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**Master of Public Health Research
Project: Unmarried Women in Ghana,
Africa: Predictors of Condom Use- An
Analysis of the 2008 Ghana Demographic
and Health Survey/Questionnaire
Database**

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May 2010

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Acknowledgments

I would like to thank my husband Brett, who is the most precious, amazing part of my life, for his patience, love, and encouragement.

I would also like to thank Caroline Stampfel, the SAS master, and Dr. Bearman, my advisor, without whom this research paper would not have been possible.

Abstract

Background: Many factors affect whether women will insist that their sexual partners use a condom. This research project will identify some of the predictors of condom use among unmarried women in Ghana, Africa.

Methods: This research project evaluated data from the 2008 DHS of women in Ghana, Africa for predictors of condom use among unmarried women. A total of 4,916 women completed the surveys. Of these, 1,966 women were unmarried. The research project employed multiple logistic regression analysis to determine condom use predictors at the time of the last sexual encounter for these 1,966 unmarried women.

Results: Women with a secondary education or beyond were 3.2 (95% CI=2-5.2) times more likely to have insisted on the use of a condom than women with a primary education or less. Women ages 15-24 were 5.3 (95% CI=2.5-11.3) times more likely to have insisted on the use of a condom than women ages 35-49. Women ages 25-34 were not significantly different than the women ages 35-49. Women living in an urban area were 1.8 (95% CI=1.3-2.5) times more likely to have insisted on the use of a condom than women living in a rural area. Women with a higher level of literacy (could read a full sentence) were 3.6 (95% CI=2.5-5.1) times more likely to have insisted on the use of a condom than women with a lower level of literacy (were unable to read a full sentence). And in concert, women who read a newspaper or a magazine once a week or more were 2.4 (95% CI=1.6-3.5) times more likely to have insisted on the use of a condom than women who read a news paper or a magazine less than once a week. Similarly, women who watched television once a week or more were 2.9 (95%CI= 1.9-4.3) times more likely to have insisted on the use of a condom than women who watched less than once a week. Women who were determined to have “excellent” knowledge about HIV were 5.8 (95% CI=1.5-22.3) times more likely to have insisted on the use of a condom than women who were determined to have “fair or poor” knowledge. The results for women with a “good” knowledge were not significantly different than for those with “fair or poor” knowledge. Women who were determined, through a series of questions about wife beating, to have a low tolerance for abuse towards women (“strong” attitude about domestic violence/women’s rights) were 1.8 (95% CI=1.2-2.7) times more likely to have insisted on the use of a condom than women who were determined to have a high tolerance for abuse towards women (“poor” attitude about domestic violence/women’s rights). Results for women with a “fair” attitude were not significantly different from those with a “poor” attitude. Total life time sexual partners, frequency of listening to the radio, and interestingly, access to condoms did not significantly affect condom use. After multivariate adjustment, the significant predictors of condom use at the time of last sexual encounter were age, literacy, and amount of television watched. The results were: women age 15-24 (compared to women ages 35-49), women who could read a full sentence, and women who watched television once a week or more were 3.7 (95% CI=1.7-8.1), 2.1 (95% CI=1.4-3.3), and 1.8 (95% CI=1.2-2.8) times more likely to have insisted on the use of a condom during their last sexual encounter, respectively.

Conclusion: Education, age, locality, literacy, media exposure (through reading the news paper or a magazine and watching television), knowledge about HIV, and attitude about domestic were predictors of condom use by the sexual partner of unmarried Ghanaian women at the time of last sexual encounter. After multivariate adjustment, only age, literacy, and amount of television watched were significant predictors of condom use at the time of the last sexual encounter.

Background

Ghana

The Republic of Ghana is centrally located on the West African coast with a total land area of 238,537 square kilometers (DHS, 2009). UNICEF estimated its total population at about 23 million in 2008 (UNICEF, 2010). Its administrative and political capital is Accra, with a population of 1.7 million (DHS, 2009). The 10 administrative regions include Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East, and Upper West (DHS, 2009).

Women's Health-Contraception

Ghana is one of the few African countries that has long embraced family planning (Takyi, 2000). A national policy to encourage the use of contraceptives was implemented in the late 1960s (Takyi, 2000). However, the proportion of women who know about any method of contraception has just recently increased dramatically--from 76 percent in 2003 to 98 percent in 2008 (DHS, 2009). Among married women, the most common modern method of contraception is the use of injectables (used by 6 percent of married women) followed by birth control pills (used by 5 percent of married women), male condoms (used by 2 percent of married women), female sterilization (used by 2 percent of married women) and implants (used by 1 percent of married women) (DHS, 2009). Rhythm is the most common traditional method, and is used by 5 percent of married women (DHS, 2009). Women in urban areas such as Greater Accra are more likely to use contraceptive methods (27 percent) than women in rural areas such as Northern Ghana (21 percent) (DHS, 2009). Women with at least a secondary education are more than twice as likely to use contraception as women with no education (DHS, 2009). Married women in the highest wealth bracket are more likely to insist that their partner use a condom (31%) than married women in the lowest wealth bracket (14%) (DHS, 2009). Thirty-five percent of married women still have an unmet need for family planning and, overall, 14 percent of births in Ghana result from unwanted pregnancies (DHS, 2009).

