared results from two national population-based knowledge, attitude, behaviour and practices telephone surveys from 1994 and 1998, in which households were randomly selected as were the individuals within them [34]. There was an observed decrease in the proportion of women aged 20-24 with multiple partners, reporting contraception use between 1994 and 1998. Meanwhile there was an observed increase in condom use as a means of AIDS prevention, which may indicate that single risk AIDS prevention campaigns may lead some women to neglect risk of unwanted pregnancy.

A similar longitudinal approach was taken by a Danish study, aiming to evaluate the effectiveness of a structured information campaign to recruit young adults for chlamydia testing by use of a home obtained and mailed sample [35]. After monitoring responses to campaign materials throughout the duration of the campaign, only a limited effect on recruiting of young adults for chlamydia testing was observed, effects were short lived and the peak was observed during the period of radio advertisements [35], an aspect which could have been further explored in the study. The only outcome measures observed were the proportion of tested individuals and the number of infections detected, therefore, it may be that the campaign had effects that were not measured in the evaluation.

Before-after studies

A simple pre-test post-test design using questionnaires was employed in a French study assessing the effectiveness of a comic-strip Hepatitis C information campaign targeting adolescents [36]. Study results showed a significant improvement in knowledge scores after the information session and specifically in those claiming to have read the comic strip compared to those who had not read it. Knowledge improvement may indicate reduction in risk behaviour, however, lack of randomisation leads to difficulties in establishing a causal pathway.

At a more complex level, a regional evaluation study, examining the effectiveness of mass media campaigns for controlling antimicrobial prescribing in the UK, was carried out by Lambert and colleagues [37]. A retrospectively controlled before-after study design was employed by the authors, who utilised pre-existing data from the Prescription Pricing Authority. Surveys of primary care organisations were also conducted (attempting to account for similar complimentary interventions), and an intervention group were controlled with matched populations in the North of England [37]. The authors demonstrated a 5.8% absolute reduction in prescribing of antibacterial drugs and as a result claimed the campaign significantly reduced the volume of such drugs taken during the winter months and thus concluded that mass media campaigns may have a role in improving antimicrobial prescribing practice. Although outcome measures were free from systematic bias, attributing cause and effect remains difficult due to incomplete reporting of potential confounders and no data regarding the mechanisms for change within the campaign components [37].

An Irish study was undertaken assessing hand hygiene compliance pre and post implementation of a theory based campaign [38]. The campaign used the PRECEDE framework which incorporates assessment of predisposing, reinforcing and enabling factors, in this case, in the adoption of hand hygiene behaviour by healthcare workers [39]. Structured observation revealed an improvement in hand hygiene compliance from 51% - 83% and a self-reported knowledge, attitudes and beliefs (KAB) questionnaire found an increase in knowledge of guidelines. The use of pre-tested theory as the foundation for this campaign adds strength to the quality of methods used.

Three before-after evaluations were carried out with respect to campaigns aiming to increase influenza vaccination uptake among different target populations, one of which was national, and distributed educational materials to healthcare workers of public hospitals in Greece [40], one Swiss regional campaign which employed multi-media activities when targeting people aged 65 years and over [41], and one hospital-based Spanish awareness raising campaign for health care workers [42]. Campaign exposure was measured only in the Swiss study, although it was self-reported. While other outcome measures included vaccination uptake, predictors and influences of vaccination uptake and reasons for refusal. Although no significant increase in vaccination uptake was observed in the Swiss study, 52.7% of respondents from the post-intervention survey (n=3098) were aware of the campaign and the brochure was the communication tool which had the most significant impact [41]. While the remaining studies restricted outcome measures to vaccination uptake and neglected to measure campaign exposure [40, 42], increases were observed in vaccination coverage from 23.7% in 2007-08 to 37% in 2008-09 [42] and from 1.72% in 2004-05 to 16.36% in 2005-06 [40].

Post-test studies

Italian research, reporting the pilot phase of a study [43], documented two stages of salmonellosis risk communication campaign evaluation. The formative research element employed focused group discussions around communicating risk of salmonellosis, and the outcome evaluation involved two phases of telephone interviews with an age stratified sample of households that had received the campaign material in the post [44]. Four focus groups, consisting of 27 participants in total, were conducted to identify target audience and campaign message medium and tone. The outcome evaluation aimed to assess effectiveness in terms of increased risk awareness and changes in attitudes and behaviours. This study highlights the importance of theory based risk communication and evaluation, having been based on explicit principles outlined by Noar [14]. Results showed that the campaign brought positive outcomes regarding message penetration and characteristics as well as measurable learning effects. However, it suffered from a common downfall of post-test designs, in that prior level of knowledge regarding salmonellosis had not been determined and therefore, establishing campaign success is difficult as comparisons were made in terms of self-reported exposure or non-exposure only [44].

It is worth noting, however, that post-test only studies have been criticised in the past for their lack of methodological quality and although the addition of a control group for comparison can improve its quality, it is important to ensure that control groups are not exposed to the campaign materials as this can hinder the comparability of the two groups [20]. This can happen if the intervention and control groups are not isolated from each other in some way.

A French study exploring the effect of national mass media campaigns on the attitudes and behaviours of people living with HIV/AIDS (PLWHAs), focusing on HIV-related sexual risk behaviour in particular, used face-to-face surveys as well as clinical data obtained from their physician [45]. Although this study did not evaluate specific campaign elements, it is a good example of how evaluations can be conducted to uncover unanticipated campaign effects within specific populations. Findings showed that general mass media campaigns can also play an efficient role in secondary prevention for PLWHAs. The study lacked a comparison group or control to strengthen its findings. Multi-stage selection bias and possible declarative bias were also limitations present.

Cross-sectional studies

Cross-sectional study designs for campaign evaluations bring with them many limitations in the form of threats to validity [20]. Issues such as voluntary participation, interviewer administered questioning, selection bias regarding the sample, and questionnaire clarity in cross-sectional surveys may also have a significant impact on the response rate and methodological rigour, as is evident from two studies carried out in the Netherlands and France [45, 46]. Although a cross-sectional evaluation study design is generally regarded as having poor methodological rigour, experts have suggested that the addition of rigorous formative and in-depth process evaluation can assist in efforts to control threats to validity [20]. Likewise pre- and post-tests or tracking surveys have been recommended as a way of improving data quality, provided outcome measures are made explicit from baseline and not added to at different stages of the evaluation [9], however, this still does not allow for causal inference [47].

Some studies have made somewhat superficial efforts to increase the reporting quality, for example in an Italian study, Signorelli et al., (2006) recruited a large sample size through a quota sampling method and utilised anonymous questionnaires when examining HIV/AIDS information sources, sexual behaviour of Italians and the subsequent role of health education campaigns [48]. As this study was not examining the effectiveness of a specific campaign, a cross-sectional design may be adequate, however, there was possible information bias caused by pre-existing attitudes towards HIV or surveys in general [48].

The Romanian Family Health Initiative [49] demonstrated a similar utilisation of a cross-sectional design where face-to-face interviews were carried out to determine recall, comprehension and reactions among a nationally representative sample regarding the '*National HIV Anti-Discrimination Media Campaign*'. The evaluation was reported in a powerpoint presentation, which offered little detail regarding methodology of the study, however, authors did, in an effort to provide a comparison group, divide respondents into self-reported viewers and non-viewers of the campaign prior to analysis [49]. This strategy has been recommended for studies lacking a control group, in order to improve the reporting quality of the data [47]. Efforts such as these are also evident in an English study of general practitioners' (GP) knowledge, opinions and beliefs about hepatitis C following an educational campaign [50]. In this study a cross-sectional survey was combined with qualitative interviews in order to obtain richer data, yielding results which showed limited knowledge of hepatitis C among GPs. No pre-test data was gathered however, and GPs suggested the information booklet was too detailed to make time to read. These results indicate that formative research should have been conducted before widespread dissemination of the booklet.

As evaluations of health communication campaigns can often drain an already resource-scarce project, existing monitoring data is often used to assist researchers with demonstrating campaign effectiveness. For example, a UK study assessing the impact of national anti-HIV sexual health campaigns over time (1971–1999), adopted a comparison of time-series data including: detailed STI data, calculated transmission estimates, HIV diagnosis reports, routine data of annual attendance at STI clinics, and specific STI diagnosis records. Considering the time period examined in this study, some of the data had to be estimated using existing trends and mathematical tools. Researchers found that self-help initiatives and awareness among homosexual men in 1983–84 contributed significantly to reduced HIV transmission among men who have sex with men (MSM). General campaigns of 1986–87 were also associated with similar effects on STI transmission [51].

The Department of Health (UK) reported methods used to evaluate the '*Max4Health Hand Hygiene Campaign*'. A thorough description of the methodology is not available, therefore it is unclear as to the link between campaign objectives and outcome measures. However, an auditing tool was used to collect data on expenditure on soap and hand gel, random interviews with hospital staff were conducted at various stages of the campaign, and hospital staff surveys were also conducted both during campaign dissemination and one month after. The campaign resulted in high general awareness of the activities, although it is worth noting that hand hygiene awareness was already high within the hospital [52].

Content analysis

Content analysis of campaign materials is a common form of evaluation observed in communication campaigns. A Romanian study investigated the content of a number of publicly available safer sex promotion leaflets, identifying 56 semantic categories, and examined the extent to which they represented young peoples' perceptions of HIV/AIDS [53], using a social representation approach [54]. A free-association task and a semi-structured questionnaire were utilised to capture 186 participants' social representations of HIV/AIDS. Although themes which arose from the content analysis were corroborated by participants' feedback, the safer sex promotion leaflets appeared to fail in altering perceptions of vulnerability and risk [53]. Another content analysis study examined similar condom use promotion materials in Germany and the UK, in terms of their reflection of cognitive and behavioural correlates of condom use, and drew comparisons between both [55]. This study found that although some leaflets promoted the strongest cognitive and behavioural correlates of condom use, overall the design of the leaflets was not guided by psychological evidence. Although it is unknown from this study whether the leaflets frequently targeting condom use correlates are actually more effective in promoting condom use compared to those that do not, the analysis offers a valuable insight into health communication practice. As these studies aim to deconstruct campaign materials and reveal their theoretical foundations, they can also help to highlight the gap between theory based campaign development and what is seen in practice [53, 55].

Cost-effectiveness studies

An increasingly important aspect of evaluation is that of cost-effectiveness [56, 57]. It is not only important in accounting for and justifying costs to programme funders, but it can also provide a perspective on programme goals and benefits [58]. A cost-effectiveness analysis with an additional behavioural cohort survey was carried out regarding a harm reduction programme which included a communication campaign element to prevent HIV [59]. The programme used multiple methods to promote safe drug use including: communication and educational activities, condom distribution and community based syringe exchange points. This multiple intervention approach means that causal pathways cannot be determined in terms of individual communication activities; nevertheless, this was the only study which explicitly examined cost-effectiveness of the campaign. The authors used dynamic mathematical modelling to estimate the number of cases of HIV avoided throughout the intervention, revealing an estimate of 176 HIV cases averted with a cost-effectiveness of \$359 per case. The authors also projected the potential effect of a gap in campaign funding, which found that relatively small funding gaps can lead to a reduction in programme impact and cost-effectiveness [59].

Looking further beyond the European context, Hutchinson and Wheeler [60] reviewed the international literature regarding cost-effectiveness analysis for health communication programmes, and included two European studies relating to communicable disease prevention [59, 61], only one of which (as previously discussed) reported detailed analysis of cost-effectiveness with regard to the activities implemented [59]. The review by Hutchinson and Wheeler contributes to the belief that health communication interventions are relatively cost-effective in achieving many forms of behaviour change, however, the authors highlighted the lack of documentation of calculation methods used, the limited identification of included costs, lack of consistency among methods used to determine effectiveness (thus limiting comparability with other studies), and consideration of associative influence of the intervention as opposed to causal influence. These findings reflect those of another review which examined cost-effectiveness studies of HIV/AIDS prevention in developing countries [62], suggesting that shortfalls with cost-effectiveness studies may be similar between developing and developed countries.

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Appendix 2. Examples of evaluation studies of health communication campaigns in Europe

Example 1:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Andersen et al. 2001 [1]</p> <p>-Effectiveness of a mass media campaign to recruit young adults for testing of Chlamydia trachomatis by use of a home obtained and mailed samples.</p> <p>- Denmark.</p>	<p>30 000 young adults aged 21-23 living in Aarhus.</p>	<p>- Website page.</p> <p>- Several newspaper articles on general information and interviews on local & national television.</p> <p>- Posters and leaflets in various places related to the target group.</p> <p>- Posters on bicycle couriers and buses.</p> <p>- Local radio advertising.</p>	<p>183 young adults, aged 21-23 years were tested, (less than 1% of target population).</p>	<p>To evaluate effectiveness of a structured information campaign aiming to recruit young adults to be tested for Chlamydia trachomatis by use of a home obtained and mailed sample.</p>	<p>No specific design declared by authors but responses to the campaign were monitored over the duration of the campaign.</p>	<p>Campaign development informed by previous efficacy testing studies documenting feasibility of this method of Chlamydia testing with more specific population groups.</p>	<p>- Questionnaire posted to all participants along with their test result.</p> <p>- SPSS statistical package version 8.0.</p>	<p>- The proportion of tested individuals.</p> <p>- The number of infections detected.</p>	<p>- Use of mass media to recruit young adults to be tested for <i>Chlamydia trachomatis</i> had only a limited effect.</p> <p>- Effects of campaign components were short lived.</p> <p>- Peak of ordering was observed during radio advertising period.</p> <p>- Total cost of the campaign (excluding testing costs) was £6 000.</p>	<p>The study evaluated what it set out to and was directly informed by the campaign aims.</p>	<p>Cost-effectiveness was mentioned but not explored further.</p> <p>- Campaign may have had effects that were not measured in this study.</p> <p>- May have benefited if explored further the relationship between campaign activity and ordering rate. This may have helped to isolate the most effective elements of campaign.</p>

Example 2:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Ingrand et al. 2004 [2]. - Prevention of viral Hepatitis C. - France. 	Secondary school students.	<ul style="list-style-type: none"> - Comic strip which depicted scenarios regarding Hepatitis C virus (HCV). - Physician led information sessions in classes. 	<ul style="list-style-type: none"> - 1 509 pupils in pre-test phase of the study and 1419 in the post-test phase. - Separate survey specific to comic strip sent respectively to 712 & 655 of pupils who completed 1st and 2nd questionnaire. 	To evaluate the results of a HCV information campaign targeting secondary school students.	Pre-test/post-test.	-	<ul style="list-style-type: none"> - Questionnaires testing knowledge and opinion. - Data was recorded using Eppi Reviewer. - Information analysed using statistical analysis system software, version 6.12 for Windows. 	Mean score calculated from the proportion of correct answers to the 11 item questionnaire.	Knowledge scores improved significantly after the information session and were significantly higher in those claiming to have read the comic strip compared to those who did not read it.	Improvement in knowledge may indicate reduction in subsequent at-risk behaviours.	<ul style="list-style-type: none"> - Lack of randomisation to show causal pathway. - No detail given regarding questionnaire referring to the actual comic strip or its specific appeal and contribution. - No detail given regarding the campaign aims.

