Research Commentary

volume 3, issue 4
NOVEMBER 2008

Condoms and CFLs: Environmental Behavior Change Lessons from Public Health

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Population Action INTERNATIONAL

Climate Change and HIV/AIDS

In 2007, the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report recognized climate change as a global issue with the potential for catastrophic environmental effects. The report stated, "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea levels."[1] Likewise, by the late 1980s HIV/AIDS was identified as an undeniable pandemic that would affect all countries. The similarities between climate change and HIV/AIDS extend beyond the global nature of these issues, though. Both have complex etiologies, the scientific bases of which are difficult to translate to the general public, and neither is fully understood, even by experts in their respective fields. For example, the development of an HIV/AIDS vaccine continues to elude researchers largely because of an inability to understand the full extent of the virus's extreme genetic variability and rapid mutation and adaptation capacities.[2] Similarly, the unprecedented changes in climate that have occurred since the Industrial Revolution, and the conflation of human-based and natural drivers, prevent a definite attribution of climate change to any specific cause.[3] Lastly, neither climate change nor HIV/AIDS are visible threats on a day-to-day basis. Once infected with HIV/AIDS, an individual may remain symptom-free for up to 10 years, obscuring internal disease progression, while climate change is a result of greenhouse gas emissions compounded over many decades, with few noticeable daily effects.[4]

Overall, the connection between HIV/AIDS and environmental behavior change lies in the global nature and the sheer enormity of these issues, the complexity of behaviors needed to alleviate them, and the necessity of a multilevel approach for significant and sustained changes. Both HIV/AIDS and climate change require addressing sensitive behaviors – sexual behavior for HIV/AIDS and the global distribution of resources and consumption use for climate change – which may lead to issue avoidance. Further, behavior change related to HIV/AIDS and climate change involves the adoption of innovations intended to prevent future rather than immediate events. For example, the well known "ABCs" HIV prevention measures (Abstinence, Be faithful, Condom use) call for specific behavior changes to reduce the risk of future HIV infection, but offer few immediate benefits.[5] Actions taken to mitigate climate change impacts, similarly, will have no effect until at least 2030 due to the climate change processes already underway.[6]

HIV/AIDS and climate change also have parallels with regards to alleviation efforts. For climate change, mitigation (preventing further climate changes by reducing greenhouse gas emissions) and adaptation (implementing measures to deal with the already occurring changes) are both important strategies. Likewise, HIV/AIDS amelioration relies on prevention and treatment efforts. Moreover, for both of these issues, a combination of prevention/treatment or mitigation/adaptation is necessary in order to affect the most positive changes.[7,8] However, despite the proven successes of various HIV prevention programs around the world, long-term effects are difficult to achieve, and positive behavior changes often decline significantly after one year. Barriers to sustained prevention include the complexity of behaviors required (e.g., continuous use of condoms), underlying social norms (e.g., norms that support risk-taking behavior), and the physical environment (e.g., the availability and accessibility of resources needed for prevention). [9] Environmental behavior change strategies are threatened by the same set of barriers.

Addressing both climate change and HIV/AIDS requires changes at multiple levels from the daily decisions made by individuals, community beliefs and attitudes, and movements for policy change. Furthermore, global partnerships and collaboration are crucial for climate change and HIV/AIDS alleviation. Within the HIV/AIDS arena, efforts by the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the Global Fund to Fight AIDS, Tuberculosis and Malaria demonstrate international concern and commitment to HIV/AIDS. For climate change too, some steps have already been taken; For example, the Kyoto protocol (which entered into force in 2005) marked an international commitment to reducing greenhouse gas emissions by industrialized countries.[10] Kyoto's first commitment period is set to end in 2012 requiring a new framework to reduce global greenhouse gas emissions, and UNFCCC (United Nations Framework Convention on Climate Change) meetings in Bali in December 2007 culminated in an international agreement to define a global limit on emissions by December 2009.[11] These policy initiatives will need to be bolstered by actions taken by individuals and communities, and will necessarily involve significant behavior changes.

