"HIV/AIDS and Women in Africa"

CALVIN ODHIAMBO
University of South Carolina Upstate
Department of Sociology, Criminal Justice, and Women's Studies
800 University Way
Spartanburg, SC 29301

Abstract

Using data from the Demographic Health Survey, this study examines the question of whether and why there are gender differences in the HIV/AIDS related knowledge, attitudes, beliefs, behaviors, and practices in sub-Saharan Africa. Females differ from men in significant ways in terms of their HIV/AIDS related beliefs, attitudes, and practices. These differences can be understood within the social and cultural contexts in which these females live. A gender-based response to HIV/AIDS that focuses on how different social expectations, roles, status and economic power of men and women affect and are affected by the epidemic is needed to ensure a meaningful campaign against the spread of AIDS.

KEY WORDS: HIV/AIDS, gender, sub-Saharan Africa,

Introduction

Of the 33.3 million people living with HIV/AIDS worldwide by the end of 2009, fifty-two percent (or 17.3 million) were women (UNAIDS 2010). The HIV/AIDS burden that women bear varies by country and region. In sub-Saharan Africa the percentage of women living with HIV/AIDS is 60%. The percentage of women living with HIV/AIDS in the rest of the world is 53% in the Caribbean, 44% in Eastern Europe and Central Asia, 36% in central and South America, 35% in the rest of Asia, and 27% in both Western and Central Europe and in North America. This makes Africa the leading region where HIV/AIDS prevalence is higher for women than men (the only other region is in the Caribbean). The relevant question to ask is why are there gender differences in the HIV/AIDS prevalence rates, especially in Sub-Saharan Africa?

The main purpose of this paper is to assess the gender differences in the AIDS-related risk behavior. More specifically, this paper focuses on two main questions. First, do factors associated with AIDS-related risk behavior vary by gender? For instance, do males and females express different AIDS-related knowledge, attitudes, beliefs, and perceptions? Second, does the structure of the relationship between the variables associated with AIDS-related risk behavior vary by gender? The paper begins with a brief overview of the Health Belief Model (HBM) as the main theoretical framework for addressing the questions posed above. This is followed by a brief summary of the research design and highlights of some of the key findings. The paper concludes with a discussion of the findings and of the empirical and theoretical implications of the study.

1. THE BASIC ASSUMPTIONS OF THE HBM

The Health Belief Model (HBM) is a socio-psychological formulation developed to explain health behavior at the level of individual decision-making. The model is based on the theory of Kurt Lewin, himself a social psychologist. Kurt Lewin hypothesized that "behavior depends on the value of an outcome to an individual, and the individual's estimate of the probability that a given action will result in that outcome" (Mikhail, 1981:67). The basic premise of the HBM is that human behavior is guided by an objectively logical and rational thought process. Thus, given appropriate information about the health risks of various behaviors and the health-protective qualities of other behaviors, individuals will modify their actions to preserve their health. Self-destructive or unhealthy behaviors are explained primarily in terms of lack of adequate knowledge of risks and hazards involved in engaging in such behaviors.

The HBM is particularly appropriate for this study because AIDS in sub-Saharan Africa is transmitted primarily through heterosexual contacts (UNAIDS/ECA, 2000). Because of this mode of transmission, people who engage in "risky sexual behavior" such as having unprotected sex with multiple partners are considered the most vulnerable to HIV infection (Korongo, 2001; Macintyre, 2001). As such, a change in risk behavior requires a shift in the psychological factors that are at the center of the Health Belief Model.

The HBM consists of four primary components (Rosenstock, 1974): (i) *Perceived susceptibility* which refers to an individual's subjective perception of the risk of contracting a disease; (ii) *Perceived severity* which relates to feelings about the seriousness or consequences of contracting a disease; (iii) *Perceived benefits* which is an individual's assessment of the relative effectiveness of the available protective actions in reducing the threat of disease; (iv) *Perceived barriers* which is an individual's subjective evaluation of the potential negative consequences of taking a particular health action that may impede attempts to undertake the recommended behavior; and (v) *Cues-to-action* which includes prompts from the mass media, campaigns, illness of a friend or family member etc. (**See Figure-1 for the original Health Belief Model)**.

Taken together, the HBM suggests that individuals will take appropriate AIDS preventive action if they have high levels of perceived susceptibility to, and high levels of perceived severity of AIDS (perceived susceptibility and severity combine to produce high levels of perceived threat). Individuals will also take appropriate action if they believe that the recommended action (such as limiting sex to one regular partner) will be beneficial in reducing either their susceptibility to AIDS, or the severity of the disease, and if they believe that the anticipated barriers to taking the recommended action are outweighed by its benefits. The model also assumes that if the perceived threat of the disease is high and perceived barriers to the recommended action is low, a cue to action can prompt or trigger an individual to adopt and maintain AIDS preventive behavior.

The HBM has generally been successful in explaining health behavior in developed countries (for instance, see Carmen, 1990; Rosenstock, 1994; Zimmerman *et al*. 1994; Edem & Harvey, 1998; LeBlanc, 1993; Becker, 1988; Stretcher and Rosenstock, 1997; Hingson *et al.* 1990 and Tanfer *et al.* 1993). Because of this success, the HBM was used to formulate AIDS campaigns by the Joint United Nations Program on AIDS (UNAIDS) and the World Health Organization (WHO) in developing countries. These campaigns have been adopted by sub-Saharan African governments as the official campaign against HIV infection. Considering the observed gender differences in the HIV/AIDS prevalence rates, one should ask whether such campaigns are equally effective for males and females, or, more specifically, whether the HBM works similarly for males and females.

