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BEHAVIORAL PARADOX?

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AIDS-RELATED KNOWLEDGE AND BEHAVIOR AMONG MARRIED KENYAN MEN: A BEHAVIORAL PARADOX?

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ABSTRACT

The heterosexual character of HIV/AIDS transmission in sub-Saharan Africa, a context where men are dominant in sexual and reproductive matters, underscores the importance of assessing male behavior in sexual and related health arenas. Despite condom use being the recommended and expected behavioral response to knowledge about the fatal outcome of HIV/AIDS infection, use continues to be extremely low in sub-Saharan Africa. This article explores the relationship between various facets of knowledge about HIV/AIDS and condom use among married Kenyan men. The main finding is one of a significant interaction effect of the recognition that it is impossible to visually identify infected parties and one's perception of self-risk. Although neither is in itself significant, simultaneously recognizing that healthy-looking persons may be infected and perceiving that one is himself not at risk significantly reduces condom use among men. This finding—of an interaction effect—plausibly explains why a perception of self-risk, on its own, does not necessarily translate into safe behavior. After all, those who believe they can identify infected persons may think they are at low risk because they avoid contact with the infected and, in selecting partners they deem free of infection, they may be less inclined to use condoms. This finding has implications for how specific aspects of AIDS-related knowledge are imparted to communities and individuals as well as for our understanding of other health-related behaviors.

INTRODUCTION

The relationship between knowledge about HIV/AIDS and associated behavior remains a paradox.¹ Despite high level of awareness about the disease, knowledge of how it spreads, the finality of consequences, and effective means of prevention, risky or unsafe sexual behavior continues (Adamako Ampofo, 1993, 1995; Bertrand and Bakutuv-widi, 1991; Brewer, 1998; Edwards, 1994a, 1994b, 1994c). Yet, because treatment and prevention alternatives in the biomedical arena do not appear soon to become practical reality, behavioral options remain fundamental to stemming the spread of the disease (Hope, 1995; van der Straten *et al.*, 1995). Indeed, Hope (1995:87) asserts that “the primary lesson” from interventions so far is that the spread of the disease is “slowed most effectively by programs that change sexual behavior and control of spread of other sexually transmitted diseases.” Likewise, van der Straten *et al.* (1995:935) argue that self-sex practices constitute the “single most effective strategy for the prevention of HIV infection.”

Sub-Saharan Africa has received particular attention for its extremely high incidence and rate of spread of HIV/AIDS. Prevalence levels for many countries in the region fall in the range of 16-30 percent with all indications being that more than two-thirds of the world’s infected people live in sub-Saharan Africa (Goliber, 1997; UNAIDS, 1998; WHO, 1998). As well, fully 80 percent of global deaths in 1998 occurred in the region. Yet, research on the behavioral aspects of the disease in the region is still relatively lacking. Because transmission occurs primarily through heterosexual contact in sub-Saharan Africa (Caldwell and Caldwell, 1993; Langstone, 1989) and decisions regarding sex and related matters are culturally bestowed

upon and dominated by men who are frequently also reluctant to use condoms (Caldwell, Caldwell, and Quiggin, 1989; Dodoo, 1993, 1998; Ezeh, 1993; Isiugo-Abanihe, 1994; Omondi-Odhiambo, 1997), the male perspective is critical to understanding sexual and reproductive health behavior, including matters related to HIV/AIDS prevention in the region (Dodoo and van Kandewijk, 1996). The current study examines the relationship between various AIDS-related knowledge indicators, perceptions of risk, and the effects of these on the condom use of Kenyan men.

BACKGROUND

The preliminary report from the 1998 Kenya Demographic and Health Survey (KDHS) indicates a sharp upturn in child mortality (NCPD *et al.*, 1998) much of which is undoubtedly HIV/AIDS related. The survivorship gains of the past few decades have been dramatically reversed across the region with the result that, in many countries, life expectancy has dipped precariously close to 40 years over the last decade. The situation is further aggravated by sub-Saharan Africa's relative disadvantage (compared to countries in the West) vis-à-vis the economic inability to deal with the mortality and health consequences of the disease (Mulder *et al.*, 1994). As donor countries have insisted on increasing cost sharing in the medical sector and government expenditures have declined as a result of economic deterioration, donor aid has diminished so that the situation in sub-Saharan Africa has become even more distressing (Ankra, 1996; Ogbu and Gallagher, 1992).

Along the East/South/Central axis of the continent, the highest levels and rates of infection on the globe has made AIDS a leading cause of death in many countries

(Bongaarts, 1996; Caldwell and Caldwell, 1993; Elias, 1991; Sher, 1993). In Kenya, the first reported case of an infected individual who had never traveled beyond the national borders occurred in 1994. Yet, by 1997, government estimates of infected persons stood at almost 1.5 million persons out of a population of 30 million (National AIDS/STD Control Program of Kenya, 1998). Most infected persons are in the economically active 20-40-year age range. Not surprisingly, the development costs (human, socio-cultural, infrastructural, political, and economic) associated with the disease are immense (Hope, 1995) and its recognition has spawned considerable activity aimed at combating the presumed misinformation and lack of knowledge about the disease. Ironically, the virus has continued to spread in the face of numerous efforts to raise levels of knowledge about HIV/AIDS (Adomako Ampofo, 1993; Bertrand and Baku-tuvwidi, 1991; Boatler, Knight, and Simpson, 1994; Irwin and Bertrand, 1991; Kitsch, 1994; Schonfeld *et al.*, 1995).