However, caution must be taken in evoking fear, a common tactic in behavior change strategies and one easily applied to global climate change. Lessons from HIV/AIDS behavior change communication demonstrate the harm in promoting fear without simultaneously providing information and alternative behaviors. Looking to public health, especially public health's response to HIV/AIDS, for help in promoting environmental behavior change represents a unique strategy with wide-reaching potential. Decades of public health research and practice in the area of health behavior have built an extensive base of behavior change theories. This paper explores ways in which public health behavior change strategies can inform environmental behavior change communication on individual, community, and policy levels. Specifically, examples of health behavior strategies frequently used in

HIV/AIDS literature are highlighted to draw parallels between HIV/AIDS prevention and climate change mitigation.

Behavior Change Communication Used in HIV/AIDS

Initial public health responses to HIV during the 1980s were directed at a poorly defined disease with a complex and unknown etiology. As a result, perceived high-risk groups, such as gay men and drug users, were blamed for the disease outbreak and individuals known to be infected were highly stigmatized.[12] Further exacerbating this situation was public health's dissemination of fear-based messages to prevent risk behaviors for disease transmission through threats of death. For example, a messaging scheme employing the Grim Reaper was used briefly in Australia in 1987, and included morbid graphics (**Figure 1**) as well as a video of the Grim Reaper mowing down victims.[13] Similarly, a 1980s era advertisement from Uganda illustrates the conflation of AIDS with death (**Figure 2**).[14]

Figure 1. © Australian Government Department of Health and Ageing

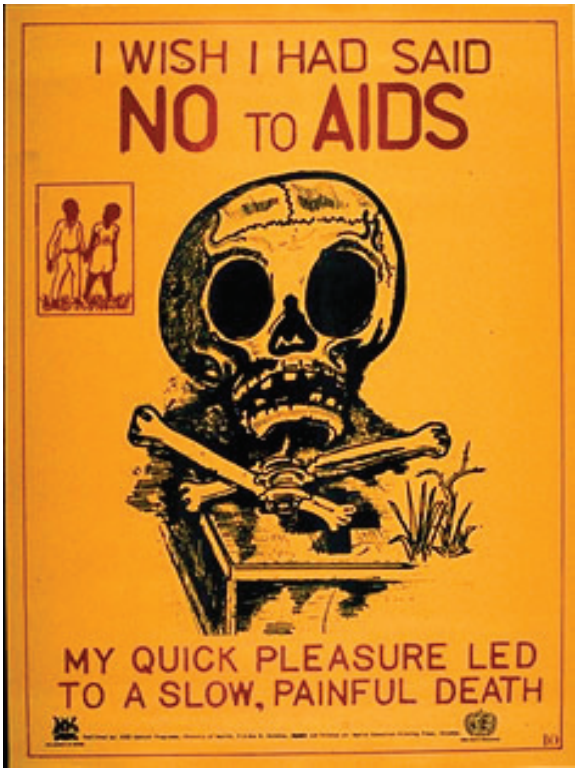

Figure 2. © Ugandan Ministry of Health

Both the Australian and Ugandan campaigns were intended to scare the public into safer behaviors and also to show that HIV was a non-discriminating killer (for example, the Australian Grim Reaper was shown terrorizing men, women, and children).[15,16] However, neither campaign provided information about HIV/AIDS nor suggested new behaviors effective in preventing HIV acquisition or transmission, and essentially only increased fear.[17] Various studies demonstrate that fear develops when individuals feel unable to respond to a perceived threat because they lack alternative behavioral responses.[18,19] Moreover,

critics of fear-based appeals assert that arousing fear without fostering awareness of protective behaviors, or providing accurate information, can be ineffective or even harmful to the target population.[20,21] Negative effects include provoking a feeling of helplessness, which results in continued high-risk behaviors or renders the audience insensitive to the intended message (threat avoidance).[22] Fear message researchers have generally concluded that fear-based appeals have inconsistent results at best and ultimately may have negative consequences.[23,24]