2. METHODS

This study is based on the analysis of the most currently available nationally representative data collected in the Kenya Demographic Health Survey (KDHS). The DHS Program is administered by Macro International with funding from the United States Agency for International Development (USAID) and implemented by the National Council of Population and Development (NCPD) and the Kenya Bureau of Statistics. Like the previous KDHS surveys conducted in 1989, 1993, and 1998, the 2003 survey was designed to provide information on levels and trends in fertility, family planning knowledge and use, infant and child mortality, and other maternal and child health indicators. In addition, both the 1998 and the 2003 KDHS went further to collect more in-depth data on HIV/AIDS-related knowledge and sexually transmitted disease from the respondents using a specially developed module called knowledge, attitude, and practice (KAP). This paper is based on the analysis of the KAP module.

All the DHS surveys use a two-stage sampling design using the same enumeration areas (EAs) that are used for the National Population Census by the Bureau of Statistics in each country. The first stage involved the selection of clusters. A total of 536 clusters were drawn; 444 from rural areas and 92 from urban areas. Due to problems of inaccessibility, six of the clusters were dropped - leaving a final list of 530 clusters. From these 530 clusters, a systematic sample of 9,465 households was selected from the urban and rural clusters. All women in their reproductive ages were eligible for interview in these households while all men in their reproductive ages from every second household were eligible for interview. In the end, an availability sample of 7881 women between the ages of 15 and 49 and 3407 men of ages 15-54 was drawn from these households and included in the female and male data sets, respectively.

The cases that are included in the present analysis are only of the sexually active men and women who reported having sexual intercourse during the 12 months prior to the survey. Sexually active respondents were identified by using two questions. Respondents were first asked "Have you ever been married or lived with a man or woman?" Those who respondent "yes" to this question were considered to be sexually active. Those who answered in the negative to the first question were further asked, "Have you ever had sexual intercourse?" Respondents who said "yes" to this question were also identified to be sexually active.

All sexually active respondents reporting sexual activity within the 12 months preceding the survey were asked

for information about the number of sex partners and use of condom. Subjects were initially asked, "In the last 12 months, how many different persons (other than your spouse/person living with) have you had sex with?" Later they were asked, "Did you use a condom that time?" Responses from these two questions were used as the key outcome variables in this analysis.

Two measures of AIDS-related risk behavior used in this analysis were constructed from the responses from the questions above. The first measure – sex with multiple partners (or multiple sex partnership), was constructed based on whether study respondents had sex with someone other than their spouse or regular sex partner within the 12 months prior to the survey (coded as 1 if 'yes' and 0, if otherwise). The second measure – unprotected sex (or lack of condom use) was constructed based on whether respondents had engaged in sexual intercourse without using a condom during sex with someone other than their spouse or regular sex partner (coded 1 if 'yes' and 0, if otherwise).

The measures of high-risk sexual behavior were selected for the following reasons. First, the Joint United Nations Program on HIV/AIDS (UNAIDS), the World Health Organization (WHO), and previous studies on sexual behavior in Africa show that sex with multiple partners and lack of condom use constitute the two most prevalent high risk sexual behaviors associated with HIV/AIDS in sub-Saharan Africa. Relatedly, these two measures have been used in a cross-section of HIV/AIDS studies in Africa. Therefore, using these two measures makes it possible to compare the findings of this study with those of previous studies. Second, while most of the studies on condom use have observed a very low usage in Kenya, as in much of sub-Saharan Africa, this paper argues that merely looking at lack of condom use does not give one a valid indicator of AIDS-related high risk behavior. The lack of condom use only becomes a valid measure of high-risk behavior if it is considered within the context of sex with multiple partners. It has been well documented that condom use is lowest in stable, monogamous relationships and between regular sex partners. This means that the mere lack of condom use during sex, notwithstanding the number of sex partners, does not constitute a reliable measure of risk behavior. Thus, the second dependent variable is labeled as 'lack of condom use during sex with multiple sex partners.'

There are four sets of independent variables in this study. These variables were chosen based on existing literature suggesting their importance in estimating AIDS-related high-risk behavior. These variables include socio-economic and demographic factors relating mainly to the background of the respondents, and psychological constructs measuring components of the HBM used in the present study to predict AIDS-related knowledge, attitudes, beliefs, and perceptions. An explanation of how these measures were operationalized is given below.

2.1) Socio-demographic factors:

(i) Residence – coded 1) if living in a city or urban area, and 0) if otherwise

(ii) Religion – measured with three dummy variables using "No Religion/other non-Christian" as reference category. The first dummy variable – "Catholic" was coded as 1) if respondent belonged to the Catholic religion, and 0) if otherwise. The second dummy variable – "prot" was coded 1) if respondent belonged to the Protestant/Other Christian religion and 0) if otherwise. The third dummy variable – "Muslim" was coded as 1) if respondent belonged to the Muslim religion, and 0) if otherwise.

(iii) Age – a continuous variable measured in years (determined by asking respondents the month and year of birth and also age at last birthday).

(iv) Gender – coded 1) if Male, and 0) if Female

(v) Marital status – a categorical variable divided into those who were "never married", "married or living together", and "formerly married" (i.e. those who were widowed, separated, or divorced). Marital status was measured with two dummy variables using the "married/living together" as referent. The first dummy variable was coded 1) if respondent was "never married" and 0) if otherwise. The second dummy variable was coded 1) if respondent was formerly married (i.e. widowed, separated, or divorced), and 0) if otherwise.

(vi) Level of Education – measured as a categorical variable divided into Primary (1-8 years of education), Secondary (9-12 years of education), Post-Secondary (more than 12 years of formal education).

