

# Convergence of behaviour change models for AIDS risk reduction in sub-Saharan Africa

Oluwole Odotolu\*

*Harvard School of Public Health, AIDS Prevention Initiative in Nigeria (APIN) 990,  
Nal Boulevard, Central Business District Abuja, Nigeria*

## SUMMARY

There is increasing programme focus on the impact of HIV and AIDS and the advances in biomedical research that are taking central stage even in sub-Saharan Africa. Perhaps out of frustration, communication and behaviour change efforts are receiving lesser attention. But as long as heterosexual intercourse remains the predominant means of transmission of HIV in sub-Saharan Africa, there is the inherent danger of more people getting infected thus mopping up the gains from other approaches. This paper therefore argues for evidence based behaviour change interventions in sub-Saharan Africa, revisits the behaviour change theories and their relevance to the African situation. It proposes an integration of models based on the convergence of three existing theories of social learning, diffusion of innovation and social networks and the author's understanding of some African culture. The beauty of the model is based on the fact that 'social norms are best understood and influenced at the level of social networks'; existing chains of communication and the naturalness of exchange of information. A case is made for application of the 'model' to precipitate sexual behaviour change and HIV reduction in sub-Saharan Africa. Copyright © 2005 John Wiley & Sons, Ltd.

**KEY WORDS:** social learning; social networks; behaviour change; HIV/AIDS; sub-Saharan Africa

## INTRODUCTION

Emphasis on HIV and AIDS programming in sub-Saharan Africa has shifted in the past few years to areas such as HIV/AIDS impact; mitigation of the impact on people infected and affected; increasing access to anti-retroviral therapy; AIDS vaccine trials and other advances in biomedical research. Similarly, voluntary counselling and testing (VCT) is being promoted over the traditional information, education and counselling strategy of promoting behaviour change (Painter, 2001). On the other hand, the infection rate is on the increase and, frustratingly, knowledge of HIV is high in most places in Africa but there is little evidence of behaviour change. Thus a vicious cycle of a growing number of new infections, larger burden of disease and worsening socio-economic conditions is being established. For example

\*Correspondence to: Dr O. Odotolu, Harvard School of Public Health, AIDS Prevention Initiative in Nigeria (APIN) 990, Nal Boulevard, Central Business District Abuja, Nigeria. E-mail: apin@cgiar.org

Contract/grant sponsor: Ford Foundation WA.

according to the UNAIDS (2002), 'sub-Saharan Africa is now home to 29.4 million people living with HIV/AIDS. Approximately 3.5 million new infections occurred there in 2002, while the epidemic claimed the lives of an estimated 2.4 million Africans in the past year. Ten million young people (aged 15–24) and almost 3 million children under 15 are living with HIV'. The figure for new infections is extremely high for comfort.

It is therefore imperative that we continue to strengthen our prevention efforts in the face of breakthroughs in other areas. Even while the best scenario for HIV/AIDS prevention and control is the availability of a safe and effective prophylactic vaccine, experts caution that other prevention efforts must still go along with the use of the vaccine in order to reduce infection drastically (Berkley, 2002). Hence there should be a return to the drawing board in order to reduce new infections in sub-Saharan Africa. Particularly important is learning from past experiences in communication and behaviour change to advance and aggregate new knowledge to promote sexual behavioural changes, such as delay the onset of sexual activity, correct and consistent condom use, reduction of sexual partners and mutual fidelity in sexual relationships.

In this light, Aggleton and Rivers (1996) assert that there is a growing need for a move towards an evidence-based HIV/AIDS related behaviour change programme. In effect intervention planners must consider how to demonstrate programme effectiveness particularly in observation, objectives-based evaluation or theory driven evaluation. Whether implicitly or explicitly most prevention interventions are based on theories, it is therefore necessary to evaluate these programmes in order to know how and in what ways they contribute to behaviour change. We also recognize that sexual behaviour is 'widely' diverse and deeply embedded in individual desires, social and cultural relationships and environmental and economic processes hence making the process of evaluation enormously complex.

Therefore this paper will review some communication and behaviour change models, their application in some interventions and the outcomes and their relevance to HIV/AIDS prevention and control in sub-Saharan Africa. In specific terms, it will examine the health belief model, theory of reasoned action, social learning theory, diffusion of innovation model, social network theory and AIDS risk reduction model. Three models (diffusion of innovation, social network and social learning theories) and their relevance to AIDS reduction in general and in particular to AIDS reduction among adolescents will be examined in greater detail in this review, together with their basic assumptions and acceptability. The paper lastly proposes an integration of these models to precipitate sexual behaviour change and HIV reduction in sub-Saharan Africa. The thrust of the proposed integrated model is to promote social network and community-level HIV prevention intervention realizing the futility of preventing an epidemic by changing behaviour piecemeal.