Example 3:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Mari et al. 2011 [3]. - Are you cooking your meat enough?. - Italy. 	Young adults and adults.	- To inform the design of future campaign materials.	245 young adults and 209 adults.	To investigate the efficacy of the Theory of Planned Behaviour (TPB) to identify the processes leading to the formation of intentions and thus to a specific behaviour.	<ul style="list-style-type: none"> - Two parallel longitudinal studies over a 2 week period. - Formative evaluation research used to inform design of future campaign materials. 	Theory of Planned Behaviour.	<ul style="list-style-type: none"> - Pilot, tested questionnaires based on existing theory measured behavioural intentions, their antecedents in the 1st stage and self-reported behaviour in the 2nd. - Analysed by structural equation modelling. 	<ul style="list-style-type: none"> - Attitude. - Subjective norm. - Perceived behavioural control. - Behavioural intentions. - Frequency of past behaviour. - Self-reported actual behaviour. 	<ul style="list-style-type: none"> - Showed superior predictive power of the TPB plus past behaviour. - Actual behaviour of the young adults is developed from intentions and perceived control, whereas behaviour of adults depends only on past behaviour. 	- Results could contribute significantly to the design of effective risk communication campaigns.	<ul style="list-style-type: none"> - Convenience sample used not representative - Self-report measures raise concerns about reliability and validity of questionnaire scales. - Single item measures may lead to higher level of measurement error.

Example 4:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Tiozzo et al. 2011 [4].</p> <p>- Development and evaluation of a risk communication campaigns on salmonellosis.</p> <p>- Italy.</p>	Households of three Italian towns (n=54,291).	<p>Campaign message was delivered through a flyer and a sliding insert mailed to each household & containing campaign slogan & basic essential information on symptoms, infection prevention, & what to do in the case of infection.</p>	<p>- 27 participants took part in 4 focus groups for formative research.</p> <p>- 1st phase of 1 026 randomly selected household interviews assessed campaign penetration.</p> <p>- After which 455 house-holds reporting having received the material, 212 of which were from original 1 026, were included in 2nd phase.</p>	<p>To develop a communication campaign on risk of salmonellosis related to food handling & storage in the home, based on principles of best practice and to evaluate the effectiveness of this campaign in terms of increased awareness of the risk and changes in attitudes and behaviours.</p>	<p>Qualitative approach using focus groups for the formative stage and telephone interviews for impact evaluation.</p>	<p>Campaign development and evaluation was based on explicit principles of communication theory and formative research that was performed to identify target audience, medium & tone of campaign message.</p>	<p>- Thematic content analysis & Lexico3 software package for focus group analysis.</p> <p>- Computer Aided Telephone Interviewing (CATI) for outcome evaluation.</p> <p>- SPSS13 software package for outcome evaluation.</p>	<p>- Campaign penetration percentage.</p> <p>- Message & medium effectiveness.</p> <p>- Percentage correct answers to questions regarding appropriate food practices & behaviours as illustrated in the campaign material.</p>	<p>- Campaign brought about positive outcomes regarding message penetration & characteristics as well as measurable learning effects.</p>	<p>- Focus group data informed campaign development by identifying target audience & campaign message medium & tone.</p> <p>- The study highlights the importance of theory based risk communication & evaluation.</p>	<p>- Postal channels seemed to be less efficient in the larger town.</p> <p>- Prior level of knowledge regarding salmonellosis was not determined.</p> <p>- Instead, comparisons were made with households that reported not having read the campaign material.</p> <p>- Only short term effects were assessed.</p>

Example 5:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Lambert, Masters and Brent 2007 [5]</p> <p>- Can mass media campaigns change antimicrobial prescribing? A regional evaluation study.</p> <p>- United Kingdom.</p>	<p>Geographical population in the North East of England.</p>	<p>- Two sequential mass media campaign phases (run during the winters of 2004 and 2005). Provided information on the appropriate use of antimicrobials. Used a cartoon character 'Moxy Malone'.</p> <p>- Campaigns were supported by print materials and in some areas professional education and prescribing support.</p> <p>- Editorial coverage in local papers, T.V. and radio.</p> <p>- Regional TV advertising was added in the 2nd phase.</p>	<p>- Intervention population consisted of people living in the areas of Gateshead, South Tyneside, Sunderland, North Tyneside, and Northumberland.</p> <p>- Control group included populations of all other primary care organisations (PCOs) in the North of England that were not exposed to wither phase of the intervention.</p>	<p>To report the first controlled evaluation study of a mass media campaign to change antimicrobial prescribing, with an aim of establishing accuracy of initial reports of the campaigns' success.</p>	<p>Retrospective controlled before-after study.</p>	<p>Justified need for higher quality evidence and controlled study but lacked exploration of theoretical basis to campaign development or evaluation.</p>	<p>- Repeated measures analysis of variance (ANOVA)</p> <p>- A survey of PCO's.</p> <p>- Data was obtained from Prescription Pricing Authority database which is pre-collected independent data.</p>	<p>- Weighted volume of all antimicrobial medication prescribed.</p> <p>- Prescribing rates were corrected for population structure and are expressed in items per 1000 STAR-PU (Specific Therapeutic group Age-sex Related Prescribing Units).</p>	<p>- Campaign was found to significantly reduce the volume of antibacterial drugs during the winter months of the intervention years.</p> <p>- Authors concluded that mass media campaigns have a role in changing antimicrobial prescribing practice.</p>	<p>- Controlled with matched populations in the North of England.</p> <p>- Evaluation was supported by a survey of PCO's to identify alternate interventions or strategies on the same topic.</p> <p>- Outcome measure was free from systematic bias.</p>	<p>- Attributing cause & effect was difficult due to incomplete reporting of similar existing interventions.</p> <p>- Unable to determine whether the reduction in year 2 was due to a follow on effect of year 1 or due to a cumulative effect from both campaign phases.</p> <p>- Mechanisms for change are unknown.</p> <p>- Cost-effectiveness was not examined.</p>

Example 6:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Peretti-Watel et al. 2005 [6].</p> <p>- Attitudes and behaviours of people living with HIV/AIDS and mass media prevention campaigns: A French survey.</p> <p>- France.</p>	The target audience of the campaigns was the French general public.	No specific campaign activities mentioned as the survey referred to French national mass media campaigns in general.	<p>- People living with HIV/AIDS (PLWHAs).</p> <p>- 889 eligible patients agreed to participate from the 1,386 HIV-infected outpatients that were recruited in a random stratified sample of 32 specialised units in two French regions.</p> <p>- Participants were 18 years or older and diagnosed for at least 1 year.</p>	To investigate the effect of national mass media campaigns in France on the attitudes and behaviours of PLWHA's, with a particular focus on HIV-related sexual risk behaviours.	Exploratory non-specific outcome evaluation study using face-to-face surveys with patients.	-	<p>- Questionnaire with 89 closed questions, administered by a trained interviewer.</p> <p>- At the same time the consulting physician also completed a short medical questionnaire regarding the patient.</p>	<p>- Socio-demographic status.</p> <p>- Opinions regarding recent AIDS information campaigns.</p> <p>- Clinical and other HIV-related characteristics.</p>	<p>- General mass media campaigns can also play an efficient role in secondary prevention for PLWHAs and therefore may need to be redesigned in order to accommodate this goal more explicitly.</p> <p>- Secondary prevention could be partially achieved with basic tools of primary prevention.</p>	<p>- Data obtained included both participant opinions and clinical data regarding health status. However more rigorous evaluation methods such as the inclusion of a control/ comparison group may have yielded more accurate results.</p> <p>- Identified possible positive effects of primary prevention initiatives.</p>	<p>- Multi-stage selection bias, as study focused on outpatients of specialised hospital units in regions with the highest HIV prevalence.</p> <p>- Possible declarative bias as PLWHAs may over-report condom use when questionnaire is administered by an interviewer.</p> <p>- Only referred to mass media campaigns in general and not any specific one.</p> <p>- Did not account for serostatus of participant's sexual partners in relation to condom use.</p>

Example 7:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Signorelli et al. 2006 [7].</p> <p>- Third Italian national survey on knowledge, attitudes, and sexual behaviour in relation to HIV/AIDS risk and the role of health education campaigns.</p> <p>- Italy.</p>	<p>General population of four different Italian provinces.</p>	<p>-</p>	<p>1 985 persons participated from a sample of 2 000 people aged 18-49 years. They were chosen using quota-sampling, considering age, sex and education level.</p>	<p>Investigated the sources of information for HIV/AIDS and sexual behaviour of the Italian general population.</p>	<p>- Cross-sectional Study design</p> <p>- Formative evaluation to identify need for further education campaigns.</p>	<p>-</p>	<p>- Anonymous self-administered questionnaire, pre-validated by a pilot study of 100 subjects.</p> <p>- Questionnaire contained 53 multiple choice questions divided into four sections.</p> <p>- Analysis used Stat View & SPSS 11.5 software.</p>	<p>- Sources of information about HIV.</p> <p>- Health education campaigns & HIV/AIDS knowledge.</p> <p>- Sexual behaviour.</p> <p>- Present sexual partners.</p>	<p>- There is a relevant need for further education campaigns and their consequent evaluations.</p> <p>- On-going monitoring of sexual behaviour of the general population is necessary.</p>	<p>- Interviewers training and standardisation of methods were used in order to avoid possible investigator bias.</p> <p>- Information bias tackled by authors as they aimed to deliver a clear and thorough questionnaire, explaining all study objectives to participants.</p>	<p>- Possibility of information bias caused by potential pre-existing attitudes towards HIV or surveys in general.</p>

Example 8:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Caramlau & Goodwin 2007 [8]. - Evaluating health promotion leaflets' impact on young people in Romania. - Romania. 	General Romanian population.	<ul style="list-style-type: none"> - A range of 22 safer sex promotion leaflets available to the general Romanian public were gathered for analysis. - Leaflets promoted condom use, HIV testing and offered sources of additional information and support. 	N=186 Romanian students aged 18-24 years.	To categorise and quantify the content of safer sex promotion leaflets available to the Romanian public and to examine the extent to which the content reflects young people's social representation of HIV/AIDS.	<ul style="list-style-type: none"> - Qualitative content analysis. - Impact evaluation using multiple methods. 	Based on the Theory of Social Representations.	<ul style="list-style-type: none"> - Content analysis of the leaflets identified 56 semantic categories. - A free association task & a semi-structured questionnaire utilised to extract participants' social representations of HIV/AIDS. - Holsti's composite reliability formula to compute level of inter-coder reliability. 	<ul style="list-style-type: none"> - Content of safer sex promotion leaflets. - Young people's perceptions of HIV/AIDS. 	<ul style="list-style-type: none"> - Findings from content analysis were corroborated by participants' social representations of HIV/AIDS. - However, although the leaflets were successful in depicting AIDS-related knowledge, they appeared to fail in altering perceptions of vulnerability and risk. 	This method of analysis helps to identify any gaps between the recommended theoretical approaches to campaign development and what approaches are actually being taken in real life practice settings.	<ul style="list-style-type: none"> - Authors did not acknowledge any limitations. - Sample of participants was reasonably small (n=186). - Leaflets were general health promotion resources and not part of any particular campaign.

Example 9:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Romanian Family Health Initiative 2004 [9]. - National HIV Anti-Discrimination Media Campaign Evaluation. - Romania. 	General Public.	<ul style="list-style-type: none"> - A selection of TV ads and print media aiming to raise awareness on and combat stigma surrounding HIV/AIDS that Romanian people face. - Included slogan: 'Open your eyes, open your heart' 	<ul style="list-style-type: none"> - N=803 nationally representative sample for the Romanian population aged 30-50, urban and rural. - Sampling methodology involved a multistage stratified procedure. 	To evaluate whether the media materials have met the communication objectives of the campaign.	Cross-sectional study for outcome evaluation.	Based on the Communication Response Model.	<ul style="list-style-type: none"> - Face-to-face interviews. - Detailed methodology and analysis are not reported here. 	<ul style="list-style-type: none"> - Awareness and degree of recall of various media and ads used in campaign. - Recall of content, understanding and retention of campaign messages. - Reactions to campaign and appropriateness of content execution. 	<ul style="list-style-type: none"> - Overall there was a high level of unaided awareness and high correct message identification. - The TV ad performed highly on the main indicators; likeability, clarity and persuasiveness 	<ul style="list-style-type: none"> - In the absence of a control group the sample was divided into those who reported exposure to the campaign and those reporting non-exposure. - Measured objectives of awareness and recall but not stigma. 	<ul style="list-style-type: none"> - PowerPoint presentation failed to detail evaluation methodology analysis and theoretical basis. - Lack of control group, viewers of the campaign was compared to those self-reporting not to have seen it. - Low quality evidence of effectiveness.

Example 10:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Bos et al. 2004 [10]. - Evaluation of the Dutch AIDS information helpline: an investigation of information needs and satisfaction of callers. - The Netherlands. 	General Public.	AIDS information helpline available to the general public eight hours a day.	309 callers participated in the study yielding a response rate of 68%.	To evaluate the Dutch AIDS information helpline in order to determine the AIDS information needs of the callers as well as satisfaction levels of callers regarding the telephone delivered consultation.	<ul style="list-style-type: none"> - Cross-sectional study as a means of process evaluation. - Involved seven minute telephone interviews carried out after each consultation with caller's consent. 	-	Questionnaire.	<ul style="list-style-type: none"> - Age, sex and education. - Topic of call content. - Participants' general satisfaction level with telephone consults. - Participants' general experience of the helpline. 	<ul style="list-style-type: none"> - Helpline was a well-appreciated information source on a variety of HIV/AIDS topics. - Authors noted difficulty in assessing long-term impact of a helpline among anonymous callers. 	<ul style="list-style-type: none"> - Compared to other studies, this one also rated caller's satisfaction. 	<ul style="list-style-type: none"> - No detail on analysis. - Did not explore health impact of the helpline. - Reached relatively few lower educated persons. - Interviewer administered questionnaire may limit honest answers.