2.2) Knowledge about HIV/AIDS:

To measure AIDS knowledge, respondents were asked if they knew how AIDS could be transmitted. Information was sought around four programmatically correct methods of AIDS transmission: Can AIDS be transmitted from mother to child? Can AIDS be transmitted through sexual intercourse? Can AIDS be transmitted through sex with prostitutes? Can AIDS be transmitted through sex with multiple partners? Each question elicited a 'Yes' or 'No'

response (coded 1 and 0, respectively). The responses were summed up and the total scores used to produce two measures of AIDS knowledge. The first measure, "Knowledge1" was coded 1, if respondents knew only one method of AIDS transmission and 0, if otherwise. The second measure, "Knowledge2" was coded 1, if respondents knew two or more methods of AIDS transmission, and 0, if otherwise. The referent was the category of respondents who had a 0 score (i.e. did not know any of the four programmatically correct methods of AIDS transmission). Respondents who knew two or more correct methods of AIDS transmission were considered as having high levels of AIDS knowledge.

2.3) Perceived Severity:

Perceived severity was determined by an individual's perception of potentially serious consequences of contracting HIV/AIDS based on the question asking respondents if they thought that persons with AIDS "almost never" die "sometimes" die or "almost always" die from the disease. The responses were recoded into a dichotomous variable and coded 1, if respondent believed that persons with AIDS "almost always" die, and 0, if otherwise. A higher score implied higher levels of perceived severity. This measure is consistent with measures used in previous studies (for instance, see Carmel, 1990; LeBlanc, 1993; Bosompra, 1998).

2. 4) Perceived Susceptibility:

Perceived susceptibility was determined by an individual's reported feelings of his or her vulnerability to the virus and/or disease (i.e. whether they considered their risk of contracting HIV/AIDS to be "nil", "small", "moderate", or "great"). A dichotomous variable was constructed and coded 1) if respondent reported having "moderate" or "great" chances of contracting HIV/AIDS, and 0) if respondent perceived "nil" or "small" chances of contracting HIV/AIDS. This measure of perceived susceptibility is also consistent with measures used in previous studies (for instance, see Carmel, 1990).

2.5) Cues-to-Action:

Cues-to-Action was measured using a question asking respondents if they personally knew someone with AIDS or who had died from AIDS. This measure is also consistent with similar measures of this variable used in previous studies (for instance, see Carmel, 1990; Hingson et al., 1990; and Tanfer et al., 1993). This question elicited a "yes" (coded 1) or "no" (coded 0) response where the affirmative answer related to high levels of cues-to-action and the negative answer related to low levels of cues-to-action.

2.6) Perceived Benefit1 (of reducing number of sex partners):

Perceived benefits of reducing the number of sex partners was determined from respondents answer to the question, "does avoiding sex with multiple partners help in reducing the risk of HIV infection?" The variable was coded 1, if respondents answered "yes" and 0, if otherwise. A "yes" response was associated with a high level of perceived benefit of reducing the number of sex partner (Benefit1). This measure is consistent with similar measures used in previous studies (for instance, see Bosompra, 1998; Carmel, 1990).

2.7) Perceived Benefit2 (of condoms):

This variable was determined from respondents' answer to the question, "does the use of condoms during sex help reduce the risk of HIV infection?" The variable was coded 1, if respondents answered, "yes" and 0, if otherwise. Consistent with the previous measure, a "yes" response was considered as indicating a high level of perceived benefit of condoms (Benefit2) while a "no" response was considered as indicative of a low level of perceived benefit. This measure is also consistent with what has been used in previous AIDS studies (for instance, see Bosompra, 1998; Carmel, 1990).

3. FINDINGS

On the question of whether there are gender differences in the AIDS-related knowledge, attitudes, beliefs, perceptions, and behavior, this study found some significant gender differences. While male respondents were the most likely to engage in sex with multiple partners and to have unprotected sex, they were also the most likely to exhibit higher levels of AIDS knowledge, cues-to-action, perceived benefits of condom use, and lower levels of perceived susceptibility, severity, and benefits of limiting sex to a regular partner, compared to their female counterparts. On the other hand, female respondents were the most likely to exhibit misconceptions about HIV/AIDS, higher levels of perceived susceptibility, severity, benefit of limiting sex to a regular partner, and lower levels of perceived cues-to-action and benefits of condom use when having sex with multiple partners, compared to their female counterparts.

Considering the structure of the relationships between the variables in the HBM associated with sex with multiple partners, Table 1 shows that urban residence, age, religion, marital status, cues-to-action, and perceived benefits affected multiple sex partnership differently for males and females. Table 2 presents the logistic regression analysis of factors associated with multiple sex partnership for the study respondents. As this table shows, first, the odds of having sex with multiple partners increased by 41% among urban females, relative to their rural counterparts. However, the effect of urban residence on men was both negative and statistically insignificant. Second, increased age raised the odds of engaging in sex with multiple partners by 47% among females while the odds for males were increased by 52%. Third, the odds of engaging in sex with multiple partners reduced by 62% for Muslim women, relative to non-Muslim women. However, being Muslim did not have any statistically significant effect on the outcome of this variable for men. Fourth, women who were never married were 74 times more likely to engage in sex with multiple partners compared to women who were currently married. On the other hand, men who were in this same category were only 24 times more likely to engage in sex with multiple partners compared to those who were married. Further, women who were formerly married were 87 times more likely to engage in sex with multiple partners compared to women who were never married, while males who were formerly married were only 21 times more likely to engage in multiple sex partnership compared to their counterparts who were currently married.