Government hospitals and clinics are the most common source for modern contraceptives (20 percent) followed by government health centers (14 percent), and government health posts or community-based health and planning services (5 percent) (DHS, 2009). Fifty-one percent of modern contraceptives are obtained from private sources (DHS, 2009). Drug stores (38%) and pharmacies (8%) make up the largest part of the providers in the private sector (DHS, 2009).

Domestic Violence

Domestic violence is of interest due to the fact that tolerance of domestic violence within the community can have demoralizing effects on women, leading to lower self confidence. Lower self confidence can cause a woman to feel that she is powerless to protect her health and to lack respect for her body. Historically, assault by husbands was considered “normal” (Amoakohene, 2004). Media reports of incidences of domestic abuse along with the intervention of various governmental agencies and women’s groups have allowed many Ghanaian women to be educated about what constitutes abuse (Amoakohene, 2004). However, Ghana remains a male dominated society, in which a woman’s behavior may be influenced to a large extent by male preferences (Takyi, 2000).

According to the 2008 DHS, which was published in 2009, 37% of Ghanaian women ages 15-49 have experienced physical violence and 17% experienced violence in the past 12 months (DHS, 2009).

Current or former husbands/partners are reported as the most common offender (DHS, 2009).

Approximately 19% of women have experienced sexual violence; again, the majority of the offenders are current or former husbands/partners (DHS, 2009). Interestingly, men are less likely (22%) than women (37%) to think that a husband is justified in beating his wife in 5 hypothetical circumstances: burning the food, leaving the house without telling the husband, neglecting the children, arguing with the husband, and refusing to have sex with the husband (DHS, 2009). Not surprisingly, the woman’s view about wife beating appears to be related to the experience of physical abuse; 31% of women who agreed in all

circumstances that a husband was justified in beating his wife reported physical violence, compared to 17% who did not agree that violence was justified (DHS, 2009).

HIV/AIDS

Overview

Acquired Immune Deficiency Syndrome (AIDS), which is caused by the human immunodeficiency virus (HIV), was first recognized in Ghana in March 1986 (Takyi, 2000). AIDS compromises the immune system and makes the body prone to opportunistic infections (DHS, 2009). Sixty-three of the first 72 victims were women, a 7:1 female to male ratio (Takyi, 2000). Although Ghana is considered a low prevalence country (estimated at 1.9% in 2007 by UNAIDS) and the HIV/AIDS epidemic has had less impact in Ghana than in many other countries in Sub-Saharan Africa, it still remains a significant problem and has the potential for wider spread of disease (Karim et al., 2003). Ghana shares common borders and languages with Cote D'Ivoire, Burkina Faso and Togo, countries that have some of the highest AIDS rates in the West African region (Takyi, 2000). People from these countries are constantly coming in and out of Ghana. In fact, during the early stages of the prevalence of AIDS in Ghana, most of those infected had lived outside the country (Takyi, 2000). This makes the health of the Ghanaian people of tremendous importance for the rest of the West African region and vice-versa.

As in most African countries, the spread of HIV is primarily through heterosexual sex (Fischetti and Danso, 2005). Data compiled by the United Nations programs on HIV/AIDS (UNAIDS) in 2007 shows that there are about 260,000 people living with HIV/AIDS in Ghana (UNAIDS, 2008). Latex condoms are the most effective method of HIV and sexually transmitted infection (STI) prevention among sexually active persons (Bedimo et al., 1998). Increasing condom use through public health efforts is essential to eliminating this devastating disease.

While awareness of AIDS in Ghana is nearly universal, knowledge about HIV/AIDS does vary somewhat by region, education, and wealth status. Awareness is lowest in the Northern region and highest among

women in the Eastern region and men in the Central region. As may be expected, awareness of AIDS increases in concert with level of education and wealth status (DHS, 2009). While awareness may be high, United Nation Children's Fund (UNICEF) estimated that between 2003 and 2008 only 33% of young males (ages 15-24) and 25% of young females (ages 15-24) had comprehensive knowledge about HIV/AIDS (UNICEF, 2010).

A study done in 2003 by Duda and Darko examined HIV prevalence and risk factors in women living in Accra and concluded that risk factors for being HIV positive included youth, sexually transmitted infection (STI) symptoms, local residence in the city and mean number of lifetime sexual partners. Interestingly, there was no association with education level, religion, ethnicity, marital status, or socioeconomic level (Duda and Darko, 2005).

Other Risk Factors

The second most common mode of transmission of HIV is mother-to-child transmission. Fortunately, the percentage of pregnant women with HIV who are receiving treatment has been increasing over the last few years. However, UNAIDS estimated that while about 2,896 women receive treatment there are an estimated 14,000 who need treatment (about 21% receive appropriate treatment to prevent mother-to-child transmission) (UNAIDS, 2008).

The risk of transmission of HIV through medical injections appears to be very low in Ghana. Most medical injections (98%) are administered using a syringe and needle taken from a new, unopened package (DHS, 2009).

The practice of circumcision, which has been shown to lower the transmission of sexually transmitted infections like HIV, appears to play a protective role as it is a widespread practice in Ghana (92 percent of males) (DHS, 2009).

