An extensive literature review of the evaluation of HIV prevention programmes

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Abstract

This paper draws out and distils three key themes that have emerged from a substantial bibliographical review of a range of HIV intervention programmes, implemented throughout the world between years 1987 and 1995. Specifically, the paper assesses (1) to what extent intervention programmes have been tailored to meet the requirements and needs of specific target groups; (2) to what extent intervention programmes are supported by social and psychological theory of attitudinal and behavioural change, and also to what extent the results and findings from the interventions have amended existing theory; and, finally, (3) the range of methodologies employed in evaluating intervention programmes and also to what extent behavioural measures have been used in examining a programme's effectiveness. In light of these themes, the paper presents and discusses the principal factors thought to contribute towards the effectiveness of HIV intervention programmes.

Introduction

The spread of HIV (the virus leading to AIDS) is now widely acknowledged as a major public health issue facing many nations, both from the developed and less developed world. Consequently, a major task of public health professionals has been to devise an effective way of halting the spread of this life-threatening virus. Given the present lack of an effective means of killing or neutralizing the virus and the unavailability of a suitable vaccine, it is apparent that the strategy of prevention of HIV transmission through education and, where necessary, the modification of behaviours is clearly the most hopeful approach to the prevention of AIDS (Mays et al., 1989). Given the corresponding upsurge in such HIV prevention intervention programmes implemented globally, there has been a growing need to review the full range of evaluated programmes and to subsequently identify the key factors considered to contribute towards the effectiveness of such programmes. Essentially, HIV (behaviour-related) prevention raises similar programmatic and evaluation challenges to other related areas of health promotion. This review seeks to assess these programme developments in terms of selected key themes.

This paper is derived from a substantial bibliographical review of a range of intervention programmes implemented throughout the world between years 1987 and 1995 (Coleman and Ford, 1995). Essentially, this paper draws out and distils the key themes that have emerged from this review by assessing (1) to what extent intervention programmes have been tailored to meet the requirements and needs of specific target groups; (2) to what extent intervention programmes are supported by social and psychological theory of attitudinal and behavioural change, and also to what extent the results and findings from the interventions have amended existing theory; and (3) to assess the range of methodologies employed in evaluating intervention programmes and also to what extent behavioural measures have been used in examining a programme's effectiveness. In light of these key themes, the paper will then conclude with a detailed
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Synopsis of those factors contributing towards effective HIV intervention programmes.

Key themes

The tailoring of intervention programmes for specific target groups

The first steps in national prevention efforts that have addressed the HIV epidemic have almost universally been mass-media campaigns using mediums such as posters, leaflets, radio broadcasts, and television, newspaper and magazine advertisements to educate and inform the general public about the transmission and prevention of HIV. Whilst most mass-media campaigns implemented in the mid to late 1980s achieved this primary objective of alerting the general public to the potential spread of HIV (Mills et al., 1986; Lehmann et al., 1987; Population Reports, 1989; de Vroome et al., 1990; Schopper 1990), they often overlooked the urgent needs of those most at risk, often harder-to-reach groups. For example, Morlett et al. (1988) reported the evaluation of the Australian national educational programme on AIDS. The evaluation of the campaign coverage was measured from the number of calls received on the AIDS hotline at the Albion Street (AIDS) Centre in Sydney and also the number of HIV antibody testing requests at this centre. Given that the AIDS hotline receives over 70% of all national telephone enquiries about AIDS and that the centre is also the busiest HIV diagnostic and management service in Australia, it was argued that the results were a good representation of the national population. Given the 327% increase in telephone calls (comparing the first month of the campaign with the 7 month period before the campaign started) and also the marked increase in attendance at the HIV antibody testing centre, it was concluded that the campaign reached a significant proportion of the Sydney population. However, closer examination revealed that whilst anxiety levels had increased (in the form of the demand for information regarding HIV antibody testing), requests for information about HIV prevention, especially from younger persons, was noticeably limited. Also, the increase in requests for HIV antibody testing was largely demanded by heterosexual men and women who were not in contact with other groups at potentially greater risk. Therefore, this campaign was successful in terms of its coverage, but less so in reaching those in the population who most needed its assistance.