## HEALTH-RELATED BEHAVIOUR CHANGE THEORIES

Health related behaviour change models have been in existence long before the AIDS epidemic (Hochbaum, 1958). The list includes the health belief model, theory of reasoned actions, social learning theory etc. For the purpose of this paper some of

the theories will be reviewed with a view to identifying their relevance to AIDS risk reduction in sub-Saharan Africa. Particular attention will be paid to the assumptions that underlie these theories and models.

### *Health belief model*

The health belief model (HBM) is perhaps the most popular of the models. It was initially developed in the 1950s (Hochbaum, 1958). Becker (1974) used the theory to explain and predict behaviour in a health context. The model postulates that the likelihood of an individual engaging in a particular action is a function of his perception of the relationship between a behaviour and subsequent illness and it involves making a conscious effort to weigh the costs and benefits of his action or inaction. In explicit terms, the constructs of the model are perception of susceptibility; perception of severity of the illness; perceived benefits of taking a health action; perceived barriers to the action and cues to action. The HBM has been used to explain and predict individual participation in programmes concerning influenza inoculation, high blood pressure screening, smoking cessation, seat belt usage and breast examination. In a review of 46 studies, Janz and Becker (1984) argue that the most sensitive construct is the perceived benefit followed by the barriers to engaging in the preventive action. Although they conclude that behaviour change actually took place in the interventions, no one could actually say how the constructs worked together to bring about change. In a review of studies, Carmel (1991) concludes that the predictive power of HBM varies with different population groups and that it is difficult to generalize the findings.

Still opponents argue that the model is based on rationalist assumptions. Rationalists assume that direct personalized information about vulnerability should, when combined with information about preventive behaviours, induce behaviour change. The question arises 'Is man always rational'? HIV prevention has shown that man is not always rational, particularly on issues relating to sex and that rationality is a concept best understood by the individual at the point of decision making. As Gage (1998) remarks, the decision to have sex by a young girl in a developing country is not driven only by the fear of the consequences. In fact there may be positive motivations, such as the need for affection and establishing a strong personal relationship. Hence as far as she is concerned she is being rational.

One other notable issue raised by Carmel (1991) was that of social norms which was operationalized by researchers in his review as barriers or benefits in the HBM. The model did not even consider social norms at all thus underplaying the importance of the social environment in behaviour. Gage (1998) argues that the socio-cultural context has a strong influence on decision-making and Aggleton and Rivers (1996) argue that people do not behave in isolation from their particular social context including the normative environment. Definitely the social context in which behaviour takes place has a significant effect on the individual. As noted by Romer and Hornik (1992) the social context is the repository of social meanings and norms for behaviour, including sexual behaviour. Social meaning includes images and interpretations that groups attach to behaviour. Norms are the social expectations that groups maintain to define appropriate behaviour. For example social norms

may define 'a good woman' as being ignorant of sex or passive in sexual encounters (Balmer *et al.*, 1995) Therefore the inability of the HBM to make tangible provision for the social environment where behaviour takes place has created a gap concerning its application in Africa where traditions are held in high esteem.

A majority of other psychological theories fall within the same premise because they are based on the assumption of a linear relationship from information to knowledge and behaviour change. The theory of reasoned action (Ajzen and Fishbein, 1980; Fishbein *et al.*, 1994; Bosompra, 2001) provides a framework for linking individual beliefs, attitudes, intentions and behaviour. Intention is noted to be affected by an individual's attitude (perceived outcomes and evaluation of those outcomes). In summary, 'information is necessary but is not sufficient to effect and sustain behaviour change in large segments of the population'.

### SOCIAL COGNITIVE OR -LEARNING THEORY

On the other end of the spectrum are groups of theories based on social learning and the social learning theory has been the most prominent in the group. Self-efficacy is the cornerstone of the social learning theory. However, the theory 'actually postulates a triadic, reciprocal interaction between the social environment, personal factors and behaviour itself to determine and predict future behavior' (Mellanby *et al.*, 1996). Bandura (1977, 1994) defines self-efficacy as people's beliefs that they can exert control over their own motivations, thought processes, emotional states and pattern of behaviour. Studies have linked self-efficacy to health promoting and health impairing behaviour. Positive self-efficacy gives assurance and confidence and promotes positive behaviour. For example perceived self-efficacy to buy and use condoms correctly predicts safer sex in adolescents (Jemmott *et al.*, 1992).

The theory compensates for some of the failings of the HBM particularly in giving better recognition to the social environment in which behaviour takes place. Conceptually the theory is sound and there is empirical evidence to support the theory up to the level of estimating biological responses in form of the catecholamines. (Bandura, 1994).