In addition, fear-based messaging may lead to attaching responsibility for the HIV/AIDS epidemic to certain high-risk groups, increasing the already widespread stigmatization of people living with HIV/AIDS. Perhaps most significantly, assigning culpability to some groups (e.g., men who have sex with men) obscures the need for broad-based involvement in prevention efforts, prevents acknowledgement of the severity of the disease, and promotes an "us" versus "them" mentality.[25] An interesting parallel is Public Health Service campaign images from the World War II era, warning against health threats such as sexually transmitted infections (STIs) and tuberculosis. These campaigns relied on dramatic posters compelling the American public to avoid "dangerous" behaviors. In particular, the STI messages utilized provocative women who embodied disease, effectively blaming STI prevalence on women and obscuring the role of male World War II soldiers in actual STI spread.[26]

Given the ineffectiveness of fear-based messages, public health practitioners working to prevent HIV/AIDS have moved towards attempts to understand why individuals enact or change certain behaviors, and then to provide strategies for effective behavior change.[27] Successful HIV/AIDS interventions, therefore, are often based on health behavior theories which inform skill and capacity building associated with disease prevention.[28] Several theories and strategies have been particularly useful in this respect, including the Health Belief Model, the Theory of Reasoned Action (and its extension, the Theory of Planned Behavior), and the Stages of Change Model at the individual level, Diffusion of Innovations Theory and Social Marketing at the community level, and structural interventions at the policy level. The next section briefly explains these strategies along with relevant examples from HIV/AIDS literature.

Individual-Level

The Health Belief Model (HBM) attempts to understand behavior as the interaction of five psychological constructs: perceived susceptibility; perceived severity; perceived benefits; perceived barriers; and self-efficacy. According to this model, a health promoting behavior will either be enacted or not based upon the degree to which an individual feels susceptible to a specific health threat, the level of severity attributed to the threat, the degree to which the behavior is believed to be beneficial in preventing or ameliorating the threat, the ease with which the behavior can be carried out, and lastly, an individual's

belief in his or her capacity to enact the behavior (a concept termed "self-efficacy").[29] The model assumes that behavior change will result from changes in these underlying health beliefs.[30] Within HIV/AIDS research, the HBM has been used most frequently to predict protective behaviors such as condom use. Self-efficacy to use condoms, perceived efficacy (of condoms), and barriers to condom use have been the constructs most predictive of actual behavior.[31,32,33]

Also commonly employed in HIV/AIDS communication are the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB), which explore the linkages between individual beliefs, attitudes, intentions, and behaviors. Within these two models, a behavior is predicted by an individual's intention to perform the behavior, positive or negative attitudes towards the behavior, behavioral beliefs (an individual's appraisal of the outcomes of the behavior), and normative beliefs (an individual's subjective evaluation of the social acceptability of the behavior). According to the TRA, behavioral intention is the most significant predictor of behavior. However, importantly, the predictive power of the TRA is based upon the premise that a behavior is under an individual's control.[34,35] To address behaviors under incomplete control, the Theory of Planned Behavior incorporates an additional construct, "perceived behavioral control," which is similar to self-efficacy.[36]

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The Theory of Reasoned Action and the Theory of Planned Behavior have both demonstrated effectiveness as predictors of condom use along with the HBM.[37] A study comparing the HBM and the TRA showed that the TRA better predicted men's consistent condom use due to its consideration of peer influence (termed the "normative beliefs construct").[38] Further, perceived behavioral control has been shown to be a significant factor in predicting condom use, supporting the TPB as a better model than the TRA in this context. The TPB has successfully predicted condom use behaviors among university students in the United States and South Africa.[39]

Finally, the Stages of Change Model assumes that behavior change proceeds through a discrete series of steps. The model includes five stages: precontemplation, not planning to perform a given behavior within the immediate future; contemplation, intending to enact a behavior in the near future and considering the costs and benefits of that specific behavior; preparation, planning to enact a behavior in the immediate future and creating a plan to do so; action, enacting behavior change; and maintenance, continuing a specific behavior for at least six months. Furthermore, additional constructs such as self-efficacy and "decisional balance" (the positive and negative aspects of performing a behavior) help explain and predict movement through the various stages.[40,41]