Example 11:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- McOwan et al. 2002 [11].</p> <p>- Can targeted HIV testing campaigns alter health-seeking behaviour?</p> <p>-United Kingdom.</p>	<p>Gay and bisexual men in London with a particular focus on those of Black and South European origin & those under the age of 25 years.</p>	<p>12 week campaign of posters, wallet cards & full page advertisements, that used peer images & included information about testing services at the campaign clinic only, in a free tabloid newspaper distributed widely to gay-friendly venues around London.</p>	<p>- Data from 3 London clinics.</p> <p>- The results from the campaign clinic were compared with pooled data from 2 other centrally located clinics.</p>	<p>To evaluate the effectiveness of a HIV testing campaign called 'gimme 5 minutes'.</p>	<p>- Serial cross-sectional pre-test-post-test design study with a control.</p> <p>- Data from the same 12 weeks of the previous year was used for comparison as well as data from 2 other clinics not mentioned in the campaign.</p>	-	<p>Pre-existing central laboratory records provided data on testing uptake by men reporting sex with men (MSM).</p>	<p>- Difference in number of MSM testing for HIV between 1999-2000 in the campaign clinic.</p> <p>- Pooled data from 2 other centrally located clinics were used for comparison with the campaign clinic.</p>	<p>- Results show positive uptake of HIV testing of MSM (from 65 in 1999 to 292 in 2000) compared with control groups where no changes were observed (239 in 1999 to 236 in 2000).</p> <p>- Initial low testing rate may have simply been due to a lack of knowledge of how to access services rather than the medium of information communication used.</p>	<p>- No similar campaigns were running concurrently.</p> <p>- Showed that a multi-media social marketing campaign had large effects on promoting HIV testing uptake.</p>	<p>- Did not explore causal pathway such as: what about the campaign was effective?</p> <p>- It was unclear if comparison groups were equivalent at baseline with regard to outcome measures.</p> <p>- Participants were not allocated randomly.</p> <p>- Did not use sequence generation, allocation concealment, or blinding.</p>

Example 12:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Nicoll et al. 2001 [12].</p> <p>- Assessing the impact of national anti-HIV sexual health campaigns: trends in the transmission of HIV and other sexually transmitted infections in England.</p> <p>- United Kingdom.</p>	<p>Campaigns ranged from those aimed toward the gay community to, young people, ethnic minority groups, young women & the general public.</p>	<p>- The period of time examined was 1971-1999.</p> <p>- Authors saw it to be important to distinguish the longer term trends in STI epidemiology, dating back to the 70's, from those that could be attributed to AIDS awareness & campaigns in the 1980s & 1990s.</p>	-	<p>To assess possible impact of the Anti-AIDS campaigns on sexual health outcomes by examining national time-series data for associations between transmission of HIV & other sexually transmitted infections (STIs).</p>	<p>- Comparison of time-series data using HIV statistics and STI surveillance data from 1971-1999.</p> <p>- Allows for the ability to track data over a long period of time & contributes to more reliable data collection.</p>	-	<p>- Annual rates of STI categories were analysed with STATA 6.0 using normal regression models to test for trends.</p> <p>- Back calculation was used to estimate HIV transmission among MSM based on data to the end of 1995, & reports of new HIV diagnoses. These were corrected for reporting delays and averaged to account for seasonal reporting fluctuations.</p>	<p>- HIV trans-mission and diagnosis among MSM's.</p> <p>- Rates of attendance and specific (STI) diagnoses at genitourinary medicine (GUM) clinics.</p> <p>- Impact of the campaigns sexual components examined by observing trends in rates over narrower periods before, during and after most intense campaigns of 1983-84 & 1986-87.</p>	<p>- Self-help initiatives and awareness among homosexual men in 1983-4 contributed significantly to a reduction in HIV transmission among MSMs.</p> <p>- General campaigns of 1986-87 were also associated with similar effects on all STI transmission.</p>	<p>Both effects appear to have occurred through altering sexual behaviour and most likely contributed to the current low HIV prevalence in the UK compared to other European countries.</p>	<p>- Monitoring methods for data had evolved over the years and some rates had to be estimated in order to observe change over time.</p>

Example 13:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Bajos et al. 2001 [13].</p> <p>- AIDS and contraception, Unanticipated effects of AIDS prevention campaigns.</p> <p>- France.</p>	<p>General population.</p>	<p>- There have been annual AIDS prevention campaigns in France since 1987 with condom promotion (for both prevention & contraceptive uses) only being introduced in 1992.</p> <p>- The last national campaign focusing on contraception only was in 1982.</p>	<p>Women aged 18-49 in two national population based surveys in 1994 (n=559) and in 1998 (n=731).</p>	<p>To address the effects of AIDS prevention campaigns on contraceptive practices, in particular exploring the validity of single-risk prevention campaigns & potential unintended effects.</p>	<p>Comparing results from two cross-sectional surveys regarding women's contraceptive practices.</p>	-	<p>- Data was obtained from two national population-based telephone KABP surveys (knowledge, attitudes, beliefs & practices) that had randomly selected households from national directory.</p> <p>- SAS and SUDAAN software were used for data analysis.</p> <p>- Samples were adjusted post-survey for age, gender, marital status and area of residence.</p>	<p>- Current contraceptive practices.</p> <p>- Condom use during first sexual intercourse, in previous 12 months, & during last sexual intercourse.</p> <p>- Abortion rates were also explored to further support findings.</p>	<p>- Observed decrease in proportion of women aged 20-24 with multiple partners, reporting contraception use between 1994 - 1998. Meanwhile there was an increase in condom use to prevent AIDS</p> <p>- Abortion rates decreased between 1991-95, but showed 4% increase between 1995-96.</p>	<p>- Single risk AIDS prevention campaigns may lead some women to neglect risk of unwanted pregnancy.</p> <p>- Post-survey adjustment reduced chance of non-response bias.</p>	<p>- Unable to match findings regarding 20-24 year olds with those of 18-19 year olds due to the small group sample size.</p> <p>- Multiple comparisons tend to increase the risk of finding apparent significant differences due to chance variation.</p> <p>- Data regarding abortion rates for 1997 onwards were unavailable for further comparison.</p> <p>- Unclear documentation of survey used, specific campaign activities, or justification of methodology chosen.</p>

Example 14:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Abraham et al. 2002 [14].</p> <p>- Do health promotion messages target cognitive and behavioural correlates of condom use? A content analysis of safer-sex promotion leaflets in two countries.</p> <p>- UK</p> <p>- Germany.</p>	<p>Widely available to the general public but some leaflets targeted sub-groups of; hetero-sexual men & women; homosexual men; and condom use only.</p>	<p>A number of widely available condom-use promotion leaflets in the UK & Germany in late 1998.</p>	<p>40 condom use promotion leaflets from the UK and 37 from Germany.</p>	<p>- To categorise and quantify the content of safer sex promotion leaflets in the UK & Germany.</p> <p>- To assess the extent to which the content reflects cognitive and behavioural correlates of condom use identified by theory-based research.</p> <p>- To compare leaflet content between the 2 countries.</p>	<p>Content analysis, investigating the theoretical basis for condom use promotion leaflets.</p>	<p>Based on a variety of social cognition models which depict the relationship between beliefs, attitudes, intentions and action.</p>	<p>- Coding manual was developed & piloted by coding 12 UK leaflets.</p> <p>- Final manual defined 45 semantic categories, including 20 correlate-representative categories. It was translated into German and independently back-translated to check for error.</p>	<p>- Proportion of 20 correlate-representative categories referred to in each leaflet.</p> <p>- Frequent inclusion of correlate-representative categories, which was indicated by 1 standard deviation above the mean.</p>	<p>- Cognitions targeted most frequently by the majority of leaflets are not those found to be most strongly correlated with condom use.</p> <p>- Few differences found between UK & German samples suggesting that there are few if any cultural or language-related differences in approaches to safer sex promotion between the countries.</p> <p>- Although some leaflets promoted the strongest cognitive and behavioural correlates of condom use, in general leaflet design has not been shaped by psychological research.</p>	<p>- Highlights gap between knowledge & practice in health communication.</p> <p>- Analyses based on most widely available condom-use promotion leaflets in the UK & Germany in late 1998.</p> <p>- Good inter-coder reliability was observed for application of all categories to UK leaflets & 89% of the categories to German leaflets.</p> <p>- Provides an approach to assessing the relationship between health promotion material content & recommendations of psychological research on antecedents of such behaviours.</p>	<p>- Not all leaflets were designed specifically to promote condom use</p> <p>- Does not test whether leaflets which frequently target cognitions & actions correlated with condom use, actually promote condom use more effectively than those that do not.</p> <p>- Authors recommend experimental trials for such a study.</p>

Example 15:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Whitingham et al. 2008 [15].</p> <p>- Experimental pre-testing of public health campaigns: A case study.</p> <p>- The Netherlands.</p>	<p>Young people aged between 13-19 years with a low to moderate level of education.</p>	<p>- Campaign material designed for the national safe sex campaign included; billboards, TV and radio adverts.</p> <p>- However the material being pre-tested was restricted to the storyline of a planned television commercial on safe sex.</p> <p>- It was presented to members of the target audience by means of a storyboard of drawings & text that made up the essential frames of the commercial.</p>	<p>Students aged between 14-16 years, enrolled in two intermediate level vocational schools were randomly assigned to experimental or control groups. N=185.</p>	<p>To discuss the pre-testing of new public health campaign materials in their developmental stage that are intended for future use in a national STI/AIDS prevention campaign in the Netherlands.</p> <p>- Campaign main aim was prevention of STIs by; stimulating condom use, increasing risk perception and emphasising the importance of taking personal responsibility when it comes to the use of condoms.</p>	<p>- Experimental pre-test design.</p> <p>- Formative evaluation.</p>	-	<p>- Questionnaire completed by both groups. The control group completed the questionnaire without viewing the commercial storyboard.</p> <p>- Two-way analysis of variance (ANOVA).</p>	<p>- Risk perception.</p> <p>- Intention to use condoms.</p> <p>- Intention to discuss condom use with partner before having sex.</p> <p>- Taking responsibility for condom use.</p> <p>- Anticipated regret.</p> <p>- Qualitative likeability measures.</p> <p>- Determinants of safe sexual behaviour such as knowledge, attitude, & self-efficacy toward condom use.</p>	<p>- A positive effect on risk perception for females only.</p> <p>- Positive effect on intention to buy, carry condoms & on the intention to take initiative in discussing condom use before having sex.</p> <p>- Storyline failed to elicit a positive effect on perceived personal responsibility, intentions to use condoms with new partners and anticipated regret.</p> <p>- Storyline appeared to be ineffective in promoting the motivation to consistently use condoms with known partners, possibly explained by ceiling effects.</p>	<p>- Suggest a positive effect of commercial exposure on important determinants of safe sex behaviour among young people.</p> <p>- Supplemented qualitative research with experimental methods in order to determine the effectiveness of new campaign materials.</p> <p>- Outcome measures relate back to the pre-determined aims of the campaign.</p> <p>- Experimental and control groups were varied within each school to control for differences between schools.</p> <p>- Experimental pre-test allows determination of causal links between campaign and outcome variables.</p> <p>- Storyboard can be altered to tackle least efficacious elements.</p>	<p>- Small sample with only two schools, due to financial and time constraints which may limit generalisability of results.</p> <p>- Campaign materials were not finished products (very expensive).</p> <p>- Long term outcome of STI rates was not explored, however this may not have been feasible for a formative research study.</p>

Example 16:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Yzer, Siero & Buunk. 2000 [16].</p> <p>- Can public campaigns effectively change psychological determinants of safer sex? An evaluation of three Dutch campaigns.</p> <p>- The Netherlands.</p>	<p>Mostly aimed towards the general public.</p>	<p>- Campaigns ran during 1994, 1995 & 1996 as part of the prevention programme, 'I have Safe Sex or No Sex'.</p> <p>- General Campaign activities involved recommending condom use with equal focus on discussing condom use with partners & actual condom use.</p> <p>- Integration of AIDS prevention with STD prevention and agenda setting was the major overall objective.</p> <p>- Channels for message circulation included; television, radio, cinemas, posters in public areas, newspapers and flyers.</p>	<p>Samples were representative of Dutch population regarding social-demographic characteristics but for this study only panel members aged 15-45 years were included as they were believed to be those at most risk.</p>	<p>- This Study aims to evaluate the 1994, 1995, & 1996 Dutch safer sex campaigns in terms of their effectiveness in improving attitudes, perceived social norms, self-efficacy and intentions regarding safer sex.</p> <p>- Focuses solely on the campaign effects & not on effects of other prevention activities.</p>	<p>- Comprehensive design including a baseline-post-test/post-test-only group design and a longitudinal or multiple assessment group design where responses from the same people at 5 consecutive assessments were examined.</p> <p>- Outcome evaluation of multiple campaigns.</p>	<p>- Campaign development was based on the Theory of Planned Behaviour.</p> <p>- Following this the evaluation strategy included the same variables included in the campaigns objectives.</p>	<p>- Electronic questionnaire completed on a household computer that is connected to the research institute.</p> <p>- Sample was obtained from information stored at the Center Data Foundation.</p>	<p>- Attitudes.</p> <p>- Perceived social norms.</p> <p>- Perceived self-efficacy and intentions regarding safer sex.</p> <p>- Outcome measures were formed from campaign objectives.</p> <p>- Between samples and constructs, Cronbach's alpha values ranges from 0.60 to 0.92.</p>	<p>- Despite high variable measures at baseline, the campaigns affected all variables positively.</p> <p>-In addition, levels of all variables decreased when there was no campaign.</p> <p>- The combination of: principles on which the campaigns were founded, the message characteristics and various media used to distribute the messages, appear to have produced an effective communication strategy.</p>	<p>- Alternative explanations for observed effects were excluded to a considerable degree due to efforts to minimise influence from the following:</p> <ol style="list-style-type: none"> 1. <i>Testing effect</i> by comparing participants of baseline & post-test assessments to a post-test only control group. 2. <i>History effect</i> minimised by comparing effects of three campaigns over time. 3. <i>Cultural change</i> effect minimised by testing for negative change in outcome variables when no campaign was conducted. 4. Potential effect from the <i>differences between sample groups</i> targeted by use of multiple assessment design. <p>- When different procedures would yield a similar pattern of results, sample differences could also be excluded as an alternative explanation.</p>	<p>- While the use of a baseline-post-test group design for each campaign allows the examination of possible campaign effects while controlling for a number of possible confounds, this procedure does not control for differences between the different samples.</p> <p>- To strengthen the study in the future, authors recommend extending the design with a measure of campaign exposure that would enable a quasi-experimental design involving an experimental group (exposed) & a control group (not exposed).</p> <p>- Self-reported measure of campaign exposure was used which has questionable reliability.</p> <p>- Safer sex determinant levels were relatively high prior to any campaign leading to questions regarding effect size & cost-effectiveness.</p> <p>- However attitudes and social norms were negatively affected when campaigns were discontinued.</p>

Example 17:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- d'Souza , 2004 [17].</p> <p>- Knowledge of chronic Hepatitis C among East London primary care physicians following the Department of Health's educational campaign.</p> <p>- England.</p>	<p>All general practitioners (GPs) in England.</p>	<p>- 46 page detailed booklet on Hepatitis C developed with an expert panel & key stakeholder assistance.</p> <p>- Aiming to; prevent new cases of Hepatitis C infection, identify those chronically infected, offer specialist advice and appropriate treatment.</p>	<p>- 482 GPs completed the survey, (141 from South-East London & 341 from North-East London).</p> <p>- 10 GPs were also selected for face-to-face open-ended interviews.</p>	<p>- To assess level of knowledge of East London GPs, 10 months after a Department of Health Hepatitis C information campaign.</p> <p>- To assess reasons for any lack of knowledge by GPs & potential ways to improve this.</p>	<p>Cross-sectional Study design, 10 months after the campaign.</p>		<p>- Self-administered questionnaire (8 closed & 2 open-ended questions).</p> <p>- Questionnaire was assessed for content and relevance by 10 senior practitioners, 6 of whom suggested 2 additional open questions, which were included.</p> <p>- Face-to-face interviews.</p>	<p>- Knowledge of Hepatitis C.</p> <p>- Opinions & beliefs about Hepatitis C transmission, screening, treatment, & ways of improving services.</p>	<p>- Results show knowledge of Hepatitis C to be limited among London GPs.</p> <p>- All GPs who participated in the survey wished to be better informed with regard to Hepatitis C.</p> <p>- Possible discrimination revealed, as some GPs seem to restrict access to healthcare for patients injecting drugs.</p>	<p>- Combination of qualitative data with cross-sectional survey in order to obtain richer data from the study.</p> <p>- Findings were similar to previous studies.</p>	<p>- Possibility of response bias as those who responded may have more interest in Hepatitis C & therefore results may be a 'best case scenario'.</p> <p>- Authors do not acknowledge the inconsistency between campaign aims and evaluation outcome measures.</p> <p>- No control group or pre-test data.</p>

Example 18:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Department of Health (UK) 2009 [18]. - The Max4Health Hand Hygiene Campaign (Report). - England. 	Healthcare workers, patients and the general public.	<ul style="list-style-type: none"> - Delivering messages regarding the importance of hand hygiene & its impact on prevention of healthcare associated infections. Based on a cartoon character called Max. - Included a wide range of materials; posters, banners, leaflets, storybooks, mouse-mats. - Week five involved a hand hygiene awareness week. 	Healthcare workers in Southampton University Hospitals NHS Trust (The Trust).	This report documents the results of an evaluation of a Max4-Health Hand Hygiene Campaign that was undertaken in Southampton University Hospitals NHS Trust over a 9 week period.	<ul style="list-style-type: none"> - No clear study design reported here. - Mixed methods study using staged interviews, before-after surveys, routine monitoring data and cost-analysis. 	-	<ul style="list-style-type: none"> - Trust's auditing tool collected data on hand hygiene compliance. - Data on expenditure on soap and hand gel was also gathered. - Random interviews with hospital staff before the campaign, weeks 1, 4, & 7, & after the campaign. - Staff survey using questionnaires was conducted during & one month after campaign. 	<ul style="list-style-type: none"> - Awareness of importance of hand hygiene. - Soap and hand gel expenditure. - Hand hygiene compliance levels. - Healthcare workers' opinions regarding campaign success, purpose, foreseeable effectiveness, appropriateness, general awareness and impression of the campaign. 	<ul style="list-style-type: none"> - The majority of staff who participated in the survey thought the campaign had made them more aware of importance & more compliant with hand hygiene. - Majority of staff thought the campaign's effects would be lasting, that it was a good tool for tackling hand hygiene, & would recommend it to other hospitals. - There was general high awareness of the campaign. - Overall cost of campaign was £115 956. 	<ul style="list-style-type: none"> - Interviews were conducted at random at several stages throughout the campaign - Awareness of hand hygiene importance was already high in the hospital - 27 healthcare associated infections would have to have been prevented in order to cover the cost of the campaign. 	<ul style="list-style-type: none"> - It was not possible within the 9 weeks of the study to show any significant improvement on hand hygiene compliance that might be attributed to the campaign; or that soap & hand gel expenditure could be used as an indicator of usage or a proxy-indicator for hand hygiene compliance. - Actual cost-effectiveness analysis was not conducted. - Self-reporting of staff opinion does not show campaign effectiveness. - No detailed reporting on reasons for methodologies adopted. - Lack of reporting on aims of evaluation and their links with campaign aims.