The health and educational services' response to the HIV/AIDS challenge has faced dilemmas regarding the focusing (and thus labelling) of certain groups considered to be at greater risk of infection than the general population. For instance, in the UK, early efforts were made to re-focus attention from 'risk groups' to 'risk behaviours'. Whilst laudable in terms of seeking to reduce HIV/AIDS-related stigmatization, some would argue that such a 'general population' emphasis has problematic resourcing implications. Thus more recently there has been calls for HIV educational resources to be re-focused to those specific groups (such as gay men, injecting drug users (IDUs) and commercial sex workers (CSWs)), which because of patterns of HIV prevalence, would be expected to be at greater risk (Small, 1994).

Findings from these mass-media campaigns have served to strengthen the need to focus HIV/AIDS prevention efforts to those groups who are expected to be of greater risk. Indeed, the shift in HIV prevention (e.g. in the UK) has been from promoting awareness that everyone is at risk in the mass-media programmes to reflecting the particular demands and requests of the minority groups by establishing target-group interventions. In short, the majority of HIV intervention programmes that have been reviewed have been tailored to suit the requirements of four dominant and distinctive groups: young people, homosexual/bisexual men, CSWs and IDUs.

Young people

This group presents researchers and policy makers with a unique chance to inform people about HIV before they embark on their sexual careers. This group is also characterized by persons experiencing more sexual encounters than in any other time of their life, as illustrated by national surveys of
sexual behaviour in the UK (Johnson et al., 1994) and the US (Kost and Forrest, 1992). There is resounding support for the more informal interventions such as peer education, drama workshops, role-plays and video-tapes (as opposed to the more formal approaches such as lectures held by health professionals), as the most effective means of promoting risk-reduction behaviours among young people (Solomon and Dejong, 1986; DiClemente et al., 1989; Ashworth et al., 1992; Jemmott et al., 1992; McEwan and Bhopal, 1992; Fennel, 1993; Hill, 1993; Walter and Vaughan, 1993; Kindeberg and Christensson 1994).

Of these more informal approaches, peer education programmes have been particularly effective in promoting positive changes in behaviours among young people (Newitt, 1990; Flux, 1991; Waldock, 1992; Costa, 1993; Svensson and Johnsson, 1993; Mathie and Ford, 1994; Mellanby et al., 1995). The apparent success of peer education programmes has been aided by the fact that young people are a relatively easy to reach group (given the nature of schooling and in contrast to other groups under review) and there have subsequently been few problems in recruiting volunteers to take part in such programmes. However, the suitability and applicability of peer education as an effective means of promoting behavioural change has also been widely utilized in the design of intervention programmes addressing other population subgroups.

**Homosexual/bisexual men**

These often represent a harder-to-reach group in comparison to young people, especially given the cultural stigmatization of homosexual behaviours. Although there have been resultant problems in recruiting peer educators (Dankmeijer, 1993), peer-led interventions have also proven to be equally effective in promoting risk-reduction behaviours among homosexual/bisexual men (Valdiserri et al., 1989; Kelly et al., 1991). Given their harder-to-reach nature, the review has shown the critical importance of researching the nature and extent of existing homosexual/bisexual sexual behaviours before implementing an intervention, so allowing the intervention to be appropriately designed and implemented in the most suitable locality (Kelly et al., 1991; Dankmeijer, 1993). This is also particularly relevant for CSWs (Wilson et al., 1990; Koetsawang and Ford, 1993; Stoller and Rutherford, 1993; Blakey and Frankland, 1994), as well as for IDUs and for those interventions implemented in the less known cultural settings of some developing countries. Although they are a harder-to-reach group than some young people, homosexual/bisexual men are similarly members of well organized groups and are usually characterized by socio-economic advantage in contrast to CSWs and IDUs.