The Stages of Change Model is particularly useful for grouping individuals based on similar personal characteristics in relation to HIV preventive behaviors (e.g., level of current condom use). In this way interventions can be tailored to specific group needs. For example, in a study of adolescent sexual risk behaviors in the United States, youth were categorized into the Stages of Change Model based on both their intention to use and actual use of condoms. Initial differences between the groups included varying perceptions of positive and negative aspects of condom use (decisional balance), risk attitudes towards using condoms, perception of invulnerability to HIV, and number of friends who accept unsafe sexual behavior.[42]

Community-Level

Diffusion of Innovations Theory focuses on the process by which an innovation - defined as a new idea, behavior, or object - is adopted and spread throughout a given population.[43] This theory is predicated on the observation that initial uptake of a new innovation is not automatic. Diffusion of Innovations, therefore, seeks to identify the process through which new practices are effectively spread throughout a population, and identifies five steps: innovation development, dissemination, adoption, implementation, and maintenance. These stages represent the sequence of events by which an innovation is developed and produced, distributed to a population, received and used by that population, and sustained over the long run. The Diffusion of Innovations Theory also recognizes various categories of innovation adopters, from innovators and early adopters to more change-resistant groups or individuals termed laggards. Notably, innovators and early adopters of a new practice often influence the uptake of the innovation by others in their social network and facilitate the innovation's spread.[44,45] For HIV/AIDS, the two most important concepts from Diffusion of Innovations are raising awareness of the disease and its prevention, and identifying and employing opinion leaders – influential or respected community members – to change attitudes and behaviors.[46]

The STOP AIDS campaign among gay men in San Francisco during the 1980s provides an example of an effective use of Diffusion of Innovations Theory in HIV prevention. This program disseminated information on HIV risk and preventive measures (e.g., monogamy and condom use) through small group informational sessions. Early adopters began implementing the recommended prevention behaviors, which then spread throughout the gay community. The program also utilized opinion leaders, respected community figures endorsing the STOP AIDS program, to further the spread of knowledge and preventive behaviors. However, barriers to Diffusion of Innovations in HIV/AIDS prevention include issues such as the complexity of preventive behaviors (e.g., condom use), compatibility of the new innovation with preexisting social norms, advantages of adopting new behaviors, and importantly, the observable results of the new behavior.[47]

Social Marketing is the application of general marketing strategies to the promotion of healthy behaviors, attitudes, and health-related commodities (e.g., condoms), with the main objective of affecting voluntary changes in the behaviors of a target population.[48,49] This goal is achieved through mass media; information, education, and communication (IEC); subsidized prices for health goods; and commercial brand promotion. Furthermore, Social Marketing attempts to remove the barriers or costs preventing the enactment of a behavior (including product price and access to services). In terms of behavior change, Social Marketing seeks to portray health promoting behaviors as more attractive than alternative less-healthy options, and uses incentives and other benefits to promote these targeted behaviors.[50]

HIV/AIDS has been a focus of Social Marketing campaigns since the beginning of the epidemic. Social Marketing techniques, however, have also been used in negative and ineffective ways, such as the initial fear-based campaigns that used mass media to spread the AIDS equals death message (as demonstrated by the Grim Reaper campaign). More recent Social Marketing programs have recognized the need to provide accurate information as well as substitutes to risky behaviors.[51] The "100% Jeune" Social Marketing campaign in Cameroon provides an example of Social Marketing's capacity to successfully promote changes in the behaviors and attitudes of a large number of individuals. This program, which targeted adolescents, used both mass media and interpersonal communication methods to promote consistent condom use with sexual partners. Specific programmatic activities included peer education, radio programs, a specialty magazine, and promotion of condoms. The program successfully increased self-efficacy related to condom use and decreased barriers to use; including a decrease in shyness related to procuring a condom and increased knowledge of nearby condom vendors. Importantly, the "100% Jeune" program was based on a strong theoretical framework incorporating constructs from both the HBM and the TRA, including self-efficacy, perceived severity, perceived susceptibility, and perceived social support, demonstrating that Social Marketing strategies can also incorporate other theoretical models.[52]