Example 19:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>National Patient Safety Agency 2004 [19].</p> <p>- Achieving our aims: Evaluating the results of the pilot 'Clean your hands campaign'.</p> <p>- UK (England and Wales).</p>	<p>Healthcare workers, patients and visitors of healthcare settings.</p>	<ul style="list-style-type: none"> - Series of posters and supporting materials. - Patient information and empowerment leaflet. The slogan was '<i>it's ok to ask</i>'. - Provision of near patient alcohol hand rub. 	<ul style="list-style-type: none"> - Six pilot sites were recruited from 60 applicants. - 708 staff participated across the two surveys. - 374 patients, relatives and carers from 9 trusts participated in surveys/ interviews. 	<ul style="list-style-type: none"> - To evaluate campaign impact on staff in terms of effectiveness. - To evaluate changes in behaviour by staff. - To assess patients' views of staff hand hygiene and of being involved in the campaign themselves. - To assess suitability of each part of the campaign for national roll-out. 	<p>Mixed methods approach as means of process evaluation, in order to developing criteria necessary to successful future campaign implementation.</p>	<p>The project was based on research and practice from the Oxford Radcliffe Hospitals NHS Trust & University Hospitals Lewisham & from a long term Swiss study.</p>	<ul style="list-style-type: none"> - Staff surveys - Patient survey and interviews - Interviews with onsite leader. - Onsite leader diary & activity log. - Records of pilot site working group meetings. 	<ul style="list-style-type: none"> - Visual impact of posters. - Staff perceptions of campaign and patient involvement. - Patients views of the campaign and staff hand hygiene. - Suitability of each aspect of the campaign. - Hand hygiene observation over time and self-reported compliance. - Product usage (before-after). 	<ul style="list-style-type: none"> - Results show that the pilot had a positive impact on key stakeholders. - Increase in use of alcohol rub and staff hand washing between patients was observed. - Sites with strongest managerial commitment appeared to be more successful in implementing the campaign. - Findings led to changes to the campaign toolkit prior to national roll-out. 	<ul style="list-style-type: none"> - The report provides compelling anecdotal evidence as to the campaign's potential for future development. - Informed future national roll out of the campaign by setting out a number of critical factors for a campaign toolkit, which should be adhered to in order to maximise chances of effectiveness in the future. 	<ul style="list-style-type: none"> - Response rate was low across the two staff surveys (42%). - Small sample & self-reporting leads to difficulty in drawing meaningful statistical conclusions. - Scope for coverage of the pilot campaign in terms of healthcare settings was limited. - Unclear declaration of outcome measures in relation to the study aims.

Example 20:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Mevisen et al. 2011 [20].</p> <p>- Justify your love: Testing an online STI risk communication intervention designed to promote condom use and STI-testing.</p> <p>- The Netherlands.</p>	<p>Young adults who had recently started a hetero-sexual relationship.</p>	<p>- Tailored web-based intervention communicating STI risks for young adults.</p> <p>- Used interactive question-and-answer format tailored to the participant's previous answer and in part to their gender.</p>	<p>- Young adults attending universities or higher vocational training colleges in Limburg province & Rotterdam City.</p> <p>- Eligible participants were: Dutch, aged 18-25 years, hetero-sexual, in a relation-ship for 6 months or less, and had access to email.</p> <p>- First phase: N=171 and second phase n=115.</p>	<p>To examine the effects of a computer-tailored intervention on psycho-social determinants of condom use & STI –testing.</p>	<p>- Randomised controlled trial (RCT) study utilising a between subjects factorial design.</p> <p>- Included three groups: 1. Tailored intervention. 2. Non-tailored intervention. 3. Control condition.</p>	<p>Intervention content was based on theoretical frameworks of the AIDS Risk Reduction Model & the Extended Parallel Process Model, which indicate that positive attitudes, self-efficacy and safer sex skills are factors that influence intention and behaviour change.</p>	<p>- E-mail messages for recruitment purposes.</p> <p>- Between subjects, the MANOVA test was performed for analyses using SPSS13.0.</p>	<p>- Perceived susceptibility.</p> <p>- Perceived probability.</p> <p>- Attitudes.</p> <p>- Normative beliefs.</p> <p>- Self-efficacy.</p> <p>- Behavioural intentions.</p> <p>- Demographic measures.</p> <p>- Skills related to condom use & STI testing.</p> <p>- Cognitive effects tested immediately after the intervention & behavioural effects were assessed 3 months after.</p>	<p>- Results showed intervention influenced risk perceptions, STI-testing intentions and had a positive impact on reported condom use.</p>	<p>- Final analyses excluded those with no risky sexual history in order to optimise the homogeneity of the study sample.</p> <p>- Participants were randomly assigned to 1 of 3 groups.</p> <p>- The results of this RCT contribute to the sparse evidence base on efficacy of online health communication</p>	<p>- Incentive was offered for participation which may have resulted in volunteer bias or same candidates entering twice with alternative email address.</p> <p>- No data about how and in which conditions participants used the site.</p> <p>- May have lost potential participants due to their strict eligibility criteria.</p> <p>- Self-reported data can have questionable reliability.</p>

Example 21:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Stone et al. 2009 [21].</p> <p>- The success & effectiveness of the world's first national 'clean your hands campaign' (CYHC) in England and Wales 2004-2008.</p> <p>- A prospective observational interrupted time-series. (Conference proceedings).</p> <p>- UK (England and Wales).</p>	<p>Healthcare workers in all acute hospitals in England and Wales.</p>	<p>- Near patient alcohol-based hand-rub</p> <p>- Posters on wards supporting hand hygiene (HH).</p> <p>- Patient empowerment materials with slogan, "<i>It's OK to ask</i>".</p> <p>- Audit/ Feedback element every 6 months.</p>	<p>187 NHS acute trusts in England and Wales.</p>	<p>To report on results of an independent 4 year evaluation study assessing the (CYHC) implementation, sustainability, effects on hand hygiene (HH) and healthcare associated infection (HCAI).</p>	<p>Prospective observational interrupted time-series study.</p>	<p>-</p>	<p>- Questionnaire sent to trusts every 6 months.</p> <p>- National routine quarterly HCAI data.</p> <p>- Statistical analysis was performed using generalised estimating equation models with exchangeable within group correlation structure.</p>	<p>- HCAI quarterly data regarding meticillin resistant and sensitive <i>S.aureus</i> bacteraemia (MRSAB, and MSSAB) & <i>C. difficile</i> infection rates.</p> <p>- Monthly soap & alcohol rub use data.</p> <p>- Bed occupancy data.</p> <p>- Implementation progress data from questionnaires.</p> <p>- Potentially confounding national interventions.</p>	<p>- Even after 3 years, CYHC was top priority in 92% of hospitals.</p> <p>- Patient empowerment materials were less successful.</p> <p>- Combined soap & AHR procurement tripled over the study period.</p> <p>- MRSAB rates were halved but no fall was observed in other HCAI rates.</p> <p>- CYHC was associated overall with a sustained change in HH behaviour nationally.</p>	<p>- Included data from other national infection control interventions to account for confounders.</p> <p>- Strong association was observed between reduction in MRSAB rates & use of alcohol-based hand-rub.</p> <p>- However this may be a reflection of the interplay between CYHC, improvement team hospital visits & other confounders.</p> <p>- Study design is a strong point as data was collected before, during & after campaign roll-out.</p>	<p>- Conference proceedings documentation which lacks detail on methodology.</p> <p>- Unclear how staff behaviour change is measured apart from soap and alcohol-based hand-rub use.</p>

Example 22:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Corrigan 2006 [22].</p> <p>- European Immunisation Week 2005 - regional evaluation of the pilot initiative.</p> <p>- Belarus, FYR Macedonia, Ireland, Italy (South Tyrol province only), Serbia & Tajikistan.</p>	<p>- Parents, caregivers, healthcare professionals & policy makers.</p> <p>- In addition to this, each country made special efforts to target vulnerable population groups within their region/ country.</p>	<p>- A range of objectives & varied activities over several European countries in the lead up & during the week of 17-23 October 2005.</p> <p>- Materials included but not limited to fact sheets, web page, logo, posters, TV spot & slogan 'Prevent. Protect. Immunize'.</p> <p>- Materials & activities varied greatly between countries but they all shared the main aim of; increasing vaccination coverage by raising awareness of the importance of every child's need & right to protection from vaccine preventable diseases.</p>	<p>- Six pilot countries.</p> <p>- Mothers with children under the age of 5 years.</p> <p>- 6 000 young people aged 17-19 years.</p>	<p>- This report documents national evaluation reports & other forms of feedback obtained from each country during their planning, implementation & evaluation stages of the first European Immunisation Week (EIW).</p> <p>- The overall goal of the evaluation report was to collate findings & examples of good practice from the pilot project & thus inform future planning at regional & country level.</p>	<p>- Formative, process and impact evaluation using multiple methods.</p> <p>- Impact evaluation was post-test only with the exception of Belarus where indicators were measured before & after the campaign.</p>	<p>- Evaluation framework was developed from extensive desk research which included the following elements:</p> <ul style="list-style-type: none"> - Formative research. - Process evaluation. - Impact evaluation. - Post Mortem Analysis. 	<p>- Questionnaires to EPI (expanded programmes on immunisation) managers were used for formative research.</p> <p>- Questionnaire, activity reports, duty travel reports & official WHO EURO staff feedback were used for process evaluation.</p> <p>- Short face-to-face surveys with mothers of young children were used as means of informal impact evaluation.</p>	<p>- Variables for formative research included: perceived barriers and potential strategies to improve rates of immunisation</p> <p>- Outcomes examined for process evaluation included: message development, partnerships, implementation progress, immunization week products available in each region, advertising and media coverage, activities targeting vulnerable groups & project timing & resourcing.</p> <p>- Performance indicators for impact evaluation were levels of awareness, understanding, confidence, relevance and action.</p> <p>- Coverage data from specific vulnerable groups.</p>	<p>- High levels of awareness & recall were recorded in Serbia and Tajikistan.</p> <p>- Penetration in South Tyrol was lower but awareness had been raised.</p> <p>- Belarus showed 33% increase in vaccination awareness & 41% increase in rubella vaccination awareness.</p> <p>- Tajikistan led 30 mobile teams in 18 districts during EIW targeting vulnerable groups and immunizing 2 204 children.</p> <p>- Campaign has good potential for commonality across the European Region, whilst allowing countries the flexibility to tailor their own campaign messages.</p>	<p>- Survey from Belarus measured key performance indicators for a significant sample of young adults (n=6000) before & after the campaign.</p> <p>- The pilot study shows the scope of the campaign in terms of partnerships, target audiences, activities, materials & channels, while also reporting important aspects & potential difficulties of cross-country campaign evaluation for future studies.</p> <p>- Although broad in scope in terms of formative, process and impact evaluation, important data is missing for many countries such as pre-testing of the key performance indicators and thus causal pathways are difficult to establish.</p>	<p>- Significant differences in terms of methodologies used and sample sizes recruited by the individual countries, which made comparability difficult.</p> <p>- Only 4 countries completed the impact evaluation due to lack of available resources or funding & only 1 of these had both pre and post-test data.</p> <p>- Materials & activities varied between countries some of which were not pre-tested.</p> <p>- Difficulties in standardising a questionnaire arose in terms of terminology used.</p> <p>- The survey in Belarus was not comparable with the other 3 as it was linked to a rubella campaign for young adults.</p> <p>- Vaccination activity took place in 3 countries during EIW but data is only available from Tajikistan.</p>

Example 23:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Bauraind et al. 2004 [23].</p> <p>- Association between antibiotic sales and public campaigns for their appropriate use (Letter to Editor).</p> <p>- Belgium.</p>	General public.	<p>- Campaigns were ran for 3 months at a time in 2000-2001 & again in 2001-2002.</p> <p>- Focused on topics conveyed through booklets, handouts, posters, prime-time television spots, & websites.</p> <p>- Slogans included; 'use antibiotics less frequently but better', 'save antibiotics, they may save your life', or 'talk to your doctor, talk to your pharmacist'.</p>	Outcomes were examined for time period of 1996-2002 (before, during & after the campaign).	To assess the effectiveness of two public campaigns aiming to improve rational use of antibiotics.	Time-series analysis.	-	<p>- Monthly outpatient antibiotic use in the community, from 1996-2002 was estimated from sales data covering 80.1% of community pharmacies & 76.1% of population.</p> <p>- National yearly gross antibiotic sales data obtained from Intercontinental Marketing Services (IMS-Health) for 1996-2002.</p> <p>- Monthly indices of Influenza-like illness (ILI's) for 1996-2002 were obtained from Belgian Scientific Institute of Public Health.</p> <p>- ARIMA transfer function model allowed control for seasonal influence of ILIs.</p>	<p>- Antibiotic sales.</p> <p>- Sales data was converted to defined daily doses (DDD's) as defined by WHO.</p> <p>- Influenza-like illness (ILI) defined as flu-like symptoms.</p>	<p>- After controlling for seasonal influence of (ILI's) the reduction in antibiotic sales was 6.5% for 2000-2001 period and 3.4% for the 2001-2002 period (later found not to be significant).</p> <p>- Data from IMS show a yearly decrease of 5.3% (DDD's) in antibiotic sales between 2000-2002, compared to a 2.9% increase noted between 1997-1999.</p> <p>- Study shows that antibiotic sales are strongly linked to (ILI's) incidence.</p>	<p>- Accounted for confounding effect of seasonal variation of (ILI's).</p> <p>- Time-series analysis allows for useful mapping of campaign success over time.</p> <p>- Significant time period examined.</p> <p>- Good use of existing monitoring data regarding antibiotic sales and (ILI's) records.</p>	<p>- Unclear whether the reduction in sales as observed in this study, will contribute to tackling pathogen resistance in the community.</p> <p>- Lack of detail presented here in terms of methodology justification, or which aspects of campaign were most effective.</p> <p>- Some of the data regarding antibiotic use in the community had to be estimated.</p> <p>- Unclear whether specific 'overuse' and 'misuse' of antibiotics was reduced – only overall reduction in sales & thus DDDs.</p>

