GENDER AND RISK OF HIV IN GHANA AND UGANDA

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Summary. Using Demographic and Health Survey (DHS) data for Ghana and Uganda, this study examines the gender differentials in perceptions of HIV risk in the two countries, which have been hit by the HIV epidemic in a different way, as in Ghana the epidemic has just started. It identifies factors associated with high or low risk of HIV infection by using logistic regression methodology. Principal findings include strong gender differentials in perceptions of risk, especially in Uganda; women felt at greater risk of HIV infection than men. In addition, strong power relationships exist as women felt at risk of HIV infection because of their partner's sexual behaviour, whereas the men's risk perception was related to their own behaviour. This illustrates the subordinate position of women within sexual relationships as well as the need to empower women to enable them to negotiate safe-sex strategies. Individual, knowledge exposure and sexual exposure factors were highly associated with perception of risk in Uganda whereas individual background characteristics were more influential in Ghana. As the HIV epidemic develops in Ghana, similar associations and gender differentials may become apparent as in Uganda.

Introduction

HIV/AIDS is an extremely important topic of study in Africa given recent figures that show that nearly 25 million of the population in sub-Saharan Africa are living with HIV/AIDS (UNAIDS, 2000). However, the majority of women and men in sub-Saharan Africa report that they have little or no chance of being infected with HIV. For example, in Uganda, 65% of women and 84% of men reported that they had little or no chance of being infected with HIV, and in Ghana, 76% of women and 80% of men reported that they had little or no chance of being infected (UDHS, 1995; GDHS, 1998). Perception of risk is important to study in the era of AIDS because it is a precursor to behaviour change, although not an indicator of, which determines future infection/prevention. It is therefore interesting to study these perceptions and gender differences as perception is a precursor to behaviour change and future HIV infection (Cross, 1992; Shrader-Frechette, 1990; Rosenstock, 1974 cited by Boroffice, 1995).

This paper's main aim is to identify the factors associated with low or high perception of HIV infection, employing logistic regression methodology, using data collected by the Uganda Demographic and Health Survey (UDHS) of 1995 and the Ghana Demographic and Health Survey (GDHS) of 1998. Of particular interest are differences in the perception of risk of HIV infection between men and women, followed by an inter-country comparison of these differences.

Literature Review

Perception of risk is a personal risk-assessment. However, it may not reflect *actual* risk. It may reflect an individual's level of and access to knowledge. Perceptions should therefore be influenced not just by objective circumstances, but by media campaigns that provide

information and, societal views, and norms that mediate their impact (Shrader-Frechette, 1990). Other studies argue that perception is socially constructed in that social experiences influence the way in which people perceive superficially identical risks (Cross, 1992). For example, the death of someone with AIDS may increase the subjective perception of risk among all members of the family or community even though some may be at very low risk. Conversely, where deaths from AIDS are rare or well-hidden, the risk of infection may be perceived as being much lower than is actually the case. Therefore, in order to understand risk-taking behaviour and behavioural change, it is the subjective perception of risk that needs to be studied, as opposed to actual risk.

The study of perception of risk is complex mainly because of the difficulty in distinguishing between *perceived* and *actual* risk as well as the associated subjectivity. In addition, DHS data collects information on how respondents report their perception and so may not portray what they believe, just how they are expected to answer.

Individuals respond differently to the AIDS epidemic and often not rationally. Some adopt the stance "*it would never happen to me*" where they assume that they are immune to infection for a variety of reasons (Weitz, 1989). Such individuals perceive their risk to be zero or negligible and because of this, they may not modify their behaviour even when their actual risk is high. Others however, adopt a fatalist attitude where they decide HIV infection as inevitable and see no point in modifying their behaviour. Clearly in countries where AIDS is a real threat, a balance must be reached where people form realistic notions about their own personal risk levels and have the option of making informed behavioural changes. Rosenstock (1974) who developed the Health Belief Model suggests that preventative action is more likely among those who feel vulnerable to a disease. This suggests that people have to perceive themselves at risk of HIV infection in order to take preventative action to safer sexual behaviour, such as monogamy or condom use.

Knowledge of AIDS may be linked to perception of risk and types of sexual behaviour. For example, in Zimbabwe, a weak association has been found between greater knowledge of AIDS and a later age at first sex (Gregson et al., 1996). When reported risk perception is high, individuals may seek ways to protect themselves through risk-avoidance behaviour and condom use (Adetunji & Meekers, 2000; Mbizvo et al., 1997 cited by Adetunji & Meekers, 2000; Wilson, Lavelle & Hood, 1990). Gregson et al. (1998), for instance, found that women in Zimbabwe who knew people who were dying of AIDS were more likely to take preventative actions. In another Zimbabwean study, conducted between 1994 and 1997, condom use increased from 3% to 22% amongst men who felt at high risk of HIV infection (Mbizvo et al., 1997; cited by Adetunji & Meekers, 2000). Similarly, the proportion of women using condoms also increased from 7% to 23%. Behavioural change has also been shown in Uganda where the age at first sex has increased as well as condom use (UNAIDS, 1998). The GDHS (1999) states that more than half of respondents in Ghana have restricted sex to one partner, 8% of women and 14% of men have reported that they have kept their virginity, 14% of men and 6% of women reported starting to use condoms in response to HIV.

It is possible that a person's self-assessed risk of HIV infection is based on the extent to which he or she takes preventative actions, such as condom use. If this is the case, then those with low self-assessed risk of HIV infection might be those who are consistently using condoms in high-risk sexual relationships or who are not at all engaged in high-risk behaviour (Adetunji & Meekers, 2000). Unfortunately, increased knowledge or indeed reported change in behaviour may not result in actual or sustained change; knowledge about AIDS and the modes of HIV transmission is very high in Eastern and Southern Africa but indications of behavioural change are rather weak.

It is can also be argued that one has to first identify a risk before preventative action is taken. As expected, respondents who believe they are at no or small risk of contracting

HIV/AIDS, were less likely to change their behaviour than those who believed that they have a moderate or great risk of getting AIDS, or who already had AIDS (GDHS, 1999). The UDHS (1996) finds that a 'disturbing' third of women who believe that they were of moderate/great risk, or who were aware that AIDS is fatal, had not modified their sexual behaviour in order to lower their risk.

