Men's Gender Attitudes and HIV Risk in Urban Malawi

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Abstract

Recent research demonstrates that men's sexual health behaviors are influenced by their gender attitudes, including their images of how "real men" behave and their beliefs about proper gender roles and relations between men and women. This study extends that research, quantitatively testing the theory in Malawi for the first time, and expanding the analysis to include new outcomes. The findings indicate that, in comparison to men who adhere to unequal gender ideologies, men with more equitable gender attitudes report fewer sexual partners, are less likely to have recently experienced symptoms of an STI, and are more likely to have ever been tested for HIV. In short, gender attitudes are associated with sexual health behaviors implicated in HIV risk. In addition, men's subjective assessment of their HIV risk is negatively associated with their gender attitudes; men with more equitable gender attitudes feel less at risk of HIV.

Introduction

A large body of literature documents the influence of gender systems on reproductive health (Blanc 2001; Mason 2001; Varga 2003; Li 2004; Dodoo and Frost 2008). Much of this literature focuses on the association between women's relative disadvantage, or lack of autonomy, and negative health outcomes (Dyson and Moore 1983; Greene and Biddlecom 2000; Beegle et al. 2001; Furuta and Salway 2006; Allendorf 2007). In addition to gender inequality, researchers are increasingly recognizing that social norms prescribing the types of actions and interactions that are considered masculine or feminine also influence sexual and health behaviors (Campbell 1997; Courtenay 2000; Silberschmidt 2001; Agadjanian 2002; Williams 2003; Barker and Ricardo 2005; Barker et al. 2010; Wyrod 2011; Odimegwu, Pallikadavath, and Adedeni 2012). Many behaviors that are commonly associated with the demonstration of masculinity—such as disregard for risk, rejection of help seeking, subordination of women, and violence—can produce negative health outcomes for men and their partners. For example, sexual practices that are socially rewarded as proof of masculinity in many contexts, including having multiple sexual partners, foregoing protection from STIs, paying for sex, and engaging in forced sex, are also associated with the spread of HIV (Rivers and Aggleton 1999; Mane and Aggleton 2001; Kaler 2003; Hunter 2005; Walker 2005; Nyanzi, Nyanzi-Wakholi, and Kalina 2009; Macia, Maharaj, and Gresh 2011; Dworkin et al. 2012).

A few recent quantitative studies have begun to examine associations at the individual level between rigid adherence to unequal gender attitudes and negative health outcomes among men (Barker et al. 2010). Individuals with unequal gender attitudes believe that men should dominate and control women, and often they will choose to enact a masculinity that is based on their understanding of gender differentiation. Studies find associations between men's gender

attitudes and their sexual and reproductive health behaviors. Much of this research has made use of the Gender Equitable Men (GEM) scale, which was constructed for this purpose (Pulerwitz and Barker 2008). In Brazil, where the GEM scale was originally developed and tested, men whose scale scores indicated that they held relatively equitable gender attitudes were less likely to report perpetration of partner violence and more likely to report contraceptive use (Pulerwitz and Barker 2008).

Similarly, a brief report from a study conducted in Tanzania and Ghana indicates that men with less equitable gender attitudes (as measured using a modified GEM scale) had more sex partners in the 12 months preceding the survey, were more likely to have concurrent sexual partners, and were less likely to use condoms than men who had more equitable attitudes (FHI 360 2012). The International Men and Gender Equality Survey (IMAGES) project conducted surveys on men's gender attitudes and their health and relationship practices in Brazil, Chile, Croatia, India, Mexico, and Rwanda (Barker et al. 2011). They found that in several countries, men with relatively more equitable gender attitudes were more likely to have been tested for HIV and more likely to have accompanied their partners to a prenatal healthcare visit. Men with relatively less equitable gender attitudes were more likely to have paid for sex and to have perpetrated intimate partner violence. Overall, existing studies show correlations between inequitable gender attitudes and negative health behaviors and outcomes.

The current study is an extension of this nascent literature. First, a modified version of the GEM scale was used to measure men's gender attitudes in Malawi for the first time. As constructions of gender are context specific, the application of this measurement tool to a new site is an opportunity to further test its usefulness in the study of sexual health behaviors. Second, the analyses include examinations of associations between gender attitudes and objective

measures of HIV risk. The results indicate that inequitable gender attitudes are associated with greater frequency of behaviors linked to risk of HIV.

Finally, this is the first study to assess the relationship between gender attitudes and subjective measures of self-assessed HIV risk. Self-assessed risk is important because perceptions of risk are correlated with adoption of risk reduction strategies (Kohler, Behrman, and Watkins 2007). The findings suggest that perceived risk may be a function of both behaviors and masculine self-image. The analysis of the association between gender attitudes and self-assessed HIV risk contributes new insights to the literature on the influence of gender systems on sexual health and indicates that this area of research is worthy of further examination.

Gender Attitudes and HIV Risk

An individual's gender attitudes encompass both ideals about how men and women should behave and how they should relate. In other words, ideals of masculinity and femininity are part of gender attitudes, as well as levels of desired egalitarianism. These facets of a person's gender ideology are integrally related and both can influence his/her sexual behaviors and risk of HIV. For example, the degree to which a man believes that there should be equality or inequality in his intimate relationships will affect who he chooses as partners and how he interacts with them. Similarly, the extent to which sexual prowess is integral to a man's successful demonstration of masculinity (to himself and to others) affects his sexual behavioral choices, including how much he is willing to put himself at risk of becoming infected with HIV.

Only a few studies in Malawi have examined the relevance of gender attitudes and contemporary constructions of masculinity for sexual health. In a study of rural Malawians, Kaler (2003) shows that some sexual behaviors labeled "risky" by public health officials are also

interpreted as markers of masculinity. She finds that men claim to be HIV-positive as a rhetorical demonstration of their masculine behaviors, such as travel (which is associated with labor market success) and having sex with many women. Similarly, Izugbara and Undie (2008) find that young men in Malawi rely on accounts of sexual exploits to achieve validation and respect from peers. These qualitative studies demonstrate that sexual behaviors are a common social domain for the performance of masculinity. They contribute to the expectation that men with inequitable gender attitudes will use sexual behaviors to demonstrate their masculinity through their domination of women, which can have implications for their sexual health and the health of their partners.

In this study, I examine the relationship between gender attitudes and three behaviors that are linked to the risk of HIV infection: number of sexual partners, experience of symptoms of a sexually transmitted infection (STI), and HIV testing. Here I briefly review explanations for each of the expected relationships. First, I anticipate that men with relatively more equitable gender attitudes will have fewer sexual partners. Men who believe in male dominance in decision-making in intimate relationships and who believe that "real men" have lots of sex are likely to aspire to having multiple sexual partners as proof of their masculinity (Hunter 2005; Simpson 2007; Macia et al. 2011). Second, I hypothesize that men with more equitable gender attitudes will be less likely to experience symptoms of an STI. In Malawi, sex without condoms is viewed as both more pleasurable and more masculine (Kaler 2003; Watkins 2004), which may lead men to forgo protection from STIs as proof of their manliness. Moreover, men who use their sexual experiences as proof of masculinity may be hesitant to prioritize protection from STIs over opportunities for sex. Finally, I expect that men with more equitable gender attitudes will be more likely to have undergone HIV testing. Men cultivating a masculine image of invincibility

and sexual prowess may avoid testing for HIV as a potential sign of weakness or as an indication that they prioritize health concerns over sexual experiences (Barker et al. 2011). Also, given their understanding of the transmissibility of HIV, men who use accounts of their sexual exploits to validate their masculinity are often ambivalent about testing because they assume that a test will indicate that they are HIV positive (Kaler 2003; Kaler 2004; Kaler and Watkins 2010). Each of these hypothesized associations is tested in the analyses.