**CSWs**

These are commonly reported as one of the hardest-to-reach groups for HIV prevention. This is often a product of the illegality of their profession (in some countries) and also since they are a very mobile section of the population, often moving seasonally and from year to year (Blakey and Frankland, 1994; Bolvary and Vaczi, 1994). In some cultures, however, CSWs are so established that it makes intervention programmes easier to initiate but more problematic to achieve the required levels of consistent condom use. In many societies, CSWs are more socio-economically disadvantaged in comparison to young people and homosexual/bisexual men, and this poses particular problems given the often reported cash bonuses provided for sexual intercourse without the use of a condom (Wilson et al., 1990; Blakey and Frankland, 1994). CSWs are further disadvantaged given the differing (unprotected) sexual behaviours often reported with clients as opposed to regular partners (Day et al., 1993; Green et al., 1993; Pickering et al., 1993; Ward et al., 1993) and also where commercial sex work is used to support an injecting drug using habit (Blakey and Frankland, 1994). Nonetheless, peer education approaches have proven to be equally effective as for young people and homosexual/bisexual men, and this has often been aided by the fact CSWs commonly
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operate in pairs or with friends and colleagues, some of whom may have first introduced them into the profession.

**IDUs**

These are especially worthy of target group intervention given the contrasting paths for HIV transmission for this group (sharing injecting equipment rather than through sexual intercourse). They probably represent the hardest of all groups to approach and are characterized by low levels of socioeconomic status. While most interventions have successfully promoted the cleaning or use of new needles only, often by introducing needle exchange schemes (Stimson et al., 1988; Hart et al., 1989; Dengeligi et al., 1990; Stephens et al., 1991; Calsyn et al., 1992), others have focused on breaking the habit of injecting drug use with particular reference to relapse-prevention strategies (McCusker et al., 1992; Baker et al., 1993).

**Others**

When examining the contrasting needs of different population sub-groups, not only does it support the need for tailored interventions, but it also becomes equally apparent that some groups have been relatively neglected as regards HIV intervention programmes. Other groups worthy of more research are therefore suggested as follows:

1. Prison inmates; given the incidence of homosexual behaviour as well as injecting drug use (Vernon et al., 1990; Kebede et al., 1991; Crane and Carswell 1992).
2. The minority of the population that report high frequencies of partner change and consistent non-use of condoms, as depicted by numerous regional sexual behaviour surveys (Bowie and Ford, 1989; Ford and Morgan, 1989; Ford, 1992; Ford, 1993; Coleman and Ford, 1993).
3. Gender issues and especially the thorough evaluation of those few programmes that have addressed women and HIV/AIDS (Norr et al., 1992; Schinke et al., 1992; Middlestadt, 1993; Quirk et al., 1993; Cash, 1994; Maticka-Tyndale et al., 1994).
4. The travelling community, both nationally and internationally, seasonally and more permanently, vocationally and holidaying, is an important but neglected in terms of rigorous evaluation of interventions (Eiser and Ford, 1995; Ford and Eiser, 1996).

**Support and amendment of existing social and psychological theory**

At the outset it can be stated that most of the numerous interventions reviewed have been informed in some manner by existing social and psychological theories of behaviour change. Providing people with the correct facts about HIV/AIDS in terms of its transmission and serious health consequences, in order to promote behavioural change, is clearly supported by aspects of the Theory of Reasoned Action (Fishbein and Ajzen, 1975) and the Health Belief Model (Rosenstock, 1974). In this manner it is assumed that knowledge leads to an intention to act which itself is manifested by the appropriate behaviour and so has formed the basis for most of the cognitive, 'information-giving' mass-media campaign of the 1980s (Mills et al., 1986; Lehmann et al., 1987; Morlet et al., 1988; Population Reports, 1989; Schopper, 1990; de Vroome et al., 1991), as well as the more formal approaches to education (often led by health professionals) addressing young people (DiClemente et al., 1989; Huzszi et al., 1989; Ashworth et al., 1992; Hill, 1993; Walter and Vaughan, 1993; Kindeberg and Christensson, 1994), homosexual/bisexual men (Kelly et al., 1991), CSWs (Ngugi et al., 1988; Stoller and Rutherford, 1989; Hill, 1993) and IDUs (Dengeligi et al., 1990; Stephens et al., 1991; Calsyn et al., 1992).