Walter *et al.* (1992) applied the social learning theory to assess factors associated with AIDS risk behaviour among adolescents in an AIDS epicentre in New York (59.2% of the subjects were black). The survey was through questionnaires. The dependent variable was AIDS risk behaviour and the independent variables were the constructs of the theory. The background variables were age, gender, race/ethnicity and school attended. Norms, values and self-efficacy were significantly associated with higher-risk behaviour.

Santelli *et al.* (1996) tested, among other models, the social learning theory in the AIDS Community Demonstration project. In the project, self-efficacy was operationalized as the ability to talk about condoms; or the ability to get a partner to use condoms or to refuse sex at some time in the recent past when a condom was not available. Among 630 women, of whom 45% were adolescent, the authors were able to establish a positive correlation between self-efficacy and condom usage. Although the two papers were able to prove that self-efficacy facilitates behaviour change, it did not test other parts of the theory.

However, from the 'A Pause' project there is ample empirical evidence to show that the theory has caused a delay in first sex among adolescents in the UK (Mahler, 1996). The 'A Pause' sex education project in UK is well established, including 5-year longitudinal studies. 'A Pause' the acronym for Added Power and Understanding in Sex Education is a school based intervention programme developed at the Department of Child Health, University of Exeter, UK. The features of the approach include a comprehensive evaluation component; application of social learning theory and a combination of teachers, health professionals and trained peers for delivering sex education. Applying the social learning theory according to Mellanby *et al.* (1993) has brought radical change to health education. The programme follows the students from the age of 13 years for 5 years. The results showed that by providing skill training along with sexual education for adolescents, participants were less likely to be sexually active than others that did not receive skill training. Participants also 'increased their knowledge of contraceptives and sexually transmitted diseases (STD), improved the accuracy of their beliefs about sexual behaviour among peers, and enhanced their attitudes about sex, relative to non-participants' (Mahler, 1996).

In explicit terms the theory postulates a triadic reciprocal interaction between the social environment, personal factors and behaviour to determine and predict future behaviour. Theoretically, the social environment component of the theory is a shift from the individualist models and a move towards working within a specific social context. Therefore, it has the potential of changing and reinforcing norms by addressing groups of people assumed to share social experiences. 'A Pause' attempts to understand the social norms of the adolescents and equip them with the skills necessary for changes. It helps to establish a new culture of responsible behaviour.

### *Integrated model*

Catania *et al.* (1990) and Coates *et al.* (1988) have unified elements from several models into an AIDS Risk Reduction Model (ARRM). The model integrates the concepts of the health belief model, the theory of reasoned action, self efficacy theory, theory of planned behaviour, emotional influences and interpersonal processes (Boyer and Kegeles, 1991 and FHI, 1997). The model was divided into three stages. Stage one: identifying and labelling one's activities as risky; stage two: commitment to reduce risky activities; while stage three is enacting the commitment to reduce risky activities. This model has been used extensively in different populations of gay men, intravenous drug users and adolescents with varying results.

In practice, the model notes that for one to diagnose one's behaviour as risky the individual must be knowledgeable about HIV transmission; discard misconceptions; accept personal susceptibility to AIDS and avoid stereotypical thinking. Perception of social norms regarding risk is also seen to be important to labelling one's behaviour as risky. The model 'posits that what an individual believes his or her peer group considers to be risky practices influences whether he or she labels the behaviour as risky.' The model clearly goes beyond giving HIV/AIDS information to recognizing the importance of individual assessment of risky behaviour based on commonly accepted behaviour standard in the immediate environment of the

individual. A study conducted among women in Zaire by Bertrand *et al.* (1992) used the ARRM. The data suggest that 'few among the study population appear to have labelled their behaviours as putting them at the risk of infection.' Similarly, Joseph *et al.* (1990) using data from the Chicago Multi-centre AIDS cohort study found that knowledge of AIDS risk was not related to risk reduction over time.

Other constructs of the last two stages of the model are attitudes to high and low risk activities, self efficacy; sexual communication; peer support and help seeking. Self-efficacy as alluded to above refers to individual need to feel capable of engaging in activities that will prevent HIV infection. In specific terms this includes the capability of adolescents to put on condoms correctly; acquiring condoms and negotiating condom use with a sex partner. Peer support is another strong construct of the model. Such support can help promote sexual communication and reduce risk among adolescents and young adults (Odotolu, 1997).

### RELEVANCE OF THE THEORIES TO THE AFRICAN SITUATION

Although there are myriads of communication and behaviour change projects in Africa in the past two decades many of them are not theory driven and often many are not evaluated. But similar findings to the three studies on social learning theory cited above were recorded in a review of projects that was based on the social learning theory in some parts of Africa. Nduati and Kiai (1997) in a review of HIV/AIDS prevention programmes in Malawi, Zambia, Uganda and Kenya identify the factors that are key to a successful programme: the use of social learning theory as a foundation for programme development, active learning methods, opportunities to practise communication and negotiate skills and the use of peer education. The paper concludes by identifying more research needs on factors that influence sexual behaviour of adolescents.