People in the same situation can have substantially different perceptions of risk because of many factors. In particular, women may have a higher perception of risk because they lack the power needed to negotiate in sexual relationships. Evidence from Blanc et al. (1996) suggests that about 25 per cent of Ugandan men and women in their sample believed that a woman cannot refuse sex with her partner, even if she knows that he has AIDS. Other studies in Ghana and Kenya show that generally men have greater influence in intimate relationships and women are more vulnerable to infection and unwanted pregnancies (Gage and Njogu, 1994; MacDonald, 1996).

Women generally have higher rates of HIV infection than men and this difference is more prominent among younger women. Table 1 shows the estimated HIV prevalence rate in young people aged 15-24 years, in selected African countries. The table illustrates that there are indeed strong gender differences in HIV infection rates. Women consistently have higher infection rates although the gender difference varies by country.

[Table 1 about here]

Behavioural change and the link between the subjective perception of risk, may differ by gender due to gender inequalities. Elias & Heise (1993) suggest that underlying power inequalities may severely limit the ability of many women to change their partner's sexual behaviour or enforce the use of condoms (cited by Gage & Njogu, 1994). In addition, there is much evidence to suggest that women have no control over contraceptive use in relationships, both before and after marriage, as it is the men who control the sexual relations and decision-making. In Botswana, it was found that young women feel at more risk of HIV, and because of cultural expectations to provide sexual satisfaction, are powerless to demand, or indeed negotiate safe sex (National AIDS Control Programme, 1992 cited by MacDonald, 1996).

High-risk sexual behaviours, including multiple sexual partners, the use of commercial sex workers, and low condom use are important determinants of HIV transmission. Polygamy is common in Uganda and Ghana. About a third of all women interviewed in the 1995 UDHS and nearly a quarter of women interviewed in the 1998 GDHS reported that they were currently in a polygamous union (UDHS, 1996; GDHS, 1999). Unless all members of a polygamous union are faithful, polygamy increases the chances of HIV infection because there are more people who can bring infection to the household. In addition, it is also culturally acceptable for married men to have more than one sexual partner (MacDonald, 1996).

Commercial sex also contributes to HIV infection in Uganda, particularly in the urban areas where unmarried males, or those whose wives live in rural areas, turn to sex workers (Anderson et al., 1991, Larson 1989, Orubuloye, Caldwell & Caldwell, 1992 cited by Caldwell & Caldwell, 1993). In fact, women turn to commercial sex work because of gender inequalities in employment opportunities (Adamako Ampofo, 1993; Ocholla-Ayayo et al., 1993 cited by Gage & Njogu, 1994). This type of risky sexual behaviour may be especially problematic because condom use is very low. Although sexual networking is acceptable, the discussion of sexual issues was, until recently, a 'taboo'. Such reticence to discuss sexual matters complicates issues, as people may not receive accurate information about HIV and other Sexually Transmitted Infections (STIs). These potentially risky behaviours and cultural

norms may influence an individual's actual or perceived risk of HIV infection in Ghana and Uganda.

Background to Study Countries

Uganda and Ghana have had different experiences of the HIV epidemic, in the East and West of sub-Saharan Africa, and because of this are interesting to compare. Recent figures suggest that by the end of 1999, more than 800,000 Ugandans were living with AIDS, which is a prevalence rate of 8.3%, and about 110,000 people had died of AIDS in that year (UNAIDS, 2000). The estimated HIV prevalence rate for young people aged 15-24 years was between 6.7% and 9.0% for women and between 2.6% and 5.1% for young men at the end of 1999. Uganda was one of the first in the continent to record such high levels of AIDS cases and the country was also the first in the continent to respond to the AIDS situation. As a result of strong efforts to control the epidemic, such as interventions targeted at adolescents, there are now indications that the epidemic is beginning to slow down in the country (UNAIDS, 2000). Uganda's case is particularly interesting to study, not only because of the high numbers of AIDS cases, but also because of the strong cultural factors associated with sexual behaviour. Further, the encouraging signs of a slow down in the epidemic are the result of changes in behaviour so that understanding perceptions of risk and their link to behavioural change is of paramount importance.

In contrast, Ghana has over 300,000 people living with AIDS and an adult prevalence rate of 3.6% and 33,000 people had died of AIDS in 1999 (UNAIDS, 2000). Estimates of HIV prevalence for young people aged 15-24 years are between 2.4% to 4.4% for females and 0.8% to 2.0% for men. Therefore this study aims to make an intra-country and inter-country comparison of two very different countries, in terms of their HIV levels, to investigate differences that could provide a clue as to the perceptions and attitudes towards the virus and hence behaviour and the future of the epidemic.

Methods

The DHS data sets are few data sources which contain information on perception of risk and sexual behaviour and were therefore used in this study to identify determinants of perception of HIV risk. In addition, these surveys collect information on knowledge and attitudes towards AIDS and condom use, classified by gender. Data from the 1995 UDHS and the 1998 GDHS are used in this paper.

Logistic regression was used to analyse the perception of risk of HIV infection. In this application, the high reported risk of HIV was modelled for Uganda and Ghana separately. Separate models were also estimated for women and men, and these models were compared to one in which both sexes were combined in order to see if there were significant gender differences in the odds ratios. The Ugandan sample after exclusions includes 6993 women and 1990 men and the Ghanaian sample includes 4843 women and 1546 men.

Although it may have been useful to investigate only those respondents who were currently sexually active (i.e. married women) to explore risk perceptions in line with sexual behaviour, an important strategy that individuals may adopt, particularly young, unmarried women, is delayed marriage or premarital abstinence. For this reason, it is important to look at the perceptions of all respondents.

Figure 1 presents a conceptual framework, summarising the interaction between the factors associated with perception of HIV risk and behavioural change. Although this study only considers perception of risk, the framework shows the importance of the study because of the potential link with behavioural change and HIV infection/prevention. Individual demographic factors influence both knowledge and sexual behaviour. Sexual exposure factors and factors relating to knowledge of HIV are hypothesised to influence perception of

HIV risk and behavioural change. In addition, perception of risk is likely to be a strong determinant of behavioural change and hence HIV infection or prevention. However, the direction of causality is unclear as a change of behaviour may also influence perception of risk.