Example 24:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Sabuncu et al.2009 [24].</p> <p>- Significant reduction of antibiotic use in the community after a nationwide campaign in France, 2002–2007.</p> <p>- France.</p>	<p>General public and healthcare professionals with a particular focus on viral respiratory illnesses (VRIs) in children.</p>	<p>- The campaign is run every winter since 2002 with an overall aim to decrease total antibiotic use in the community by 25%.</p> <p>- Included an educational campaign for healthcare workers.</p> <p>- Promotion of rapid tests for diagnosis of streptococcal infections.</p> <p>- Public information campaign about VRIs & antibiotic resistance.</p>	<p>Data from 2000-2007 including 453,407, 458 individual re-imburement records & incidence of flu-like syndromes (FLSs).</p>	<p>To evaluate the effectiveness of the 'Keep Antibiotics Working' campaign by analysis of the evolution of outpatient antibiotic use in France 2000-2007, in terms of therapeutic class & geographic & age-group patterns.</p>	<p>Time-series analysis.</p>	-	<p>- Data were obtained from the French National Health Insurance database and provided by the French Sentinel Network.</p> <p>- Analyses were performed using SAS 9.1.</p>	<p>- Weekly rate of antibiotic prescriptions per 100 inhabitants.</p> <p>- Weekly incidence of flu-like syndromes (FLS).</p>	<p>- When compared with pre-intervention data (2000-2002) the total number of antibiotic prescriptions per 100 inhabitants fell by 26.5% over 5 years, and in children under 6 years, by 30.1%.</p> <p>- Decline was observed in all 22 regions of France & in all antibiotic therapeutic classes except quinolones.</p> <p>- Significant reduction observed in relationship between incidence of FLS's & antibiotic prescriptions (45%).</p> <p>- Results show that the overall aim of the campaign was achieved.</p>	<p>- Accounted for seasonal variations in FLS.</p> <p>- Significant body of data present here with nearly half a billion data entries over a considerable time-series.</p> <p>- Potential influence from nearby national campaigns such as Belgium should be considered in addition to the potential influence from decreased marketing from pharmaceutical companies.</p> <p>- Potential underestimation of link between community viral infection & antibiotic prescription due to FLS data not accounting for other VRIs.</p>	<p>- Quasi-experimental Study design lacks a control group & with limited pre-intervention data, a causal relationship cannot be proven.</p> <p>- No data present linking antibiotic prescription to a particular clinical condition.</p> <p>- The added effectiveness of other local campaigns was not examined.</p> <p>- Adverse effects of reduced antibiotic use should be questioned.</p> <p>- Reasons for reductions in antibiotic use were also not examined here.</p> <p>- Justification of evaluation methodologies chosen is not discussed.</p>

Example 25:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Toscani, Gauthey & Robert 2003 [25].</p> <p>- The information network of senior citizens in Geneva, Switzerland, and progress in flu vaccination coverage between 1991 and 2000.</p> <p>- Switzerland.</p>	<p>- General public, risk groups: (over 65s & people with chronic conditions or immuno-suppression) and health professionals</p> <p>- Campaign was initially rolled out in Geneva, gradually expanding to other French, Italian, and more recently German speaking regions of Switzerland.</p>	<p>- Campaign was entitled "United against Flu" which included production of TV spots, press conferences, cultural events, education & training events, information sent to health professionals, a website & materials such as information leaflets, handkerchief packages, stickers & posters for risk groups.</p> <p>- Campaign aimed to increase vaccination coverage in risk groups in order to decrease morbidity & mortality linked to flu.</p> <p>- Specifically aimed to increase vaccination coverage to 60% in the over 65's by the year 2000.</p>	<p>- Geriatric population (people aged 65 years or older) living in Geneva.</p> <p>- Random samples were obtained from the Cantonal Population Office and questionnaires were posted to 1 200, 2 300, and 1 500 individuals in 1994, 1996 and 2000 respectively.</p> <p>- Response rate was always higher than 70%.</p>	Not stated.	Interrupted time-series.	-	<p>- Repeated surveys.</p> <p>- Semi-structured telephone interviews with a sub-sample in the first survey only.</p> <p>- Data on general demographics were obtained through Cantonal Population Office.</p> <p>- Chi squared analysis for trend.</p>	<p>- Vaccination coverage.</p> <p>- Network of informants.</p> <p>- Knowledge & perceptions within the geriatric population.</p> <p>- Motivations for vaccination uptake (sub-sample only).</p>	<p>- Reported influenza vaccination coverage of those aged over 65 years increased significantly from 28.7 ±3.1% in 1991 to 58.5 ±3.0% in 2000 (p<0.01).</p> <p>- Exact figures are not available for the years 1992-1999.</p> <p>- Main sources of information were the media and physicians.</p> <p>- Knowledge regarding flu vaccination appeared adequate & improved over time.</p>	<p>- Authors acknowledged the confounding influence of the addition of the flu vaccination in 1996 to the measures reimbursed by health insurance. Although cost was not perceived to be a barrier and increases were observed before this change, particularly in regions where campaign was most concentrated.</p> <p>- Quasi-experimental design using interrupted time-series can only provide estimated success of the campaign over time.</p> <p>- Evaluation strategy appears to be linked in with campaign aims & objectives.</p>	<p>- Vaccination uptake was self-reported, leading to questionable reliability.</p> <p>- Surveys sent over the three years differed slightly.</p> <p>- Unable to make direct causal links between campaign activities and findings due to lack of control.</p> <p>- As messages were disseminated via various channels, the effect of repeated message exposure from varying sources was not assessed.</p> <p>- No theoretical basis or formative research to inform message development, dissemination, evaluation methodology.</p>

Example 26:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- De Juanes et al. 2007 [26].</p> <p>- Influenza vaccination coverage among hospital personnel over three consecutive vaccination campaigns (2001-2002 to 2003-2004).</p> <p>- Spain.</p>	<p>Hospital workforce of the "12 de Octubre" Hospital, Madrid, Spain.</p>	<p>- Campaign aimed to increase healthcare workers immunisation rates.</p> <p>- Informative leaflets were given to department heads to distribute & posters with information regarding disease, vaccines, recommendations & scheduled sites of vaccination sessions were distributed in the hospital in 2001-2002 and 2002-2003, and in the 2003-2004 season.</p> <p>- Recommendations were also published in the hospital bulletin and Website.</p> <p>- Vaccination was also offered in the workplace.</p>	<p>All healthcare workers and ancillary staff within the hospital. The number & population did not change during the study period. N= 5654.</p>	<p>To assess influenza vaccination rates among hospital personnel (healthcare workers & ancillary staff) & the impact of three hospital-based health promotion campaigns designed to increase vaccination coverage over a three year period.</p>	<p>Interrupted time-series with a hospital cohort.</p>	-	<p>- Analysis involved Chi-square test for proportions and McNemar test to compare group rates over the three years.</p> <p>- Association between previous vaccination and vaccination in successive years was examined by Odds Ratios (OR).</p>	<p>- Vaccination coverage (calculated as the ratio between number of vaccines & total potential population to be vaccinated).</p> <p>- Association between previous vaccination and vaccination in successive years.</p>	<p>- A significant increase in immunisation uptake was observed among all professional groups over the three seasons: 15.9% vaccinated in 2001-2002; 21.4% in 2002-2003; & 40.4% in 2003-2004.</p> <p>- Those vaccinated in a previous campaign were more likely to be vaccinated in future campaigns.</p> <p>- Vaccination uptake varied by profession with the lowest rates among nursing staff.</p>	<p>- Other factors may have contributed to increased uptake such as heightened concerns over SARS or avian flu within the same period.</p> <p>- Nursing staff may need information more targeted to their needs and concerns in future campaigns.</p> <p>- Vaccination rate at end of study period was still far below the minimum recommended 60% for risk groups.</p>	<p>- No theoretical basis or formative research to inform message development or dissemination or evaluation strategy.</p> <p>- Unable to make direct causal links between Campaign activities and findings due to lack of control.</p> <p>- Messages were distributed in various ways but were not assessed individually for their effectiveness.</p> <p>- Campaign exposure was not measured.</p> <p>- Success of the campaign was only measured by uptake of vaccination.</p>

Example 27:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Llopia et al. 2010 [27].</p> <p>- New interventions to increase influenza vaccination rates in health care workers.</p> <p>- Spain.</p>	<p>- Healthcare workers (HCW's) of the Hospital Clinic of Barcelona (HCB).</p> <p>- The aim of the campaign was to change the vertical model of message flows and recommending vaccination to a more horizontal flow model using a variety of new strategies.</p>	<p>- Annual campaign included posters placed in strategic sites, institutional support by means of an e-mail to all HCWs, and free influenza vaccination.</p> <p>- 2008-2009 campaign added strategies to promote peer-to-peer communication among HCW's, incorporating:</p> <ul style="list-style-type: none"> - Increased institutional support from highest level. - Awareness and interest raising of vaccination via discussions & weekly educational & advertising messages sent by e-mail, prize draws for vaccinated HCWs, & a webpage titled '<i>I've already been vaccinated</i>' with staff photos. - Improved accessibility by increasing numbers of vaccination mobile unit staff. 	<p>Healthcare workers (HCW's) N>4500 temporary and permanent staff of a Spanish University hospital.</p>	<p>To examine whether an active vaccination campaign promoting communication among HCW's increased influenza vaccination coverage rates and allowed for a shorter campaign period.</p>	<p>Before-after study using the 2007-2008 campaign data as pre-intervention & the 2008-2009 campaign as post-intervention.</p>	-	<p>- Proportional analysis using Fisher's exact test, and Mann-Whitney U test.</p> <p>- Website to stimulate communication and interest.</p>	<p>Vaccination uptake.</p>	<p>- Overall, the coverage achieved was 37% in 2008-09, compared with 23.7% in 2007-08.</p> <p>- Physicians were the professional category with highest uptake rate in both seasons studied, while nurses had the lowest.</p> <p>- The authors attribute the increase to the faster, more effective transmission of campaign messages & the involvement of HCW's in this transmission process.</p> <p>- HCW's with hospital email accounts (physicians & administrative staff) had higher rates of vaccination uptake compared to those without hospital email accounts (support staff).</p>	<p>- Although all staff had access to the Internet on each ward, findings would suggest that the email strategy was a more effective tool for diffusing the information compared to the webpage.</p> <p>- The 2007-08 campaign was used as a pre-intervention control in order to assess the effectiveness of the additional strategies.</p>	<p>- No theoretical basis or formative research to inform message development or evaluation strategy.</p> <p>- Campaign had various elements for distributing messages but these were not assessed individually for their effectiveness .</p> <p>- Success of the campaign was only measured by uptake of vaccination.</p> <p>- Data collected from the 2007-08 campaign had some gaps.</p> <p>- Access to email accounts was not equal among all staff which may have contributed to uneven coverage among professional categories.</p>

Example 28:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Maltezou et al. 2007 [28].</p> <p>- Factors influencing influenza vaccination rates among healthcare workers in Greek hospitals.</p> <p>- Greece.</p>	<p>Healthcare workers (HCWs) in public hospitals in Greece (healthcare workers were defined as anyone employed in a hospital with or without a healthcare occupation including permanent, casual, & contract staff).</p>	<p>A nationwide campaign by the Hellenic Centre for Disease Control and Prevention (HCDCP) involved sending influenza immunisation leaflets & educational materials with information on vaccination strategies to all Greek hospitals in an effort to increase influenza immunisation rates among HCWs.</p>	<p>Participants were 86765 HCW's from 132 Greek public hospitals (136 hospitals contacted, giving a response rate of 97%).</p>	<p>To describe the effect of the nationwide campaign on other factors that influence vaccine uptake among HCWs.</p>	<p>Before-after Study design using data from the previous season as pre-intervention data.</p>	-	<p>- Chi squared tests were used for comparison of groups.</p> <p>- Kruskal-Wallis used for continuous variables.</p> <p>- Logistic regression analysis used to identify risk factors for decreased vaccination uptake.</p>	<p>Vaccination uptake.</p>	<p>- Vaccination rate was 16.36% during the 2005-2006 influenza season, compared to a self-reported vaccination rate of 1.72% in the previous season 2004-2005 leading to a 9.5-fold increase in HCW vaccination.</p> <p>- Vaccination uptake in the 2005-2006 influenza season varied by HCW profession, type of hospital, size of hospital and by region of Greece.</p>	<p>- Authors acknowledged a limited budget for this campaign.</p> <p>- Hospital-associated influencing factors were identified which could inform future campaigns.</p>	<p>- Level of significance was not reported for main findings.</p> <p>- Data were self-reported but it is unclear as to how data were gathered and in what form.</p> <p>- Limited reporting on methodology and campaign communication activities.</p> <p>- Exposure to and direct impact of campaign materials is unknown.</p> <p>- Unclear description of pre-intervention situation.</p>

Example 29:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Dey et al. 2001 [29].</p> <p>- Promoting uptake of influenza vaccination among health care workers: a randomised controlled trial.</p> <p>- England - United Kingdom.</p>	<p>Healthcare workers (HCWs) in NHS nursing homes and in primary care.</p>	<p>- Intervention group were visited by public health nurse who raised awareness of campaign & emphasised the efficacy & safety of vaccination while also outlining possible side effects, & influence of influenza on absenteeism, as well as clarifying any misconceptions.</p> <p>- Promotional materials were also distributed by the nurses, informing HCW's where to avail of free vaccination.</p> <p>- The control group did not receive a visit.</p>	<p>- HCW's in primary health care teams (n=457 for intervention group & n=395 for control) and nursing homes (n=768 for intervention group & n=1364 for control) in Bury and Rochdale Health Authority.</p> <p>- Post-intervention survey (n=375).</p>	<p>To evaluate the effectiveness of an intervention designed to promote uptake of influenza vaccination in HCW in nursing homes and in primary care.</p>	<p>Cluster Randomised Controlled Trial.</p>	<p>Health Belief Model (HBM).</p>	<p>- Chi-square, adjusted for clustered randomisation.</p> <p>- Post intervention survey.</p>	<p>Vaccination uptake.</p>	<p>- No significant differences in vaccination uptake between intervention and control groups two months post intervention.</p> <p>- Authors concluded that the HBM was not an appropriate model when aiming to change HCW's behaviour regarding vaccination uptake.</p>	<p>- Health belief model was referenced as basis for campaign design however not in sufficient detail.</p> <p>- Good quality study design suitable to the aim of the evaluation.</p> <p>- Low rate of vaccination uptake led to authors' appraisal of attitudes to & knowledge of vaccination among a random sample of 375 HCW's 6 months post trial & had a response rate of 74%.</p> <p>- Over 90% were aware of seriousness of flu, that they were at risk & that vaccination was safe. 88% understood that vaccination was not totally effective.</p>	<p>- Success of the campaign was only measured by uptake of vaccination.</p> <p>- Unclear as to how control group were prevented from campaign message contamination.</p> <p>- No limitations acknowledged by the authors.</p> <p>- Reporting states that 'awareness was raised' by nurse's visit, however awareness was only measured post intervention.</p> <p>- Unclear relevance of additional post intervention survey.</p>