In addition to studying links between gender attitudes and sexual health behaviors, I also examine the associations between gender attitudes and self-assessed risk of current and future HIV infection. Perceptions of individual and community-level risk of HIV are thought to be important determinants of sexual behavior and, therefore, have implications for the spread of HIV (Smith 2003; Smith and Watkins 2005). Previous studies of self-assessed risk have demonstrated that demographic characteristics, sexual behavior, perceptions of partners' sexual behavior, and perceived community prevalence of HIV are associated with self-assessed HIV risk (Anglewicz and Kohler 2009). I hypothesize that gender attitudes will also be associated with self-assessed risk. Drawing on qualitative work from rural Malawi (Kaler 2003), I expect respondents who adhere to inequitable gender norms to be more likely to report that they are at medium to high risk of HIV for two reasons. First, as examined in the first part of the analysis, the frequency of HIV-risk behaviors, such as having multiple partners and having sex without condoms, is expected to mediate an association between gender attitudes and self-assessed risk (Do and Meekers 2009). Second, men whose masculine identity is founded partially on sexual prowess may cultivate a self-image of high HIV risk, regardless of their actual sexual behaviors. Given the available data, I am unable to completely disentangle these two explanations, but the plausibility of each is examined.

Setting

This research was conducted in a low and middle income neighborhood in Lilongwe, Malawi's capital city. The neighborhood is accessible by public transportation from the main bus depot and the two main commercial centers of the city. The variety of house constructions provides visible evidence of the socioeconomic heterogeneity. Houses range from mud structures in disrepair with no privacy to buildings made of cement with corrugated iron roofs, brick fences, and iron gates. Most residents of the area rent their accommodations; relatively few well-off families own their own homes. At the time of this data collection, Malawi was experiencing a period of economic instability resulting in fuel shortages and rising prices for basic goods.

Malawi's estimated HIV adult prevalence rate is 11 percent (National Statistics Office [Malawi] and ICF Macro 2011), which is among the highest in the world. The prevalence rate is much higher in urban areas, such as the study site, averaging 17 percent of adults. Among men, the HIV prevalence rate rises steadily with age and it is generally positively correlated with education and wealth. Approximately half of adult men have ever been tested for HIV and the percent ever tested also increases with education and wealth.

Data and Measures

The data for this paper come from a stratified random sample of nearly 1,250 men in one area of Lilongwe, as well as in-depth interviews with a sub-sample of those men. The data were collected as part of a larger survey experiment investigating demand for adult male circumcision for HIV prevention. The research site and sampling strategy for both the quantitative and qualitative data collection were designed to meet the needs of the larger project. In March 2010,

participants in the circumcision study were sampled from the catchment area of the study's partner clinic, which corresponded to 29 census enumeration areas as defined by the Malawi National Statistics Office. The enumeration areas were further sub-divided into blocks using natural landmarks such as roads, walking paths, and streams. Two blocks per enumeration area were selected for inclusion and a full census was conducted in each selected block. One uncircumcised man between the ages of 18 and 35 was randomly selected from each household. Upon receiving consent, selected men were administered a baseline survey questionnaire about circumcision. The baseline survey sample consisted of approximately 1,700 men. A little more than one year later, in June 2011, the research team attempted to re-contact all baseline survey respondents and achieved a response rate of about 77 percent.

Questions about gender attitudes and sexual health practices were included in the follow-up survey and were administered to nearly 1,250 men. The survey was conducted face-to-face in a private location by young male Malawian enumerators. Because only uncircumcised men were eligible for participation in the survey, Muslim men and men from ethnic groups that regularly practice circumcision as part of a rite of passage (primarily Yao men) are excluded from the sample. Otherwise, the sample is designed to be representative of the target neighborhood in Lilongwe.

Data for the behavioral outcomes come from four survey questions. Respondents were asked how many different women they had sex with during the preceding month and during the preceding year. The answers are continuous, starting at zero and ranging up to 10 for the number of partners in the past month and up to 30 partners in the past year. The question regarding STIs asked about specific symptoms: "*Some men experience pain during urination, have an unusual discharge from the penis, or have sores in the genital area. During the past 4 weeks, have you*

had… Pain during urination? Unusual discharge? Sores in the genital area?" The three symptoms of an STI were combined into one variable coded 1 for respondents who had experienced any of the symptoms in the preceding month, and 0 otherwise. Finally, respondents were asked whether they had ever been tested for HIV and the answers were coded 1 for those who had been and 0 otherwise.

The survey included two questions to capture subjective assessment of HIV risk. The first asked, "*In your opinion, what is the likelihood (chance) that you are infected with HIV/AIDS now, no likelihood, low likelihood, medium likelihood, or high likelihood?"* In the analyses, respondents who said that there was a medium or high likelihood that they are currently infected (coded 1) are compared with all other respondents (coded 0).[1] The second question asked about future risk: "*Now think about you yourself, do you think you are at higher, lower or equal risk than the average man of becoming infected with HIV/AIDS?"* Again, the analyses compare men who said they were at higher risk than average (coded 1) with everyone else (coded 0).

The independent variable of interest was a modified GEM scale score. Based on qualitative fieldwork, 13 statements from the inequitable gender norms scale (Pulerwitz and Barker 2008) were selected for inclusion in the final section of the survey. Respondents were asked whether they agreed, partially agreed, or disagreed with each of these statements:

- *It is the man who decides when to have sex*
- *There are times when a women deserves to be beaten*
- *You don't talk about sex, you just do it*
- *Changing diapers, giving the kids a bath, and feeding the kids are a woman's responsibility*
- *I would be outraged if my wife asked me to use a condom*
- *A man should have the final word about decisions in his home*

[1] Responses were dichotomized in the same way by Anglewicz and Kohler (2009) who provide evidence that self-perceived medium and high likelihood of infection is interpreted as higher than average risk.

- *It is a woman's responsibility to avoid getting pregnant when a pregnancy is not desired*
- *Women need health services more than men*
- *I would feel weak if I asked for help*
- *If a woman cheats on a man, it is okay for him to hit her*
- *Men need sex more than women do*
- *A man needs other women, even if things are fine with his wife*
- *Men are always ready to have sex*

The gender equitable response to each of these statements was 'disagree.' Responses to the scale items were summed into an additive scale that included one point for every 'disagree' response.[2] Thus scale responses ranged from 0 to 13, with 13 representing the most equitable response pattern. The internal reliability of the additive scale was tested using Cronbach's alpha and produced a score of 0.71, which indicates an acceptable level of internal consistency.

Some of the models include controls for respondent age, education, and wealth. Years of age was treated as a continuous variable. Education was captured using a continuous measure of number of years of education completed. An estimate of how much the respondent spent during the month preceding the survey was used as a proxy measure for wealth. As this is a survey of a relatively poor neighborhood, the amount spent on basic items—clothes, medical expenses, food, transportation, and cell phone airtime—was a reasonably good measure of wealth. Income was not a good measure because few of the respondents had salaried positions, and their income can vary substantially month-to-month. To create an estimate of total monthly expenses, amount spent on each of the basic items was summed, converted so that each unit was the equivalent of $100 U.S. Dollars, and logged to reduce the skew in the distribution.