Those interventions including an additional component such as motivation development, behavioural and communication skills, and resistance to relapse, typical of the more informal educational approaches to young people (Solomon and DeJong, 1986; Jemmott et al., 1992; McEwan and Bhopal, 1992; Fennel, 1993; Hill, 1993) and IDUs (McCusker et al., 1992; Baker et al., 1993) are
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In this way, the reviewed intervention programmes have assisted in initiating and promoting the shift in theoretical research, relevant for HIV prevention and behavioural change, from the traditional, rational-based, individualistic approaches to those theories documenting normative and social group influences in addition to an array of attitudinal factors, to account for why a person's intention is often inconsistent with their resultant sexual behaviour.

However, the main point was to determine whether the programmes were designed from an explicit theoretical basis. Only a minority of the evaluated programmes reviewed started from an explicit reference to relevant psycho-social/preventive theory in their design. However, the minority which did explicitly indicate how the programmes were derived or related to underlying social scientific theory appeared to benefit in terms of the coherence and rationale of their set of design components. There was very little reference to interventions whose evaluation had led to the refinement or re-formulation of underlying psycho-social theory. However, there has been wide ranging support for a general acknowledgement of the limited value of purely cognitive, 'information-giving' approaches. The review suggests that there is much to be gained from collaboration between theoretically grounded researchers and those responsible for designing and evaluating programmes.

**Approaches to evaluation and the use of behavioural measures**

In light of the relatively recent and rapid global spread of HIV, programmes designed to educate and inform the public in face of what was initially perceived as an emergency were rapidly implemented. As a consequence, many of the early intervention programmes were (following recognition of the problem) implemented with limited planning and with no intention to evaluate their effectiveness (Padayachee, 1991). In order to ensure that programmes deliver information and education effectively and efficiently, the pressure
and need for evaluation components for such programmes has been mounting: it has been quite clear from the review that the inclusion of a formal evaluation component in already existing programmes not only helped direct such programmes most effectively, but has also been beneficial in the design and implementation of new and innovative interventions. For example, the use of formative evaluation has been commonly used in assessing the likely effectiveness of mass-media campaigns prior to their launch to the general public (Morlett et al., 1988; Evian et al., 1990; de Vroome et al., 1991). Quite often, posters, leaflets, advertisements, etc., used in mass-media appear notably different once viewed by the general public, in comparison to their first drafts: Hastings et al. (1987) documents the use of formative evaluation in the design of an AIDS-information leaflet produced by the Scottish Health Education Group (SHEG) as follows, ‘... the most fundamental lesson is the importance of consumer research in developing mass-media material. The third draft of the SHEG’s leaflet bears little resemblance to the first. The changes could not have been made without careful research, and without them the leaflet would not only have been ineffective but also counterproductive’ (p. 49).

In similar fashion to this ‘consumer research’ in the production of mass-media material, a consistent theme of those interventions tailored for specific population sub-groups has been the incorporation of the respective groups' views in the design of such interventions, which so often has determined their suitability and ultimately their success in promoting attitudinal and behavioural change. This was particularly apparent with respect to peer education strategies, where the most successful programmes had incorporated the views of the peer educators in the final design.