[Figure 1 about here]

The DHS surveys ask *"Do you think your chances of getting AIDS are small, moderate, great or that you have no risk at all?"* (UDHS, 1996). Respondents who considered themselves at no risk and small risk of HIV infection were grouped into a '*no/low risk*' category, whereas those who considered themselves at moderate and great risk were grouped '*high risk'*. The dependent variable was coded '1' for the latter, high-risk group. An ordered logit model could have been used but binary logistic regression was preferred for ease of interpretation. Missing cases and those who did not know their perception of risk were excluded from the analysis. As there were only 77 women and 6 men in the Ugandan sample classified in these missing and don't know groups, their exclusion should not bias the results significantly. However, 1002 women and 203 men from the Ghanaian sample were excluded for this reason and so this is a limitation.

Table 2 states what explanatory variables were used and how they were defined. The same variables and categories were used in the male and female models to ensure compatibility. Where possible, the same variables were also used for both countries. However, this was not always possible because of what questions were asked in the corresponding DHS questionnaires, and the way in which the data were coded. For example, Ghana does not have DISH districts, it has ten regions compared to Uganda's four, different religious categories and the GDHS did not ask if the respondents listened to the radio every week.

[Table 2 about here]

Results

The preliminary results indicate that perception of HIV risk is higher in Uganda than in Ghana. Gender differences are also stronger in Uganda than Ghana, with 34% of women perceiving their risk of infection as being moderate/great compared to only 16% of men (see Figure 2).

[Figure 2 about here]

Education appeared to make more of a difference in Uganda. The percentage of women considering themselves at moderate/great risk increased with educational level in Uganda. This association was significant at a 1% level in the chi-squared test. The reverse was true for men in Ghana with the percentage reporting themselves at moderate/great risk decreasing with educational level. Education appeared to have very little influence on women's perception of risk in Ghana.

Marital status also seemed to have more of an association with risk perception in Uganda and was significant at a 1% level for both men and women (see Figure 3). However, only female marital status was significant in Ghana, and at a 5% level. Married/cohabiting women in both Uganda and Ghana reported moderate/great HIV risk the most and never married the least. In contrast, married/cohabiting men appear to have one of the lowest reported moderate/great risk in both Uganda and Ghana.

[Figure 3 about here]

Many of the findings from the preliminary results were echoed in the multivariate analysis. These models also demonstrate that there are some important differences between males and females in their perception of risk. A combined model with both male and female respondents was fitted and compared to one in with sex-specific models. A log-likelihood ratio test indicated that the separate sex models significantly improved the fit of the model. Further, the imbalance in the sample sizes between males and females meant that the female results dominated the combined model. From the combined Ugandan model, it was found that men were 60% less likely to perceive themselves at risk of HIV infection compared to females. Similarly, the Ghanaian model showed that men were 23% less likely to report themselves at risk. However, both results suggest that gender plays a significant role in determining perceptions of risk of HIV infection. Only the results from the separate models are presented and discussed further in this paper.

Uganda

Table 3 shows the odds ratios, for the female and male logistic regression models for Uganda. The table presents the odds ratios for the female and male models as well as the numbers in each group, with their associated significance.

[Table 3 about here]

The table shows that there were many factors associated with the perception of HIV risk and that there were strong gender differentials. The odds of perceiving a high HIV risk show an inverted U-shape distribution by age. The highest proportion among women who perceived their risk of HIV to be moderate/great was among those aged 30-34 years; for males the peak was among those aged 20-24 years. Men and women of these ages were twice as likely to perceive a high HIV risk compared to women aged 15-19 years. Both men and women aged 15-19 years had the lowest odds of a high HIV risk perception. There were also gender differences by region of residence. Women from the Eastern region were 17% less likely and women from the Western region were 13% more likely to perceive themselves at high risk of HIV compared to women from the Central region. In contrast, the reverse was true for men. Men from the Eastern region had higher odds of perceiving high risk compared to those from the Central region. In fact, men from the Western region were 16% less likely and men from the Eastern region were twice as likely to perceive an HIV risk. Residence in a DISH district showed a highly significant relationship to men's reported perceived HIV risk. Their reported perception was increased in DISH districts, being nearly twice as likely to perceive a high HIV risk compared to those not living in a DISH district, although there was no such significant relationship for women. However, residence in urban areas increased the odds of a high HIV risk for both men and women.

Education showed a positive relationship with perceived HIV risk for women, whereas the reverse was true for men. As the level of education increased for women, the odds of a perceived high HIV risk increased. Women with primary education were 26% more likely and women with secondary or higher education were 43% more likely to perceive themselves at high risk of HIV perception compared to those with no education. As the level of education increased for men, the odds decreased, although the association was not significant for men as it was for women. Catholic women perceived the greatest odds of HIV risk whereas women of 'other' religions perceived the lowest. Women of 'other' religions were 66% less likely to perceive a high HIV risk compared to women of Catholic faith. Men of 'other' religions also perceived the lowest odds of HIV risk, but men of

Protestant/Muslim/Seventh Day Advent religions perceived the greatest risk. The religious associations were not significant in the male model. Occupation did not have a significant association on HIV perception of risk, although there were gender differences. Women who worked in manual/other occupations perceived the greatest risk and those working in agriculture perceived the lowest. However, men of white-collar occupations perceived the greatest HIV risk and unemployed men perceived the lowest risk. Men and women of middle Socio-Economic Status (SES) perceived the greatest HIV risk and those of high SES perceived the lowest. Although the same pattern was found for both men and women, a significant association was only found in the female model. Women of middle SES were 1.2 times as likely to report perceiving a high HIV risk compared to those of low SES.

As well as individual factors, knowledge exposure factors also influenced HIV perception, although only listening to the radio and the reliability of the AIDS information source were significant, and only so in the female model. The odds of perceiving a high HIV risk were reduced for women who read a newspaper, watched television or listened to the radio every week. This same pattern was only found for men who watched television every week as the reverse was true for men who read a newspaper or listened to the radio. Women who listened to the radio were 13% less likely to report a perceived high HIV risk compared to those who did not. Both men and women who heard about AIDS from a formal reliable source had increased odds of perceiving themselves at risk of HIV, although it was only significant in the female model. Women who had heard from a reliable source were 1.2 times as likely to report perceiving a high HIV risk compared to those who had heard of AIDS from an unreliable source. However, men and women who knew ways to avoid HIV transmission, had lower odds of HIV risk.

Sexual exposure factors were significantly associated with perception of HIV risk as one would expect. Interestingly, never married women were 62% less likely to report a high HIV risk perception compared to women in a stable union, that is married or cohabiting. Men not living with anyone were 3.5 times as likely to report a high HIV risk perception compared to men in a stable union. Men and women who had first sex prior to age 15 years and had ever used a condom had increased odds of perceiving high HIV risk, although the associations were only significant in the female model. Women who had their first sexual intercourse prior to age 15 years were 44% more likely to report perceiving a high HIV risk compared to those who had had sex for the first time at a later age. Women who had ever used a condom were 26% more likely to report a high HIV risk compared to those who had not.