The models of self-assessed risk also include measures of whether the respondent thinks his primary sexual partner has multiple partners and his estimate of the prevalence of HIV in his

[2] Factor analysis was also used to create a weighted scale score for each respondent. The correlation between the weighted and un-weighted scale scores was 0.96, so the un-weighted additive scale was used for the sake of clarity.

neighborhood. Trust in the faithfulness of primary partner was measured at baseline with a question asking the respondent to choose among a series of statements to characterize his assessment of his partner's behavior. Responses were dichotomized so that men who either suspect or know that their primary partner has one or more other partners are coded 0, and men who think or know that their partner has no other partners are coded 1. An estimate of HIV prevalence was obtained during the follow-up survey by asking, "*If we took a group of 10 people from this area—just normal people who live around you —how many of them do you think would now have HIV/AIDS?*" Responses range between 0 and 10.

In addition to the quantitative survey, in-depth interviews were conducted with a stratified random sub-sample of the survey participants. In all, 64 men participated in interviews that lasted between 45 minutes and 3 hours and were conducted by male Malawian interviewers. The first half of the interview focused on beliefs and attitudes about circumcision. The second half included questions about a broader range of sexual and reproductive health behaviors, such as their relationship with their most recent partner and HIV testing, as well as questions designed to interrogate gender ideologies. For example, in the last section of each in-depth interview, the participant was asked, "*In general, around here, what are some of the things that men do to earn the admiration/respect of their male peers?*" and "*When Malawians say that someone is a real man, what do they consider?*" The interviews were conducted in Chichewa and subsequently translated into English and transcribed by the interviewers.

Results

Table 1 presents descriptive statistics for all dependent and independent variables. Men averaged nearly two sexual partners in the past year. Eleven percent of respondents reported

experiencing symptoms of an STI in the month preceding the survey and 72 percent said they had been tested for HIV. The second set of dependent variables explores men's subjective assessment of their risk of HIV. Twenty-four percent of respondents believed that there was a medium to high chance that they were already infected with HIV; and 14 percent thought they had a higher than average risk of becoming infected with HIV in the future. As expected, these rates of subjective perception of risk are higher than similar rates from rural areas of Malawi where HIV prevalence is lower (Anglewicz and Kohler 2009).

The mean and standard deviation of the GEM scale score indicate a relatively wide range of gender attitudes centered around men with only moderately equitable attitudes. Barker et al. (2011) trichotomized the scale by score, categorizing men in the bottom third of the scale as low equity, middle third as medium equity, and top third as high equity. Using this same method, nearly 30 percent of the men in this sample are low equity, 49 percent are categorized as medium equity, and 21 percent are high equity. In comparison to the findings of other studies, the gender attitudes of men in Malawi are comparable to attitudes among men in Rwanda, generally more equitable than gender attitudes among men in India, and less equitable than gender attitudes among men in Latin American and East European countries (Barker et al. 2011).

The last few rows in Table 1 provide descriptive statistics for the other independent variables included in the models. The average respondent age is 27 and respondents have completed an average of 11 years of schooling. The mean amount spent on basic items in the month before the survey was the equivalent of $144. That the standard deviation of expenditures is $168 is an indication that there is considerable variation in wealth among survey respondents. As of the baseline survey, only 30 percent of respondents believed that their primary partner had no other partners. Finally, on average, respondents estimated that 5 out of 10 people in their

neighborhood were infected with HIV, which is much higher than the actual prevalence rate. I now turn to the analysis of the results.

Gender attitudes

The first step of the analysis was an examination of the responses to the GEM scale questions, presented in Table 2. The percent of respondents who provided the gender equitable response is shown in the 'disagree' column of the table. The proportion of respondents providing the gender equitable response varied by GEM scale item, ranging between 21 and 90 percent of respondents. Men were most likely to reject the statements "*I would feel weak if I asked for help*;" "*You don't talk about sex, you just do it*;" "*I would be outraged if my wife asked me to use a condom*;" and "*If a woman cheats on a man, it is okay for him to hit her*." The statements that were least likely to be rejected were "*A man needs other women, even if things are fine with his wife*;" "*Women need health services more than men*;" and "*It is the man who decides when to have sex*." The distribution of the summed GEM scale scores is presented in Figure 1.

Table 3 shows results from an examination of associations between the GEM scale scores and measures of demographic and socioeconomic status. GEM scale scores were generally positively associated with age, although the relationship was not statistically significant. Additional analyses (not shown) indicated that the relationship was somewhat curvilinear; GEM scale score was positively associated with age for respondents under the age of 35 and the association was negative for respondents in their late 30s or older. Models that included variables for both age and age-squared still failed to reach statistical significance, however, so age-squared was omitted for the sake of parsimony.

Higher levels of both education and wealth were associated with more equitable gender attitudes. When all of these measures were entered into a model together, however, the effect of

education dominated. Holding other factors constant, the average difference in GEM scale score between someone with no education and someone with more than secondary education was 4.5 points, a substantial difference on this 14-point scale. The strong association between gender attitudes and education was consistent with theories of gender, as well as the findings of previous studies (Pulerwitz and Barker 2008; Barker et al. 2011). Men with more education are more likely to have been exposed to a variety of forms of gender relations and are less likely to rely on explicit notions of gender inequality to assert their masculinity (Connell 1995).

Gender attitudes and sexual health behaviors

The analyses found strong associations between gender attitudes and sexual behaviors that were related to HIV risk, which are graphically displayed in Figures 2-4. Figure 2 shows that the mean number of sex partners in the past year decreased as the GEM scale score increased. This statistically significant downward trend is captured in Table 4 in the bivariate OLS regression model 1. The bivariate model indicates that, on average, men at the high end of the GEM scale who were more supportive of gender equity had approximately 2 fewer sex partners in the year prior to the survey than did men at the low end of the GEM scale who held relatively inequitable gender attitudes.[3]

This relationship was further explored in model 2, which controlled for age, education, and wealth. The addition of controls to the model provided additional information on who had relatively more sexual partners, but it did not account for the relationship between gender attitudes and number of sexual partners. In particular, model 2 shows that wealth was associated with greater numbers of sexual partners, which was consistent with previous studies that have shown that wealth is used to attract partners and that resource exchange is an important part of

[3] The relationship remained statistically significant and was of similar magnitude when the measure of number of sex partners in the previous year was top-coded at 5 or more.

intimate relationships in Malawi (Swidler and Watkins 2007). Nonetheless, gender attitudes remained an important predictor of number of sexual partners, even when controlling for age, education, and wealth.

The in-depth interviews provided evidence that having multiple sexual partners was a commonly recognized strategy for proving masculinity. This particular construction of masculinity, which emphasized the sexual conquest of women, was likely associated with relatively inequitable gender attitudes. Adam, who was age 27, said, "*There are some [men] that are famous for having many girlfriends to say, 'this one, he has that woman, that woman, this one is a man.' When it is us who do not manage to propose [to women], they say that this one is a 'fule' [a castrated man]*." For Adam, "real men" had sex with many women. Victor, age 25, confirmed that men are motivated to have many partners in order to impress their peers: "*What they mostly talk about is on having some extra marital affairs. Outside marital relationships so that their fellow men should respect them*." The interviewer then asked, "*And this earns them respect?*" And Victor said, "*Yes, and that is why they do it*." Men who used this social norm to guide their behavior put themselves at higher risk of HIV infection.