Policy-Level

At the policy-level, structural interventions can be implemented to indirectly change individuals' behavior by directly changing the environment in which those behaviors occur. Structural interventions do not target specific behaviors, but rather enable safer behaviors by changing aspects of the environment. For example, one of the most effective health-related structural interventions in the United States was the enactment of seatbelt legislation in 1984. Mandatory seatbelt laws, requiring seatbelts to be worn in moving vehicles, significantly reduced traffic-related deaths.[53] Structural interventions frequently employ public policy to foster change; however, policy formation is predicated on stakeholder interests, value judgments, and ideological inputs which may present considerable barriers.[54]

Structural interventions related to HIV/AIDS include the implementation of harm reduction strategies for injecting drug users. Two such interventions are syringe exchange programs (SEPs) and safer injection facilities (SIFs). These interventions require policies removing barriers to syringe access; for example, in the United States, removing government restrictions on the acquisition of syringes without a prescription. SEPs are effective in reducing the risk of HIV transmission and other illnesses by ensuring that a new sterile syringe is available for each injection act, preventing sharing among users and needle reuse.[55,56] SIFs similarly provide sterile injecting equipment and also a safe and clean environment, with a nurse available to supervise the injection and provide emergency medical care.[57] Both interventions have been shown to increase safe-injecting practices, most importantly for HIV/AIDS, the use of a sterile syringe for each injection. SEPs have also been found to significantly reduce both the prevalence of sharing and reuse of syringes.[58,59]

Condom use also can be supported by structural interventions. For example, the "100% Condom Programme" implemented in Thailand during the 1990s was able to significantly increase condom use in sex work throughout the country. The program required all sex workers to use a condom with every client in every sex work establishment. Additionally, the program utilized Social Marketing to promote condoms through media, education, and public outreach measures targeted at specific groups, and also provided free condoms to sex work establishments.[60]

Implications for Environmental Behavior Change

Fostering environmental behavior change is an opening for the application of public health communication, and various theoretical constructs and strategies demonstrate the feasibility of deconstructing and predicting behaviors in order to develop effective behavior change strategies. Researchers have already recommended constructs from the HBM and TRA/TPB, such as self-efficacy and perceived benefits of behavior, for climate change communicators to improve public responses to mitigation messages.[61] A simple behavior, the replacement of standard light bulbs with compact fluorescent light bulbs (CFLs), provides an example of the ways behavior change communication can be integrated into environmental behavior change. On the individual level, promotion of CFLs focuses on direct individual benefits in terms of cost-effectiveness and reduced annual electricity expenditure. Energy Star states that the use of one CFL would save $30 or more in individual energy costs, while the use of one CFL in every American household would reduce annual energy costs by $600 million, and would reduce greenhouse gas emissions by the equivalent of 800,000 cars.[62] To expand the practice of this behavior, Social Marketing strategies would be particularly useful in informing the public about the benefits of CFLs, and providing access to these products. Furthermore, Diffusion of Innovations Theory would help in identifying opinion leaders and changing social norms related to light bulb use and

ultimately energy expenditure. At a policy level, incorporating CFLs into building regulations would be a potential structural intervention to decrease energy consumption by making an electricity-efficient product mandatory. Additionally, behavior promotion aligned with dominant cultural norms will be more effective in eliciting change. In the United States, the predominant cultural value of consumerism presents a significant barrier to climate change mitigation strategies which most often involve decreasing levels of consumption. Therefore, strategies that emphasize smarter consumption (e.g., substitution of a CFL for a standard bulb) rather than reduced consumption may be more effective in the United States context.[63]

In the United States, the predominant cultural value of consumerism presents a significant barrier to climate change mitigation strategies which most often involve decreasing levels of consumption.