Efforts to Combat HIV/AIDS

Although the prevalence of HIV/AIDS is relatively low in Ghana, a troubling finding is that in the early 2000's the prevalence of HIV moved in a cyclical fashion, decreasing and increasing again, highlighting the need for sustained efforts to fight the epidemic (Asante and Fenny, 2007). The National AIDS Spending Assessment (NASA) showed that the total expenditure on HIV/AIDS related activities in Ghana for 2007 was 52,445,091.00 US dollars (largely from international organizations)--an increase of 61% from 2006 (Asante and Fenny, 2007). While there was an increase in the availability of antiretroviral treatment and increased efforts for the prevention of mother to baby transmission, the uptake of these services is still low due to factors such as stigma and discrimination (UNAIDS, 2008). In addition, the 2008 DHS found that only 21 percent of women and 14 percent of men ages 15-49 have been tested for HIV and of those tested only 17 percent of women and 12 percent of men received the results of the test (DHS, 2008).

Condom Use

Despite the magnitude of the problem of HIV/AIDS and other STIs and unwanted pregnancies in sub-Saharan Africa, to the author's knowledge this is the first formal evaluation of the predictors of whether unmarried female Ghanaians will insist that their partners use a condom. A similar study was done in 2000 looking at whether HIV/AIDS knowledge translated to increased insistence upon condom use in married Ghanaian women. This study, which also used the DHS data set, found that while HIV/AIDS education messages have been effective in increasing awareness of the disease, this had not translated to increased condom use (Takyi, 2000). Many other variables other than the worry of contracting HIV/AIDS affect condom use. For instance, a study published in the Journal of Health and Human Services Administration in 2001, which also analyzed the DHS data set, found that high levels of HIV/AIDS knowledge in Ghanaian men translated to the avoidance of multiple sexual partners rather than the use of condoms in their sexual encounters (Takyi, 2001).

While concern about contracting HIV/AIDS is only a small part of the equation in determining condom use, it still may be an important factor. A study in the *Journal of Adolescent Health* by Adih and Alexander in 1999 looking at young Ghanaian men ages 15-24 found that only 25% of males had used a condom during their last sexual encounter. Their findings indicated that the barriers to condom use were significantly affected by perceived susceptibility and self-efficacy (belief in one's capabilities to achieve a goal). Thus, adolescents who felt highly susceptible to the HIV infection and who felt there were few barriers to condom use were almost six times more likely to have used condoms at last intercourse (Adih and Alexander, 1999). Further, those who had a high level of self-efficacy and who felt there were few barriers to condom use were almost three times more likely to have used a condom at last intercourse (Adih and Alexander, 1999). Thus, this study indicates that HIV prevention programs should emphasize personal vulnerability, instill a belief that adolescents are in control of their sexual choices and address how to overcome barriers to condom use (Adih and Alexander, 1999).

A study by Adu-Mireku in 2003 looked at a sample of 894 students at two senior secondary schools in Accra and found that approximately 44% of the students had used a condom during their last sexual encounter, a very different percentage than Adih and Alexander had found (Adu-Mireku, 2003). This may be due to the fact that the study by Adih and Alexander was a community based sample while the study by Adu-Mireku included only those with a higher education level. Another major difference is that women were included in the study by Adu-Mireku. Adu-Mireku found that communication about HIV/AIDS between students and parents or other family members increased the odds of using a condom at last sexual intercourse (OR=2.21) (Adu-Mireku, 2003). Thus, prevention programs which attempt to educate Ghanaian students about sexual risk behavior should encourage communication about HIV/AIDS between students and their family members.

The results of a study in 2003 by Karim et al., published in the *International Family Planning Perspectives*, were consistent with some of the findings of both of the studies discussed above, and provided further support for the notion that there is a gap between knowledge about condoms and their

use. The study found that while Ghanaian youth ages 12-24 were knowledgeable about condoms, only 24% of sexually experienced males and 20% of sexually experienced females reported consistent condom use with their current or most recent partner (Karim et al., 2003). They found that condom use is heavily influenced by young people's personal characteristics such as gender role perceptions, condom use self-efficacy, and communication with partners concerning pregnancy and STI risks (Karim et al., 2003). In contrast, they found that contextual factors such as school attendance and community connections had a stronger influence on the initiation of sex (Karim et al., 2003).

In looking more specifically at demographic characteristics and risky sexual behavior, a 2008 study by Awusabo-Asare and Annim analyzing the 2003 DHS found that, in general, men in the highest wealth quintiles for both Ghana and Kenya were more likely to have multiple sexual partners than other groups (Awusabo-Asare and Annim, 2008). Thus, it may not be the case that poverty is still driving the HIV/AIDS epidemic. More likely, however, it is a more complicated web of interactions between wealth and a number of other sociodemographic factors that explain sexual risk-taking behavior (Awusabo-Asare and Annim, 2008). The 2008 DHS found that among women who reported having had higher-risk intercourse (not a spouse or cohabiting partner) in the past 12 months, only 25 percent used a condom at the last encounter while for men the figure was almost twice that at 45 percent. Condom use in higher risk situations was more common among urban residents, those who had never been married, were in a younger age bracket (ages 20-29) and who lived in the Upper East region (DHS, 2009). A study looking at predictors of condom use in general, found similar results with Nigerian students; significant predictors of condom use included male gender, a higher level of education and being single (Sabitou et al., 2007).