Regarding the psychological constructs associated with multiple sex partnership, this study found two main gender differences in the structure of the relationships of the variables. First, while the odds of engaging in multiple sex partnership increased by 48% for men who had high cues-to-action, compared to those who had low cues-to-action, this variable was not statistically significant for women. Likewise, while the odds of multiple sex partnership increased by 25% among men who had higher levels of perceived benefits, this variable was also not statistically significant for the female respondents.

Regarding the second outcome variable, Table 3 shows that age, marital status, perceived risks, and perceived benefits affected lack of condom use differently for males and females. Table 4 presents the logistic regression analysis for this variable. First, as the findings show, increased age raised the odds of lack of condom use by 36% among females. However, the increase was only by26% among males. Second, women who were never married were 52 times more likely to engage in unprotected sex, compared to women who were currently married. However, men who were in the same category were only 5 times more likely to engage in unprotected sex, compared to men who were currently married. Third, the odds of engaging in unprotected sex was 66 times greater for females who were formerly married compared to those who were currently married while the same odds were only 8 times greater for the male respondents in the same category. Regarding the psychological constructs associated with lack of condom use, Table 4 shows that two of the six variables in this category were statistically significant – suggesting gender differences.

First, the odds of engaging in unprotected was 3 times higher for women who had increased perceived risk of HIV infection compared to women with low levels of perceived risk. The same odds were two times greater for men in the same category. Further, women who had increased perceived benefits of condom use were 65% more likely to engage in unprotected sex compared to women who did not, while men who were in the same category were only 50% more likely to engage in unprotected sex, compared to men who had low levels of perceived benefits of condom use. Evidently, the structure of relationships of a number of HBM variables associated with the AIDS-related risk behavior do not have the same effects on males as they do on females in the present study.

4. DISCUSSIONS

While there may be a number of factors that may help to explain the gender differences observed in this study, this discussion will focus on three main points. These three relate to (i) Behavioral and Biological (or physiological), (ii) Economic, and (iii) Social and Cultural factors (see the summary on Table 5)

4.1 Behavioral and Biological Factors

Women are generally more susceptible than men to infection from HIV in any given heterosexual encounter, mainly due to biological factors mainly associated (i) the greater area of mucous membrane exposed during sex in women than men, (ii) the greater quantity of fluids transferred from men to women during sexual intercourse, (iii) the higher viral content of male sexual fluids, and (iv) the micro tears that can occur in vaginal (or rectal) tissue from sexual penetration, especially associated with coerced sex, including rape, other sexual abuse, and also the

practice of "dry" sex. This can explain why, in general, women reported higher levels of perceived susceptibility to HIV infection than men. On the other hand, a growing volume of AIDS literature shows that females become sexually active at a much younger age than men and that they engage in sex with multiple partners more than their male counterparts do. This, among other reasons, could explain why HIV infection rates among younger women ages 15-24 are twice as high as the rates for younger men of the same age group (UNAIDS 2003).

4.2 Economic Factors

Generally, most women in sub-Saharan Africa are still economically dependent on the men in their lives – whether these are their husbands, fathers, brothers, etc. This disempowerment limits their ability to translate their knowledge and perceptions into action especially concerning to AIDS-related risk behavior. Further, the growing rate of unemployment especially among females in much of Africa, coupled with the relatively poor education and low levels of literacy among females in general, have produced an incentive for women to look for alternative means of livelihood. The promise of quick money in exchange for sex without the rigorous demands of qualifications for employment has increasingly attracted many urban women to the growing ranks of commercial sex workers in Kenya. This could explain why urban residence significantly increased the odds of engaging in multiple sex partnership for women, relative to the men, as is shown on Table 2.

This study found that formerly married women had a greater tendency to engage in AIDS-related risk behavior compared to their male counterparts. The gender difference here can also be understood within the context of economic dependency of women on men. Considering that men are still considered the main breadwinners in much of Sub-Saharan Africa, and considering the economic dependence of most African women on the men in their lives, the loss of the male head of the household through widowhood, separation, or divorce is likely to put these formerly married women at a greater economic disadvantage. Resultantly, this could increase their vulnerability to risky sexual behaviors such as unprotected sex. Coupled with the fact that they are relatively older, and with little or no formal education, a majority of the formerly married females probably also have increased perceptions of barriers to condom use. Even though the data set used in this study did not include an adequate measure of perceived barriers, evidence from previous studies on condom use suggest that formerly married women have higher levels of perceived barriers to condom use than women from other marital status categories. For instance, Grady et al., (1993) found that, among other characteristics, respondents who were formerly married and less educated generally exhibited higher levels of perceived barriers to condom use. They usually agreed that using a condom sends unwanted messages to one's partner. The researchers found responses such as, "condom use or the suggestion of condom use makes your partner think that you have AIDS" and "using or suggesting the use of condoms shows that you think your partner has AIDS." Furthermore, these formerly married women also had more negative perceptions about device-related consequences of condom use. For instance, they reported 'fear of condom breakage', "difficulty in putting condoms on', and concern that "condoms always come off during sex."

4.3 Socio-cultural Factors

A variety of factors increase the vulnerability of women and girls to HIV. These include social norms that deny women sexual health knowledge and other cultural practices that prevent them from controlling their bodies or deciding the terms on which they have sex. They also include expectations of silence on sexual matters. For instance, in many sub-Saharan African customs, it is considered inappropriate for women to express sexual interest or to suggest condom use. Consequently, even if a woman feels susceptible to HIV infection or strongly believes that using condoms will prevent her from infection, these cultural constrains prevent these perceptions from being translated into appropriate action. On the other hand, these same cultural norms allow men to have multiple wives and even encourage older men to have sexual relations with younger women. In some cases, religion is used to perpetuate some of these cultural practices. For instance, in Islam, while men are allowed to have more than four wives, women can only have one husband. This could explain, for instance, why the odds of engaging in sex with multiple partners significantly decreased for Muslim women, as opposed to Muslim men.