Theoretical Considerations

Two theories related to health care behavior have particular relevance for this study. Rosenstock's (1974) health belief model and Ajzen and Fischbein's (1980) theory of reasoned action are useful for distinguishing people who practice healthy lifestyles from those who do not (Terry, Gallois, and McCamish, 1993). Both examine health behaviors from the perspective of an individual's knowledge base. The health belief model is premised on a personal evaluation of the threat associated with a disease, perception of self-risk, and the evaluation of the costs and benefits of a given action (Becker *et al.*, 1977; Janz and Becker, 1984).

The more recent theory of reasoned action further acknowledges the role of normative influences vis-à-vis an individual's factoring of other's expectations of them into their decision-making (Terry *et al.*, 1993). Both theories clearly acknowledge rationality as the basis of behavior. From this perspective, it appears imperative to search for rationality even where it is not clearly evident. As well, there is the need to explore the extent to which socio-cultural factors govern decision-making and more so in Africa where male authority in this realm is substantial.

It is not surprising that the presumption guiding many AIDS-related studies, albeit frequently latent, is that improved levels of knowledge about modes of transmission and prevention will incline people towards behavior conducive to combating the disease. Indeed, the position of the World Health Organization (WHO) is that behavioral change is, today, the sole means to check the spread of the virus (Cleland and Ferry, 1995). However, our understanding of the link between people's knowledge about the virus and their behavior is limited. There is sufficient reason to question whether the apparently logical link between knowledge and behavior necessarily, or even always, exists. After all, despite high levels of knowledge, sexual behavior remains risky both in the West (Brewer, 1988; Edwards, 1994a, 1994b, 1995c) and in Africa (Adomako Ampofo, 1993, 1995; Bertrand and Bakutuvwidi, 1991). Although a variety of behavioral responses exists (abstinence, reduced number of partners, partner selectivity, among others), condom use continues to be the most realistic option in a cultural context where widespread abstinence prior to marriage is unlikely to become the norm and social supports and economic hardship undergird multiple multiple partnership through both de jure and de facto polygamy (Zulu, Ezeh, and Dodoo, 2000).

Rushing's (1995) comprehensive assessment of the literature on cultural behavior informs the discussion about the social context of HIV/AIDS in the developing countries. In devoting considerable space on Africa, he makes an argument for the viability of utilizing a social behavioral perspective as a framework for examining responses to the spread of the virus.¹ He contends that individuals reflect on their knowledge bases and cultural contexts to choose courses of action that yield the best rewards for them. Likewise, perceptions surrounding the disease undergird the rationality of behavioral responses.

Sex, Gender, Power, and AIDS in Africa

Studies of the link between knowledge and behavior more often focus on women perhaps because of their greater vulnerability to the disease during sexual intercourse (Chin, 1990). Yet, beyond the fact that the condom is essentially a male method or that its use necessarily requires male involvement or consent, patriliney and patriarchy give men considerable power in the reproductive realm in sub-Saharan Africa (Caldwell and Caldwell, 1993; Dodo, 1995, 1998; Omondi-Odhiambo, 1997). Not too long ago, a Newsweek article (September, 1997), titled "Making Men Listen," linked the fact that men close to 70 percent of the world's HIV-positive people live in sub-Saharan Africa to the very patriarchal climate of the region. In many patrilineal societies, where children belong to the man's family, women are not even expected to express a preference in reproductive matters; where they do, they are still expected to defer to men (Isiugo-Abanihe, 1994).

Beyond the gender power advantage, the cultural dictates are such that males usually form sexual bonds with females who are considerably younger and, thus, further

disadvantaged in these societies where age and authority are generally synonymous. Men are permitted sexual license even before, as well as during, marriage (David and Voas, 1981; Caldwell *et al.*, 1989). In societies where *male* adultery is essentially considered licit (Caldwell *et al.*, 1989; Nyamwaya, 1991) and women appear to have relatively little ability or inclination to refuse their partners' sexual demands (Schoepf, 1988; Sseikiboobo, 1992), it stands to reason that male attitudes and behavior are, indeed, crucial to the understanding and management of infections.²

The relationship between knowledge about the disease and behavior needs to be viewed against the socio-cultural context of HIV/AIDS in the region. Men's power in sexual relationships derives from the nature of gender relations and, particularly, marriage (Caldwell, Caldwell, and Quiggin, 1989). Because HIV/AIDS spreads primarily via heterosexual means in the region (Caldwell and Caldwell, 1993; Langstone, 1989; National AIDS/STD Control Program of Kenya, 1991; Nzioka, 1994; Oyoo, 1992; van de Walle, 1990), men's reluctance to use condoms, and more so with their married partners, is critical. Men report reduced stimulation or pleasure or the fear that suggested use to partners signals promiscuity. At the same time, even among monogamously married men, more than one-half report having had multiple sexual partners (NCD *et al.*, 1994).³ The implication is that condom use should have a greater effect in reducing the transmission of HIV/AIDS in sub-Saharan Africa relative to the rest of the world.