In the evaluation report of the Social Marketing of Adolescent Health: Results from Operations Research Projects in Botswana, Cameroon, Guinea and South Africa using the health belief model, Ashford *et al.* (2000) note changes in the knowledge and attitude of the young people having little impact on behaviour. The project was carried out for 2 to 3 years in the four countries, the evaluation report showed that the projects were successful in improving awareness of the benefits of taking protective action but had less impact on young peoples' perceptions about susceptibility to reproductive health problems. In most cases, knowledge and attitude improved but behaviour change was lacking. The authors suggest that the duration of the intervention was short and hence it was not likely that behaviour change would have occurred. But more discerning was one of their other suggestions that 'although mass media is an effective tool for increasing awareness face to face communication is often needed to address youths' concerns and to build confidence.

Obviously social interactions have tremendous effect on learning new behaviour and using new technology. Studies mentioned above prove the relevance of the social learning theory to behaviour change on the continent. In a way the social learning theory seems to have overcome some of the problems of theories based solely on rationality.

In summarizing and contrasting the theories mentioned above. Aggleton and Rivers (1996) raised the contrast between these theories when they attest to the fact that 'each of the other models places emphasis on changing behaviour through information giving, rational discussion and skill development'. They opine that such individual approaches tend to marginalize the social and cultural context which informs individual experience, i.e. people do not behave in isolation of their particular social context. For example, it is a consequence of the social constructions of female and male sexuality as well as the profound inequalities that continue to characterize many heterosexual relationships in Africa (Aniekwu, 2002). Culturally, sex continues to be defined primarily in terms of male desire with women being passive recipients of the male passion. As a result of such disparity 'it is estimated that in parts of Africa 60%–80% of women infected with HIV have only one sexual partner—their male spouse or regular partner (Kippas, 1994). In essence 'it tends to be social norms (expectations of other specific individuals and groups and the importance of meeting these expectations), relationships and gender imbalances that create the meaning and determinants of behaviour and behavioural change'. This is very true especially in Africa where societal or peer acceptance is a motivating factor for behaviour. Acceptability is a big issue and adherence to social norms is often mandatory.

Secondly with reference to adolescents, teenagers reach sexual maturity at an age when they may well not have developed intellectually to be able to change behaviour on the basis of facts. Thus interventions, which rely on information giving, will be rendered ineffective. It is also a known fact that many youths in Africa are out of school hence such academic exercise is beyond their scope. Mellamby *et al.* (1993) even postulated that the health belief model might well predict how adults will respond but not how 14 and 15 year olds will behave.

Thirdly, Africans are not individualistic but rather their actions are guided by community norms and traditional practices. Therefore, anything that will change their behaviour will first need to be acceptable to their community. This does not mean that the African culture is resistant to change but the process is complex and beyond individual decision. Therefore, the inclusion of social norms in the social learning theory paves the way for changes within the milieu in which the behaviour takes place. But there are other activities going on within the community that have been found to impact on behaviour and behaviour change. Rogers (1983) describes the diffusion of innovation theory on how new ideas are passed down the communication lines in the communities and how this affects uptake or otherwise of new ideas. Various studies of family planning programmes have shed encouraging light on behaviour change in many communities based on this theory. Close to this is the social network theory as another means of collegiate influencing one another to assume new behaviour. Are these theories viable alternatives?

#### *Diffusion of innovation and social network theories and lessons from family planning programmes*

As mentioned above, the diffusion of innovation theory is 'based on the idea that most innovations spread gradually from innovators, who are usually influential and persuasive, to the rest of the community' (Kebasetswe and Norr, 2002). The

theory has four essential elements: the innovation, its communication, the social system and time. It portends that people's exposure to a new idea, which takes place within a social network or through the media, will determine the rate at which various people adopt a new behaviour. Boyer and Kegeles (1991) posits that adopting a new behaviour on the basis of a new idea is based on the evaluation of the outcome of such behaviour as observed in respected persons.

### *Social network theory*

The social network theory looks at social behaviour not as an individual phenomenon but through relationships, and appreciates that HIV risk behaviour, unlike many other health behaviours, directly involves two people.

The UNAIDS (1999) suggests that programmes using this theory to guide them would investigate:

1. The composition of important social networks in a community.
2. The attitudes of the social networks towards safer sex.
3. Whether the social network provides the necessary support to change behaviour.
4. Whether particular people within the social network are at particularly high risk and may put many others at risk.