In order to assess the impact of an intervention, several of the reviewed studies examined the actual ‘numbers’ reached or contacted as a result of the programme. (Mills et al., 1986; Morlett et al., 1988; Newitt, 1990; Waldoock, 1992; Hill, 1993; Bolvary and Vaczi, 1994). Although satisfactory as an initial measure of the programmes’ effectiveness, this 'process evaluation' does not truly represent the impact of the programme upon the knowledge, beliefs, intentions and behaviours of the individuals that it served. Indeed, given the reported criticism of purely rational-based theories of health preventive behaviour that was touched upon previously, it appears that behavioural measures, be they number of sexual partners, frequency of condom use or frequency of needle sharing, are the most comprehensive way of examining a programme’s effectiveness. It is of some concern that only a minority of the intervention programmes reviewed have explicitly included behavioural measures as an indicator of a programme’s success (mass-media: Population Reports, 1989; Schopper 1990; interventions targeting young people: Newitt, 1990; Jemmott et al., 1992; Svenson and Johnsson, 1993; Walter and Vaughan, 1993; Mathie and Ford, 1994; homosexual/bisexual men: McKusick et al., 1985; Joseph et al., 1987; Martin, 1987; Becker and Joseph, 1988; Ekstrand and Coates, 1990; Kelly et al., 1991; CSWs: Ngugi et al., 1988; IDUs: Hart et al., 1989; Abdul-Quader et al., 1990; Guydish et al., 1990; Stephens et al., 1991; Calsyn et al., 1992; McCusker et al., 1992; Baker et al., 1993).

This inconsistent use of behavioural indices is somewhat a product of the methodology employed when evaluating the impact of an intervention programme. On the whole, most of the reviewed interventions have successfully and effectively utilized simple pre- and post-test interviews and self-administered questionnaires for both experimental and equivalent control groups. However, some interventions lend most emphasis toward pre- and immediate post-test designs, whereby the time between intervention and post-test is so short that it is impossible to record behavioural changes, and is rather more conducive to merely ascertain alterations in knowledge, beliefs and intentions. There is therefore a need for more follow-up at post-test, not only to record behavioural changes but also to test the sustainability of such changes, and in particular develop studies that follow population cohorts over a series of years. Such longitudinal designs have been utilized more extensively for those interventions addressing homosexual/bisexual men (McKusick et al., 1985; Joseph et al.,
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1987; Martin, 1987; Becker and Joseph, 1988; Ekstrand and Coates, 1990; Prout, 1992) and IDUs (Abdul-Quader et al., 1990; Guydish et al., 1990), in contrast to young people (Svenson and Johnsson, 1993; Mathie and Ford, 1994) and CSWs, for whom none of the reviewed studies had utilized a longitudinal design.

Having established the need for behavioural measures to accurately determine a programme’s effectiveness, an additional (and final) observation in light of the reviewed studies was with regard to actually ‘who’ was being evaluated and whether they were truly representative of the population to which the programme was directed. While most evaluation strategies assessed the impact upon those persons for whom the intervention was specifically and ultimately designed, this was not always the case. This notable exception was with regard to the numerous peer education strategies where the evaluation had focused mostly on the peer educators and only on a few occasions had actually comprehensively evaluated the impact of the intervention upon the wider audience for whom the peer education was ultimately designed (those peer education strategies targeting young people: Flux, 1991; Hill, 1993; Svenson and Johnsson, 1993; Mathie and Ford, 1994; and for homosexual bisexual men: Valdiserri et al., 1989).

The methodological limitations of many behavioural interventions for HIV/AIDS prevention have also been highlighted in another recently published review paper (Oakley et al., 1995). In their review of 68 separate outcome evaluation reports, Oakley et al. judged only 18 methodologically adequate. In particular they identified problems such as ‘lack of a control group or non-equivalent/unbalanced control groups, small sample sizes, failures to report pre-intervention measures, short follow-up, and high attrition rates’ (Oakley et al., 1995, p. 479).

Discussion and conclusion

Having discussed three key areas of interest in the review of numerous HIV preventive intervention programmes, this final section attempts to summarize what authors have consistently perceived as some of the principal factors contributing towards effective intervention programmes. It is intended that this synthesis will be of direct relevance to health policy planners and academic researchers alike. General factors are presented first and these are followed by those of relevance to specific programmes/population sub-groups.