Ghana

There were far fewer significant associations in the Ghanaian models as well as less prominent gender differentials. Table 4 shows the odds ratios for high perception of HIV risk by gender, the numbers in each group and associated significance.

[Table 4 about here]

The table shows an inverted U-shape distribution of odds for age for women and a bimodal distribution for men. Both women and men had the greatest odds of HIV risk at age 20-24 years. Men aged 30-34 years were nearly three times as likely to perceive a high HIV risk and women were 1.5 times as likely compared to those aged 15-19 years. Region of residence showed a highly significant association to HIV perception. In fact, the odds of perceiving a high HIV risk increased with the country's latitude. Women from the Northern Belt were 4.2 times as likely and men were 3.4 times as likely to perceive a high HIV risk compared to men and women from the Southern Belt. Both men and women with no education had the lowest perception of risk and those of primary education had the highest, although the relationship

was only significant in the female model. Women with primary education were 45% more likely and women with secondary or higher education were 39% more likely to perceive a high HIV risk compared to women with no education. Women of 'other Christian' faiths and men with no religion or of other religions had the highest odds of high HIV perception, whereas Catholic men and women with no religion or of other religions had the lowest odds. However, religion was not statistically significant in either model. Occupation was significant in the female model but not in the male model. Unemployed men and women had the lowest odds of high HIV perception but women working in agriculture and men in manual/other work had the greatest odds. Women of white-collar occupations were 1.6 times as likely to report a HIV risk and women working in agriculture were 1.7 times as likely to report a high HIV risk compared to women who were not working. Women of middle SES perceived themselves at the lowest risk, whereas these men perceived themselves at the highest risk.

Knowledge exposure factors had very few significant associations. Reading a newspaper and watching television were not statistically significant in either model. Hearing of AIDS from a reliable formal information source, increased the odds of high HIV perception significantly for women. Women who had heard of AIDS from a formal source were 24% more likely to perceive themselves at risk of HIV compared to those who had not. Unlike in Uganda, sexual exposure factors did not significantly influence high HIV perception in that there were no differences in the odds of high-risk perception across the sexual union groups.

Discussion

The objectives of this paper were to investigate gender differentials in perceptions of HIV risk in Ghana and Uganda and to identify factors associated with perceptions. The main finding of this paper is that there are indeed strong gender differentials in perceptions in Uganda as well as many factors of influence. In contrast, gender differentials were not so prominent in Ghana and there were fewer associations.

Intra-country Comparison

Uganda

There were strong gender differentials in perception of risk in Uganda. More women perceived risk to be high, or at least reported feeling more at risk, as men were 60% less likely to perceive themselves at risk of HIV infection compared to females. This may be accounted for by the gender differentials in infection (UNAIDS, 2000). In addition, men have greater knowledge and so may have more accurate perceptions (UDHS, 1999). However, the principle reason for this gender differential in risk perceptions may be a result of the reasons underlying the perceptions. Women felt at risk mainly because of their partner's behaviour as opposed to men who felt at risk because of their own behaviour, that is, lack of condom use and multiple partners.

The analysis has shown that women who perceived themselves at risk of HIV infection were typically 30-34 years of age, from urban residences, of at least secondary education, of Catholic faith, and of middle socio-economic status. In addition, they were married or cohabiting, had first sex at an early age, and had used a condom at some time. In contrast, men who perceived themselves at risk of HIV infection were aged 20-24 years of age, from the eastern region, lived in a DISH project regions and were single. The fewer significant associations may be attributed to the relatively smaller sample size. However, in interpreting these results, it should be borne in mind that perceptions of risk may not accurately reflect actual or sustained risk, revealing who may be more receptive to change.

The age pattern of self-assessed risk may be due to women aged 30-34 and men aged 20-24 years, being at the peak of sexually activity. This is consistent with the age pattern of

HIV infection, which impacts the economically active. Risk assessment may increase with age as exposure to risk increases but the older generations may not perceive themselves at risk because of a lack of knowledge/awareness of HIV transmission and avoidance strategies. A reduction in sexual activity may also account for this trend, possibly because of the existence of the grand-mother effect at older ages, whereby fertility reduces and often sexual activity ceases when a woman becomes a grandmother (Sathar & Alam, 1983).

Women felt at the lowest risk of HIV in the Eastern and Northern region, where men felt at the highest. A possible reason for the regional differential in perception of risk is that the Eastern region has a high Total Fertility Rate (TFR) and the highest level of teenage childbearing (UDHS, 1996). This indicates the importance of reproduction as well as the young age of sexual activity. In addition, twice as many women to men have no education and only 6% of married women report using a modern method of contraception with less than 1% using condoms. This shows the strong gender inequities in education as well as contraceptive use, which could influence the gender differentials in HIV perception. It could be that the Eastern and Northern regions are less developed and so have less knowledge and awareness of AIDS leading to a lower perception of risk.

The male perception of risk model found a significant influence of government intervention through DISH regions. This may be because of differential access to DISH regions, whereby men have better access to DISH intervention, as well as linked to condom promotion and availability in DISH regions. Although it was expected that residence in a DISH region would increase perception of risk and change of behaviour, the whole country being saturated with HIV information may account for the insignificance of DISH regions in the female model. Uganda has AIDS information disseminated through government agencies such as the AIDS Control Programme (ACP) and the Ugandan AIDS Commission, Non-Governmental Organisations (NGOs) and donor agencies (UDHS, 1996). Basic information about transmission methods and prevention strategies are widely publicised. The AIDS Commission launched a countrywide educational campaign by means of various media, including radio, billboards and community workshops to inform the population about HIV. Also, the high death rate from AIDS in this country is likely to have enhanced receptivity to such messages (Cross, 1992; Hulton, Cullen & Wamala Khalokho, 2000). Both men and women have a greater perceived HIV risk in urban areas. Residents in urban areas may be engaging in riskier sexual behaviour such as involvement in the commercial sex industry. The urban-rural differential in perception may also be explained by better access to education and exposure to campaigns and the media in urban areas, increasing accurate perception of risk. Rural areas are less likely to be informed about STDs and misinformed about transmission (UDHS, 1996). In addition, rural areas have lower HIV prevalence rates, which may account for the lower perceptions because of a lower acquaintance with the virus.