Example 30:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Leitmeyer et al. 2006 [30].</p> <p>- Influenza vaccination in German health care workers: Effects and findings after two rounds of a nationwide awareness campaign.</p> <p>- Germany.</p>	<p>Health care workers (HCWs) in hospitals in Germany.</p>	<p>- The campaign involved mass mailing to the medical services of all German hospitals, with information & training materials, such as a power-point presentation for on-site education, posters, handouts and text suggestions for employee mailings.</p> <p>- Additionally information about the campaign was published in the national public health bulletin & the German Medical Association journal.</p> <p>- Professional associations were contacted for their support.</p>	<p>20 hospitals participated in the study which yielded 396 returned questionnaires (50% response rate).</p>	<p>To conduct and evaluate a two year nationwide campaign to increase influenza vaccination among HCWs in Germany.</p>	<p>Not made explicit by authors but mixed methods were used including interrupted time-series study with a cross-sectional survey that incorporated formative research to inform campaign design.</p>	-	<p>- Anonymous self-administered questionnaire.</p> <p>- Epi Info version 6.0 was used for data management and analysis.</p>	<p>- Demographic characteristics.</p> <p>- Vaccination uptake in coming season (2003-04) and previous seasons (2001-02 & 2002-03).</p> <p>- Risk perceptions.</p> <p>- Beliefs about vaccine effectiveness.</p>	<p>- A national campaign is feasible with limited resources & it is possible to achieve positive results once motivation is present.</p> <p>- Vaccination coverage increased significantly between 2001-2003 among physicians only.</p> <p>- Physicians were also more likely to believe in the effectiveness of the vaccine and themselves at increased risk of influenza.</p> <p>- Perception to be at increased risk & trust in the vaccine were significantly associated with having converted from vaccine non-recipient to vaccine recipient over the study period.</p> <p>- Only HCW's who both believed in their risk & in high vaccine effectiveness had a significant increase in vaccination rate.</p>	<p>- Findings suggest that a certain level of desirable knowledge and attitude is vital in achieving increased rates.</p> <p>- The absolute increase in vaccination rates was only marginal.</p> <p>- Campaign development was informed by formative research carried out to determine self-reported reasons for receipt and non-receipt of influenza vaccine among HCWs.</p> <p>- Randomised systematic sample of 20 nursing & 20 physician staff obtained from alphabetical hospital staff lists.</p> <p>- May be first study to evaluate such a campaign on a nationwide level as opposed to one hospital.</p> <p>- Incorporated several outcome measures.</p>	<p>- Potential selection bias with regard to responding HCW's and participating hospitals.</p> <p>- Unable to make direct causal links between campaign activities and findings due to lack of control group measures.</p> <p>- Comparisons were made between hospitals who used the materials, in a campaign and in a routine vaccination programme, against those that did not use the materials at all. However, the extent to which materials were utilised across hospitals is unknown & therefore it is difficult to attribute causal links between activities & change in vaccination rates.</p> <p>- Self reported vaccination uptake.</p> <p>- Campaign exposure was not measured with regard to individual HCWs.</p>

Example 31:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Luthi et al. 2002 [31].</p> <p>- Evaluation of a population-based prevention program against influenza among Swiss elderly people.</p> <p>- Switzerland.</p>	<p>People aged 65 years or over living in Vaud Canton and staff of socio-medical institutions and services.</p>	<p>- Campaign aimed to improve the uptake and image of the vaccination within the target population, in particular awareness and knowledge regarding influenza and immunisation.</p> <p>- Campaign was a population based influenza prevention programme entitled, "<i>Un plus pour les SENIORS: la vaccination contre la grippe</i>".</p> <p>- Activities included information meetings among associations for the elderly & for the staff of socio-medical institutions & services.</p> <p>- Materials such as video, leaflets, brochures, articles in the lay press, a website & a press-conference were implemented and included use of a local TV-network.</p>	<p>- Two different stratified random samples of people aged 65 years and over in the Canton of Vaud, Switzerland.</p> <p>- Pre-intervention n =2933 (response rate 75.8%) Post-intervention n = 3098 (response rate 81%).</p> <p>- Total of 4007 surveys were sent out for each of the pre and post testing.</p>	<p>- To evaluate the impact of a population-based influenza prevention programme, implemented during autumn of 2000.</p> <p>- Secondary aims included:</p> <p>- To assess which sub-groups responded best to the programme.</p> <p>- To assess which campaign component had the most impact.</p> <p>- To assess which factors were predictors of vaccination coverage.</p>	<p>- Pre-intervention/post-intervention Study design.</p> <p>- Pre-intervention vaccination coverage survey carried out in summer of 2000, the programme was then rolled out in autumn of 2000, followed by a post-intervention survey in spring of 2001.</p>		<p>- Questionnaires (developed in collaboration with the regional health department and the Institute for Social and Preventative Medicine, University of Lausanne).</p> <p>- The two surveys differed slightly with the post-intervention survey including questions regarding the impact of the campaign.</p> <p>- Address files were used to obtain a random sample.</p> <p>- Univariate, bivariate and multivariate analysis was conducted using SAS software, and included chi-square tests and logistic regression.</p>	<p>- Vaccination uptake.</p> <p>- Awareness of promotional campaign.</p> <p>- Predictors of vaccination uptake such as frequency of physician visit or demographic characteristics.</p> <p>- Influences and motivations for vaccination uptake.</p> <p>- Reasons for vaccination refusal.</p> <p>- Means by which respondents heard about the programme.</p>	<p>- No significant increase in vaccination uptake from pre-intervention (58.0%) to post-intervention (58.4%).</p> <p>- A significant increase in vaccination uptake was observed in a sub-group aged 65-69 years.</p> <p>- Coverage was higher among those who had a home visit from a social worker, nurse or other family help (74.7%) compared to those who had not (55.4%).</p> <p>- 52.7% of all the respondents in the post-intervention survey were aware of the campaign.</p> <p>- The brochure, "La grippe se sert de vous", was the tool which had the most impact (28.7%).</p>	<p>- Large random sample.</p> <p>- This study went deeper in its assessment of the campaign effectiveness in attempting to identify why vaccination uptake is low within this age group and what could be done to improve it in future campaigns.</p> <p>- For example authors identified that the main source of motivation for vaccination was advice from a physician and the most important predicting factors for vaccination uptake were age and medical visits during the autumn.</p> <p>- This was one of the only studies to examine the impact of each campaign component.</p>	<p>- Pre-post-intervention design yields questionable reliability. (authors justify not choosing an experimental design with practical and ethical reasons).</p> <p>- Causal links cannot be established with this Study design.</p> <p>- Address file used led to some difficulties in that people younger than the age cut off were also contacted.</p> <p>- Sample was not representative of the Vaud population as it did not include people living in nursing homes.</p> <p>- Possibility of recall bias with this age group and general questionable reliability of self-reporting.</p> <p>- No theoretical basis or formative research to inform message development or dissemination or evaluation strategy.</p>

Example 32:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Malmvall et al. 2007 [32].</p> <p>- The Rate of Influenza Immunization to People Aged 65 Years and Older was Increased from 45% to 70% by a primary health care-based multi-professional approach.</p> <p>- Sweden.</p>	<p>People aged 65 or over, people in medical risk groups for influenza, and health care workers HCWs (general practitioners & nurses) in Jonkoping County, Sweden.</p>	<p>- Media campaign designed by marketing and public relations experts.</p> <p>- Used TV and newspaper advertisements; posters in waiting rooms & pharmacies; a web-based registry that allowed health centres to monitor their results; & performance feedback to primary health nurses.</p> <p>- Advertisements depicted an old-fashioned nurse advocating the importance of vaccination with both humour and anger.</p> <p>- Free vaccination for people aged 65 and over.</p> <p>- A multi-professional campaign team & annual education meetings in each of the county's 3 districts focusing on nurses in the primary healthcare organisation.</p>	<p>- 500 older adults were given a questionnaire during the 2002 season.</p> <p>- Formative research was conducted with only 15 older adults.</p>	<p>To report on the development and evaluation of a multifaceted campaign aiming to increase influenza immunisation coverage in people aged 65 years or over, and in medical risk groups.</p>	<p>Interrupted time-series with incorporated formative research to identify knowledge gaps within the target group before campaign development.</p>	-	<p>- Questionnaire .</p> <p>- Vaccination rate was calculated from the number of vaccinations on the official registry.</p>	<p>- Vaccination uptake.</p> <p>- Source of vaccination information.</p> <p>- Source of previous vaccinations.</p> <p>- Waiting time for vaccination.</p>	<p>- Vaccination rate in over 65s increased from 45% in 2001 to 70% in 2005.</p> <p>- Rates monitored over the 7 years for over 65s in were as follows: 1999: 39% 2000: 45% 2001: 52% 2002: 59% 2003: 66% 2004: 68% 2005: 70%.</p> <p>- Newspapers, TV and the county's house magazine were three powerful information channels in addition to word of mouth through relatives or friends.</p>	<p>- The system of registration of vaccinations led to an exact and safe figure of vaccination coverage as opposed to self-reported vaccinations in other studies.</p> <p>- Logistical issues were monitored through consultations with nursing staff, within the health centres and tackled appropriately.</p> <p>- Same campaign was run over the three seasons (2002-2004) while being monitored for inefficiencies.</p> <p>- At the end of 2005 the vaccination rate for this county was the highest in the country.</p> <p>- Same activities continued from 2005, but were reported here as part of a specific campaign.</p>	<p>- No limitations of the study were outlined by the authors.</p> <p>- No indication of significance was given for main finding (p-value).</p> <p>- Vaccination rate for 2001 and before were estimated from delivery records and their ratio to usage in the following years.</p> <p>- Response rate, data collection and analysis from questionnaire and formative research aspects were unclear in this reporting.</p> <p>- Data regarding vaccination uptake within medical risk groups is not reported here although it is part of the campaign aim.</p> <p>- No theoretical basis to inform message development or evaluation strategy.</p>

Example 33:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Porter et al. 2000 [33].</p> <p>- Role of Health Communications in Russia's Diphtheria Immunization Program.</p> <p>- The intervention was a collaborative Russian-American programme involving BASICS (Basic Support for Institutionalising Child Survival).</p> <p>- A project funded through the US Agency for International Development, the Russian Ministry of Health, & the former State Committee for Sanitary and Epidemiologic Surveillance.</p> <p>- Russia.</p>	<p>Adults, in particular those aged 40-59 years, the group most at risk for diphtheria mortality, and mothers in Novgorod City, Voronezh Oblast & Yekaterinburg city, Russia.</p>	<p>- The intervention took place in 1996 and activities were implemented by city/regional public health agencies.</p> <p>- Key messages were developed based on formative research and incorporated into a variety of media products, including, four TV and radio public service advertisements (PSAs); print advertisements, posters; leaflets & transit cards.</p> <p>- Three of the four PSAs focused on adult immunisation, & emphasised key messages, while the fourth PSA targeted mothers and focused on the timely completion of the full childhood immunisation schedule.</p> <p>- Other media products were created and used locally where regional teams worked with local media to generate news coverage & to get free placement for TV and radio PSAs.</p>	<p>- Vaccination coverage and campaign exposure was monitored in Novgorod and Voronezh.</p> <p>- For the case-control study element of the evaluation a random sample composed of 2 groups drawn from a population of 40-59 year olds in Novgorod city only.</p> <p>- The 2 groups consisted of: controls (those having received at least 1 dose of vaccine but not during intervention period) and cases (those having received 2nd & 3rd doses during the intervention period).</p> <p>- N=174 (87 controls & 87 cases).</p>	<p>- This paper reports on the development and evaluation elements of a Russian diphtheria communication intervention.</p> <p>- Novgorod tracking Study aimed:</p> <p>- To estimate diphtheria vaccination coverage rates immediately before & just after the 2-month period of more intensive communication activities.</p> <p>- To explore the relative importance of psychological & social factors that influenced the reception of 2nd or 3rd vaccine doses.</p> <p>- To assess the feasibility of a survey that could be implemented with minimal time and cost while still employing statistically rigorous sampling procedures.</p>	<p>- Multiple methods evaluation involving a two-phase design.</p> <p>- Phase 1: systematic review of vaccination records.</p> <p>- Phase 2: household surveys of controls and cases.</p> <p>- Information to guide programme design and assess performance came from both health information systems (HIS) & preliminary rapid and inexpensive studies such as: exploratory focus groups, quantitative communications tracking studies, rapid, semi-quantitative consumer surveys, and selective sampling employment.</p>		<p>- Information to assess performance was obtained from regional (HIS).</p> <p>- Diphtheria immunisation records were obtained at random from the city's Sanitary-Epidemiologic Station.</p> <p>- Systematic sampling of these records provided dose-specific coverage estimates for the period immediately before & after the core communication intervention.</p> <p>- Questionnaire (pre-tested with 2 focus groups)</p> <p>- Descriptive analysis.</p>	<p>- Vaccination uptake.</p> <p>- Campaign exposure.</p> <p>- Attitudes.</p> <p>- Social Norms.</p> <p>- Reasons for getting vaccinated.</p> <p>- Reasons for not getting the additional vaccine doses.</p> <p>- Qualitative measures within focus groups (not specified).</p>	<p>- First dose coverage rates of diphtheria immunisation in adults aged 40-59 years increased from 74.1% immediately before the intervention, to 76.2% just after the intervention.</p> <p>- Coverage rates for second dose increased from 21.3% to 22.7% in the same period, while coverage rates for third dose increased from 9.2% to 10.2%</p> <p>- Vaccination coverage appeared greater in the region of Voronezh (80% after period of intensified communication)</p> <p>- Case-control study found that people who had 2nd or 3rd vaccine doses during the intervention period were significantly more likely to have been exposed to the campaign than those who did not have 2nd or 3rd doses during the intervention period.</p> <p>- Lack of knowledge regarding need for 2nd & 3rd doses was most popular reason for not receiving additional doses.</p>	<p>- Key messages were developed based on formative research.</p> <p>- Higher coverage rates in Voronezh are partially explained by media activities and better placement of PSAs during popular TV soaps.</p> <p>- Those who were immunised were also significantly more likely to have been advised to do so by a doctor or nurse or required by their workplace.</p> <p>- Social norms, attitudes or beliefs did not explain differences in dose-specific vaccination status.</p> <p>- Campaign activities and intensity varied between regions.</p> <p>- Authors acknowledge the need to understand the order of events in health communication from message development to the desired action.</p>	<p>- The authors did not report levels of significance for main findings.</p> <p>- Reporting on evaluation of the campaign in the area of Voronezh is brief and unclear.</p> <p>- Difficulty in establishing causal pathways between Campaign activities and increase in vaccination rate.</p> <p>- Relatively small sample size for case-control study and unclear as to whether it is representative of Novgorod population.</p> <p>- Authors only briefly discuss the application of behavioural theories to the process of promoting vaccination.</p>