Increasing condom use will require an in depth understanding of the culture of the Ghanaian people and the various demographic characteristics that influence sexual risk-taking. This paper will attempt to add to this limited body of knowledge by looking at the specific factors which influence whether an unmarried Ghanaian woman is more likely to have reported her partner using a condom during her last sexual encounter.

Objectives

The purpose of this research project is to identify predictors of insistence upon condom use within the population of unmarried Ghanaian women ages 15-49. Factors such as knowledge about HIV infection, feelings about domestic violence, demographic characteristics, and condom availability will be examined as possible predictors of condom use during the last sexual encounter. Evidence based methods of increasing condom use will be proposed.

Methods

Study Population

The Ghana Demographic and Health Survey (GDHS) 2008 is a national survey implemented by the Statistical Service of Ghana in association with other stakeholders within the Ghanaian government, research departments, civil society organizations and international organizations. The planning and implementation of the survey was carried out jointly by the Statistical Service and the Ministry of Health/Ghana Health Service management team. Additional funding came from United States Agency for International development (USAID), UNFPA, Danida, UNICEF, and the Ghana AIDS Commission and technical support came from ICF Macro.

Nationally representative samples of 11,778 households were successfully interviewed by the Statistical Service and the Ministry of Health/Ghana Health Service management team, and in 6,180 of the households 4,916 women ages 15-49 and 4,568 men ages 15-59 were interviewed. This represents a response rate of 99% for households, 97% for women and 96% for men. This cross-sectional survey, which took place over a three month period from the beginning of September to the end of November 2008, provides estimates for Ghana as a whole, for urban and rural areas, and for the 10 regions which are divided administratively.

Women ages 15-49 who were never married or who were formerly married were included in this analysis. This is due to the fact that married women may be attempting to have children. Including them in the study would yield results which would not be helpful in analyzing the population in which we would like to increase condom use. There were a total of 1,966 never married or formerly married women included in this analysis.

Data Collection

The Ghana Demographic and Health Survey (DHS) program was established in 1984 by USAID and awarded to part of OCR Macro. It was designed as a follow-up to the World Fertility and the Contraceptive Prevalence Survey projects. The aim of the DHS program is to collect data that are comparable across countries; thus, each country is asked to adopt a single model questionnaire. The focus of the data collection is marriage, fertility, family planning, reproductive health, child health and HIV/AIDS. Thus, women of reproductive ages (15-49) are the main targets for the survey. A household questionnaire was used to identify women eligible for an individual interview.

The Ghana Statistical Service and the Ghana Health Service administered the 2008 Ghana Demographic and Health Survey. The questionnaires were translated from English into three major local languages, Akan, Ga, and Ewe. The GDHS utilized a two-stage sample design. In the first stage, clusters were selected from an updated master sampling frame constructed from the 2000 Ghana Population and Housing Census. A total of 412 clusters were selected from the master sampling frame. They were selected using systematic sampling with probability proportional to size. The second stage of selection involved sampling of 30 of the households in each cluster. Data was not collected in one of the clusters due to security reasons resulting in a final sample of 12,323 selected households. Weights were calculated taking into consideration cluster, household, and individual non-responses, so the representations were not distorted.

Data were entered using CSPro, a program specially developed for use in the DHS Program. The DHS uses a special software package, ISSA, to process its surveys. One of its key features is its ability to handle hierarchical files.

The variables of interest were level of education, age, locality, literacy, total life time sexual partners, media exposure (to radio, television, news paper or magazines), knowledge about HIV/AIDS, attitude about domestic violence/spousal abuse, access to condoms and whether a condom was used during the last sexual encounter.

Data Coding

From a total of 3901 variables available, 29 variables were selected for inclusion in the analysis.

Fourteen of the variables explored knowledge questions about HIV/AIDS, five of the variables explored attitudes about spousal abuse and eight of the variables were demographic characteristics and participant attributes. One variable explored the ability to obtain a condom while the last variable specifically queried whether a condom was used during the last sexual encounter. The fourteen variables which pertained to knowledge about HIV were collapsed into three categories based on answers to questions about HIV: excellent, good, fair/ poor knowledge. The five variables which pertained to domestic violence tolerance were also collapsed into three categories, strong women's rights beliefs, fair women's rights beliefs and poor women's rights beliefs, based on questions answered about whether a husband is justified in beating his wife in certain situations: burning the food, leaving the house without telling the husband, neglecting the children, arguing with the husband, and refusing to have sex with the husband. In order to avoid skewed results from questions that were not answered, the categories were all created using ratios such that when fewer questions were answered more weight was given to those questions. The level of education was divided into two groups: secondary education or higher and primary education or less. Age was divided into three categories: 15-24, 25-34 and 35-49. Literacy was divided into two categories: those who could read a full sentence and those who could not read a full sentence. Those who were blind

or disabled were placed into the missing category and thus not included in the analysis. Number of life time sexual partners was divided into three categories: 0 or 1, 2 or 3 or 4, and more than 4. Frequency of listening to the radio, reading the news paper or magazine and watching television were all divided into two categories with often being once a week or more and not often being less than once a week. Condom access was an additional predictive variable. The single outcome variable was whether the individual's partner used a condom during her last sexual encounter.