Meanwhile, research on Africa, as in the West, has focused more on the so-called "high-risk" groups.⁴ For Africa, this has generally meant prostitutes, single urban residents, long-distance truck drivers, and teenagers (Adomako Ampolo, 1995; Akande and Ross, 1994; Anarfi,

1990; Ankomah and Ford, 1993; Nsanze, 1990; Schoepf, 1988). The emphasis on the high-risk potentially diverts attention from a focus on risky *behaviors*, especially as they occur among groups perceived to have lower risk (Lewis and Kashima, 1993). A consequence is that people who do not belong to the advertised high-risk groups frequently consider themselves not a risk of infection regardless of their behavior. Where prevalence is high and incidence of the disease has spread beyond core transmission groups, it is important for studies to go beyond high-risk groups.

Relatively less empirical attention has been paid to the relationship between AIDS-related knowledge and behavior among groups not considered high-risk, including married persons and especially those in monogamous marriages. Such groups, however, may actually be at greater risk than the supposed high-risk groups (for example prostitutes) because the latter benefit from being more targeted by public health and educational efforts (Adomako Ampoto, 1995). As well, people may be more cautious in their interaction with, say, prostitutes than they would be with partners from "low-risk" groups. Thus, it is plausible for heterosexuals in monogamous marriages to actually be at greater risk of HIV-infection because they or their partners sometimes engage in unprotected extra-marital sex, ironically, precisely because they deem themselves not at risk.

Few national-level studies of the link between knowledge and behavior regarding HIV/AIDS in Africa and, indeed, the developing world exist. Recognition of this weakness in our understanding of AIDS-related behavior at the national level in the developing world spawned a 16-nation WHO study which, among other things, examined the link between knowledge and behavior (Cleland and

Ferry, 1995). The significance of the WHO study lies in the fact that, prior to it, “no national surveys on sexual behavior” existed in the developing world (*Ibid.*, xvii). A major finding of that work is of a significant positive link between *risky* behavior (defined as multiple partnerships, commercial sex, etc.) and condom use. Yet, a question about time sequencing of events remains because this attempt to establish causality employs the *ever-user* of condoms as the dependent variable (Mehryar, in Cleland and Ferry, 1995). Moreover, the fact that condom use can be driven by fertility preferences necessitates that any examination of the causal effect of AIDS-KAP include controls for the motivation to use contraception.

These shortcomings of the WHO study are significant, particularly because condom use is more likely in extra-marital relationships which are frequently defined as risky and are also the very relationships in which children are, typically, not wanted. The WHO study also overlooked the role that deeming a potential partner infection-free may play in preventing an otherwise knowledgeable person (about other aspects of the disease) from utilizing condoms in sexual encounters.

THE CURRENT STUDY

The preceding discussion points to the need to carry out research among groups not traditionally classified as high-risk. Here, a focus on married men is important not only because they are, as a group, not conventionally deemed high-risk but also because of their power in sexual matters and, in particular, in the use of condoms. This study examines the effects of various facets of knowledge about HIV/AIDS and perceptions of self-risk of infection on the condom use of married men who have been relatively

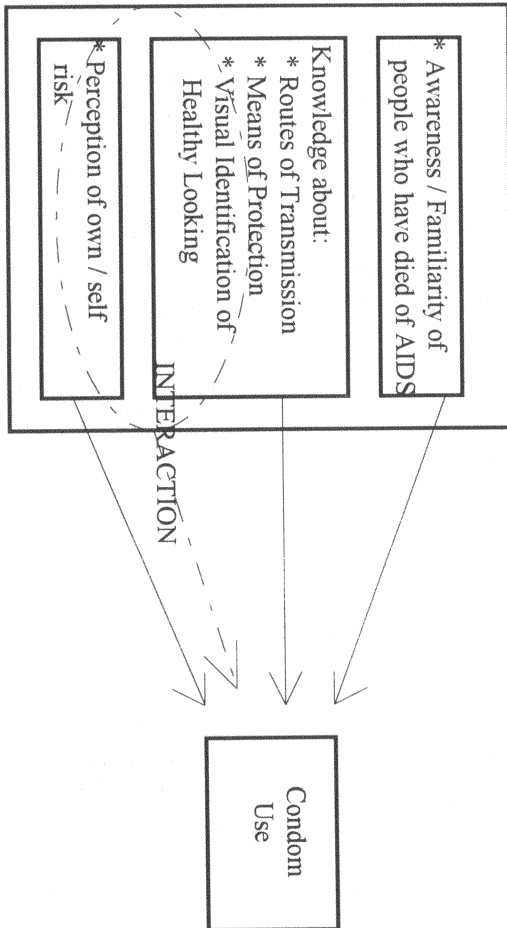
excluded from precious research on behavioral responses to the disease. The basic research question asked here is how is condom use among married Kenyan men influenced by what they know about HIV/AIDS and their own perception of self risk?