According to the same report from the UNAIDS 'although few network-based interventions have been tried, the concept has proven complementary to individual-based theories for the design of prevention programmes by focusing on the partnership as well as the larger social group'.

Borrowing from family planning programmes, there is a very rich body of literature on social networks and diffusion of innovation and a good correlation with increasing contraceptive uptake. Kohler *et al.* (2001) from their study in Kenya argue that the density of social networks affect individuals' contraceptive decisions and that social learning is most relevant with high market activity. They note that social influence is the dominant means by which social networks affect women's contraceptive use. Montgomery and Casterline (1998, 1996) identify the role of social networks in social learning and the use of social influence for fertility decision and in contraceptive uptake and they assert that 'social effects affect the pace of aggregate fertility change'. Kohler (1996) argues that 'women are uncertain about merits of modern contraception, and estimate the differential quality of available methods based upon both information obtained from network partners'.

### *Convergence of models*

Moreover, as earlier parts of this paper suggest, the social learning theory lends itself relevant to sexual behaviour change and HIV prevention in Africa. While the use of innovation diffusion and network theories have no doubt produced significant behaviour change especially in contraceptive uptake among members of social networks, the convergence of opinion at this point is that *social norms are best understood and influenced at the level of social networks*. Thus there is a place for the three theories

individually or combined in the sexual behaviour change and the fight against sexual transmission of HIV in the sub-Saharan Africa cultural settings. I, therefore, suggest the convergence of models approach to behaviour change communication.

Inherently the three theories have the aspect of social learning common to them. As highlighted above, diffusion of information is a by-product of normal human interaction. However, this model suggests deliberate efforts to infuse appropriate behaviour change information and skills into societies. This convergence of models approach assumes that the social networks are the ready vehicles for transformation to precipitate massive behaviour change that can drastically reduce the HIV infection rates in sub-Saharan Africa. The model essentially proposes four components:

1. Social learning
2. Social networks
3. Virile and change committed leadership
4. External supporting organization (networking with social networks)

*Social learning.* Social learning refers to acquisition of information from others. Such information may be related to a new technology or to the health, social and economic consequences of decision taking. It is the dominant mechanism through which social networks affect individual members. Societal norms, religious criteria and gender-power relations infuse meaning into behaviour, enabling positive or negative changes (UNAIDS, 1999). A main difference between individual and social models is that the latter aim at changes at the community level. Social models aim at changes at the community level. In order to promote positive sexual behaviour social learning can be used to:

1. Strengthen acceptable social norms such as delayed onset of sexual activities. Premarital sex was an unacceptable practice in most traditional societies in Africa and virginity is seen as a virtue. Information diffusion can therefore go a long way to promote abstinence among networks of adolescents and young adults. The peer education programme is being used widely to this effect in sub-Saharan Africa.
2. Discourage unacceptable practices such as intergenerational sex that is known to increase disproportionately the incidence of HIV infection among female adolescents and young adults and the exchange of materials, money and favour for unprotected sex. (While I agree that an argument can be made against intergenerational transactional sex outside of marriage, one should bear in mind that the idea of intergenerational sex is often encouraged within African culture). Others include polygamy (the same argument above extends in this case especially in view of religious practices) and wife inheritance even when the cause of death is unknown. Condom social marketing among sex workers (as a social network) in many programmes in Africa is an example of using social learning to reduce the practice of unprotected sex among sex workers and thus reducing the chance of contracting HIV.
3. Remove barriers to change especially in correct and consistent condoms usage.

Perhaps the most widely applied social learning approach in Africa today is the Stepping Stones approach. Stepping Stones is a training package on HIV/AIDS, gender, communication and relationship skills. The key features of the approach are working with peers, use of non verbal communication, exploration of sex and sexuality issues, developing communication and assertiveness skills and planning for the future (Bhattacharjee, 2000). The tool is participatory and holistic. It believes that every member of the community plays a role in facilitating behaviour change.

*Social networks* are traditional institutions where social learning occurs and social influence is exercised. In Africa, there abound many such social networks, which could be among age grades, gender, professions, and religious groups, social and ethnic affiliations. These networks are used to better the lots of individual members of the network and there are always reciprocal expectations between the members. Principally, the networks are a forum for information dissemination and members are almost always bound by a code of conduct. Compliance is assured by fear of social exclusion and recrimination. To promote positive sexual behaviour, the networks can be used as a source of information dissemination on HIV/AIDS and a means of promoting and enhancing the skills of members in positive sexual negotiation and the use of condoms. Acceptability is a strong expectation of every member of a social network. Members will comply with the norms of his/her social networks to remain welcomed as a member of the group. This could serve as a positive incentive for positive behaviour change and on a wider scope help members limit or stop their risk taking activities. In the same vein Kelly (1995) affirms that 'when beneficial prevention beliefs are instilled and widely held within one's immediate social network, individuals' behaviour is more likely to be consistent with the perceived social norms'. This is evident in the findings of Kincaid (2000) in Bangladesh. He found out that 'the increase in contraceptives use was five times greater among women in the social network than among women who were visited by field workers at home'. The added advantages of the social network are the existing chains of communication and naturalness of the exchange of information especially when the information centres round sex. There is also the benefit of peer promoted self-efficacy as the networks serve as forum for promoting competencies. Lastly when community norms are changed, individual behaviour will be modified based on the social influence within the person's social network.