Education plays a very important role in risk-assessment as increased education may determine a well-informed and accurate perception of risk. Perception of risk increased with education for women but not for men, showing the important effect of education for women. Wolff, Blanc & Ssekamatte-Ssebulia (2000) also found that education was a strong predictor of perceptions, especially for women in the Masaka and Lira districts of Uganda 1995-96. Also, those with no formal education are less likely to be informed about STDs and know ways to avoid HIV transmission and be misinformed about transmission (UDHS, 1996).

Religion plays a strong part in perception of HIV risk as it may be a barrier towards contraceptive use. Religion may sometime act as an obstacle to family planning take-up and hence HIV transmission (Gregson et al., 1996). For example, the Catholic faith teaches its followers to use natural methods of contraception so that safe-sex strategies in the form of condom use are not condoned. In contrast, religiosity is also associated with less risk-taking behaviour, with marriage being a monogamous union. This means that some religious groups

may have a lower perception of risk. The results suggests that Catholics perceive the greatest HIV risk, suggesting that the perhaps the former is true.

Married women had the highest odds of high HIV risk and the never married the least. In contrast, the reverse was true for men. Married women may feel at risk of infection if they suspect their spouse to be having extramarital relationships. Also, the reasons given behind the risk perceptions show that men's risk perception was attributed to their own behaviour, whereas women's risk perception lies in their partner's behaviour. It appears that women may be in a subordinate position both before and after marriage and may feel vulnerable because they are unable to influence their partner's sexual risk-taking behaviour, which is putting them at risk also. In addition, they may not be able to suggest the use of condoms as it broaches issues of infidelity within the relationship. Adetunji & Meekers (2000) report that men, in general, (both married and unmarried) are three times more likely than women to report more than one casual partner, and more than three times as likely than women to report two or more casual partners. In contrast, the low perception associated with unmarried women may be attributed to a reluctance of unmarried women to admit that they are sexually active, or indeed they may be sexually inactive. However, power relationships clearly exist as married women felt most at risk compared to single men. There may be an imbalance in power and status between men and women which is contributing to differences in perception of risk.

Those who had first sex prior to age 15 years, reported higher risk perceptions, possibly because they have had greater exposure to risk. In the UDHS (1996), almost a third of respondents interviewed experienced their first sexual intercourse by age 15 years. In addition, at least half of the six million people infected with HIV globally are younger than 25 years of age, suggesting that they must have acquired the virus prior to age 20 years (United Nations Development Program (UNDP), 1997 cited by Hulton, Cullen & Wamala Khalokho, 2000). Hulton, Cullen & Wamala Khalokho (2000) also discuss possible reasons for adolescents' perceived risk as *a "combination of risky sexual behaviour and frequent lack of information and access to services"* (McMauley & Salter, 1985; cited by Hulton, Cullen & Wamala Khalokho, 2000 pp35). It is suggested that adolescents are unable or unwilling to adopt safe practices because of socio-economic and cultural motivations (Hulton, Cullen & Wamala Khalokho, 2000). The adolescence period includes rapid and uneven physical, psychological, and social growth and development, and the onset of sexual activity that is often combined with a lack of knowledge that compromises healthy choices (Ferguson 1988, Gyepi-Garbrah 1985, Youn 1996 cited by Hulton, Cullen & Wamala Khalokho, 2000). Those respondents who had ever used a condom reported greatest risk. This group may have been exposed to risk and so are attempting to protect themselves in their high-risk behaviour.

Ghana

In contrast to Uganda, there were fewer significant associations in Ghana, although individual background characteristics, such as region, were found more fundamental. However, the combined Ghanaian model showed that men were 23% less likely to report themselves at risk, illustrating that sex does play a role. Women who were most likely to report high perceived HIV risk were aged 20-24 years, from the Northern Belt, of primary education, in agricultural employment and had heard of AIDS from a reliable source. Similarly, men who were most likely to report a high HIV risk were aged 20-24 years of age and from the Nothern Belt.

The age-pattern of self-assessed risk showed that 20-24 year old men and women reported the greatest odds of high HIV risk perception. This group may be at the peak of their sexual activity. Regional residence seemed to have the greatest association with perceptions. For both men and women, those from the Southern Belt reported the lowest odds of high HIV risk and the Northern Belt the highest and the odds of high HIV risk increased with latitude.

This may be attributed to the north being less developed than the south. There is relatively lower awareness and knowledge in the North as residents are less likely to have heard of AIDS and know the modes of transmission (GDHS, 1999). In addition, condom use is much more likely in the South in the Greater Accra region.

Men and women with primary education reported the greatest odds of high HIV risk and those with no education the least risk. Knowledge of AIDS-related issues is lower among those with no education (GDHS, 1999). Both women and men not working had the lowest perception of risk, and men in manual/other work and women in agriculture had the greatest odds of high HIV perception.

The role of the media was not significant. The media was much more important informing highly educated respondents (GDHS, 1999). Hearing from a reliable source increased odds of high-risk perception for women but not for men. The GDHS (1999) reported that hearing from the radio was the most important source.

Inter-country Comparison

The analyses have shown that women in both Uganda and Ghana have a greater perception of risk than men. Many individual, knowledge exposure and sexual exposure factors were significantly associated with high reported HIV risk in Uganda. In contrast, the knowledge and sexual exposure factors played little influence in determining perceptions in Ghana, where individual background factors were most dominant. These very different patterns may be accounted for by the different way in which the AIDS epidemic has hit the two countries. In Uganda, the AIDS epidemic is a lot more developed and generalised throughout the whole country, whereas in Ghana, the epidemic is less developed and more localised.

There were gender differentials by region in Uganda, whereas in Ghana there were no gender differences by region. Urban-rural residence showed a different pattern in Ghana and Uganda also. In Uganda, residence in an urban area increased the odds of high HIV risk perception for both men and women. In contrast, there was no such significant association in Ghana. In a country where the epidemic is starting, the rural areas are likely to be less developed and so access to information about AIDS would be more limited. The GDHS (1999) reports that urban respondents were more likely to have heard of AIDS from the television than rural women and knowledge is reported to be a lot lower in rural areas. This may well be because the epidemic is less developed in Ghana. In Uganda, the virus was probably introduced in the late 1970s/early 1980s and the first AIDS cases were among commercial sex workers and traders in Rakai and spread to rural areas along the trans-Africa highway (UDHS, 1996). In contrast, the first AIDS case in Ghana was identified in 1986 (GDHS, 1999). Therefore, once the HIV epidemic develops in Ghana, the same urban-rural patterns as Uganda may be found.