Knowledge about routes of transmission, effective means of protection, and possible symptoms of the disease should all influence sexual behavior and condom use. Likewise, knowing people who have died from the disease should condition whether individuals adapt their behavior. Beyond the knowledge that individuals possess, another plausible explanation for behavior adaptation regards the extent to which they perceive themselves at risk of infection.

Although studies of the link between knowledge about supposedly risky phenomena and associated response behaviors often measure perceptions of risk, they typically neglect how such perception may itself be clouded by notions of self or of the associated behavior that are not altogether valid. For example, individuals who are actually at risk of contracting HIV through frequent sexual intercourse with multiple partners may deem themselves otherwise. Such people may not practice safe sex because they erroneously deem that they can visually identify and, hence, avoid prospective partners who are infected. In this vein, Sternberg's (1986) argument, that people make "rational" choices regarding others they relate to, is extremely relevant.

It is also conceivable that those who are aware of the protective benefit of condoms may not deem use necessary with potential partners who are healthy-looking because they might signal distrust or even suggest that one is, himself or herself, not an ideal sexual partner. Although this logic appears intuitive and would probably surprise no

Figure 1. Conceptual Framework



one, it remains important to verify the importance of the implied interaction effect because such a finding should boost our confidence that behavior is indeed rational and help clarify why condom use remains low in the face of high perception of risk.

The framework guiding the study is presented in Figure 1. The authors anticipate effects on condom use of knowledge about HIV/AIDS (and, in this study, particularly regarding knowledge of the routes of transmission, methods of protection, and about whether it is possible to visually identify infected partners), awareness of or familiarity with people who have the disease (or have died from it), and perception of self- or own-risk of infection. The primary contribution of this study regards the further exploration of an *independent* effect of an interaction between HIV/AIDS knowledge and perception of self-risk. The interaction is captured by the ellipse that straddles the “Knowledge” and “Perception” boxes in Figure 1 and has, as indicated by broken arrows, a direct effect on condom use.

DATA AND MEASUREMENT

The data for this study come from the 1993 KDHS which is one of a global set of standardized surveys executed by Macro International (MI) in conjunction with local agencies (in the case of Kenya, the National Council for Population and Development [NCPD] and the Central Bureau of Statistics [CBS]). These surveys, including the 1991 KDHS, are nationally representative samples of the respective countries. As has been typical of demographic surveys, the KDHS focuses primarily on women of reproductive age (15-49) using standardized survey questionnaires to interview a statistically selected sample of 7,540

women between February and August 1993 (NCPD *et al.*, 1994). An increasing interest in men's influence in reproductive and health decision-making has led to the recent incorporation of male samples in the global surveys (although these remain smaller than the female samples). As a result, the 1993 KDHS also provides a nationally representative sample of 2,336 men aged 20-54. These survey data yield valuable information about the fertility, mortality, maternal and child health, and family planning portraits of Kenya.

A module on HIV/AIDS represented a major innovative characteristic of the KDHS. In the face of the rapid spread of the virus in the developing world, the module was designed to generate information about the "knowledge and attitudes of respondents regarding transmission mechanisms and prevention of infection" (NCPD *et al.*, 1994:237). These data, although limited in scope, afford some opportunity to examine a national-level sample in a country where the prevalence and rate of increase of AIDS are high but knowledge about the disease is also high and education and family planning have a reasonable strong foothold in the population (NCPD *et al.*, 1994). The KDHS reports that 99 percent of interviewed men admit having heard about AIDS.

In the current study, the data from the AIDS module are combined with other information gathered on condom use, fertility intentions, sexual activity, and related background characteristics. The KDHS actually asks questions about men's condom use with extra-marital partners, permitting measurement of "risky behavior." However, only currently married men in the sample were asked about their reproductive preferences and intentions. Because the authors expect male reproductive intentions to strongly influence their contraceptive or condom use and because there is no

information about the reproductive preferences of unmarried men, this analysis focuses on married men.

THE AIDS MODULE

Respondents were asked questions about HIV/AIDS as well as about their sexual activity. Responses to these questions constitute the subject of this investigation. Interviewed males were asked the number of women they had been sexually active with, how AIDS is generally transmitted (and how respondents might themselves catch the disease), whether it is possible for healthy-looking people to be infected, whether and how people can protect themselves from the disease, whether they know anyone who is currently infected with the virus or who had died from AIDS, and whether the respondents thought they, themselves, were at risk of catching the disease. Respondents who thought they were at risk were further questioned about the possible sources from which they might contract the disease. These questions permit investigation of the effects of men's awareness about AIDS and their perceived level of self-risk on their condom use.

THE DEPENDENT VARIABLE

In the sexual activity and AIDS module, men were asked the number of women they had been sexually active with in the last six months and, subsequently, whether they had used condoms with any of these women. This measure of condom use, no doubt, has some problems. There is potential for overstatement of the level of condom use specifically because men were not asked to indicate which, or how many, of their sexual partners with whom they used condoms. The possibility of overstatement is especially true

for men with multiple sexual partners who may be subject to varying degrees of risk with their different partners. There is also no indication of the frequency or consistency of condom use even where there is only one sexual partner. Neither is there any indication of whether use is for family planning purposes although, in this case, the authors were able to control for fertility preferences.