Example 34:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Looijmans et al. 2010 [34].</p> <p>- Effects of a multi-faceted program to increase influenza vaccine uptake among health care workers (HCWs) in nursing homes: A cluster randomised controlled trial.</p> <p>- The Netherlands.</p>	<p>Healthcare workers (HCWs) in 33 nursing homes in The Netherlands.</p>	<p>- A multi-faceted intervention program with three main components;</p> <p>- Outreach visit by the primary researcher where homes received a script of the program, all required materials including personal invitation letters for meetings, information leaflets, posters, reference to the website and background information.</p> <p>- Plenary 1 hour information meeting (twice in each home) by a specialised nurse of the local health centre (including discussion in small groups & video with role models).</p> <p>- Appointment of a local programme coordinator.</p> <p>- Control groups = usual programme.</p>	<p>- N=16 nursing homes in the intervention group and N=17 in the control group.</p> <p>- Total of 6 636 HCWs.</p>	<p>- To assess the effects of a systematically developed multi-faceted intervention program on influenza vaccine uptake among HCWs in nursing homes at cluster level.</p> <p>- Secondary aim was to explore whether compliance to certain programme elements influenced the outcome and estimated the programme costs in terms of time and money.</p>	<p>Cluster randomised controlled trial with nursing homes as the clustering variable.</p>	-	<p>- Prior to trial implementation, authors developed a 13-item multivariate prediction model of demographical, behavioural & organisational determinants of influenza vaccination uptake among this target group.</p> <p>- This informed the development of the multi-faceted intervention programme.</p> <p>- Analysis was conducted with SPSS for Windows version 15.0 and included generalised estimation equation analysis, adjusted relative risk (RR) & one-way ANOVA tests.</p>	<p>- Vaccination uptake (measured by individual registration on-site).</p> <p>- Baseline characteristics of participating nursing homes such as number of HCW's & patients, experience of previous influenza outbreak or presence of an influenza vaccination policy.</p> <p>- Compliance with elements of the implementation programme.</p> <p>- Cost of the implementation programme.</p>	<p>- 25% of all HCWs in the intervention group were vaccinated against influenza compared to 16% in the control group, yielding a significant difference of 9%.</p> <p>- A non-significant trend was seen towards higher vaccination rates if homes complied with more elements of the intervention ranging from 17% in control group to 48% when all 3 intervention elements were implemented.</p> <p>- Average cost of implementing the programme was calculated as €1421 per nursing home.</p>	<p>- Adequate sample size & good execution of a randomised design.</p> <p>- Variation in vaccination rates may be explained by varying programme compliance by nursing homes.</p> <p>- The 13-item multivariate prediction model was developed as a form of formative research which informed campaign development.</p> <p>- Baseline characteristics of intervention and control nursing homes were comparable with influenza vaccination rates in the previous year (2005).</p> <p>- There was a large variation in vaccination rates between individual nursing homes, with intervention home rates ranging from 6-81%, & control homes 0.4-36%.</p>	<p>- Only one home complied with all three recommended components of the programme.</p> <p>- The homes included in the study were already more active in promoting influenza vaccination for HCWs.</p> <p>- Therefore there is a possibility of selection bias.</p>

Example 35:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Sartor et al. 2004 [35].</p> <p>- Use of a mobile cart influenza programme for vaccination of hospital employees.</p> <p>- France.</p>	<p>Healthcare workers (HCWs) of a university hospital.</p>	<p>- In order to raise awareness of a mobile cart influenza vaccination unit, an information campaign was implemented.</p> <p>- This included articles published in the monthly infection control newspaper & delivered to each physician & unit of the hospital, announcements published in letters personally addressed to each physician & head nurse, posters located throughout the hospital, and additional education sessions for units with particularly low vaccination uptake.</p> <p>- Unvaccinated staff were educated about benefits of the vaccine, adverse reactions, the epidemiology of nosocomial influenza in the setting and the impact of the vaccination of HCWs on the patient health protection.</p>	<p>- All hospital workers (except for administration staff) of The Hopital de la Conception in France.</p> <p>- N=2300 (varies over each year).</p>	<p>To evaluate the impact of a mobile cart influenza vaccination programme on HCW vaccination rates.</p>	<p>Interrupted time-series Study design.</p>	-	<p>- Questionnaire.</p> <p>- Epi-Info software and Mantel-Haenszel test analysis.</p>	<p>- Vaccination uptake.</p> <p>- Other questions related to vaccination in the previous year, adverse reactions, and reasons for opposition to the vaccine.</p>	<p>- There was a significant increase in the overall HCW vaccination rate from 6% in 1998 and 7% in 1999 before the mobile cart to 32% in 2000, 35% in 2001, and 32% in 2002 after the programme was implemented.</p> <p>- The most common reason cited for opposition to vaccines in principle, was a feeling that the HCW will never contract influenza.</p> <p>- Vaccination rate of the chief or associate professor of the unit significantly increased the vaccination rate of the medical staff (leader effect).</p>	<p>- The employee health service annual vaccination campaign continued to run as normal during the intervention.</p> <p>- There was limited vaccination of employees due to sick days and vacation days.</p>	<p>- Detail of activities and impact of the annual vaccination campaign is unclear.</p> <p>- There was limited vaccination of employees due to leave.</p> <p>- The communication elements of the intervention were not assessed individually for their effectiveness.</p> <p>- Campaign exposure was not measured.</p> <p>- No theoretical basis or formative research to inform message development, dissemination or evaluation.</p>

Example 36:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Pittet et al. 2000 (36).</p> <p>- Effectiveness of a hospital-wide programme to improve compliance with hand hygiene.</p> <p>- Switzerland.</p>	<p>Healthcare workers (HCWs) in the University of Geneva Hospitals (UGH).</p>	<p>- The campaign aimed to improve hand-hygiene compliance among hospital HCWs focusing particularly on alcohol based hand disinfection.</p> <p>- It included A3 colour posters which focused on the importance of hand hygiene and which were displayed at 250 strategic locations in the hospital. Seventy different posters were produced on topics such as healthcare associated infections (HCAI), cross transmission & hand disinfection, with 3-5 copies displayed simultaneously throughout the hospital at any given time.</p> <p>- There was also increased availability of alcohol-based hand rub (ABHR) solution across the hospital & performance feedback.</p>	<p>- Healthcare workers in a teaching hospital in Geneva.</p> <p>- More than 20 000 opportunities for hand hygiene were observed.</p>	<p>To describe a programme which aimed to improve hand hygiene compliance among hospital HCWs, and report its effectiveness.</p>	<p>Time-series analysis including seven hospital-wide observational surveys conducted twice yearly from December 1994 to December 1997.</p>	-	<p>- Hand hygiene compliance and nosocomial infection rates were monitored by nurses.</p> <p>- Concordance among the observers was excellent; sensitivity to detect predetermined opportunities for hand hygiene averaged 98% & inter-rater reliability was high for all variables.</p> <p>- Statistical analysis was performed using chi-squared tests, logistic regression, & linear trend tests.</p> <p>- Performance feedback.</p>	<p>- Hand hygiene compliance.</p> <p>- Secondary outcome measures were; nosocomial infection rates; attack rates of metticillin-resistant Staphylococcus aureus (MRSA) and consumption of hand rub disinfectant.</p>	<p>- Hand hygiene compliance increased significantly from 48% before the campaign, to 66% three years after the start of the campaign.</p> <p>- Compliance improved significantly among nurses & assistants, but not among doctors.</p> <p>- Frequency of hand disinfection increased significantly, along with a rise in the volume of ABHR used.</p> <p>- Prevalence of HCAI decreased significantly over the same period, from 16.9% to 9.9%.</p>	<p>- The authors suggested that the difference in compliance rates between the professions may have been due to lower campaign awareness among doctors, however as campaign awareness was not measured, further study is needed to determine the real reasons for these differences.</p> <p>- Observers worked from a strict protocol and were as unobtrusive as possible.</p> <p>- The authors noted that although the study lacked a control group, the campaign was the only preventative measure applied during the study period, providing strong evidence that the reduction was as a direct result of the intervention.</p>	<p>- The authors acknowledged that the study findings may be context specific, noting that the lack of randomisation leads to its limited contribution to future campaigns in other healthcare institutions.</p> <p>- Also due to the multi-faceted nature of this campaign it is difficult to assess effectiveness of individual components such as various communication methods.</p> <p>- Potential observer bias and the Hawthorne effect should also be considered</p> <p>- No reporting of theoretical foundation to campaign.</p>

Example 37:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Vernaz et al. 2008 [37].</p> <p>- Temporal effects of antibiotic use and hand rub consumption on the incidence of MRSA and Clostridium difficile.</p> <p>- Switzerland.</p>	<p>Health care workers (HCWs) of The University of Geneva Hospitals (HUG), a 2200 bed primary & tertiary healthcare centre.</p>	<p>- In 2003 a programme called <i>VigiGerme</i> based on social marketing theory was initiated for the homogeneous implementation of standard & isolation precautions.</p> <p>- Followed by a second initiative in 2005 focusing on frequent and proper use of alcohol-based hand rub (ABHR), which was implemented as part of a Swiss national hand hygiene promotion campaign & the Global Patient Safety Challenge <i>'Clean care is safer care'</i>.</p>	<p>Monthly aggregated data for HUG was obtained through the pharmacy department from Feb 2000 to Sept 2006.</p>	<p>To determine the temporal relation between the use of antibiotics & alcohol-based hand rubs (ABHRs) & the incidence of methicillin-resistant Staphylococcus aureus (MRSA) & Clostridium difficile.</p>	<p>Interventional time-series analysis was performed to evaluate the impact of two promotional campaigns on the consumption of ABHRs & to assess their effect on the incidence of non-duplicate clinical isolates of MRSA and C. difficile from Feb 2000 to Sept 2006.</p>	-	<p>Analysis primarily used auto-aggressive integrated moving average (ARIMA) models using the Box-Jenkins method for analysis.</p>	<p>- Monthly aggregated defined daily dose (DDD) of antimicrobial drugs & normalised per 100 patient-days.</p> <p>- Monthly use of litres of ABHR were also collected & normalised per 100 patient-days.</p> <p>- Hospital occupation rate expressed as occupied beds per 100 patient-days.</p> <p>- Monthly aggregated data on MRSA incidence density (number of MRSA cultures per 100 patient-days).</p> <p>- C. difficile occurrence was monitored from equivalent monthly incidence data of laboratory-based surveillance.</p>	<p>- Consumption of ABHR correlated with MRSA, but not with C. difficile.</p> <p>- The final model demonstrated the immediate effect of the second hand hygiene promotion campaign.</p> <p>- An aggregate-level relation between the monthly MRSA incidence and the use of different antibiotic classes & increased ABHR consumption after a hand hygiene campaign was observed.</p> <p>- Increase in ABHR use was observed during the study period from 1.3 ltrs per 100 patient-days in 2001 to 2 ltrs per 100 patient-days in 2006.</p>	<p>- During the study period there was no institutional policy regarding antibiotic use at HUG.</p> <p>- Authors note that modelling drug use versus susceptibility relations is a useful tool for complementing traditional monitoring processes & epidemiological studies & also allows for external comparisons to be drawn with other institutes.</p>	<p>- No detail as regards campaign activities or the extent of the promotion.</p> <p>- Group-level analyses of aggregate data may be distorted by ecological bias.</p> <p>- DDD unit may not represent the true prescription data.</p> <p>- Monitoring of ABHR does not distinguish appropriate hand hygiene related to specific patient care indications or loss via spillage or theft.</p> <p>- Potential confounding from the implementation of MRSA control policies during the study period, thus it is not possible to attribute success solely to the campaigns.</p>

Example 38:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Creedon 2005 [38].</p> <p>- Healthcare workers' (HCWs) hand decontamination practices: compliance with recommended guidelines.</p> <p>- Ireland.</p>	Healthcare workers in a large urban teaching hospital in Ireland.	The programme aimed to predispose HCW to adopt hand hygiene behaviour (through poster campaign & educational leaflet), reinforce (feedback on pre-test results), & enable the behaviour (by provision of alcohol-based hand rub (ABHR) beside each patient bedside).	<p>- Healthcare workers in a large urban teaching hospital in Ireland.</p> <p>- Observation of behaviour (n=314).</p> <p>- Predisposition to compliance questionnaire, (n=62).</p>	To observe healthcare workers' compliance with hand hygiene guidelines, from a behavioural perspective, during patient care in an ICU in Ireland before & after implementation of a hand hygiene programme.	Quasi-experimental study design before and after study using a convenience sample.	The (PRECEDE) Predisposing, Reinforcing, Enabling Constructs in Educational Diagnosis and Evaluation Health Education Theory was used as the theoretical framework for the study.	<p>- Structured observation schedule-designed to capture observational data on hand-washing compliance.</p> <p>- Self-report questionnaire – designed to capture attitudes, beliefs, & knowledge regarding compliance with hand-washing guidelines.</p> <p>- SPSS & METLAB statistical packages were used for analysis.</p>	<p>- Hand hygiene compliance.</p> <p>- Knowledge, attitudes and beliefs to hand hygiene.</p>	<p>- The multi-faceted programme resulted in an overall improvement in hand hygiene guideline compliance from 51%-83%.</p> <p>- An increase in knowledge of hand-washing guidelines was also observed.</p> <p>- HCWs believed their skin condition improved during the campaign.</p>	<p>- Observer spent a week in the hospital prior to the study in order to familiarise himself to the HCW & minimise potential Hawthorne effect.</p> <p>- Content validity of both measurement instruments was determined thorough review of the literature, expert opinion, a pilot study. Cronbach's alpha tests also yielded high reliability.</p> <p>- Theoretical foundations contributed great strength to the structure and design of the campaign & its evaluation.</p> <p>- Contributes to the literature regarding the effectiveness of multi-strategy hospital-based programmes.</p> <p>- Campaign materials were developed from the existing literature.</p>	<p>- Lack of follow-on observational data, control group and limited time-frame all contribute to limitations as regards generalisability of findings.</p> <p>- Due to the multi-faceted nature of the campaign it is impossible to determine the individual effectiveness of each campaign component.</p> <p>- Limited reporting on development of poster campaign & educational leaflet.</p>

Example 39:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Gopal Rao et al. 2002 [39].</p> <p>- Marketing hand hygiene in hospitals- a case study.</p> <p>- United Kingdom.</p>	<p>Healthcare workers (HCWs) in University Hospital Lewisham (UHL).</p>	<p>- The intervention involved: offering a choice of hand decontamination products, including the introduction of a new alcohol-based hand rub (ABHR), which was made widely accessible & maintained in various suitable locations throughout the hospital.</p> <p>- Promotional materials, designed by the Infection Control Team (ICT), said to be original in their concepts & content including interactive educational materials such as a theatrical multidisciplinary 'grand round' presentation to a packed auditorium followed by a discussion.</p> <p>- The hospital Chief Executive wrote to all senior staff to emphasise the role of hand hygiene in preventing HCAI & the serious view he took toward it. He also formally empowered the ICT to oversee the programme implementation in the hospital.</p>	<p>- Healthcare workers in University Hospital Lewisham (UHL) over a twelve month period.</p> <p>- N=64 for the post-implementation survey (no detail given as to the sample size for the informal survey, formative research element).</p>	<p>To describe an experience of applying principles of societal marketing to promote hand hygiene in a teaching hospital in the UK.</p>	<p>Case study using an informal survey.</p>	<p>Intervention development was informed by principles of societal marketing.</p>	<p>Authors conducted an informal survey to inform the selection of an acceptable hand hygiene product.</p>	<p>- Preference of hand disinfectant products.</p> <p>- Incidence of <i>Clostridium difficile</i> associated diarrhoea (CDAD).</p> <p>- Incidence of <i>hospital-acquired methicillin-resistant Staphylococcus aureus</i> (HAMRSA) (average incidence rate was used in order to account for seasonal variations).</p>	<p>- There was a reduction in HAMRSA incidence from an average of nearly 50% before ABHR introduction to an average of 39% after.</p> <p>- There was a 17.4% reduction in the incidence of CDAD following the introduction of ABHR (not statistically significant).</p> <p>- The availability of hand rub by patient beds was 'widely supported' by hospital staff.</p> <p>- Alcohol-based hand rub ABHR was found consistently at the ends of more than 95% of hospital beds & ward entrances, 12 months post-implementation.</p> <p>- Authors estimated that the intervention had saved approximately £208,000 through the prevention of CDAD infections.</p>	<p>- SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was conducted at the outset.</p> <p>- This analysis allowed for the identification of specific contextual factors contributing to successes & failures of the existing strategy, in order to inform the development of a new hand hygiene strategy.</p> <p>- Formative research using an informal survey determined insights into HCW thoughts & beliefs regarding the products & their quality.</p> <p>- This study took broader influences into consideration such as product, price, promotion & place, in keeping with societal marketing theory.</p>	<p>- Authors stated that as a result of the intervention, there was a 'sustained change in attitude of HCWs towards hand hygiene', although this appears to be based on anecdotal evidence as hand hygiene compliance was not measured here.</p> <p>- Cost-effectiveness was merely estimated considering the cost of ABHR for the hospital and the potential cost of 52 CDAD infections to the health system.</p> <p>- This study does not allow for determination of the individual effectiveness of each campaign component.</p> <p>- The conclusion that application of societal marketing principles can be effective in promoting & sustaining hand hygiene is questionable given the lack of measurement of compliance or campaign exposure.</p>