Knowing the health consequences of having multiple sexual partners, many men regarded this masculine expectation as problematic, but acknowledged its existence and its power nonetheless. Francis (age 23) said that a man was admired when he *"likes to sleep around with women…"* Francis himself was praised for his sexual prowess, although he knew that he was risking his health by having sex with many women. He said, "*when they say this one is a real man... That saying just aims at destroying you."* Despite his understanding of the associated health risks, Francis enjoyed the praise and flattery that he received because he had many sexual

partners. He accepted and enacted a model of masculinity that privileged having sex with many women, despite the risks.

Figure 3 examines the relationship between gender attitudes and experience of sexually transmitted infections (STIs). It shows that men who were more supportive of gender equity had a lower likelihood of having an STI in the month prior to the survey, when compared with men who expressed inequitable gender attitudes. Models 3 and 4 in Table 4 show odds ratios from logistic regressions predicting recent experience of STI symptoms. The bivariate model shows that with each additional point on the GEM scale, respondents had 0.9 times the odds of STI symptoms. Model 4 shows that more equitable gender attitudes continued to be associated with lower odds of STI symptoms, although the coefficient was no longer statistically significant in the multivariate model. In this model, education captured some of the variation initially explained by gender attitudes. Education may be an important explanation for differential rates of STIs because education is positively associated with contraceptive use (National Statistics Office [Malawi] and ICF Macro 2011). The use of contraception may also explain why wealthy men, who had greater numbers of partners, did not appear to have higher rates of STIs in this sample.

In the in-depth interviews, a few respondents described uncontrollable masculine sexual desires as reasons for experiencing STIs. For example, Christopher, who is 25 years old, illustrates, "*one may use protection against STIs, but you may not always be ready to do that [use a condom]. You may want to have sex when you do not have condoms. In my case, I travel quite a lot. I was in Zomba yesterday and I might be travelling to Karonga today. Such things happen. It may happen sometimes that we have a breakdown and you are found at an awkward place unexpectedly and forced to sleep. You may have sexual desires that you cannot control.*

You may not have an opportunity to use a condom." Uncontrollable sexual desires were integral to the performance of certain types of masculinity. The quantitative results showed that 58 percent of the sample agreed that men were always ready to have sex and 73 percent agreed that men need other women, even if things with their wives are fine. Those enacting a masculinity based on sexual prowess made behavioral choices in a context where "real men" did not turn down an opportunity for sex because of a lack of protection. In this way, gender attitudes influenced men's risk of contracting STIs.

Figure 4 and models 5 and 6 in Table 4 show that men with more equitable gender attitudes were more likely to have ever been tested for HIV than those with less equitable attitudes, even when controlling for age and socioeconomic status. The odds ratio of 1.10 means that, holding other variables constant at their mean, men at the low end of the GEM scale had about a 0.6 predicted probability of having been tested for HIV, while at the high end of the GEM scale, men had greater than a 0.8 predicted probability of having been tested. This is an important difference in a place where universal testing is encouraged as an important strategy for combating the spread of HIV.

In some of the in-depth interviews, men suggested that those who do not test were those who have had unprotected sex with many women and who were afraid to know their HIV status. Zachariah, age 34, explained, "*Young men who are sexually active are afraid of knowing their status. They feel they have already contracted HIV and are tensed up.*" Markus, age 29, was one of those men. He said, "*...I feel like if I can go there to get tested, there they will tell me, 'Oh, we have found you with a virus.'*" Often, men who described their sexual behavior as risky were disinclined to get tested for HIV. It follows, therefore, that men whose masculine identity was based on their sexual prowess were less likely to get tested.

Gender attitudes and self-assessed HIV risk

The final part of the analysis examined associations between men's gender attitudes and their subjective assessment of their own risk of HIV infection. All of the coefficients presented in the four models in Table 5 are odds ratios based on logistic regression. Models 1 and 2 indicate that men with more equitable gender attitudes were less likely to report that they had a medium or high chance of being infected with HIV. The coefficients in these models translate into substantial effect sizes. The predicted probability that a respondent reported that he had a medium or high chance of being HIV positive ranged from about 0.17 among those with the most equitable gender attitudes to a predicted probability greater than 0.3 among those with the least equitable attitudes.

Gender attitudes remained an important predictor when controlling for the types of variables included in previous studies of self-assessed HIV risk (Anglewicz and Kohler 2009). Model 2 controlled for age, years of education, expenditures, number of sex partners in the previous year, the respondent's assessment of whether his partner has other partners, and the respondent's estimate of the HIV prevalence rate in his neighborhood. Not surprisingly, the respondent's reported number of sex partners in the previous year was positively associated with his probability of reporting that there was a medium or high chance that he was already infected with HIV. Men in this area are aware that having multiple sex partners increases their risk of becoming infected with HIV. Including the control for the number of sexual partners in the past year accounted for some, but not all of the association between gender attitudes and self-assessed risk. Whether the respondent thought that his primary partner had other partners as of the baseline survey was not related to his self-assessed risk. Likewise, the respondent's estimate of

the HIV prevalence among people in his neighborhood was not associated with his perceived risk.

Models 3 and 4 show similar findings: men with more equitable gender attitudes were less likely to say that they had a higher than average risk of HIV infection in the future, even when controlling for common predictors of self-assessed risk. Men with the most equitable attitudes had a predicted probability of approximately 0.06 of reporting that they were at higher than average risk. Respondents with the least equitable attitudes had a predicted probability greater than 0.2 of reporting higher than average risk of future HIV infection. Controlling for one aspect of the respondent's sexual behavior (number of sexual partners in the past year), his perception of the sexual behavior of his partner, and his assessment of HIV prevalence did little to explain the association between gender attitudes and self-assessed risk of future HIV infection. Interestingly, the greater the HIV prevalence rate perceived by the respondent, the greater his probability of reporting that he had a higher than average risk of future HIV infection.

In the interview transcripts, evidence for an association between gender attitudes and self-assessed risk of HIV appeared in discussions about HIV testing. As part of a demonstration of masculinity, some men claimed that they must be HIV positive because they had many "risky" sexual experiences (see also Kaler 2003). Since they could already assume their HIV status, therefore, there was no reason to get tested. Gibson, age 24, remarked that he heard this reasoning from his friends: "*When we are having our discussions as young men, what comes out as one of the reasons for not testing is the self-doubt of being found to be HIV positive. Some young men don't want to know their HIV status because for sure they are aware that the women they had sex with had sex with another man before them. So they are afraid of knowing their HIV*

status." Gibson's friends were simultaneously making the claim that they were masculine men who have a lot of sex and that they were at high risk of HIV.

Edward, age 27, associated being a man with engaging in sexual behaviors that put him at risk of sexually transmitted infections. He described his behavioral choices as an inevitable result of the fact that he is a man. He explained, "*So, I am a man. [I think] 'I should drink one [beer] here.' You may meet prostitutes, yeah. When you meet those prostitutes you do things under intoxication and you cannot remember a condom. You just say, 'Ah, you, I will give you money. Let us have sex here.' So, those things can cause a person... you will find that you will do that alright, but you will find that [after] three days, four days something has started itching in the body, yeah*." Edward asserted his masculinity by claiming that he had uncontrollable sexual urges and by disregarding risk for the sake of sexual satisfaction. His assertion that he was at risk of sexually transmitted infections was part of the construction of his masculine self-image.