Finally, measuring current use in a six-month window, albeit inherently better than an *ever-use* measure, still raises questions about the relative timing of dependent and independent variables. Obviously, the quality of the variable raises some concern.⁵ Yet, these data allow the researchers to, at least, glean the relationship between AIDS-related knowledge and behavior. The authors expects that, if the anticipated relationships are strong, they should still see some indication of these in the data.

After deleting cases missing on condom use and other study variables (and husbands whose wives are infected or have been sterilized), 1,285 respondents were available for study. Although barriers to condom use exist, the authors assumed that use, when it occurs, reflex conscious choice, making it a viable study variable.

Condom use is a dichotomous measure coded "1" when use is present at the time of the survey, and "0" otherwise. Fully 14 percent of the sample reports current use of condoms. The dichotomous dependent variable lends itself to the employment of logistic regression for the current analysis (Morgan and Teachman, 1988). The dependent variable can be expressed as the summation of the products of covariate means (x_i) and regression coefficients (b_i) and translates into the log odds of condom use as follows:

$$\text{Logit}(p_i) = \ln(p_i/[1-p_i]) = b_i x_i$$

The coefficients from the logistic regression are interpretable as log odds of the respective variables and each measures the effect of a given variable on condom use. The multivariate tables present the traditional coefficients and standard errors (and levels of significance) for the selected variables as well as overall model statistics (chi-square, log likelihood, etc.). A nested model enables the assessment of the interaction effect, net of the other variables, comparing a model with the interaction effect to a reduced version that does not sport the interaction, provides insight into the superiority or inferiority of the former over the latter.

INDEPENDENT VARIABLES

The independent study variables include three indicators representing various facets of knowledge about HIV/AIDS, a measure of awareness or familiarity of the manifestations of the disease, and a measure of risk perception of respondents. One facet of knowledge about HIV/AIDS can be tapped from a question inquiring about routes of disease transmission. Respondents were asked how the virus is transmitted and were allowed to provide as many responses as they deemed necessary. Their responses were placed into eight categories by the DHS.⁶

Table 1 indicates a reasonable high level of AIDS awareness in Kenya; more than 96 percent of men mention sexual intercourse as either one, or the only, mode of transmission. The authors expect those who know that the virus can be transmitted through intercourse to be more likely than others to use condoms. In the multivariate analysis, men who either report means of transmission other than intercourse or indicate that they do not know that

Table 1. Averages and Proportions of Sample of Married Men, Kenya 1993.

	Proportion	Proportion Using Condoms
Condom Use	.140	
Age(Mean)	36.3	
Education		
No formal education	.101	.031
Some primary education	.537	.115
Some secondary education	.362	.209
Residence		
Urban residence	.237	.187
Rural	.763	.126
Marital Status		
Monogamous	.881	.153
Polygamous	.119	.048
Number of partners		
Two or more partners	.285	.188
One or no partners	.715	.121
Fertility Preferences		
Husband wants no more	.409	.151
Husband wants children	.501	.133
<u>AIDS-Related Variables:</u>		
Routes of transmission		
Sexual intercourse (included)	.964	.145
Non-intercourse/DK	.036	.043
Can people protect themselves (and how)		
Condom among others	.261	.278
Non-condom methods	.601	.108
Not possible/DK	.137	.029

intercourse is a potential mode of transmission, are compared to their counterparts who correctly mention intercourse as a mode of transmission (the reference category).

Responses to a question tapping knowledge about how people can protect themselves from getting AIDS have been placed into six categories.⁷ Although abstinence from sex may represent the surest way to prevent the spread of the disease, it is generally seen as an improbable societal check against HIV/AIDS and should be, perhaps, considered even more so in sub-Saharan Africa where men are permitted to have several partners both legally and socially (Caldwell *et al.*, 1989).⁸

The authors anticipate that, relative to respondents who do not recognize the condom to be an effective form of protection, those who do (roughly 26 percent of the sample) will be more likely to actually use them. In the ensuing analysis, a three-category variable compares people who indicate that the condom constitutes a viable means of protection (variance category), to their counterparts who believe protection from the virus is possible although they do not mention condoms as a means of doing so (approximately 60 percent of the sample), and to those who either do not think or do not know protection is possible (14 percent).

Health-related behavior in Africa has broad-ranging ties to social structure as well as to philosophical and religious beliefs. Traditionally, in many societies credence is given to social and spiritual theories of disease causation and prevention (Twumasi, 1975, 1981). Furthermore, diseases are still largely associated with obvious physical signs. In fact, there is evidence that, despite reports in surveys that healthy-looking persons can be infected, many still relate visual signs with HIV/AIDS. For instance, Fapohunda and Rutenberg (1999:64) indicate that, in Kenya, the symptoms

of AIDS include “weight loss,” “coughing,” “reddening of lips,” and “hair loss.”