Education played a similar role in both countries, with a significant association for women but not for men. Those with no education reported the lowest odds of high HIV risk showing the importance of increased education. However, this is likely to be because they lack knowledge and awareness to make an informed risk-assessment. Religion had an association with perception of HIV risk for women in Uganda but was insignificant in Ghana.

Occupation was not shown to be associated to HIV perception in Uganda but was highly significant for women in Ghana. In contrast, SES was significant for women in Uganda but the variable made no real difference in Ghana. In addition, the media played a role in Uganda, with listening to the radio being significant, but the media had no such association in Ghana. This may be accounted for by the absence of the ‘listening to the radio every week’ variable in the GDHS, as the report stated that hearing of AIDS from the radio was the most important source (GDHS, 1999). Related to this, there was a similarity between

the two countries with reference to the reliability of the AIDS information source. In both countries, those who heard of AIDS from a reliable source, had increased odds of a high HIV risk, significantly for women. Also, knowledge of the ways to avoid HIV infection was insignificant in both countries.

Interestingly, sexual exposure factors were highly significant in Uganda but not in Ghana. Married women in Uganda had the highest odds of HIV risk and married men had the lowest. Also, those who had first sex prior to age 15 years and had ever used a condom, had increased odds of a high perception of HIV risk but there was no real association in Ghana. It is therefore likely that as the HIV epidemic develops in Ghana, the associations and gender differentials may be apparent as in Uganda.

Conclusion

In conclusion, this paper has found that strong gender differentials exist, especially in Uganda. Women in both Ghana and Uganda reported feeling at greater HIV risk than men. Although women perceived themselves at greater risk than men, they may not be able to change their behaviour due to their subordinate position in society and sexual relationships. Importantly, it may not be their own behaviour, which is putting them at risk but that of their partners, and so important changes might be more outside their locus of control. In fact, there seem to be distinct power relationships involved as men in Uganda perceived themselves at risk because of their own behaviour whereas women feel at risk because of their partner's behaviour. Married women perceived the greatest risk of HIV and married men perceived the least risk of HIV. Demographic factors, knowledge exposure factors and sexual exposure factors all influenced HIV perception in Uganda but individual background factors dominated perceptions in Ghana where there were fewer associations and gender differences. There are obviously different socio-cultural factors acting and influencing the spread of the HIV epidemic and underlying perceptions in these two very different countries. As the HIV epidemic develops and becomes more generalised in Ghana, it may be likely that similar associations and gender differentials emerge as they have in Uganda.

Steps Forward

This analysis has shown that there are strong gender differentials in Uganda and that many factors are associated with perception of risk. The strong gender differentials found in Uganda suggest that there is a definitive need to empower women and achieve equal status by utilising gender sensitive interventions, targeting both men and women, and investigate the power relationships that exist. There is a need to involve men in intervention strategies as their behaviour is putting their partners at risk and a need to focus resources and intervention strategies towards women to increase their safer sex negotiation. This is especially true for women with no education and young, single women living in rural areas to increase their perception of risk and behavioural change, which may determine the future of the epidemic.

Rural areas need to be targeted with outreach services and education, which may increase access to and availability of condoms as well as knowledge and awareness of HIV. Urban areas also need to be targeted because of the associated risk-taking sexual behaviour. As residence in DISH districts was significant in the Ugandan male model, there may be differential access that needs to be overcome.

Education was found important in both Uganda and Ghana. Access to education needs to be increased, especially for women, both to increase accurate perception of risk and to delay childbearing and exposure to risk. Perceptions increased with education, especially for women. An early age of sexual initiation increased perceptions of HIV risk in Uganda. These results suggest that adolescents should be targeted, as well as older women, by intervention strategies to increase safe sexual behaviour consideration of longer–term

implications. In addition, if secondary or higher education was increased then age at first sex may be delayed.

This analysis has shown that there were geographical differentials, especially in Ghana. It has also hypothesised that Ghana may experience similar factors of association and gender differentials with time, when the HIV epidemic develops and becomes more widespread. Therefore Ghana must attempt to address the development of the epidemic and raise awareness, learning from the experiences of Uganda, through intervention strategies.

More investigation is needed to develop a better understanding of how people perceive their risk, with the use of focus group discussions. This may lead to more of an understanding as to why Ghana and Uganda have experienced substantially different HIV impacts and help an understanding of how perceptions bring forth risk-aversion strategies which will determine the future of the epidemic.

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Table 1. Estimated HIV prevalence rate (%) in young people aged 15-24 years, at the end of 1999

Country	Female		Male	
	Low Estimate	High Estimate	Low Estimate	High Estimate
Botswana	32.6	36.1	13.7	18.0
Kenya	11.07	15.0	4.3	8.5
Lesotho	23.9	28.9	8.0	16.1
Malawi	14.5	16.0	6.1	8.0
Mozambique	13.4	16.1	4.5	9.0
Rwanda	9.0	12.2	3.5	7.0
South Africa	22.5	27.1	7.6	15.1
Swaziland	25.9	31.2	8.7	17.4
Zambia	16.9	18.7	7.1	9.3
Zimbabwe	23.3	25.8	9.8	12.9