Men like Edward were at high risk of HIV because they engaged in sexual behaviors that increase one's risk of infection. In addition, regardless of their actual behavior, their masculine self-image was based, in part, on their high level of risk. It is important to note that Edward's behavior and his rationalization of his behavior were by no means representative of all interview respondents. Although many men would have disapproved of Edward's behavior (and there were plenty of responses in the interviews that indicated that men tried to distance themselves from this type of behavior), most men recognized the existence of this cultural script linking masculinity with high levels of HIV risk. A man's subjective assessment of his own risk of HIV, therefore, may reflect both the objective riskiness of his behaviors and his self-image about what kind of man he is.

Discussion

The findings of this study provide an important foundation for much needed additional research on gender attitudes, masculinity, and sexual health behaviors in Malawi and beyond. First, the Gender Equitable Men (GEM) scale proved useful in capturing variation in urban Malawian men's attitudes about gender. The percent of men giving the gender equitable response to each scale item varied from 21 percent to 90 percent. The scale captures both attitudes about masculinity and attitudes about gender relations/equality. Statements intended to capture ideals of masculinity include "*I would feel weak if I asked for help*"; "*Men are always ready to have sex*"; and "*A man needs other women, even if things are fine with his wife*." It is worth noting that 73 percent of respondents agreed with that last statement. This finding, by itself, provides motivation for further research on the role of masculine ideals in promoting the spread of HIV in urban Malawi.

The attitude that "real men" need multiple partners has also been recognized in places such as South Africa (Hunter 2005; Walker 2005). Hunter (2005) documents the rise of the *isoka* masculine ideal, which is based on securing multiple sexual partners. He argues that high unemployment undermined many historical avenues for expressing manliness, especially becoming the head of an independent household, which led to the rise in prominence of the *isoka* masculinity. Hunter, and others (Walker 2005; Morrell 2001; Lynch, Brouard, and Visser 2010; Dworkin et al. 2012), however, also document men's increasing doubts about this form of masculinity in the face of the high death tolls caused by HIV/AIDS. Masculinity is never singular or static (Connell 1995; Morrell 1998) and in-depth research is needed to examine the ways in which men in Malawi express their manliness, and the ways in which ideals of masculinity are shifting in the context of the threat of HIV. Given the responses to the GEM

scale items in this study, it is clear that many, but not all, Malawian men regard sexual behaviors as a mode of establishing manhood. This makes the study of masculinities important to the study of HIV risk.

GEM scale items capturing attitudes about gender relations also point to inequitable gender norms as potentially influential in HIV risk. Relevant scale items include "*It is a woman's responsibility to avoid getting pregnant when a pregnancy is not wanted*"; "*A man should have the final word about decisions in his home*"; and "*It is the man who decides when to have sex*." Among the survey respondents, only 25 percent disagreed with the last statement, indicating an expectation that men control sexual encounters. By influencing the character of negotiations regarding safe sex practices, this inequitable gender norm also has the potential to affect the spread of HIV (Varga 2003).

Basic regression analyses demonstrated that men with more education generally hold more equitable gender attitudes, and that education is the most salient demographic predictor of gender attitudes. This is consistent with expectations and previous findings (Pulerwitz and Barker 2008; Barker et al. 2011). Education is a mechanism for the spread of alternative ideals of masculinity and gender norms. Also, men who achieve high levels of schooling can use their educational attainment as a social marker of success and may feel less social pressure to prove their masculinity through other means, such as sexual prowess or the overt domination of women (Connell 1995). Finally, highly educated men may be more likely to recognize questions about gender attitudes as politically sensitive and to respond to those questions in socially desirable ways.

The second set of important findings from this study is that gender attitudes are correlated with sexual health behaviors that influence men's risk of HIV infection, including number of

sexual partners, experience of STIs, and testing for HIV. The results show that wealth is an important predictor of number of sexual partners. Nonetheless, even when controlling for wealth and education, gender attitudes continue to predict number of partners. This is suggestive evidence that gender attitudes, including ideals of masculinity, provide motivation (or post-hoc rationalization) for having multiple sexual partners, despite the associated risk of HIV. It is also clear that not all Malawian men support a masculine ideology that privileges sexual prowess and that this variation is linked to variation in sexual behaviors. As noted in other study settings, such variation in masculine ideals can provide openings for social and cultural change (Morrell 2001; Hunter 2005; Walker 2005).

The results also show a somewhat weak association between gender attitudes and recent experience of STI symptoms. This is further evidence that gender attitudes are associated with HIV risk. Men who have STIs have evidently had unprotected sex, which means they have recently put themselves at risk of HIV infection. In addition, men with STIs are at higher risk of acquiring HIV from an HIV positive partner (WHO 2006), which means that they have an elevated future risk of HIV as well.

The analysis also documents an association between gender attitudes and HIV testing. Men with more equitable gender attitudes are substantially more likely to have ever been tested for HIV. There is relatively easy access to HIV testing in this urban setting (National Statistics Office [Malawi] and ICF Macro 2011), so differential access, although unmeasured, is unlikely to explain this finding. HIV testing is important so that individuals can adjust their behaviors to maintain HIV negative status or to reduce the risk of transmitting HIV to others if they are HIV positive. Men in Malawi generally over-estimate the transmissibility of HIV and, given the prevalence of the disease, men often assume they are HIV positive because they have not always

practiced safe sex (Anglewicz and Kohler 2009; Kaler and Watkins 2010). This can be used to justify the continuation of unprotected sex with multiple partners on the assumption that they are already infected. HIV testing could encourage such men to re-evaluate their sexual behaviors.

A far greater percentage of Malawian adult women have been tested for HIV in their lifetimes (73 percent) than Malawian adult men (53 percent) (National Statistics Office [Malawi] and ICF Macro 2011). Much of this discrepancy is due to the fact that women are routinely tested when they seek antenatal care. The association between men's gender attitudes and HIV testing may also prove to be part of the explanation for lower testing rates among men. Men with relatively inequitable gender attitudes may opt not to get tested because they already assume they are HIV positive and/or because getting tested for HIV implies an unmanly willingness to prioritize health over the satisfaction of sexual desires.

Finally, this study is the first to document a quantitative correlation between gender attitudes and self-assessed risk of HIV. It is possible that this association is mediated entirely by a corresponding association between gender attitudes and sexual behaviors. As demonstrated in the second part of the analyses, men with less equitable gender attitudes are more likely to engage in some of the behaviors that are associated with HIV risk. And, the analysis of self-assessed risk showed that a higher number of sex partners in the year preceding the survey was associated with a higher likelihood of reporting medium or high risk of HIV infection. Other unmeasured aspects of sexual relationships may further explain the association between gender attitudes and subjective risk assessment. For example, men with less equitable gender attitudes may be less likely to use condoms with casual sex partners or more likely to pay prostitutes for sex. These men may accurately assess that they are at higher than average risk of HIV. Thus, at least part of the explanation for the association between gender attitudes and subjective

perception of HIV risk is that men who hold less equitable gender attitudes engage in more risky sexual behaviors, and, knowing that they are putting themselves at risk, reasonably assume there is a relatively high chance that they are infected with HIV. The same explanation could apply to the association between gender attitudes and future risk of HIV, presuming that men with less equitable gender attitudes intend to continue engaging in risky sexual behaviors. The current survey does not include enough measures of sexual behavior to fully examine this potential explanation.