In this vein, respondents were asked whether healthy-looking people could have AIDS, with affirmative, negative, and uncertain being the available response options. Indicating that healthy-looking persons may be infected represents implicit acknowledgement that infected parties cannot be visually identified. The anticipation is that people who are aware that infected persons can truly not be visually identified will be more cautious in their relationships and, thus, more likely to use condoms, although this may not be the case among those who believe that they may be, themselves, already infected. It is also plausible that people who think they can visually identify infected parties may, in lieu of avoiding sexual contact with the latter, use condoms more frequently with those they deem to be infected. The study distinguishes the response category comprising the nearly 88 percent who correctly state that healthy-looking persons can be infected from their counterparts who are unsure or responded in the negative (reference category).

Respondents in the survey were asked whether they knew anyone afflicted by, or who had died from, AIDS. A dichotomous (yes-no) variable measures this familiarity or “proximity” aspect of awareness with the reference category in the multivariate analysis being those who did not know anyone afflicted by the virus. The hypothesis is that proximity should increase the likelihood of protective behavior. Attesting to the high incidence of HIV/AIDS, approximately 41 percent of men in the sample knew someone with AIDS or who had died from the disease.

Several studies have indicated the significance of risk-perception vis-à-vis condom use. Ross and McLaws (1993), for example, suggest the use of condoms when individuals deem infection unlikely. Respondents were asked

whether they deemed *themselves* at risk of catching the disease. Those who answered in the affirmative were further asked about potential routes of infection.⁹ Two categories of response are examined with a dichotomous variable distinguishing those who did not think they were at risk (roughly 23 percent) from their counterparts who were uncertain or perceived being at risk (omitted category). In the ensuing multivariate analysis, the reference category includes those who deem themselves at risk.¹⁰ Beyond these AIDS-related indicators, the authors also assess the impact of an interaction term formed between the response category of risk protection (that is, those who perceive no risk) and the variables that measure various types of knowledge about the disease and its transmission.

CONTROL AND BACKGROUND VARIABLES

The logical link between men's fertility preferences and their contraceptive use has been empirically documented (see, for example, Dodoo, 1993, 1998). Wanting no children has a particularly telling effect on contraceptive use so that controlling for reproductive preferences is necessary in assessing the effects of AIDS knowledge and awareness of condom use. A dichotomous variable distinguishes men who want no more children (roughly 41 percent of the sample) from those who want children or are uncertain about their reproductive preferences.

Having multiple sexual partners has long been accepted as a correlate and cause of the spread of HIV/AIDS. The number of sexual partners respondents had in the six months prior to the survey is measured as a dichotomous variable in which men with more than one partner in the period are compared to their one-partner counterparts.^{11, 12} Those with more than one partner, because they likely are

Table 2. Determinants of Condom use among Married Men in Kenya, 1993.

	Model I		Model II	
	b	s.e.	b	s.e.
Intercept	-1.379	0.981	-1.708 ^x	0.977
Age	-0.066**	0.015	-0.068**	0.015
Education				
Some primary	0.692	0.570	0.718	0.536
Some secondary	1.117+	0.573	1.151*	0.542
(No schooling)				
Residence				
Urban	-0.079	0.213	0.086	0.214
(Rural)				
Marriage				
Monogamous	1.357**	0.433	1.304**	0.436
(Polygamous)				
Multiple partners	0.954**	0.227	0.937**	0.225
(One or none)				
Fertility Preferences				
Husband, no more	0.623**	0.223	0.646**	0.224
(Wants children)				
<u>AIDS-Related Variables:</u>				
Routes of transmission				
Non-sex response	-0.404	0.827	-0.523	0.851
(Sexual intercourse)				
Can people protect themselves (and how)				
Yes, non-condom	-0.901**	0.204	-0.915**	0.205
No/Don't know	-2.281**	0.481	-2.355**	0.505
(Yes, condom cited)				
Healthy-looking people can have AIDS				

TABLE 2 (Continued)

Yes (No/Don't Know)	-0.093	0.344	0.360	0.391
Know someone with, or died from AIDS				
Yes (No)	0.167	0.199	0.173	0.201
Self-perception of risk				
Perceive no risk (Perceive risk)	-0.206	0.245	0.997	0.634
Interaction: Can not visually tell*Perceive no risk	-	-	-1.368*	0.682
Chi-square	113.61		117.37	
df	13		14	
-2logL	919.97		915.56	
N	1,285		1,285	

Notes:

- Omitted categories for dummy variables in parentheses
- Significance levels: * $p < .05$ ** $p < .01$ + $p < .06$
^x $p < .10$

at higher risk, should be more inclined to use condoms. The data indicate that more than 28 percent of the men had sexual encounters with multiple partners in the reference period. Because polygamy is non-trivial in Kenya (and by definition raises the number of sexual partners) and married men, be they monogamous or polygamous, are susceptible to extramarital encounters, the authors also control for marital status to differentiate it from multiple partnership.

RESULTS

Model I of Table 2 presents a logistic regression of condom use on the selected independent variables. Each additional year of age lowers the likelihood of condom use by more than six percent. Schooling is positively related to condom use; relative to men with no schooling, those with some secondary schooling are considerably more likely to report condom use with a partner.¹³ Surprisingly, the residence (urban-rural) effect is not significant. Meanwhile, monogamously married men are more likely to use condoms than are their polygamous counterparts.¹⁴ Men with multiple sexual partners have higher condom use relative to their counterparts. At the same time, controlling for fertility preferences is clearly important; those who want no more children are much more likely to use condoms.