As the study has found, women generally tend to feel more vulnerable to HIV infection. However, as the study has shown, these feelings of susceptibility do not prevent women from engaging in high risk behavior such as having sex without using condoms. This behavior should also be understood within the context of unequal gender power relations. The unequal power relations that most Sub-Saharan African women experience limits their ability to negotiate issues of safe sex or even to insist on the use of condoms, even when they suspect that their male partners are having sex with multiple partners. This can explain why women who had high perceived benefit

of condom use still had increased odds of engaging in sex without using condoms. Even though the gender power structure favors men, the seemingly counterintuitive effect of some of the variables such as perceived benefit for men needs to be understood within the prevailing cultural context. Most African men see sex with multiple partners as a cultural right or entitlement. The implication of this is that, even when they have high-perceived benefit of limiting sex to one partner, this perception is unlikely to translate into a change in risk behavior. The important gender difference here is that, while for women, this reaction is caused by a general feeling of powerlessness. However, for men, limiting sex to one partner would be seen as powerlessness while engaging in sex with multiple partners would be seen as a way to celebrate the male sexual prowess. The implication here is that higher levels of perceived benefits works differently for men than for women and that at the center of this differing outcome is different gender power relations.

While these three factors are discussed separately here, it is important to note that these factors interact to create the gender disparity observed here. For instance, the economic vulnerability of women makes it more likely that they will exchange sex for money or favors, less likely that they will succeed in negotiating protection, and less likely that they will leave a relationship that they perceive to be risky. Thus, even though they may have feelings of perceived vulnerability of susceptibility to HIV infection, a combination of these biological, economic, and socio-cultural factors will prevent women from acting on their perceptions, negotiating the terms and conditions of the sexual relationship, and even changing their behavior or to avoid high risk behavior.

In conclusion, HIV/AIDS is having a devastating effect on women's health, particularly the health of adolescent girls and young women. They often do not have the power to insist on safe and responsible sex practices and have little access to information and services for prevention and treatment. Women, who represent slightly more than half of all adults newly infected with HIV/AIDS and other sexually transmitted diseases, experience social vulnerability and the unequal power relationships which present obstacles to safe sex. The consequences of HIV/AIDS reach beyond women's health to their role as mothers and caregivers and their contribution to the economic support of their families – thus making the HIV/AIDS problem a gender problem in most developing societies, such as Sub-Saharan Africa. An effective campaign against the spread of the AIDS virus must therefore not only be limited to providing AIDS education and other antiretroviral drugs, but also to empowering women and addressing the physiological, economic, and socio-cultural factors that increase women’s predisposition to HIV/AIDS. In other words, a gender-based response to HIV/AIDS that focuses on how different social expectations, roles, status and economic power of men and women affect and are affected by the epidemic is needed to ensure a meaningful fight against the spread of AIDS. Such an approach would analyze gender stereotypes and explore ways to reduce inequalities between women and men so that a supportive environment can be created, enabling both males and females to undertake appropriate prevention measures and to cope better with the AIDS epidemic.

FIGURE 1

THE ORIGINAL HBM
(Rosenstock1974:334)