Statistical Analysis

The analysis used SAS software (version 9.2) to analyze the data. For the survey population, level of education, age, local, reading ability, total lifetime number of sexual partners, frequency of listening to the radio, frequency of reading the newspaper or a magazine, frequency of watching television, knowledge about HIV/AIDS, tolerance of spousal abuse and availability of condoms was assessed. To determine independent predictors of condom use for unmarried women in Ghana, the analysis conducted multiple logistic regressions. The univariate variables were chosen based on perceived demographic characteristics and population attributes which would affect whether a Ghanaian woman insisted that her last sexual partner use a condom. The perceptions of the characteristics of Ghanaian women and their social determinates of health were based on a literature review of studies done by Takyi, Adih and Alexander, Adu-Mireku, Karim et al., Awusabo-Asare, Annim and Sabitu et al, UNAIDS and UNICEF as well as the DHS. In the multivariate analysis, only those variables that were statistically significant in the univariate analysis were included. Specifically, odds ratios and 95% confidence intervals were calculated with a p-value < 0.05 considered statistically significant.

Results

Table 1 summarizes the demographic characteristics of the women surveyed. Of the 4916 Ghanaian women surveyed, 1966 were included in the analysis because they were unmarried or previously married. Most of the women were younger, with about 70% (N=1375) of the women being 24 years of age or less,

15% (N=297) being ages 25-34 and 15% (N=294) being ages 35-49. There was a similar distribution between those living in rural areas (about 47%, N=921) and those living in urban areas (about 53%, N=1045). Twenty seven percent (N=527) of women had zero or one sexual partners in their life, 31% (N=612) had two, three or four partners and 2% (N=48) had more than four. With regards to condom access, 42% (N=822) could not get a condom or were not sure and 31% (N=610) could get a condom. Overall condom use was low: 10% (N=190) of women stated that they had used a condom during their last sexual encounter while 28% (N=554) did not.

Table 2 summarizes participant level of education and exposure to the media. Seventy one percent (N=1402) had attained a level of education classified as secondary or beyond and 29% (N=563) had no education or only a primary education. However, while 53% (N=1032) could read a full sentence, 47% (N=923) had difficulty reading a full sentence. Seventy-five percent (N=1480) of respondents reported listening to the radio at least once a week and 25% (N=484) reported listening less than once a week. Fifty nine percent (N=1164) reported watching television at least once a week and 41% (N=802) reported watching less than once a week. Only 23% (N=451) reported reading the newspaper or a magazine at least once a week while 77% (N=1512) reported reading less than once a week.

Table 3 summarizes participant knowledge about HIV and attitudes about domestic violence. After categorizing women into three knowledge levels about HIV, the majority of women had “excellent” knowledge at 61% (N=1193). Thirty one percent (N=599) had “good knowledge” and 9% (N=174) had poor or fair knowledge. With regard to attitudes about domestic violence, 59% (N=1168) of the women had a “strong” attitude against domestic violence or a low tolerance for abuse towards women, 13% (N=245) had a “fair” attitude and 28% (N=553) had a “poor” attitude about domestic violence or a high tolerance for abuse towards women.

Table 4 summarizes univariate predictors for using a condom at the time of last sexual encounter. The crude odds ratio shows that women with a secondary education or beyond were 3.2 times more likely

(95% CI=2-5.2) than those with a primary education or less to have used a condom during their last sexual encounter. Similarly, women who could read a full sentence were 3.6 times more likely (95% CI=2.5-5.1) to have used a condom during their last sexual encounter. Younger women ages 15 to 24 were 5.3 times more likely (95% CI=2.5-11.3) than older women ages 35-49 to have used a condom during their last sexual encounter. Women ages 25-34 were not significantly different than the older women ages 35-49. Women living in an urban environment were 1.8 times more likely (95% CI=1.3-2.5) to have used a condom during their last sexual encounter. While the odds of having used a condom did increase for those women with fewer life time sexual partners, the results were not statistically significant. Listening to the radio once a week or more did not produce statistically significant results but reading the newspaper or a magazine at least once a week was associated with a 2.4 times higher likelihood (95% CI=1.6-3.5) and watching television was associated with a 2.9 times higher likelihood (95% CI=1.9-4.3) of having used a condom during the last sexual encounter. “Good” knowledge about HIV was not associated with a statistically significant difference from those who had “fair to poor” knowledge but those with “excellent” knowledge were 5.8 times more likely (95% CI=1.5-22.3) to have used a condom than those with “fair or poor knowledge”. The same principal was true for attitude towards domestic violence with a “fair” attitude not being associated with a statistically significant difference from those with a “poor” attitude but those with a “strong” attitude were 1.8 times more likely (95% CI=1.2-2.7) to have used a condom than those with a “poor” attitude. Having access to a condom did not affect condom use.