*Promoting leadership.* An important community-level intervention (the Popular Opinion Leader) conducted by Kelly *et al.* (1992) demonstrated the utility of the theory of diffusion of social innovation in intervention design. The study trained and used popular opinion leaders—influential and popular people—to promote behaviour change in a gay bar. At follow up the risk behaviour has reduced. Kelly (1995) explains that 'when the diffusion theory is applied to HIV risk reduction, normative and risk behavioural changes can be initiated when enough key opinion leaders adopt and endorse behavioural changes, influence others to do the same and eventually diffuse the new norm widely within peer networks'. There is a major role for the leadership of the social networks to play if this model is to succeed. Leaders have social influence, defined as power which individuals have over each other

through authority, deference and social conformity pressures. Therefore for the whole process to succeed, there must be a way to develop virile and committed leadership for the social network. Such leadership must have a lot of social influence. For our purpose, they must be knowledgeable about HIV/AIDS prevention and should be ready to model for promoting safer sex; an example is the local leadership on HIV/AIDS in Zambia (Atkins, 2001). Many peer education programmes in Africa are based on this principle of creating youth leaders who will in turn influence the behaviour of their peers (Oshinowo *et al.*, 1998). In Zambia's southern province, the Peer Education Programme (PEP) of the Anti- AIDS Project has been able successfully to address the epidemic by involving chiefs, taking advantage of traditional leaders' roles and influence.. Similarly in Uganda, 3000 Muslim religious leaders and their assistants were trained to provide HIV education in Mpigi and Iganga districts (Kagimu *et al.*, 1998). They provided HIV education to their communities during home visits and religious gatherings. The intervention showed a reduced number of sexual partners. Lastly the entire Uganda success story is based on good leadership and political commitment. In the same vein, there is also the need for an external organization supporting the process.

*External supporting organization/s (networking with the social network)*

This is the real agent of change but its operations must not overshadow or threaten that of the leadership of the social networks. The partnership must be defined for the external agent to have appreciable influence on the social network. Governmental and non-governmental organizations working on HIV/AIDS can be used to build the capacity of the leadership of the organization to promoted basic HIV/AIDS education and skill building activities. The whole process can be initiated by these change agents from the point of identification of the social networks and their leadership. The role of the agency should be to give careful guidance and facilitation. It should not usurp the leadership of the organization. It is vital that ownership belongs to the social network for multiple reasons, some of which include trust and sustainability.

## CONCLUSION

The convergence of models approach as proposed has weaved in a lot about the African culture and beliefs based on the traditional chains of communication in acceptable, dynamic and regulatory social institutions. The age long reliance and reliability of the social networks make them acceptable to people and in return confers social recognition on its members. It is my belief that as behaviour is shaped by the networks, it can also influence and transfer new behaviour. Essentially the focus will have to shift to community-level prevention intervention. The value added is that 'the approach has the potential to reach large numbers of people in a cost-effective' manner in resource constraints settings (Pequegnat and Stover, 2000). Programmes based on this approach can therefore precipitate sexual behaviour change and substantial HIV reduction in sub-Saharan Africa. Merson *et al.*

(2000) sum it all up with their comment on the Senegal experience that 'the positive interaction between the existing sexual norms in Senegal and HIV prevention interventions suggests that identifying and promoting 'protective' social norms could be effective in other countries.

## ACKNOWLEDGEMENTS

I am grateful to the Ford Foundation WA and in particular Dr Babatunde Ahonsi for supporting my fellowship programme at the University of Exeter—where this work started—in the winter of 1999. I also appreciate the contribution of staff (Judith and Elaine Davies) and colleagues at the Institute of Population Studies in Exeter who were working on the A- Pause project evaluation report and its adaptability to other cultures. Lastly, I wish to thank my mentor and friend, Professor Stephen Schensul of the University of Connecticut Health Centre, West Hartford; Professor Lawrence Adeokun of Association for Reproductive and Family Health, Ibadan and Dr Adebola Adedimeji of the University of Ibadan Nigeria for reviewing earlier versions of this paper.