Example 40:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Kumaranayake et al. 2004 [40].</p> <p>- The cost-effectiveness of HIV preventative measures among injecting drug users in Svetlogorsk, Belarus</p> <p>- Belarus.</p>	<p>Injecting Drug Users (IDUs) in the small town of Svetlogorsk with a population of 75,000.</p>	<p>- Starting in 1997 the prevention project involved multiple elements including activities such as: distribution of syringes, condoms, information, education and communication (IEC) materials related to HIV prevention & harm reduction at two syringe exchange points (SEP's).</p> <p>- Volunteers were also recruited to carry out outreach activities with IDUs and newspapers, radio, and TV were used to inform the Svetlogorsk population about HIV/AIDS & risks surrounding intravenous drug use.</p>	<p>565 IDUs in the small town of Svetlogorsk.</p>	<p>To conduct a cost-effectiveness analysis of a harm reduction & HIV prevention project for IDU's in Eastern Europe.</p>	<p>Retrospective cost-effectiveness analysis with an additional behavioural cohort survey (pre-test-post-test).</p>	-	<p>- Estimates of the intervention impact on sexual & drug injecting behaviour were obtained from existing pre- & post-intervention behavioural surveys of IDUs.</p> <p>- Dynamic mathematical modelling (used to translate any changes into estimates of HIV infections averted among IDUs & their sexual partners).</p> <p>- Sensitivity analysis.</p> <p>- Behavioural surveys were also conducted in 1997 and again in 1999.</p>	<p>- Financial & economic costs of implementing the project were analysed.</p> <p>- Estimates of the intervention impact on sexual & drug injecting behaviour.</p> <p>- HIV infections averted.</p>	<p>- The intervention averted 176 HIV with a cost-effectiveness of \$359 per HIV infection averted. Without the \$2311 reduction (7%) in financing, the estimated cost-effectiveness ratio of the project would have been 11% or lower. Authors conclude that harm reduction activities among IDUs can be cost-effective, even when IDU HIV prevalence & incidence is high.</p> <p>- Relatively small gaps in programme funding can reduce impact/cost-effectiveness.</p> <p>- A significant decrease in IDU risk behaviour was observed from behavioural surveys estimating risk behaviour such as needle sharing.</p>	<p>- Projections of the potential effect of the shortfall in funding on the impact and cost-effectiveness of the intervention were made.</p> <p>- The costing methods used to measure donated mass media can influence cost & cost-effectiveness estimates.</p> <p>- Behavioural surveys also found significant reductions in percentage of IDUs injecting for less than a year, suggesting that the campaign may have had an impact on the number of people initiating the risk behaviour.</p> <p>- Documented a list of cost categories & amounts in table form.</p>	<p>- The limitations of this study are reflected in the constraints of using routinely collected data to undertake a cost-effectiveness analysis of a non-research-focused intervention, and also in the challenges associated with estimating impact on an infectious disease.</p> <p>- The reduction in those initiating injecting may also be a result of police pressure.</p>

Example 41:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<ul style="list-style-type: none"> - Goossens et al., (2006) [41]. - National campaigns to improve antibiotic use. - Belgium. 	Belgium: the public and prescribers.	<ul style="list-style-type: none"> - Nationwide: 3 successive, 3 month campaigns promoting rational use of antibiotics to the public through: television, radio, posters, brochures information folders. - To prescribers through personel letters and campaign materials. 	<ul style="list-style-type: none"> - General public representing the national population in relation to: age, socioeconomic profile, region and habitat (n=1,014 in 2000 and n= 1.015 in 2001). - Prescribers of antibiotics (n+400 in 2001 and 2002). 	<ul style="list-style-type: none"> - To evaluate the impact of national level mass media campaigns in two countries aimed at reducing antibiotic use. 	<ul style="list-style-type: none"> - Pre and post campaign survey of the public. - Post campaign survey of prescribers. - Cost effectiveness analysis. 	No reference to a theoretical foundation.	<ul style="list-style-type: none"> - Face to face interviews with the public. - Survey of prescribers. 	<ul style="list-style-type: none"> - Campaign recall and awareness, for public and prescribers. - Reimbursement data on antibiotic use. - Antibiotic sales. 	<ul style="list-style-type: none"> - 46% of the public remembered the campaign. - The 1st campaign had high visibility to GP's. - Public expectations for antibiotics were reduced. 	<ul style="list-style-type: none"> - Antibiotic rates identified as high in both Belgium and France and so impact of media campaigns considered. - Potential unintended effects recognised. 	<ul style="list-style-type: none"> - Alternative explanations for reduction in antibiotic use provided such as: reduction in those with respiratory infections presenting to GP indicating lack of control of confounders acknowledged by the authors. - Design limitations identified by the authors.
<ul style="list-style-type: none"> - France. 	France: the public and prescribers.	<ul style="list-style-type: none"> - Nationwide: - Public: Written materials and television advertisements. - Prescribers: in community: academic detailing, peer to peer visits, promotion of specific rapid tests for sore throat. In hospitals: stricter policies implemented re antibiotic use. 	<ul style="list-style-type: none"> - General public opinion polls. No detail of sample or size. - GP's. 		<ul style="list-style-type: none"> - No detail provided. 		<ul style="list-style-type: none"> - Opinion polls and prescribing rates. 	<ul style="list-style-type: none"> - Antibiotic use. 	<ul style="list-style-type: none"> - 13% reduction in antibiotic use in France. - Change in public knowledge of antibiotic use. 		

Example 42:

Authors, title of study, year & country	Campaign target audience	Campaign activities	Study sample	Study aim	Study design	Theory base	Tools utilised	Outcomes measured	Main findings	Significance	Limitations
<p>- Lambert et al., (2007) [42].</p> <p>- Can mass media campaigns change antimicrobial prescribing? A regional evaluation study.</p> <p>- England.</p>	Public in North East England	<p>- Two sequential mass media campaigns promoting appropriate use of antimicrobials using a cartoon character.</p> <p>- Channels included: local radio, posters, leaflets, posters and TV.</p>	General population in one geographical region of England.	Evaluation of the application of a regional mass media campaign aimed at reducing antimicrobial prescribing.	<p>- Retrospective controlled before – after study.</p> <p>- Survey of primary care organisations to identify all interventions aimed to impact on antimicrobial use.</p>	No reference to a theoretical foundation.	Prescribing rates.	Prescribing rates, for all microbial agents for the study population corrected for population structure.	There were 21.7 fewer items prescribed per 1000 population (P<0.0005) in the intervention group equivalent to a 5.8% reduction in prescribing.	The importance of contextual factors such as adjuvant interventions is recognised but the study was unable to control for this due to a lack of reporting.	Incomplete reporting of adjuvant interventions means attributing cause and effect to the mass media campaign is difficult.

References - Appendix 2

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Appendix 3. Examples of reviews of evaluations of health communication campaigns

Example 1:

Authors & title	Country & target audience	Study aims	Study design	Tools utilised	Outcomes measured	Findings	Conclusion/ recommendation	Limitations found in studies examined
<p>- Vidanapathirana et al. 2005 [1].</p> <p>- 'Mass media interventions for promoting HIV testing (Review)'.</p>	<p>- Included 7 UK studies (only 1 of which was post 2000).</p> <p>- Interventions targeting general public as well as specific target groups were included.</p>	To assess the effect of mass media interventions in relation to changes in HIV testing.	Systematic review of randomised controlled trials (RCTs), controlled clinical trials (CCT's) & interrupted time-series analyses (ITS).	Individual ITS' were reanalysed using the Prais-Winstein method to avoid statistical heterogeneity.	<p>- Primary outcome measure was the change in the rate of persons tested for HIV in the general population or the specific target population.</p> <p>- Also looked at changes in HIV seropositive prevalence status of same populations.</p>	<p>Although there was evidence of significant immediate and overall effect, no long term effects were found from the studies analysed.</p>	<p>- Further research is necessary to assess effectiveness of various types of interventions, cost-effectiveness, and message characteristics.</p> <p>- Meta analysis of ITS needs to be further investigated.</p>	<p>- Comparison between different types of mass media could not be performed due to insufficient data.</p> <p>- No studies reported cost-effectiveness.</p> <p>- Method used to reanalyse ITS neglects the rigorous assessment of the quality of regression parameter estimates.</p>

Example 2:

Authors & title	Country & target audience	Study aims	Study design	Tools utilised	Outcomes measured	Findings	Conclusion/ recommendation	Limitations found in studies examined
<p>- Wei et al. 2011 [2].</p> <p>- 'Social marketing interventions to increase HIV/STI testing uptake among men who have sex with men and male-to-female transgender women (Review)'.</p>	<p>- Studies were conducted in the UK, Australia and the USA.</p> <p>- Men who have sex with men and transgender women.</p>	To assess the impact of social marketing interventions on HIV/STI testing uptake among men who have sex with men and transgender women compared to pre-intervention or control group testing uptake in the same population.	Systematic review including three serial cross-sectional pre-test, post-test study designs (1 with a control group & 2 without).	<p>- Meta-analyses were performed to compare pre- & post-intervention & intervention and control group outcomes.</p> <p>- Statistical pooling was conducted for 2 studies.</p>	<p>- Primary outcome measured HIV infection rates, compared to those within the control or pre-intervention group.</p> <p>- Secondary outcomes included STI infection & quality of life which were also compared with control or pre-intervention group.</p>	<p>- Low quality evidence that multi-media social marketing campaigns can be effective in increasing HIV testing uptake among MSM.</p> <p>- However, the campaigns were not found to be effective in increasing STI testing uptake.</p>	<p>- Future evaluation studies of social marketing interventions for MSM should adopt more rigorous Study designs & also aim to incorporate long term impact evaluation.</p> <p>- Detailed implementation and process evaluation is vital to identify the most effective elements of the intervention.</p>	<p>- Within the studies reviewed, risk of bias was high and quality of evidence was low.</p> <p>- No RCTs or CCTs were identified for this review.</p> <p>- Unable to assess effect of social marketing interventions on HIV prevalence or incidence as no studies measured biological outcomes.</p>

Example 3:

Authors & title	Country & target audience	Study aims	Study design	Tools utilised	Outcomes measured	Findings	Conclusion/ recommendation	Limitations found in studies examined
<p>- Huttner et al. 2010 [3]</p> <p>- Characteristics and outcomes of public campaigns aimed at improving the use of antibiotics in outpatients in high-income countries.</p>	<p>- The campaigns focused on respiratory tract infections and were targeted towards a range of populations including one or a combination of the following: general public, parents of young children, older adults, lower socioeconomic classes, healthcare professionals, paediatricians or pharmacists.</p> <p>- 16 campaigns were conducted in Europe, 3 in North America, 2 in Oceania, and 1 in Israel.</p>	<p>To identify and review the characteristics and outcomes of twenty two campaigns aimed at improving use of antibiotics in outpatients, conducted at a national or regional level in high-income countries between 1997-2007.</p>	<p>Literature review using a comprehensive search strategy and structured interviews.</p>	<p>- The majority of data obtained for this review was gathered directly from those involved in the campaigns, due to the lack of documentation of campaign characteristics and outcomes in scientific journal articles. This method, however, brings potential biases and thus a systematic review of the data was not possible here.</p> <p>- Surveys were generally used among the campaigns to assess public & professional knowledge & attitudes.</p>	<p>- Characteristics of the campaigns were examined including: the organisation of the campaign, infections and populations targeted, messages delivered, methods of message deliver and channels used.</p> <p>- Where evaluations had been carried out the following outcomes were examined: - Knowledge and attitudes of the public. - Professional knowledge and perceived patient demand. - Use of antibiotics by outpatients. - Resistance to antimicrobial drugs. - Potential adverse effects of reducing prescribing. - Cost-benefit.</p>	<p>- Campaigns promoting appropriate antibiotic use in high-income countries vary greatly in many characteristics from simple low cost internet campaigns to expensive mass-media campaigns.</p> <p>- The most consistent data for a reduction effect was found in Belgium (where a 36% reduction in antibiotic prescribing was observed between 1999-2000 and 2006-07) and France (where a 26.5% reduction was observed between 2002-2007 when compared with a pre-intervention phase 2000-02).</p> <p>- Although formal cost-benefit analyses were not present, the authors found through personal communication that the French & Belgian national campaigns were associated with cost savings of €850 million and €70 million respectively.</p> <p>- Authors found incomplete evaluation of effects on: knowledge, attitudes & behaviours of patients & prescribers, on use of & resistance to antibiotics & on possible adverse outcomes of a reduction in rates of prescribing antibiotics.</p>	<p>- Although lacking in methodologically sound effectiveness studies, present findings would suggest a positive effect on use of antibiotics, the most significant of which appears to come from the campaigns that are multifaceted & repeated over several years.</p> <p>- Due to multiple potential confounding factors & poor availability of data, the effect of these campaigns on bacterial resistance to antimicrobial drugs cannot be accurately assessed at present, therefore further research is required.</p> <p>- The heterogeneity of culture, health-care systems, consumption of & resistance to antibiotics across high- income countries most likely warrants a country specific approach using evidence relating to social marketing.</p> <p>- Authors recommend future research to: - Evaluate alternative indicators for measuring antibiotic outpatient use; - Consider potential confounding factors or unintended effects; - Explore cost-effectiveness in the context of competing public health issues.</p>	<p>- The multifaceted nature of these campaigns makes it difficult to establish cause and effect of individual activities thus it is unclear to what degree the positive effect on antibiotic prescribing is due to a change in physician or patient behaviour or both.</p> <p>- This review only included campaigns in high-income countries, justifying so by the variation in healthcare between these and low-to-middle income countries.</p> <p>- Publication bias cannot be ruled out here although the authors did look beyond published articles for data. - Authors note that even the published studies appeared to lack descriptive detail regarding the campaign and its implementation.</p> <p>- Information provided around costs varied greatly in quantities, estimates and what was counted as cost.</p> <p>- Authors were unable to obtain information regarding the theoretical background of campaign development.</p>

Example 4:

Authors & title	Country & target audience	Study aims	Study design	Tools utilised	Outcomes measured	Findings	Conclusion/ recommendation	Limitations found in studies examined
<p>- Naranbhai V, et al. 2011 [4].</p> <p>- Interventions to modify sexual risk behaviours for preventing HIV in homeless youth.</p>	<p>- Studies identified all from USA.</p> <p>- Interventions targeted at homeless youth (12-24 years).</p>	<p>To evaluate and summarise the effectiveness of interventions aimed at modifying sexual risk behaviours and preventing transmission of HIV.</p>	<p>Systematic review which identified 3 RCTs.</p>	<p>Due to the variation between the studies identified estimation of summary effect measures could not be undertaken.</p>	<p>These varied by study but included: self-reported measures of sexual risk behaviour.</p>	<p>The interventions individually reported some changes in sexual risk behaviour but the review identified that these results should be viewed with caution.</p>	<p>The authors concluded that the body of evidence is inadequate to draw conclusions and more research is required.</p>	<p>- Risk of bias was assessed as high for each of the studies. This was identified as due to attrition bias due to differential follow up rates in intervention and control groups.</p> <p>- Reporting bias was identified as a result of incomplete reporting of outcomes.</p> <p>- Outcome assessment was self-reported by unblended participants.</p> <p>- None of the trials reported primary (biological) outcomes.</p>

References – Appendix 3

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