In the final analysis, shown in Table 5, three variables were significant determinates of condom use at the time of last sexual encounter. Women ages 15 to 24 were 3.7 times more likely (95% CI=1.7-8.1) to have used a condom during their last sexual encounter than women ages 35-49. Women who were able to read a full sentence were 2.1 times more likely (95% CI=1.4-3.3) to have used a condom during their last sexual encounter compared to women who could not read a full sentence. And finally, women who

watched television once a week or more were 1.8 times more likely (95% CI=1.2-2.8) to have used a condom during their last sexual encounter compared to those who watched less than once a week.

Discussion

Condom use is important both to prevent sexually transmitted infections (STIs) such as HIV/AIDS and to prevent unwanted pregnancies. Although Ghana is considered a low prevalence country by UNAIDS in terms of HIV, work must be done to eliminate the HIV epidemic and decrease other sexually transmitted infections, to decrease the number of unwanted pregnancies and to increase overall health education. Contraceptive behaviors of the Ghanaian women involve a complex web of factors operating at the individual, family, community and societal levels. And while education is a vital piece of the puzzle, there may be a missing link that still remains between the knowledge of the consequences of risky behavior and condom use. Thus in answering the question, why do unmarried women in Ghana engage in high risk sexual behavior, we must ask several important questions; what were the barriers to using protection? Do individuals know about the risks of unprotected sexual intercourse and the ways they can protect themselves? How can health professionals most effectively influence these women to protect themselves? Among women who did insist that their partner use a condom, what was their motivation and how can this be extrapolated to the rest of the population? These questions have not been readily addressed in the literature with respect to unmarried Ghanaian women and thus, evidenced based interventions on how to increase condom use in Ghana cannot take place in the most effective way. The purpose of this research project was to identify predictors of condom use by the sexual partners of unmarried women in Ghana. This data may guide policy and interventions to limit sexually transmitted infections and unwanted pregnancies.

Overall, 10% (N=190) of unmarried or previously married Ghanaian women reported using a condom during their last sexual encounter. The majority of the women, about 70% (N=1375) were ages 15-24. After adjusting for all seven other variables, women ages 15-24 were 3.7 times more likely (95% CI=1.7-

8.1) to have insisted on condom use during their last sexual encounter than women ages 35-49. Looking more closely at the study by Adu-Mireku in 2003 which analyzed condom use among students in secondary schools, it was found that a fairly high percentage of girls (57%), with an average age of 17.4 years, had used a condom during their last sexual encounter (Adu-Mireku, 2003). While these statistics still can and should be improved, it is encouraging that more young people (especially young educated women) are using condoms. This is particularly important considering the fact that more than half of the new HIV cases are among persons between the ages of 15 and 24 (Adu-Mireku, 2003). Additionally, Adu-Mireku found that almost 26% of the sexually experienced students had initiated sexual intercourse at age 11 years or younger (Adu-Mireku, 2003). The 2008 DHS found slightly lower numbers, but none the less very significant; more women than men have had sex by age 15 and 18; 8 percent of women and 4 percent of men have had sex before age 15, and 44 percent of women and 28 percent of men by age 18 (DHS, 2009). The initiation of sex at such a young age makes ubiquitous condom use all the more important to thwart devastating consequences. Higher condom use among the younger age group may be due to the fact that younger Ghanaians have had more sex education in school. Sex education may promote increased safe sexual practices that prevent disease and encourage women not to be afraid to ask their partner to use a condom. In addition, as women's rights have been bolstered in Ghana, the younger women may feel more in charge of their sexual well-being and their futures. In fact, this trend can also be applied to married women, as the 2008 DHS found that with regard to making decisions on household purchases, only 29% of women made these decisions in 2003, while in 2008 that percentage rose to 44% (DHS, 2009). Increased condom use by younger women's sexual partners may also be due to greater perceived risk of pregnancy, thus providing a contraceptive incentive for condom use.

Although considered a more affluent African country, only about 53% percent (N=1032) of unmarried Ghanaian women could read a full sentence and about 47% (N=923) could not. Even more concerning are the consequences; after adjusting for all seven other variables, women who could read a full sentence were 2.1 times more likely (95% CI=1.4-3.3) to have used a condom during their last sexual encounter.

Women who are more educated are more likely to use a condom for a multitude of reasons; some factors could be increased self-confidence and knowledge about the risks of unprotected sex and STIs. In addition, more educated women may want time to pursue academic interests instead of raising many children. Women of lower socioeconomic status may want to get pregnant in order to gain support or feelings of self worth. In agricultural communities, where the education level is likely to be lower, children also constitute an important source of labor needed for farming and thus having children is seen as being of utmost importance (Takyi, 2000).

Ghanaian women who watched television at least once a week were 1.8 times more likely (95% CI=1.2-2.8) to have used a condom. This may be explained by the fact that those who can afford a television or who have time to watch it may be of higher socioeconomic status and thus be more educated and have more self confidence. Women who live in the city are also more likely to have a television and these women are generally more educated and are of a higher socioeconomic status. The media is also likely to be progressive and less traditional (as is the case in with the American media) and thus may give Ghanaian women a general feeling of independence.