Source: Adapted from UNAIDS, 2000, pp125

Table 2. Description of explanatory variables

Variable	Definition
Age	Grouped into five-year age groups, with open-ended last category.
Region	Uganda's four regions -- Central, Eastern, Northern and Western. Ghana's ten regions were coded into three ecological zones: Southern Belt – Western, Central, Greater Accra and Volta. Central Belt – Eastern, Ashanti and Brong Ahafo. Northern Belt – Northern, Upper West and Upper East.
DISH Region	Ten of Uganda's 39 districts were coded as Delivery of Improved Services (DISH) districts. Does not apply for Ghana.
Residence	Split into Urban and Rural residence.
Education	Collapsed into three categories – none, primary and secondary plus (secondary and higher).
Religion	Uganda's religions were collapsed into three categories – Catholic, Protestant/Muslim/Seventh Day Advents and Other. Ghana's religions were collapsed into four groups – No/Other (& Spiritualists, Moslems, Traditionalists), Catholic, Protestant (& Anglican, Methodist, Presbyterian) and Other Christians.
Occupation	Collapsed into four groups – Not Working, White Collar (Professional/Technical/Managerial, Clerical, Sales), Agriculture (Agriculture self-employed and employee) and Manual/Other (Household/Domestic, Services, Skilled Manual, Unskilled Manual, Don't Know).
Socio-Economic Status	Collapsed into ordinal index from whether the respondent had electricity, radio, television, refrigerator, bicycle, motorcycle and car. None or one of these was considered low, two to four was considered moderate and five or more was considered high. Subjective measure.
Reads Newspaper	Whether reads a newspaper once a week or not.
Watches Television	Whether watches television every week or not.
Listens to Radio	Whether listens to the radio every week or not. Does not apply to Ghana.
Reliable Source	If the respondent had heard of AIDS from a formal source such as clinic/health workers or pamphlets/posters, it was considered a reliable source, if not, it was considered unreliable e.g. friends or relatives.
Ways to Avoid AIDS	The DHS index of whether the respondent knew an accurate way to avoid HIV transmission was used.
Marital Status	Those who were married or cohabiting were grouped, leaving five categories – never married, in stable union, widowed, divorced, not living with anyone.
Early Sex	If respondent had their first sexual intercourse 14 years of under, it was coded as having had early sex, prior to age 15 years.
Condom Use	If a respondent had ever used a condom before or not.

Table 3. Odds ratios for 'high' perception of risk by gender, Uganda 1995

Variable	Female		Male	
	Odds Ratio	n	Odds Ratio	n
Individual Factors				
Age - 15-19	1.00**	1604	1.00*	373
20-24	1.58**	1548	2.03**	379
25-29	1.97**	1309	1.85*	380
30-34	2.13**	979	1.91*	254
35-39	1.78**	738	1.67	249
40-44	1.37**	470	1.34	158
45+	1.07	345	1.14	197
Region - Central	1.00**	2203	1.00**	636
East	0.82**	1900	2.43**	545
North	0.77**	1091	1.85**	331
West	1.13	1799	0.84	478
DISH Region - No	1.00	4519	1.00	1285
Yes	1.06	2474	1.76**	705
Residence - Rural	1.00	4574	1.00	1337
Urban	1.22**	2419	1.26	653
Education - None	1.00**	1765	1.00	198
Primary	1.26**	3873	0.92	1171
Secondary +	1.43**	1355	0.86	621
Religion - Catholic	1.00**	2968	1.00	896
Protestant/Muslim/Seventh Day Advents	0.96	3818	1.05	1052
Other Religion	0.34**	207	0.52	42
Occupation -Not Working	1.00	2410	1.00	273
White Collar	1.03	1031	1.59	319
Agriculture	0.90	2741	1.48	988
Manual/Other	1.01	811	1.24	410
Socio-economic status - Low	1.00*	4443	1.00	1253
Middle	1.19**	2400	1.14	684
High	0.99	150	0.53	53
Knowledge Exposure Factors				
Read Newspaper - No	1.00	5217	1.00	1199
Yes	0.98	1776	1.09	791
Watch Television - No	1.00	6362	1.00	1715
Yes	0.88	631	0.97	275
Listen to Radio - No	1.00	3605	1.00	670
Yes	0.87*	3388	1.15	1320
Reliable Source - No	1.00	2016	1.00	301
Yes	1.23*	4977	1.13	1689
Ways to Avoid AIDS - No	1.00	787	1.00	141
Yes	0.96	6206	0.68	1879
Sexual Exposure Factors				
Marital Status - in union	1.00**	4851	1.00**	1238
Never Married	0.38**	1255	1.30	607
Widowed	0.75*	301	1.62	23
Divorced	0.69*	136	2.51*	28
Not Living with Anyone	0.65**	450	3.45**	94
Early Sex (< 15 years) - No	1.00	5342	1.00	1612
Yes	1.44**	1651	1.19	378
Condom Use - No	1.00	6094	1.00	1432
Yes	1.26**	899	1.12	558

* = $p < 0.05$ ** = $p < 0.01$. *Source: UDHS, 1995*

Table 4. Odds ratios for 'high' perception of risk by gender, Ghana 1998

Variable	Female		Male	
	Odds Ratio	n	Odds Ratio	n
Individual Factors				
Age - 15-19	1.00	705	1.00	268
20-24	1.51*	711	2.72**	211
25-29	1.41	689	1.86	185
30-34	1.18	524	2.44*	183
35-39	0.99	489	1.75*	144
40-44	1.17	377	1.49	113
45+	1.08	346	1.95	239
Region – Southern Belt	1.00**	1796	1.00**	624
Central Belt	1.12	1306	1.17	412
Northern Belt	4.20**	739	3.38**	307
Residence - Rural	1.00	2408	1.00	897
Urban	0.97	1433	0.94	446
Education - None	1.00*	1114	1.00	253
Primary	1.45*	661	1.32	155
Secondary +	1.39*	2066	1.21	935
Religion - Catholic	1.00	622	1.00	243
Protestant	0.87	800	1.14	250
Other Christian	1.08	1470	1.09	414
No/Other	0.80	949	1.17	436
Occupation -Not Working	1.00**	867	1.00	251
White Collar	1.56**	1326	1.66	178
Agriculture	1.74**	921	1.06	585
Manual/Other	1.31	727	1.67	329
Socio-economic status - Low	1.00	2023	1.00	820
Middle	0.97	1583	1.08	483
High	1.05	235	0.86	40
Knowledge Exposure Factors				
Read Newspaper - No	1.00	3071	1.00	797
Yes	1.28	770	0.85	546
Watch Television - No	1.00	1923	1.00	599
Yes	0.97	1918	0.81	744
Reliable Source - No	1.00	2795	1.00	1008
Yes	1.24*	1046	1.00	335
Ways to Avoid AIDS - No	1.00	640	1.00	135
Yes	1.24	3201	1.29	1208
Sexual Exposure Factors				
Marital Status - in union	1.00	2524	1.00	734
Never Married	0.97	893	1.28	528
Widowed	0.64	63	1.09	9
Divorced	0.80	165	1.78	32
Not Living with Anyone	0.96	191	1.06	40
Early Sex (< 15 years) - No	1.00	3561	1.00	1259
Yes	0.96	280	1.06	84
Condom Use - No	1.00	3104	1.00	870
Yes	1.27	737	1.26	473