Behavior change communication must also be tailored to specific targets. Engaging various groups with differing levels of climate change knowledge, environmental commitment, and capability to enact behavior changes, requires effective communication strategies aimed at specific group needs. For example, various geographic locations have differing greenhouse gas contributions as well as commitment to climate change mitigation activities. One study suggests that commitment to climate change mitigation is associated with civic capacity (measured by percentage of residents involved in environmental campaigns, number of nonprofit environmental organizations, and residents' level of education and income), and the amount of stress the area releases onto the environment (measured by the intensity of high carbon dioxide (CO_2) producing industry).[64] The study found that the cities least involved in CO_2 production are, conversely, those that have the highest civic engagement in climate change issues. Furthermore, heavy CO_2 producing areas are predominantly situated in geographic locations that will not be highly effected by negative climate change impacts (e.g., far away from coastal regions), which reduces the incentive to enact climate mitigation activities. Local governments therefore need to increase both awareness of the climate change issue and build civic capacity to deal with climate change effects.[65] However, policy makers may be disengaged from the climate change issue, just as local governments are, due to their geographic isolation from adverse impacts of environmental degradation, and the fact that climate change frequently takes a backseat to seemingly higher-priority economic and employment issues.[66,67] The Stages of Change Model would be helpful for classifying individuals and groups based on varying climate change knowledge, capacity, and commitment. For example, individuals with no intention of changing their light bulb choice within the near future require very different behavior change strategies than individuals who have just begun to "green" their behavior and need support to maintain this choice.

Moreover, as researchers have noted, "it is not enough for people to know about climate change in order to be engaged; they also need to care about it, be motivated, and able to take action."[68] One of the most significant barriers to behavior change is the perception that mitigation strategies will require drastic changes in individual lifestyles and will require considerable personal effort.[69] Therefore, behavior change communication should focus on behaviors that are perceived as easily achievable and personally important to the target audience. For example, a recycling study showed that ease of recycling was a significant determinant of attitude towards recycling, which subsequently was the most significant predictor of intention to recycle.[70] Additionally, a United States national household survey on feelings towards global warming identified using less energy, utilizing energy-efficient appliances, recycling, and using less gasoline as the actions respondents described as the most important for individual climate change mitigation.[71] Focusing behavior change communication on these types of behaviors has the potential to maximize the impact of behavioral messages.

Figure 3. © Greenpeace, 2004

Figure 4. © Greenpeace, 2004

Communicating the seriousness of climate change to the general public has also proven difficult; just as with HIV/AIDS, appeals based on fear have had inconsistent results.[72] Examples from mass media include the movie *The Day After Tomorrow* (2004) portraying catastrophic effects of global warming. Although the intent of the movie was entertainment, it also had the potential to impact public awareness of the climate issue.[73,74] Nevertheless, a study comparing viewers' perspectives on climate change before and after viewing the film showed that viewers were only marginally more concerned about catastrophic climate change after the movie. This may be a result of viewers questioning the likelihood of the events in the movie, undermining the credibility of the film's message and thus the need for concern. Additionally, even when concern was raised, viewers felt more removed from the climate change issue after the film, attributed

to "denial" and "disbelief" in the catastrophic environmental events shown. The authors state that, "people feel overwhelmed by shocking images and, although it heightens their concern, it also reduces their self-efficacy to take action and lessen these events through personal action."[75] Fatalism, or the perception that the magnitude of climate change is so great that mitigation efforts are futile, presents a significant barrier to public engagement in behavior change.[76]

Lastly, strengthening existing and future programs (both for HIV/AIDS and climate change) so that changes are maintained over time requires community involvement and strong political will in addition to individual commitment towards behavioral change. Both HIV/AIDS and climate change mitigation thus necessitate multilevel approaches that enable individuals, communities, and policy makers to take preventive actions without evoking fear. Environmental behavior change communication can utilize public health strategies at each level – individual, community, and policy – to create effective and sustainable interventions, and some reports of success in this type of integration have already been documented.[77, 78] Whether small-scale individual changes such as replacing standard light bulbs with CFLs, or large-scale changes such as implementing post-Kyoto commitments to reduce greenhouse gas emissions, public health behavior change communication can support the adoption and sustained performance of mitigation behaviors. The magnitude of the global climate change issue requires immediate action. Utilizing knowledge and best practices garnered from other fields, including public health, will strengthen the effectiveness and reach of current mitigation campaigns as well as inform future interventions.

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Notes

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