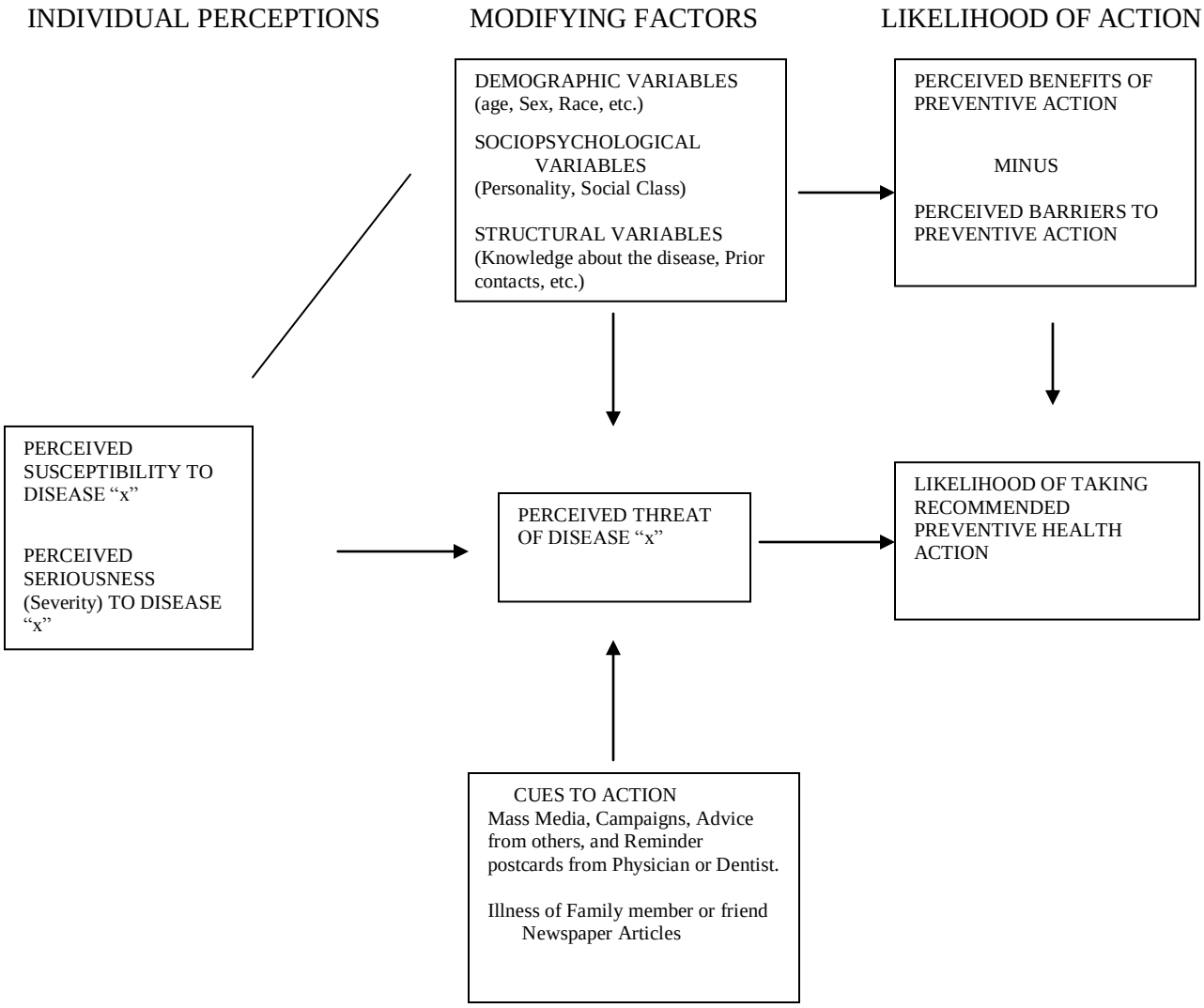

Table 1: Interaction Terms Relating to Factors Associated with Multiple Sex Partnership Among Men and Women in Kenya_ (N=11,135)

Predictors/Effects	Model 1 (SOCDEM) (B)	(EXP B)	Model 2 (PSYCH) (B)	(EXP B)
Constant	-4.781**		-5.477**	
Gender	2.924**	18.614	2.355**	76.051
Urban Residence	0.442**	1.556	0.401**	1.494
Gender by Urban	**-0.368****	**0.692**	-0.282	0.754
Age	0.020**	1.020	0.018**	1.018
Gender by Age	**-0.018***	**0.982**	**-0.018****	**0.982**
Prot	-0.102	0.903	-0.102	0.903
Gender by Prot	-0.044	0.957	-0.023	0.977
Muslim	-0.478**	0.620	-0.355	0.701
Gender by Muslim	**0.677***	**1.968**	**0.626****	**1.871**
Single	3.583**	35.999	3.900**	49.425
Gender by Single	**-1.435****	**0.238**	**-1.462****	**0.232**
Former	4.056**	57.729	4.294**	73.264
Gender by Former	**-1.343****	**0.261**	**-1.361****	**0.256**
Education	0.051	1.053	-0.027	0.974
Gender by Education	0.120	1.128	0.077	1.080
Knowledge1			0.028	1.028
Gender by Knowledge1			0.285	1.330
Knowledge2			0.112	1.119
Gender by Knowledge2			0.622	1.863
Risk			1.146**	3.145
Gender by Risk			-0.074	0.929
Severity1			0.119	1.127
Gender by Severity1			-0.120	0.887
Cues-to-action1			0.116	1.123
Gender by Cues-to-Action1			**0.337****	**1.401**
Benefits			-0.018	0.982
Gender by Benefits			**0.270***	**1.309**

***p<0.05** ****p<0.01** **Missing = 153**

Table 2: Logistic Regression Analysis of Factors Associated with Multiple Sex Partnership Among Female and Male Respondents in Kenya

Predictors/Effects	Females[a] (N=7758)			Males[b] N=3368)		
	(B)	(EXP B)	(SE)	(B)	(EXP B)	(SE)
Constant	**-10.133****		**0.546**	**-9.198****		**0.674**
Urban residence[1]	0.336**	1.413	0.100	0.012	1.012	0.116
Age	0.385**	1.470	0.033	0.420**	1.522	0.036
Age2	-0.006**	0.994	0.001	-0.006**	0.994	0.001
Protestant[2]	-0.107	0.898	0.084	-0.094	0.910	0.091
Muslim[3]	-0.473*	0.623	0.194	0.280	1.324	0.205
Never married[4]	4.297**	73.470	0.150	3.178**	24.002	0.161
Formerly Married[5]	4.470**	87.327	0.149	3.039**	20.880	0.233
Education	-0.239**	0.787	0.070	-0.153*	0.858	0.075
Knowledge1	0.014	1.014	0.277	0.353	1.423	0.357
Knowledge2	0.000	1.000	0.262	0.657	1.930	0.343
Risk	1.034**	2.814	0.088	0.973**	2.646	0.101
Severity	0.123	1.131	0.110	0.047	1.048	0.105
Cues	0.084	1.088	0.085	0.393**	1.481	0.097
Benefits1	-0.032	0.969	0.087	0.223*	1.250	0.109
Model Chi-square [df]	2296.176 [14]		1157.447 [14]			
Block Chi-squire [df]	145.605 [6]		138.261 [6]			
% Correct Predictions	86.9		78.5			
Nagelkerke R^2	0.448		0.394			

***p<0.05 **p<0.01**
[a]Missing for Females=123
[b]Missing for Males = 84

[1] The referent is Rural Residence
[2] The referent is "Other Religions" (including Catholic, and other non-Christian traditional religions)
[3] The referent is the same as #2 above
[4] The referent is the "Currently Married"
[5] The referent is the same as #4 above