* = $p < 0.05$ ** = $p < 0.01$. *Source: GDHS, 1998*

Figure 1. Association between risk perception and change of behaviour

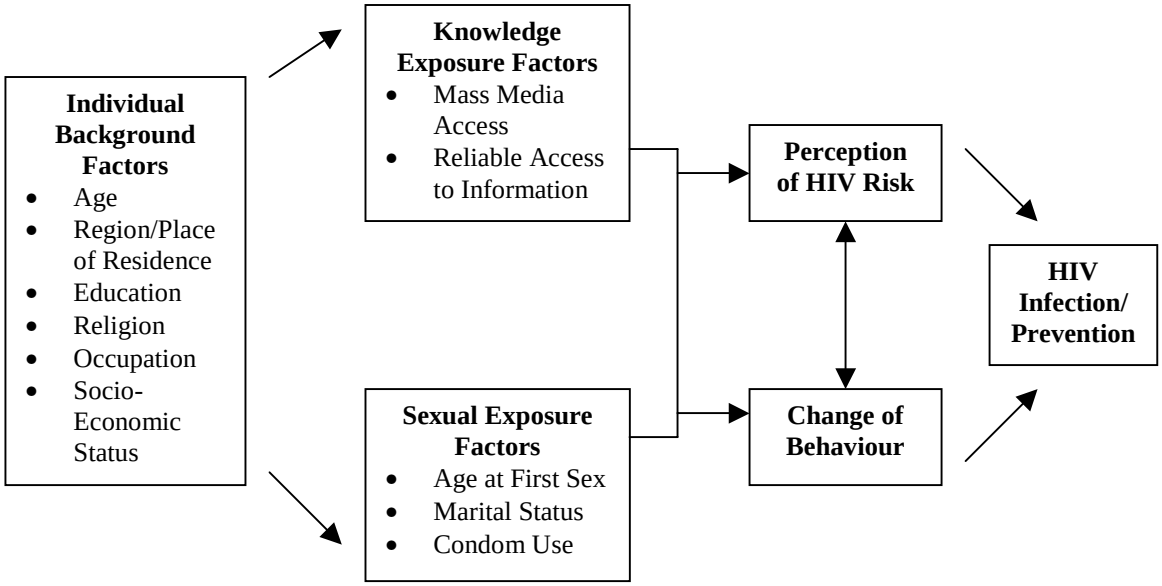


Figure 2. Percentage of men and women considering themselves at moderate/great HIV Risk in Uganda and Ghana

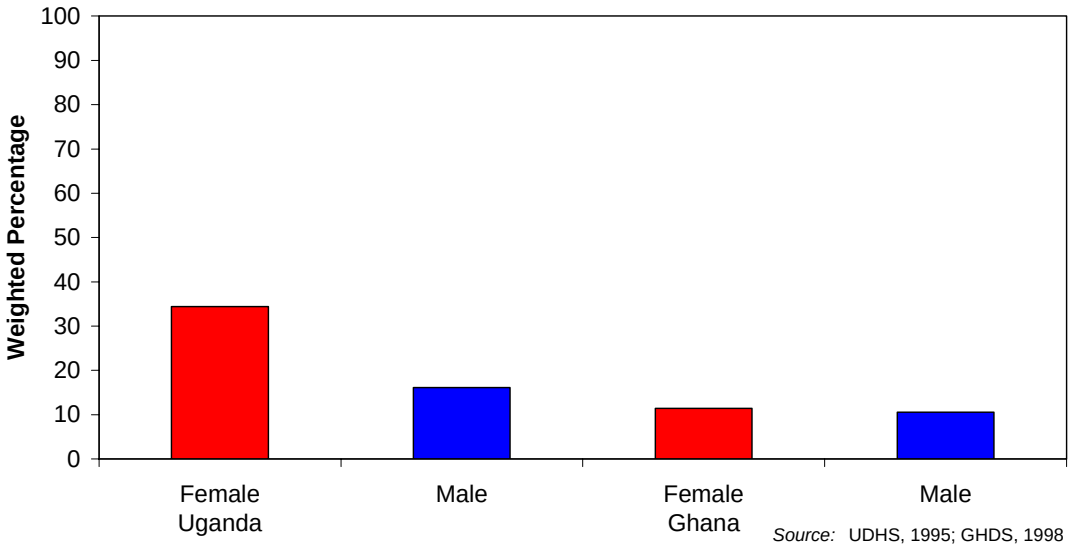
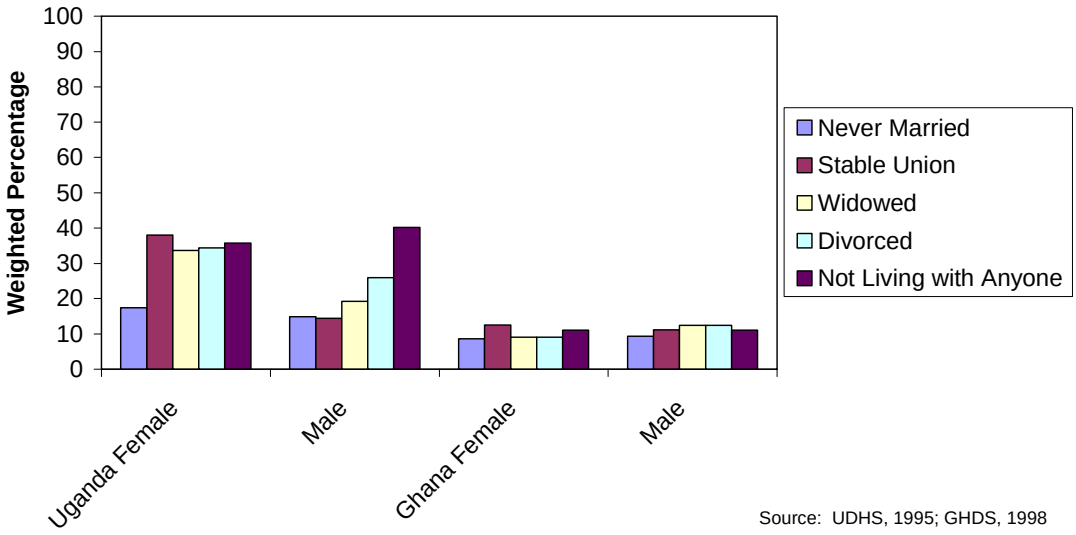


Figure 3. Percentage of men and women considering themselves at moderate/great HIV Risk in Uganda and Ghana, by marital status



Source: UDHS, 1995; GHDS, 1998