Knowledge, Awareness, Risk Perception, and Condom Use

Results of the knowledge and behavior relationship are also presented in Model I of Table 2. There appears to be no significant effect of the specific knowledge of sexual intercourse as a means of transmission of the virus. However, knowledge about means of protection from AIDS is significantly related to condom use. Men who know that

condoms offer protection against transmission are also considerably more likely to use them compared to their counterparts who think that there are means of protection (although these do not include condoms). The former are even more likely to use condoms than are men who either do not know whether protection is possible or indicate that it is impossible for individuals to protect themselves.

It is also the case that correct knowledge that healthy-looking people can still have AIDS does not significantly translate into higher contraceptive use, net of the measured variables. Likewise, whether a respondent is acquainted with someone who has died from, or currently has, AIDS does not have a significant impact. Neither does the perception of self-risk, believing that one is himself at risk of infection, significantly raise the likelihood of contraceptive use.

As indicated earlier, another way to conceptualize the effect of whether healthy-looking persons may be infected by the virus is as an interaction with the other study variables. Model II of Table 2 shows a significant interaction effect of perceiving no self-risk and believing that healthy-looking persons may be infected.¹⁵

In essence, the combination of perceiving no self-risk while simultaneously believing that healthy-looking persons can, indeed, be infected (or in other words, that it is not possible to visually identify infected persons) acts to lower condom use significantly (odds = 0.255). The model with the interaction term is significantly superior to the one without at the .05 level. A likelihood-ratio tests (based on the values of -2LogL) for the nested models yields a chi-square of 4.41 (1 d.f.).

The authors further investigated whether the interaction effect would similarly prove significant among never-married men. Given that these men were not asked about

their reproductive preferences, the authors deemed it necessary to compare the model for these unmarried men to one for married men that also excluded the preferences control variable. This comparison evidences a significant interaction effect (at the .06 level, when the authors delete fertility preferences) for married but not unmarried men.

DISCUSSION

This article set out to explore the relationship between AIDS-related knowledge and behavior with emphasis on the interaction effect of the possibility of visual identification of infected parties and perception of self-risk. The expectation was that, all things being equal, behavior would be rational (Rosenstock, 1974; Ajzen and Fischbein, 1980) in that greater levels of knowledge about the disease should translate into higher condom use. The authors find that, other than knowledge how people can protect themselves, none of the other knowledge indicators or, for that matter, perception of self risk, is significantly associated with higher condom use. While improving knowledge about self-risk may be a necessary condition, it is clearly not a sufficient condition for facilitating behavior change.

More important is the reflection of that knowledge against the backdrop of people's beliefs and perceptions (Adomako Ampofo, 1997; Nzioka, 1996). In this vein, although perceptions of self-risk do not themselves appear to influence condom use, the finding of a significant interaction between perception of such risk and knowledge that healthy-looking persons may be infected is important.

The significant interaction confirms the fundamental rationality of human behavior in that, even when perception of self-risk and the considerable knowledge people have about the disease do not translate into behavior change,

there may be good reason for this. Although neither of the variables is itself significant as a main effect in Model I of Table 2, knowing that one cannot identify infected parties (that is, that healthy-looking persons can already be infected) and simultaneously feeling of sense of no self-risk leads to significantly lower condom use. The confirmation of rationality is in line with the expectations of both the health belief model and the theory of reasoned action (Rosenstock, 1974; Ajzen and Fishbein, 1980). The further finding that behavior appears to be predicated on personal evaluation of self-risk (Becker *et al.*, 1977; Janz and Becker, 1984) and the normative belief in this particular African context that the HIV/AIDS phenomenon manifests itself in a manner than can be visually identified (Rushing, 1995) is critical.

The corollary of the main finding is that, even in the face of a perception of self-risk, as long as a couple people believe that they are able to visually identify infected persons, non-adaptation of risky behavior may be rational. This finding echoes similar ones among heterosexuals, gay men, and also among sex workers that perceptible characteristics—the way potential partners look or speak—influence individuals' perceptions about who is infected (Adomako Ampofo, 1997; Gold, 1993). Perhaps this is why, in Africa as in the West, numerous people seem to be acting fatalistically.

Ross and McLaws (1993) argue that judgment of risk appears to be lower with known partners. Perhaps these individuals also think they are able to identify and avoid infected parties. An obvious implication is that the emphasis on shoring up knowledge levels among the general population has to include rectification of this other form of "knowledge" that visual identification of infected parties is hardly reliable. Although programs undoubtedly try to

increase awareness that symptoms are not visible, more needs to be done since this notion is deeply entrenched in the society.

Fapohunda and Rutenberg (1999) show clearly that, despite the large proportion of people who respond that healthy-looking persons can have AIDS, the notion that there are identifiable physical traits of infected persons is prevalent in Kenya. Perhaps we must revisit the interpretation that the survey respondents attach to the concept of "healthy-looking." Ironically, Nzioka (1994) reports that the Kenyan government, on the basis of a rational choice model, mainly concerns itself with information supply rather than educational efforts about HIV/AIDS. A more aggressive educational approach should simultaneously address the entrenched belief that infected parties can be visually identified while also tackling the ability to properly evaluate self-risk.