## REFERENCES

- Aggleton P, Rivers K. 1996. Behaviour interventions for adolescents. In *Preventing HIV Infection in Developing Countries*, Gibney L, DiClemente R, Vermund (eds). Plenum: New York.
- Aniekwu Nkoli I. 2002. Gender and human rights dimensions of HIV/AIDS in Nigeria. *Afr J Reprod Health* **6**(3): 30–37.
- Ashford L, Bulsara K, Neukom J. 2000. *Social Marketing for Adolescent Sexual Health: Results of Operations Research Projects in Botswana, Cameroon, Guinea, and South Africa*. Population Services International [PSI]: Washington, DC, 28.
- Atkins N. 2001. Local leadership on HIV/AIDS in Zambia. *Sex Health Exch* 2001; (3): 6–7.
- Azjen I, Fishbein M. 1980. *Understanding Attitudes and Predicting Behaviour*. Prentice Hall: Englewood Cliffs, NJ.
- Balmer DH, Gikundi E, Kanyotu M, Waithaka R. 1995. The negotiating strategies determining coitus in stable heterosexual relationships. *Health Trans Rev* **5**: 85–95.
- Bandura A. 1990. Perceived self-efficacy in the exercise of control over AIDS infection. *Eval Progr Plann* **13**: 9–17.
- Bandura A. 1994. Social cognitive theory and exercise of control over HIV infection. In *Preventing AIDS Theories and Methods of Behavioural Interventions*, DiClemente RJ, Peterson JL (eds). Plenum Press: New York and London, 25–55.
- Becker M. 1974. The health belief model and personal health behaviour. *Health Educ Monogr* **2**: 236–473.
- Berkley S. 2002. The need for a vaccine. In *AIDS in Africa* (2nd edn), Essex M, Mboup S, Kanki PJ, Marlink RG, Tlou SD (eds). Kluwer Academic/Plenum: New York.
- Bertrand JT, Brown LF, Kinzongi M, Mansilu M, Djunghu B. 1992. AIDS knowledge in three sites in Bas-Zaïre. *AIDS Educ Prev* **4**: 251–266.
- Bhattacharjee P. 2000. Stepping stones—a participatory tool to integrate gender into HIV/AIDS work. *Dev Pract* **10**(5): 691–694.
- Bosompra K. 2001. Determinants of condom use intentions of university students in Ghana: an application of the theory of reasoned action. *Soc Sci Med* **52**: 1057–1069.

- Boyer CB, Kegeles SM. 1991. AIDS risk and prevention among adolescents. *Soc Sci Med* **33**: 11–23.
- Carmel S. 1991. The health belief model in the research of AIDS related preventive behaviour. *Public Health Rev* **18**: 73–85.
- Catania J, Kegeles J, Coates T. 1990. Toward and understanding of risk behaviour: an AIDS Risk Reduction Model. *Health Educ Q* **17**: 53–72.
- Coates TJ, Stall RD, Catania JA, Kegeles SM. 1988. Behaviour factors in the spread of HIV infection. *AIDS* **2**(Suppl. 1): S239–S246.
- Family Health International [FHI]. AIDS Control and Prevention Project [AIDSCAP]. Behavioural Research Unit 1997 Behavior change- a summary of four major theories [unpublished] World wide web address: [http:// reservoir.fhi.org/aids/aidscap/aidspubs/behres/bcr4theo.html](http://reservoir.fhi.org/aids/aidscap/aidspubs/behres/bcr4theo.html).12p
- Fishbein M, Middlestadt SE, Hitchcock PJ. 1994. Using information to change sexually transmitted disease related behaviours: an analysis based on theory of reasoned action. In *Preventing AIDS Theories and Methods of Behavioural Interventions*, DiClemente RJ, Peterson JL (eds). Plenum Press: New York and London, 25–5; 61–78.
- Gage AJ. 1998. Sexual activity and contraceptive use: the components of the decision-making process. *Stud Fam Plann* **29**: 154–165.
- Hochbaum GM. 1958. *Quote from Preventing AIDS Theories and Methods of Behavioural Interventions*, DiClemente RJ, Peterson JL (eds). Plenum Press: New York and London, 25–55.
- Janz NK, Becker MH. 1984. The health belief model: a decade later. *Health Educ Q* **11**: 1–47.
- Jemmott JB, Jemmott LS, Font GT. 1992. Reduction in HIV risk-associated sexual behaviours among black male adolescents: effects on AIDS prevention intervention. *Am J Public Health* **82**: 372–377.
- Joseph JG, Caumartin SM, Tal M, Kirscht JP *et al.* 1990. Psychosocial functioning in a cohort of gay men at risk for AIDS: A three-year descriptive study. *J Nerv Ment Disease* **178**(10): 107–115.
- Kagimu M, Marum E, Wabwire-Mangen F, Nakyanjo N, Walakira Y, Hogle J. 1998. Evaluation of effectiveness of AIDS health education interventions in the Muslim community in Uganda. *AIDS Educ Prev* **9**: 49–69.
- Kebasbetswe P, Norr KF. 2002. In *AIDS in Africa* (2nd edn), Essex M, Mboup S, Kanki PJ, Marlink RG, Tlou SD (eds). Kluwer Academic/Plenum: New York.
- Kelly J. 1995. *Changing HIV Risk Behaviour: Practical Strategies 1995*. The Guilford Press: New York.
- Kelly J, Lawrence J, Stevenson Y, *et al.* 1992. Community AIDS/HIV risk reduction: the effects of endorsements by popular people in three cities. *Am J Public Health* **82**: 1483–1489.
- Kincaid DL. 2000. Social networks ideation, and contraceptive behavior in Bangladesh: a longitudinal analysis. *Soc Sci med* **50**: 215–231.
- Kohler HP, Behrman JR, Watkins SC. 2001. The density of social networks and fertility decisions: evidence from South Nyanza District. *Kenya Demogr* **38**: 43–58.
- Mahler K. 1996. Delay in first sex is seen among British teenagers in sex education program. *Fam Plann Perspect* **28**: 83–84.
- Mellanby AR, Phelps FA, Crichton NJ, Tripp JH. 1996a. School sex education, a process for evaluation: methodology and results. *Health Educ Res* **11**: 205–214.
- Mellanby A, Phelps F, Tripp J. 1993. Teenagers, Sex and risk taking. *BMJ* **307**(6895): 25.
- Merson MH, Dayton JM, O'Reilly K. 2000. Effectiveness of HIV prevention interventions on developing countries. *AIDS* **14**(Suppl. 2): S68–S84.
- Montgomery MR, Casterline JB. 1996. Social learning, social influence, and new model of fertility. *Popul Dev Rev* **22**(Suppl.): 151–175.
- Montgomery MR, Casterline JB. 1998. *Social Networks and The Diffusion of Fertility Control*. Policy Research Division Working papers no. 119. Population Council: New York.