General factors associated with the effectiveness of intervention programmes

- Intervention programmes should involve a significant pre-planning component to assess the nature and extent of relevant behaviours in the locality/groups prior to intervention implementation.
- Given the complexities surrounding the determinants of behaviour change, there is a need for more multifaceted prevention efforts focusing not only on the acquisition of knowledge but also on social skills, role-plays, communication techniques, assertiveness training and improvements in self-efficacy.
- Working with the community in a non-stigmatizing way is especially important when addressing harder-to-reach groups. Participation can be beneficial at different levels of involvement. For example, needle exchange schemes are a more effective means of promoting HIV harm-minimization behaviours than trying to reduce the extent of injecting drug use.
- Interventions approaching harder-to-reach groups should establish firm links with the local health care agencies to facilitate swift and efficient referrals.

HIV intervention programmes should now be incorporated within the broader spectrum of promoting ‘sexual health’, whereby strategies can be developed to tackle other sexually transmitted infections, family planning, pregnancy prevention and HIV.

Factors associated with the effectiveness of specific intervention programmes or population sub-groups

Mass media materials being formatively evaluated during their design are more likely to suit the specific social and cultural setting.
• Young people are more likely to respond positively to those educational efforts implemented in a less formal manner. For example, a group discussion or role-play exercises rather than a more formalized lecture.

• Young people are more likely to respond positively to those educational efforts implemented with an element of flexibility and humour rather than in an exclusively serious context.

• Peer education for all target groups and in all social and cultural contexts is a most effective HIV intervention strategy.

• Members of the relevant peer groups should be involved in designing the content and manner in which information should be conveyed.

• In the context of workshops held by youthful peer educators, a less formal environment (e.g. a youth club rather than a school) and single-sex groups are more conducive to open discussion.

• Taking more time to inform staff members and appropriate personnel about a proposed peer education project that is to be implemented in that locality/environment, e.g. via a series of meetings or videos, is an important determinant of such a project's success.

• Evaluation of peer education programmes needs to extend beyond the peer educators and towards its impact on the wider audience. At present most peer education reports have concentrated more on problematic methodological issues rather than the actual evaluation.

• Training CSWs to educate their peers is a successful means of promoting HIV risk-reduction behaviours, especially since CSWs often work in pairs or groups.

• There needs to be more research into clients' resistance to condom use during encounters with CSWs, and also into the sexual behaviours between CSWs and their regular partners in addition to their clients.

• The most successful needle exchange schemes are those that are located in areas with a high prevalence of injecting drug use, have ease of access, both physical and psychological, have staff who are non-judgmental and who have built up informal working relationships with clients.

When considering these 'principal factors' it is important to acknowledge not only the problems encountered in measuring behaviour change, but also the uncertainties common to all field experiments of attributing changes in attitude and behaviour exclusively to the intervention programme. Nonetheless, in light of the literature that has been reviewed, this paper is finalized by presenting what the authors consider to be the primary elements of a hypothesised 'ideal' evaluation strategy:

• Explicit theoretical grounding.

• Combines both process and outcome evaluation methodologies.

• Thorough pre-testing to assess the attitudes and behaviours prior to programme implementation.

• The use of equivalent control groups.

• Covers both cognitive and behavioural impacts of the intervention programme.

• Thorough evaluation of the programme is undertaken for all relevant persons including the audience, programme designers and educators and trainers (if applicable).

• Post-test analysis should include an examination of behaviours at a later date as well as directly after intervention (dependant on the type of intervention) to record behavioural changes.

• A longitudinal evaluation design to assess sustained changes over time.

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References

Some references listed here are not cited in this paper, but derive from the more detailed review by Coleman, L. M. and Ford, N. J. (1995)

drug users and sexual risk reduction in New York City. 

AIDS, 4, 1075–1079.


Aggleton, P. (1992) What have we all been doing—and have we been doing it right? AIDS Action, 16, 1–3.


adolescents—schools as agents of behaviours change. *Journal of the American Medical Association*, 270(6), 760–762.


Rosenstock, I. M. (1974) Historical origins of the health belief

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