These outcomes may be helpful in directing future public health initiatives to increase condom use in Ghana. Clearly, education is the theme that ties all of the statistically significant predictors together. Although it was not a significant predictor variable in this analysis, because 75% (N=1480) of these women listen to the radio at least once a week, this may be a good channel through which to have public health announcements about safe sex practices. According to an article by Panford et al. in 2001, radio is a “powerful and credible” information and entertainment medium in most developing countries (Panford et al., 2001). Portable battery-operated radio sets are often brought to farms and other rural locals, even in the most remote areas in Ghana enabling messages to be heard by a large, diverse audience (Panford et al., 2001). In addition, although only 59% (N=1164) watch television at least once a week, it appears to be an influential medium (although this may be due to confounding factors) and thus would be another possible target for public health announcements. To date there is only one study looking at the

effectiveness of televised public health messages; a study looking at road safety messages in Ghana. This study showed that television advertisements had a larger reach than signs and print (Blantari et al., 2004). Moreover, there was not the barrier of illiteracy. Major constraints confronting television advertising is the expense and the need for at least five or six alternative languages (Blantari et al., 2004). In contrast, radio stations are more likely to be locally based and the use of local languages could be better targeted (Blantari et al., 2004).

Condom access was not a predictive factor in determining whether women used a condom and as such, working to increase condom availability is recommended only as an ancillary measure. This outcome may be due to the fact that most African countries have initiated mass social marketing of condoms and many large-scale organizations including schools and workplaces have made condoms accessible for free. A study in 2008 published in *AIDS Care* by Sunmola et al. found that, among Nigerian men, buying condoms is a significant predictor of consistent condom use (Sunmola et al., 2008). In contrast, always having free condoms or having a mix of free and bought condoms is not significant predictor of condom use (Sunmola et al., 2008). Having free condoms does not automatically translate to their consistent use because commitment to protect oneself in sexual contexts is needed in order to increase condom use (Sunmola et al., 2008).

After adjustment for age, education, locality, reading the newspaper/magazine, watching television, and attitude about women's rights, HIV knowledge was not a significant predictor for increased condom use. And because the majority of women had "excellent" HIV knowledge, education about HIV should not be the main focus of a public health initiative. This finding is in concert with previous studies that highlighted the failure of the knowledge about HIV to translate to increased condom use. In a similar vein, after adjustment for age, education, locality, reading the newspaper/magazine, watching television, and HIV/AIDS knowledge, attitude about women's rights was not a significant predictor for increased condom use. As a result, education about women's empowerment should not be the main focus of a public health initiative either. Another component is that the actions of male partners will surely exert a

tremendous impact on the decisions about the use or non-use of condoms. Thus, in order for a public health intervention to be most successful, the men must be involved. A 2009 study published in the Health Education Research Journal by Exner et al. found that a workshop for Nigerian men designed to help them decrease their risk for HIV/STIs and unintended pregnancy was very successful; men assigned to the intervention were almost four times more likely than comparison men to report condom use at last intercourse (Exner et al., 2009). Similarly, in a study attempting to understand the barriers to condom use among HIV-infected African American women through focus groups here in the US, it was found that one of the barriers was the male partner's refusal to use condoms (Bedimo et al., 1998).

Overall, putting money into more broad, sweeping projects such as improving the quality of Ghanaian schools and increasing literacy rates will likely yield improved outcomes over more specific, targeted campaigns about HIV/AIDS and condoms. Meanwhile, advertising through public health announcements on the radio (because of its large listening audience) and television and in the newspapers and magazines should be employed.

A significant limitation of this study is due to the study design. In this study the sampling weights are adjustment factors applied to each case in tabulations to adjust for differences in probability of selection and interview between cases in a sample, either due to design or chance. However, the design is such that the results are significant for the sample cases only, and may not be extrapolated to the rest of the Ghanaian population. In addition, for data regarding condom use and condom access many responses were missing likely due to the sensitive nature of the question. Finally, the questions relating to knowledge about HIV and attitude towards domestic violence were chosen according to the authors' judgment of whether the questions were "important in the assessment" of either HIV knowledge or attitude towards domestic violence. These are somewhat arbitrary determinants of knowledge about HIV and attitudes towards domestic violence.

The strengths of this survey are that Ghanaian men and women were required to take a long survey, administered by an interviewer, so that information was gathered in a structured fashion for each Ghanaian household. Additionally, the response rate was very high-- 99% for households and 97% for women. Because the study was cross-sectional, there were several exposures and it was possible to screen for new hypotheses. Analyzing the frequency of condom use and thus the health needs of a large population is useful for health planning. Additionally, because the DHS performs serial surveys, it is possible to monitor the trend of condom use.