It is also possible, however, that the association between self-assessed risk of HIV and gender attitudes is not driven entirely by behavioral differences. Kaler's (2003) work in rural Malawi shows that some men construct a masculine self-image that is based on insatiable sexual desire and sexual prowess, and the attendant higher risk of HIV. It is plausible that some men evaluate their risk of HIV based on their self-image in addition to an objective assessment of the riskiness of their sexual behaviors. Existing studies show that the formation of risk perceptions is a social process (Buhler and Kohler 2003; Kohler, Behrman, and Watkins 2007). It is possible that centrality of sexual prowess to the construction of masculinity within a man's social network affects both his sexual behaviors and his subjective assessment of his risk of contracting HIV. Unfortunately, these data do not provide the tools necessary to fully evaluate this possible explanation. The results do show, however, that gender attitudes remain a significant predictor of self-assessed risk, even when controlling for a number of factors that are central to HIV risk.

In addition to having a limited number of measures of sexual behavior, there are several other limitations to this study. First and foremost, the analyses are based on cross-sectional data, so no conclusions can be drawn about causal effects. The observed associations could result from gender attitudes influencing sexual behaviors or vice versa. For example, I have hypothesized

above that men with less equitable gender attitudes will be less likely to seek HIV testing. However, it is possible that the causal direction is reversed: interactions with clinic personnel in the process of HIV testing may influence men's gender attitudes.

The data are also limited in coverage and content. The sample includes only urban men. Additional studies that include women and are more expansive in geographic scope are warranted. Future studies would also do well to include more detailed measures of demographic and socioeconomic status, more information on sexual behavior, as well as measures of behavioral intentions and motivations, which can begin to illuminate the mechanisms linking gender attitudes and sexual behaviors.

This study was an initial investigation of the relationship between gender attitudes and HIV risk among urban Malawian men. The findings show that the GEM scale is useful for capturing variation in gender attitudes in this setting. Results also demonstrate an association between gender attitudes and both objective measures of sexual health behaviors that are linked to the spread of HIV, and subjective self-assessed HIV risk. While preliminary, the results suggest that there is need for further research on gender attitudes and how they relate to sexual health behaviors in Malawi and beyond.

References

Agadjanian, Victor. 2002. “Men’s Talk About ‘Women’s Matters’: Gender, Communication, and Contraception in Urban Mozambique.” *Gender & Society* 16(2):194–215.

Allendorf, Keera. 2007. “Couples’ Reports of Women's Autonomy and Health-care Use in Nepal.” *Studies in Family Planning* 38(1):35–46.

Anglewicz, Philip and Hans-Peter Kohler. 2009. “Overestimating HIV Infection: The Construction and Accuracy of Subjective Probabilities of HIV Infection in Rural Malawi.” *Demographic Research* 20(6):65-96.

Barker, Gary, and Christine Ricardo. 2005. *Young Men and the Construction of Masculinity in Sub-Saharan Africa: Implications for HIV/AIDS, Conflict, and Violence*. Social Development Papers: Conflict Prevention and Reconstruction. Paper Number 26. Washington D.C.: The World Bank.

Barker, Gary, C. Ricardo, M. Nascimento, A. Olukoya, and C. Santos. 2010. “Questioning Gender Norms with Men to Improve Health Outcomes: Evidence of Impact.” *Global Public Health* 5(5):539–553.

Barker, Gary, J.M. Contreras, B. Heilman, A.K. Singh, R.K. Verma, and M. Nascimento. 2011. *Evolving Men: Initial Results from the International Men and Gender Equality Survey (IMAGES)*. Washington D.C. and Rio de Janeiro: International Center for Research on Women (ICRW) and Instituto Promundo.

Beegle, Kathleen, Elizabeth Frankenberg, and Duncan Thomas. 2001. “Bargaining power within Couples and Use of Prenatal and Delivery Care in Indonesia.” *Studies in Family Planning* 32(2):130–146.

Blanc, Ann K. 2001. “The Effect of Power in Sexual Relationships on Sexual and Reproductive Health: An Examination of the Evidence.” *Studies in Family Planning* 32(3):189–213.

Campbell, Catherine. 1997. “Migrancy, masculine identities and AIDS: the psychosocial context of HIV transmission on the South African gold mines.” *Social Science & Medicine* 45(2):273–81.

Connell, R.W. 1995. *Masculinities*. University of California Press.

Courtenay, Will H. 2000. “Constructions of Masculinity and their Influence on Men’s Well-Being: A Theory of Gender and Health.” *Social Science & Medicine* 50(10):1385–1401.

Do, Mai and Dominique Meekers. 2009. “Multiple Sex Partners and Perceived Risk of HIV Infection in Zambia: Attitudinal Determinants and Gender Differences.” *AIDS Care* 21(10): 1211-1221.

Dodoo, F. Nii-Amoo, and Ashley E. Frost. 2008. "Gender in African Population Research: The Fertility/Reproductive Health Example." *Annual Review of Sociology* 34:431–452.

Dworkin, Shari L., Christopher Colvin, Abbey Hatcher, and Dean Peacock. 2012. "Men's Perceptions of Women's Rights and Changing Gender Relations in South Africa: Lessons for Working With Men and Boys in HIV and Antiviolence Programs." *Gender & Society* 26(1):97–120.

Dyson, Tim, and Mick Moore. 1983. "On Kinship Structure, Female Autonomy, and Demographic Behavior in India." *Population and Development Review* 9(1):35–60.

FHI 360. 2012. "Assessing Gender Norms Among Men in Ghana and Tanzania." *Perspectives on Gender and Health*. Accessed September 2012: http://www.fhi.org/en/Topics/gender.htm.

Furuta, Marie, and Sarah Salway. 2006. "Women's Position within the Household as a Determinant of Maternal Health Care Use in Nepal." *International Family Planning Perspectives* 32(1):17–27.

Greene, Margaret E., and Ann E. Biddlecom. 2000. "Absent and Problematic Men: Demographic Accounts of Male Reproductive Roles." *Population and Development Review* 26(1):81–115.

Hunter, Mark. 2005. "Cultural politics and masculinities: Multiple-partners in historical perspective in KwaZulu-Natal." *Culture, Health & Sexuality* 7(3):209–223.

Izugbara, Chimaraoke O., and Chi-Chi Undie. 2008. "Masculinity Scripts and the Sexual Vulnerability of Male Youth in Malawi." *International Journal of Sexual Health* 20(4):281–294.

Kaler, Amy. 2003. "'My Girlfriends Could Fill A Yanu-Yanu Bus': Rural Malawian Men's Claims About Their Own Serostatus." *Demographic Research* Special Collection 1, Article 11:349–372.

Kaler, Amy. 2004. "AIDS –Talk in Everyday Life: The Presence of HIV/AIDS in Men's Informal Conversation in Southern Malawi." *Social Science & Medicine* 59(2):285-297.

Kaler, Amy and Susan Cotts Watkins. 2010. "Asking God about the Date You Will Die: HIV Testing as a Zone of Uncertainty in Rural Malawi." *Demographic Research* 23(32):905-932.