More research is needed to verify the findings in this article. For one, concerns about data quality are evident although a comparison of these results to those that obtain from a model based on another measure of condom use described in Note 5 suggests that these findings are indeed valid. In the same vein, more and better measures of the study concepts and cultural context are needed. It is also important that attempts be made to understand why the notion of visual identification persists in the face of all the ongoing educational efforts.

Finally, future research should explore the applicability of such reasoning to other health and social contexts and behavior. For instance, the disturbing levels of premarital pregnancy, although apparently unrelated to young women's knowledge of the implications of early childbearing, may be clarified by their perception of lower associated opportunity costs. Societal misunderstanding of their

actions may, therefore, seem to be a function of the variance between our and young women's perceptions of their life chances. Thus, an interaction effect of their knowledge and perceived life chances may yield explanatory profit.

NOTES

1. Rushing concedes that he presents no original evidence.
2. Wives in patrilineal societies in Africa have a lot to lose if their marriages break up and they are. Therefore, unlikely to "engage in brinkmanship in refusing" intercourse with their husbands (Orubuloye *et al.* 1993:870) or on insisting on condom use. Orubuloye *et al.*, indicate, for example, that, although a Yoruba woman may run some risks by refusing her husband's sexual advances over a period, "most persons do not recognize venereal disease as a reason for refusing sex to partners and the concept certainly now exists in the society." For many women from patrilineal societies, the ease with which a woman can refuse sex, choose to leave a marriage or risk being divorced depends, to a large extent, on her access to resources, her ability to retain control over her own income, and her ability to gain access to land and other resources from her family of birth. In East Africa, women, on leaving their families of origin, are generally leaving to join the lineages of their husbands. Doing so makes divorce a highly risky or unattractive option.
3. Fully 39.2 percent of monogamously married men have had two or three partners and another 15.9 percent have had at least four partners.
4. In the era of AIDS, risk in sexual relationships is typically measured in terms of non-condom use because commercial, casual, and/or multiple partners are assumed to exist. Once the virus exists in such a population, further rapid spread is expected. This approach has tended to mask the fact that non-condom use, among other subgroups that engage in less partner switching, could be just as risky once the virus permeates such groups.
5. Fortunately, the availability of a second measure of condom use in the data served to temper the authors' concern about the

6. quality of their measure because the former permitted cross-verification of the validity of their dependent variable, The second measure of condom use is found in the contraception (family planning) module where men were asked whether they were *currently* doing anything to delay or avoid pregnancy (of their partner[s]). Affirmative responses led to further solicitation of the method or choice. Condom users can, thus, be identified. Although this measure is superior to the "sexual activity and AIDS module" on used in this study, it comes with its own set of problems. For one, it fails to account for condom use that is unrelated to family planning choices and, therefore, potentially understates the level of use. Also, a question regarding consistency or frequency of use remains. Despite this, analysis, not shown here but available from the authors, produces findings consistent with this study thus alleviating much of the concern regarding the validity and reliability of their selected measure. Net of controls for fertility preferences and other selected variables, favorable comparisons between the relationship of the independent variables and the two dependent variables measures (one utilized in this study and the other available from the authors) increase confidence in these results.
7. The categories include sexual intercourse: (A); shaving/razors (B); injections (C); circumcision, tattoos (D); mother-to-child (E); transfusion of infected blood (F); other-specify (G); and does not know (H).
8. The categories include: do not have sex at all (A); limit number of sexual partners (B); use condoms during sex (C); sterilize syringes/needles (D); other-specify (E); and not sure/does not know (F).
9. Although studies in the West indicate that many adults have multiple partners (see, for example, Edwards, 1994c), the difference is that extramarital sexual relations are not considered to represent potential marriage relationships as they can be in many African societies. Hence, they carry less societal censure in Africa.
10. The categories include: wife/partner; needles/injections; blood transfusions; other-specify; and those who think they can catch it but are not sure how.
11. Because of the centrality of the risk perception measure to the formation of the interaction, the authors exclude respondents

who indicate that they are uncertain about whether or not they are at risk. Thus, in the multivariate analysis, they compare two categories: those who perceive themselves at risk and those who do not.

12. A parallel analysis examined the total number of sexual partners respondents had been with in their lifetimes. The outcome was unchanged. The "recent" period was retained because of concerns of recall in a "lifetime" period.
13. As a check, the authors also performed the analysis representing multiple partners as a continuous variable. The results remained similar. The dichotomous measure was retained, given a primary interest in multiple sexual partnerships.
14. It is argued that men's reproductive preferences (and condom use associated with family planning motives) are, typically, hardly constrained by socioeconomic variables because women bear a disproportionate share of costs associated with childbearing and rearing (Caldwell, 1983; Dodoo and Seal, 1994; Fapohunda and Todaro, 1988).
15. The exponent of a logistic coefficient translates into the likelihood of condom use.
16. Interactions between the healthy-looking variable and all the other AIDS-related variables proved insignificant and were, for the sake of parsimony, excluded from the results presented here.
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