- Nduati RW, Kiai W. 1997. *Communicating with Adolescents about AIDS: Experience from Eastern and Southern Africa*. International Development Research Centre [IDRC]: Ottawa, Canada.
- Odutolu O. 1997. HIV/AIDS: Sexual Communication and Risk Reduction among Adolescents. Presented at the *10th International Conference on AIDS and STDs in Africa Abidjan*. 1997. ICASA Conference Proceedings.
- Oshinowo KA, Delano GE, Laniyan CE, et al. 1998. *The West African Youth Initiative: Promoting Change in Adolescent Health Through Peer Education*. ARFH Monograph Series No. 3. ARFH Publication Ibadan.
- Painter TM. 2001. Voluntary counseling and testing for couples: a high leverage for HIV/AIDS prevention in sub-Saharan Africa. *Soc Sci Med* **53**: 1397–1411.
- Pequegnat W, Stover E. 2000. Behavioral prevention is today's AIDS vaccine. *AIDS* 2000 **14**(Suppl.): S1–S7.
- Rogers EM. 1983. *Diffusion of Innovations*, 3rd edn. Free Press: New York.
- Rogers EM. 1995. *Diffusion of Innovations*, 4th edn. Free Press: New York.
- Romer D, Hornik R. 1992. HIV education for youth the importance of social consensus in behaviour change. *AIDS Care* **4**: 285–301.
- Santelli JS, Kouzis AC, Hoover DR, Polacsek M, Burwell LG, Celentano DD. 1996. Stage of behaviour change for condom use: the influence of partner type, relationship and pregnancy factors. *Fam Plann Perspect* **28**: 101–107.
- UNAIDS. 1999. *Sexual Behaviour Change for HIV: Where have the Theories Taken Us?* UNAIDS, Geneva, 1992.
- UNAIDS. 1999. *Communications Framework for HIV/AIDS: A New Direction*. UNAIDS, Geneva, 1992.
- UNAIDS. 2002. *The UNAIDS REPORT*. UNAIDS, Geneva, 1992.
- Valente TW, Jato M, van der Straten A, Tsitsol LP. 1994. Social network influences on contraceptive use among Cameroonian women in voluntary associations [unpublished]. *122nd Annual Meeting of the American Public Health Association [APHA], Washington DC, October 30–November 3*. 38.
- Vaughan PW, Rogers EM. 2000. A staged model of communication effects: evidence from an entertainment-education radio soap opera in Tanzania. *J Health commu* **5**: 203–227.
- Walter HJ, Vaughan RD, Gladis MM, Ragin DF, Kosen S, Cohall AT. 1992. Factors associated with AIDS risk behaviours among high school students in an AIDS epicenter. *Am J Public Health* **82**: 528–532.