Kohler, Hans-Peter, Jere R. Behrman, and Susan Cotts Watkins. 2007. "Social Networks and HIV/AIDS Risk Perceptions." *Demography* 44(1):1-33.

Li, Jianghong. 2004. "Gender Inequality, Family Planning, and Maternal and Child Care in a Rural Chinese County." *Social Science & Medicine* 59(4):695–708.

Lynch, Ingrid, Pierre W. Brouard, and Maretha J. Visser. 2010. "Constructions of Masculinity Among a Group of South African Men Living with HIV/AIDS: Reflections on Resistance and Change." *Culture, Health & Sexuality* 12(1):15-27.

Macia, Manuel, Pranitha Maharaj, and Ashley Gresh. 2011. "Masculinity and male sexual behaviour in Mozambique." *Culture, Health & Sexuality* 13(10):1181–1192.

Mane, Purnima, and Peter Aggleton. 2001. "Gender and HIV/AIDS: What Do Men Have to Do with It?" *Current Sociology* 49(6):23–37.

Mason, Karen Oppenheim. 2001. "Gender and Family Systems in the Fertility Transition." *Population and Development Review* 27(Supplement: Global Fertility Transition):160–176.

Morrell, Robert. 1998. "Of boys and men: masculinity and gender in Southern African studies." *Journal of Southern African Studies* 24(4):605–630.

Morrell, Robert. 2001. "The Times of Change: Men and Masculinity in South Africa." Pp. 3–40 in *Changing Men in Southern Africa*, edited by Robert Morell. London: Zed Books Ltd.

National Statistical Office (NSO) and ICF Macro. 2011. *Malawi Demographic and Health Survey 2010*. Zomba, Malawi, and Calverton, Maryland, USA: NSO and ICF Macro.

Nyanzi, Stella, Barbara Nyanzi-Wakholi, and Bessie Kalina. 2009. "Male Promiscuity: The Negotiation of Masculinities by Motorbike Taxi-Riders in Masaka, Uganda." *Men and Masculinities* 12(1):73–89.

Odimegwu, Clifford, Pallikadavath, Saseendran, and Sunday Adedeni. 2012. "The Cost of Being a Man: Social and Health Consequences of Igbo Masculinity." *Culture, Health & Sexuality.* 15(2):219-234.

Pulerwitz, Julie, and Gary Barker. 2008. "Measuring Attitudes toward Gender Norms among Young Men in Brazil: Development and Psychometric Evaluation of the GEM Scale." *Men and Masculinities* 10(3):322–338.

Rivers, Kim, and Peter Aggleton. 1999. *Men and the HIV Epidemic*. New York: United Nations Development Program (UNDP).

Silberschmidt, Margrethe. 2001. "Disempowerment of Men in Rural and Urban East Africa: Implications for Male Identity and Sexual Behavior." *World Development* 29(4):657–671.

Simpson, Anthony. 2007. "Learning Sex and Gender in Zambia: Masculinities and HIV/AIDS Risk." *Sexualities* 10(2):173–188.

Smith, Kirsten P. 2003. "Why Are They Worried? Concern about HIV/AIDS in Rural Malawi." *Demographic Research* Special Collection 1(Article 9):279-318.

Smith, Kirsten P. and Susan Cotts Watkins. 2005. “Perceptions of Risk and Strategies for Prevention: Responses to HIV/AIDS in Rural Malawi.” *Social Science & Medicine* 60(3):649-660.

Swidler, Ann, and Susan Cotts Watkins. 2007. “Ties of Dependence: AIDS and Transactional Sex in Rural Malawi.” *Studies in Family Planning* 38(3):147-162.

Varga, Christine A. 2003. “How Gender Roles Influence Sexual and Reproductive Health among South African Adolescents.” *Studies in Family Planning* 34(3):160–172.

Walker, Liz. 2005. “Men behaving differently: South African men since 1994.” *Culture, Health & Sexuality* 7(3):225–238.

Watkins, Susan Cotts. 2004. “Navigating the AIDS Epidemic in Rural Malawi.” *Population and Development Review* 30(4):673–705.

Williams, David R. 2003. “The Health of Men: Structured Inequalities and Opportunities.” *American Journal of Public Health* 93(5):724–731.

WHO. 2006. “Treatment for sexually transmitted infections has a role in HIV prevention.” News Release dated 16 August 2006. Accessed January 8, 2013: http://www.who.int/mediacentre/news/releases/2006/pr40/en/.

Wyrod, Robert. 2011. “Masculinity and the Persistence of AIDS Stigma.” *Culture, Health & Sexuality* 13(4):443–456.

Table 1: Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum
Dependent variables				
Number of sex partners last year	1.83	2.30	0	30
Symptoms of STI in past month	0.11	0.31	0	1
Ever tested for HIV	0.72	0.45	0	1
High/medium chance HIV positive	0.24	0.43	0	1
Higher risk of HIV than average	0.14	0.35	0	1
Independent variables				
GEM Scale score	6.21	2.76	0	13
Age	26.72	5.43	16	52
Years of education	11.05	2.40	0	14
Expenditures last month (USD)	144.61	168.10	0	2000
Believe partner is faithful	0.29	0.46	0	1
Number HIV positive out of 10 people	5.05	2.00	0	10

Table 2: GEM Scale Components

	Agree	Partially Agree	**Disagree**
I would feel weak if I asked for help	8.8%	1.2%	**90.0%**
You don't talk about sex, you just do it	19.0%	3.9%	**77.1%**
I would be outraged if my wife asked me to use a condom	24.3%	4.0%	**71.7%**
If a woman cheats on a man, it is ok for him to hit her	26.3%	3.8%	**69.9%**
There are times when a woman deserves to be beaten	40.9%	5.1%	**54.0%**
Men need sex more than women do	41.6%	10.0%	**48.4%**
It is a woman's responsibility to avoid getting pregnant when a pregnancy is not wanted	56.4%	5.0%	**38.6%**
Changing diapers, giving the kids a bath, and feeding the kids are a woman's responsibility	55.6%	6.5%	**37.9%**
Men are always ready to have sex	58.0%	5.2%	**36.8%**
A man should have the final word about decisions in his home	64.4%	6.5%	**29.2%**
It is the man who decides when to have sex	64.7%	10.2%	**25.2%**
Women need health services more than men	73.1%	5.1%	**21.8%**
A man needs other women, even if things are fine with his wife	73.4%	6.1%	**20.5%**

Notes: "Disagree" is the gender equitable response to each item.

Table 3: Predictors of GEM Scale Score

	Model 1	Model 2	Model 3	Model 4
Age	0.03			0.01
	(0.02)			(0.02)
Years of education		0.33***		0.32***
		(0.03)		(0.03)
Log of expenditures last month			0.20**	0.09
			(0.07)	(0.07)
Constant	5.51***	2.57***	6.23***	2.30***
	(0.41)	(0.37)	(0.08)	(0.57)
n	1132	1132	1132	1132

Notes: Models use OLS regression. * p<0.05; **p<0.01; ***p<0.001

Table 4: Gender Attitudes and Sexual Health Behaviors

	Sex partners last year (OLS regression)		**Symptoms of STI** (Odds ratios from logistic regression)		**Ever tested for HIV** (Odds ratios from logistic regression)	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
GEM Scale score	-0.16***	-0.16***	0.90**	0.93	1.12***	1.10***
	(0.02)	(0.02)	(0.04)	(0.04)	(0.03)	(0.03)
Age		-0.03*		1.01		1.04*
		(0.01)		(0.02)		(0.01)
Years of education		-0.02		0.90**		1.04
		(0.03)		(0.03)		(0.03)
Log of expenditures last month		0.19**		1.08		1.09
		(0.07)		(0.10)		(0.07)
Constant	2.83***	3.84***	0.21***	0.38	1.30	0.36*
	(0.18)	(0.54)	(0.05)	(0.24)	(0.20)	(0.18)
n	1132	1132	1132	1132	1132	1132

Notes: Robust standard errors shown in parentheses. *p<0.05; **p<0.01; ***p<0.001. Models 1&2 present coefficients from OLS regression. Models 3-6 present odds ratios from logistic regression.