Table 3: Interaction Terms Relating to Factors Associated with Lack of Condom Use Among Men and Women in Kenya_(N=11,127)

Predictors/Effects	Model 1 (SOCDEM) (B)	(EXP B)	Model 2 (PSYCH) (B)	(EXP B)
Constant	-4.571**		-5.153**	
Gender	3.167**	23.742	3.265**	26.177
Urban Residence	0.254**	1.289	0.132	1.141
Gender by Urban	-0.221	0.802	-0.101	0.904
Age	0.015**	1.016	0.014*	1.014
Gender by Age	**-0.023****	**0.977**	**-0.020***	**0.982**
Prot	-0.062	0.940	-0.061	0.941
Gender by Prot	-0.038	0.962	0.008	1.008
Muslim	-0.390*	0.677	-0.277	0.758
Gender by Muslim	0.510	1.665	0.467	1.594
Single	3.322**	27.726	3.644**	38.248
Gender by Single	**-2.145****	**0.117**	**-2.430****	**0.088**
Former	3.858**	47.370	4.061**	58.030
Gender by Former	**-1.836****	**0.159**	**-2.038****	**0.130**
Education	-0.022	0.978	-0.159*	0.853
Gender by Education	-0.118	0.889	-0.055	0.947
Knowledge1			-0.192	0.825
Gender by Knowledge1			0.223	1.250
Knowledge2			-0.169	0.845
Gender by Knowledge2			0.320	1.377
Risk			1.047**	2.850
Gender by Risk			**-0.279***	**0.756**
Severity1			0.157	1.170
Gender by Severity1			-0.265	0.767
Cues-to-action1			0.089	1.094
Gender by Cues-to-Action1			-0.089	0.915
Benefit2			0.541**	1.718
Gender by Benefit2			**-0.108***	**0.897**

***p<0.05** ****p<0.01** **Missing = 161**

Table 4: Logistic Regression Analysis of Factors Associated with Lack of Condom Use Among Female and Male Respondents in Kenya

Predictors/Effects	Females[a] (N=7758)			Males[b](N=3368)		
	(B)	(EXP B)	(SE)	(B)	(EXP B)	(SE)
Constant	**-8.889****		**0.552**	**-5.175****		**0.624**
Urban residence[6]	0.081	1.084	0.104	-0.029	0.971	0.118
Age	0.309**	1.362	0.033	0.230**	1.258	0.034
Age2	-0.005**	0.995	0.001	-0.004**	0.996	0.001
Protestant[7]	-0.062	0.940	0.087	-0.030	0.970	0.092
Muslim[8]	-0.361	0.697	0.201	0.183	1.200	0.203
Never married[9]	3.956**	52.270	0.151	1.544**	4.684	0.145
Formerly Married[10]	4.183**	65.568	0.149	2.034**	7.645	0.201
Education	-0.323**	0.724	0.072	-0.336*	0.715	0.077
Knowledge1	-0.200	0.819	0.279	0.049	1.050	0.353
Knowledge2	-0.260	0.771	0.263	0.095	1.100	0.339
Risk	0.953**	2.595	0.088	0.690**	1.993	0.096
Severity	0.159	1.172	0.114	-0.089	0.915	0.104
Cues	0.066	1.068	0.088	-0.038	0.962	0.096
Benefits1	0.498**	1.645	0.083	0.403**	1.496	0.089
Model Chi-square [df]	1883.464 [14]			440.056 [14]		
Block Chi-squire [df]	167.397 [6]			75.024 [6]		
% Correct Predictions	88.0			76.1		
Nagelkerke R^2	0.401			0.183		

*p<0.05 **p<0.01

[a]Missing for Females=123 [b]Missing for Males = 39

[6] The referent is Rural Residence
[7] The referent is "Other Religions" (including Catholic, and other non-Christian traditional religions)
[8] The referent is the same as #2 above
[9] The referent is the "Currently Married"
[10] The referent is the same as #4 above

Table 5: Factors that Affect the Risk and Vulnerability of Men and Women.

Men	**Women**
Different perceptions of, and responses to, risk and vulnerability	
Behavioral and Physiological Factors	
Usually infected at later age (>30)	Usually infected 5-10 years earlier than men, especially aged 11-29.
Multiple sex partners as norm.	High-risk behavior of regular sexual partner.
Lower physiological risk/vulnerability for men.	Physiology: women four times more likely to contract HIV and other STDs than men.
Economic Factors	
Economic power	Economic dependence/insecurity
Command over resources	Less access to and control of economic assets, and fewer options for income/asset creation, leading to greater vulnerability (exchange sex for money/favors)
Male occupations (e.g., truck driving) involve mobility and family disruption	Resorting to sex work by migrant or refugee women when families are disrupted
Socio-Cultural Factors: Prevailing Norms and Expectations	
Sexual domination	Emphasis on virginity and value of marriage and motherhood
Presumption of knowledge (prevents seeking information/contraception/treatment)	Culture of silence on sexual matters (inappropriate to be aware of sexuality or to suggest condom use)
Cultural practices encourage marriage of multiple wives (e.g. up to 4 wives in Islam, and polygamy in Africa.) Violence (incl. associated with drugs/alcohol)	Cultural practices: female genital cutting, ritual cleansing, widow inheritance
Imbalance of sexual power (incl. violence)	Vulnerable to coerced sex, including rape and other sexual abuse, practice of "dry" sex.