Conclusion

There is a significant gap in the research needed in order to properly address the sexual health needs in sub-Saharan African countries. In order to prevent the spread of HIV/AIDS and other STIs in addition to unwanted pregnancies, public health initiatives must be implemented which are aimed at making condom use in these countries more common. This research project suggests that education, more specifically literacy, is a key component in determining condom use among the partners of unmarried women in Ghana. In addition, women who watch television at least once a week were more likely to have reported condom use. Finally, younger women ages 15-24 are more likely to have reported condom use. These factors were statistically significant after adjusting for the other significant variables: level of education, locality, frequency of reading a newspaper or a magazine, HIV knowledge and attitude about domestic violence. Public health efforts should focus on improving the education within the primary and secondary schools both in terms of literacy and sexual health. And while listening to the radio was not a significant predictor of condom use, the majority of women in Ghana listen to the radio at least once a week and listening to the radio does not require the ability to read. Thus the radio may be an effective medium through which to conduct a public health campaign. Further research needs to be undertaken to determine the reason behind why watching television leads to a significant increase in the rates of reporting having used a condom at the last sexual encounter. While health communication is an important area for study and public health action, long term goals to increase the overall literacy rate of Ghanaian women should

be emphasized. The most recent estimate by UNICEF of total literacy rate (percentage of persons age 15 and over who can read and write) of only 65% appears to be the root of the cause of low condom usage (UNICEF, 2010). A solid education for Ghanaian women which allows for more reading and critical thinking about all the various aspects and consequences of unprotected sex may help to fill the large gap between knowing about the risks of unprotected sex and insisting that their partners use protection.

Table 1. Demographics and Population Attributes of Unmarried Ghanaian Women Survey

respondents

Variable	Number of Women (N)	Percent (%)
Age		
15-24	1375	70 (1375/1966)
25-34	297	15 (297/1966)
35-49	294	15 (294/1966)
Local		
Urban	1045	53 (1045/1966)
Rural	921	47 (921/1966)
Total lifetime sexual partners		
0 or 1	527	27 (527/1966)
2,3,or 4	612	31 (612/1966)
More than 4	48	2 (48/1966)
Condom access		
No or not sure if could get a condom	822	42 (822/1966)
Yes, could get a condom	610	31 (610/1966)
Used a condom during last sexual encounter		
No	554	28 (554/1966)
Yes	190	10 (190/1966)

Table 2. Education

Variable	Number of Women (N)	Percent (%)
Level of education		
No education or only primary	563	29 (563/1966)
Secondary or beyond	1402	71 (1402/1966)
Literacy		
Proficient	1032	53 (1032/1966)
Not proficient	923	47 (923/1966)
Frequency of listening to the radio		
Often (once a week or more)	1480	75 (1480/1966)
Not often (less than once a week)	484	25 (484/1966)
Frequency of reading the newspaper or magazine		
Often (once a week or more)	451	23 (451/1966)
Not often (less than once a week)	1512	77 (1512/1966)
Frequency of watching TV		
Often (once a week or more)	1164	59 (1164/1966)
Not often (less than once a week)	802	41 (802/1966)

Table 3. Knowledge about HIV and Attitude about Spousal Abuse

Variable	Number of Women (N)	Percent (%)
Knowledge about HIV		
Poor to fair	174	9 (174/1966)
Good	599	31 (599/1966)
Excellent	1193	61 (1193/1966)
Attitude towards domestic violence/women's rights		
Poor	553	28 (553/1966)
Fair	245	13 (245/1966)
Strong	1168	59 (1168/1966)

Table 4. Predictors for Condom Use- Univariate Analysis

Variable	OR for using a condom	OR 95% CI for the variable
Education		
Secondary or beyond	3.2	2-5.2
No education or only primary	--	--
Age		
15-24	5.3	2.5-11.3
25-34	1.2	0.8-1.7
35-49	--	--
Local		
Urban	1.8	1.3-2.5
Rural	--	--
Literacy		
Proficient	3.6	2.5-5.1
Not proficient	--	--
Total lifetime sexual partners		
0 or 1	2.3	0.9-5.7
2,3,or 4	1.4	1-1.9
More than 4	--	--
Frequency of listening to the radio		
Often (once a week or more)	1.3	0.9-2.2
Not often (less than once a week)	--	--
Frequency of reading the newspaper or magazine		
Often (once a week or more)	2.4	1.6-3.5
Not often (less than once a week)	--	--
Frequency of watching TV		
Often (once a week or more)	2.9	1.9-4.3
Not often (less than once a week)	--	--
Knowledge about HIV		
Excellent	5.8	1.5-22.3
Good	1.1	0.8-1.6
Poor to fair	--	--

Attitude towards domestic violence/women's rights		
Strong	1.8	1.2-2.7
Fair	1	0.6-1.7
Poor	--	--
Condom access		
Yes, could get a condom	1	0.7-1.4
No or not sure if could get a condom	--	--

Table 5. Predictors for Condom Use- Multivariate Analysis

Variable	Adjusted OR for using a condom	Adjusted OR 95% CI for the variable
Education		
Secondary or beyond	1.5	0.8-2.6
No education or only primary	--	--
Age		
15-24	3.7	1.7-8.1
25-34	1.0	0.6-1.4
35-49	--	--
Local		
Urban	1.1	0.8-1.7
Rural	--	--
Literacy		
Proficient	2.1	1.4-3.3
Not proficient	--	--
Frequency of reading the newspaper or magazine		
Often (once a week or more)	1.3	0.9-2
Not often (less than once a week)	--	--
Frequency of watching TV		
Often (once a week or more)	1.8	1.2-2.8
Not often (less than once a week)	--	--
Knowledge about HIV		
Excellent	2.9	0.7-11.9
Good	0.8	0.5-1.2
Poor to fair	--	--
Attitude towards domestic violence/women's rights		
Strong	1.4	0.9-2.2
Fair	0.9	0.5-1.5
Poor	--	--

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