Adapted from: G. Rao Gupta and other materials drawn from the Royal Tropical Institute (KIT), Netherlands. Retrieved from: World Bank 2001.

5. REFERENCES

Bosompra, Kwadwo. (1998). "Psychological Determinants of Condom Use Among Ghana Students: An Application of the Theory of Planned Behavior and the Health Belief Model." Ph.D. Dissertation. University of Massachusetts, Amherst.

Caldwell, C. John, Pat Caldwell, and Pat Quiggin. (1989). The Social Context of AIDS in sub-Saharan Africa. Population and Development Review 15, 185-234.

Carmel, S. (1990/1991). The Health Belief Model in the Research of AIDS-related Preventive Behavior. Public Health Review 18, 73-85.

DHS. (2000). DHS Surveys and Research. Available, <http://www.macroint.com/dhs/about>. May 2000.

Gausset, Quentin. (2001). "AIDS and Cultural Practices in Africa: The Case of the Tonga (Zambia)". Social Science and Medicine 52:509-518.

Grady et al. (1993) "Condom Characteristics: The Perceptions and Preferences of Men in the United States." Family Planning Perspectives 25:67-73

Grady, W.R., D.H. Klepinger, and J.O.G. Billy (1993). "The Influence of Community Characteristics on the Practice of Effective Contraception." Family Planning Perspectives 25:4-11.

Guo, Jie. (1997). "Determinants of Condom Use for Disease Prevention among Heterosexual Men in the United States: The Health Belief Model (HBM) and Beyond." Ph.D. Dissertation. University of Washington.

Heald, Suzette. (2002). "It's Never as Easy as ABC: Understandings of AIDS in Botswana". African Journal of AIDS Research 1, 1, May, 1-10

Hingson, R. W., Strunin, L., Berlin, B. M. and Heeren, T. (1990)."Beliefs about AIDS, use of alcohol and drugs, and unprotected sex among Massachusetts adolescents". AJPH, 80, 295—299.

Hrdy, Daniel B. (1987). "Cultural Practices Contributing to the Transmission of Human Immunodeficiency Virus in Africa." Review of Infectious Diseases 9(6): 1109-1119.

KDHS – Kenya Demographic Health Survey. (1999). Kenya Demographic Health Survey Report Republic of Kenya, Micro International. Government Printers.

Korongo, Allan. (2001)."Marital Sexuality in the Context of HIV/AIDS". Research on Aging 8:460-479.

Macintyre, M., L. Brown, and S. Sosler. (2001). "It is not what you know. But who you knew: Examining the Relationship between Behavior Change and AIDS Mortality in Africa." AIDS Education and Prevention 13(2): 160-174.

Mikhail, B. (1981). "The Health Belief Model: A Review and Critical Evaluation of the Model, Research, and Practice." Advancement in Nursing Science 4:65-82

Miller N. and R.C. Rockwell (Eds.). (1988). AIDS in Africa: The Social and Policy Impact. Lewiston, NY: Edwin Mellen.

Nnko, S. and R. Pool (1997). "Sexual Discourse in the Context of AIDS: Dominant Themes on Adolescent Sexuality Among Primary School Pupils in Magu District, Tanzania." Health Transition Review 7:67-81.

Ochola-Ayayo, A.B.C. (1993). "Culture and HIV/AIDS Transmission." District Development Plans for 1994-1996. Nairobi: Ministry of Planning and Development.

Rosenstock, M. Irwin. (1974). "The Health Belief Model and Preventive Health Behavior." Health Education Monographs 2(4): 354-385.

Rosenstock, M. Irwin, et al. (1994). "The Health Belief Model and HIV Risk Behavior Change." In Preventing AIDS: Theories and Methods of Behavioral Interventions, Ed. By DiClemente, R.J., and J.L. Peterson. New York: Plenum Press.

Tanfer, K. et al. (1993). "Condom Use among U.S. Men, 1991". Family Planning Perspectives, 25:61-66.

Tobias, Barbara. (2001). "A Descriptive Study of the Cultural Mores and Beliefs toward HIV/AIDS in Swaziland, Southern Africa". International Journal for the Advancement of Counseling 23(2): 99-113.

UNAIDS. (2010). "Global Report: UNAIDS Report on the global Aids Epidemic 2010. United Nations: Geneva.

UNAIDS/ECA. (2003). " AIDS in Africa: Country-by-Country". Available, <http: www.unaids.org/ wac/2000/wad00/files/AIDS_in_Africa.pdf>. June 2003.

Van de Walle E. (1990): "The Social Impact of AIDS in sub-Saharan Africa." Milbank Quarterly 1990: 68 (Supple. 1): 10-32.

Varga, C.A. (1997)."Sexual Decision-Making and Negotiation in the Midst of AIDS: Youth in KwaZulu/Natal, South Africa." Health Transition Review 7(3):45-67.

Volk, E. Jonathan and Cheryl Koopman. (2001). "Factors Associated with Condom use in Kenya: A Test of the Health Belief Model". AIDS Education and Prevention 13(6): 495-508.

Washington Post. (1997). "Deadly Dowry: Inheriting AIDS in Kenya." Washington Post. August 8.

Wilson, D., R. Greenspan, and C. Wilson (1989). "Knowledge About AIDS and self-Reported Behavior Among Zimbabwean Secondary School Pupils." Social Science and Medicine 28(9):957-961.

Wojcicki, J, Maia and Josephine Malala. (2001). "Condom Use, Power and HIV/AIDS Risk: Sex-Workers Bargain for Survival in Hillbrow/Joubert Park/Berea, Johannesburg". Social Science and Medicine, 2001, 53 (1): 99-121