Table 5: Subjective HIV Risk Assessment

	Medium or high chance of current HIV infection		Higher risk than average of future HIV infection	
	Model 1	Model 2	Model 3	Model 4
GEM Scale score	0.88***	0.93*	0.84***	0.88***
	(0.02)	(0.03)	(0.03)	(0.03)
Age		0.99		0.99
		(0.01)		(0.02)
Years of education		0.91**		0.94
		(0.03)		(0.04)
Log of expenditures last month		0.96		0.93
		(0.07)		(0.09)
Sex partners last year		1.16***		1.09**
		(0.04)		(0.04)
Faithful partner		1.21		1.07
		(0.20)		(0.22)
Estimated HIV rate		1.01		1.14**
		(0.04)		(0.06)
Constant	0.67*	1.04	0.40***	0.31
	(0.12)	(0.62)	(0.09)	(0.27)
n	995	995	995	995

Notes: Robust standard errors shown in parentheses. *p<0.05; **p<0.01; ***p<0.001. All models present odds ratios from logistic regression.

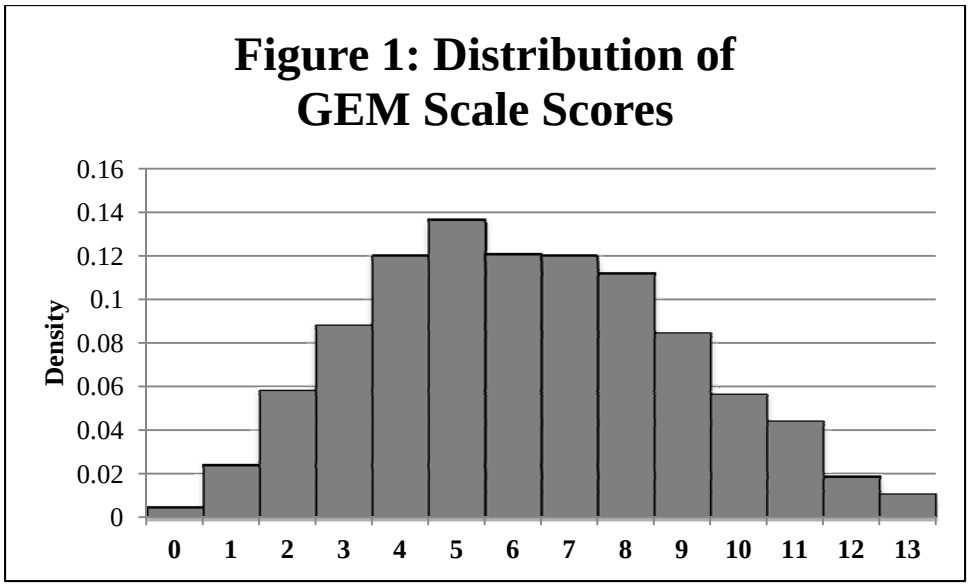
Figure 1: Distribution of GEM Scale Scores
Density
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13

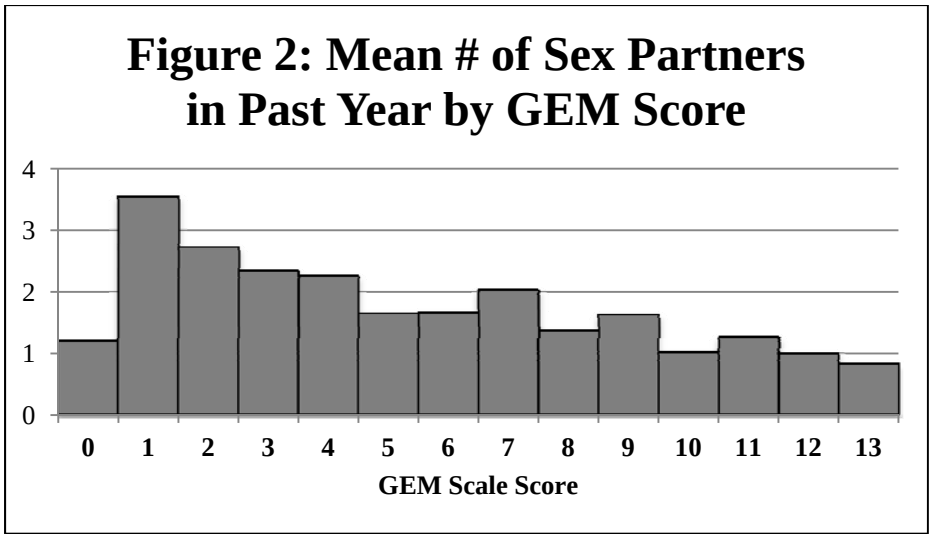
Figure 2: Mean # of Sex Partners in Past Year by GEM Score
4
3
2
1
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13
GEM Scale Score

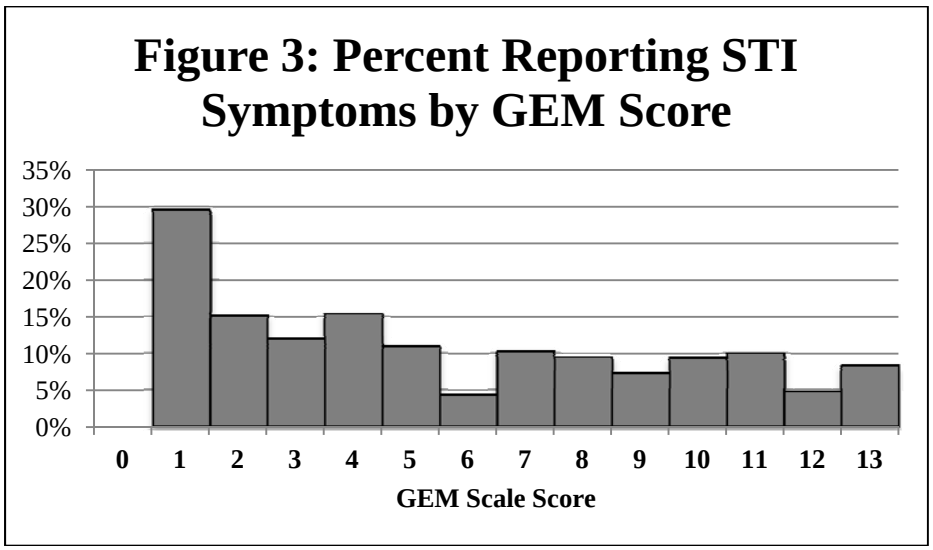
Figure 3: Percent Reporting STI Symptoms by GEM Score
35%
30%
25%
20%
15%
10%
5%
0%
0 1 2 3 4 5 6 7 8 9 10 11 12 13
GEM Scale Score

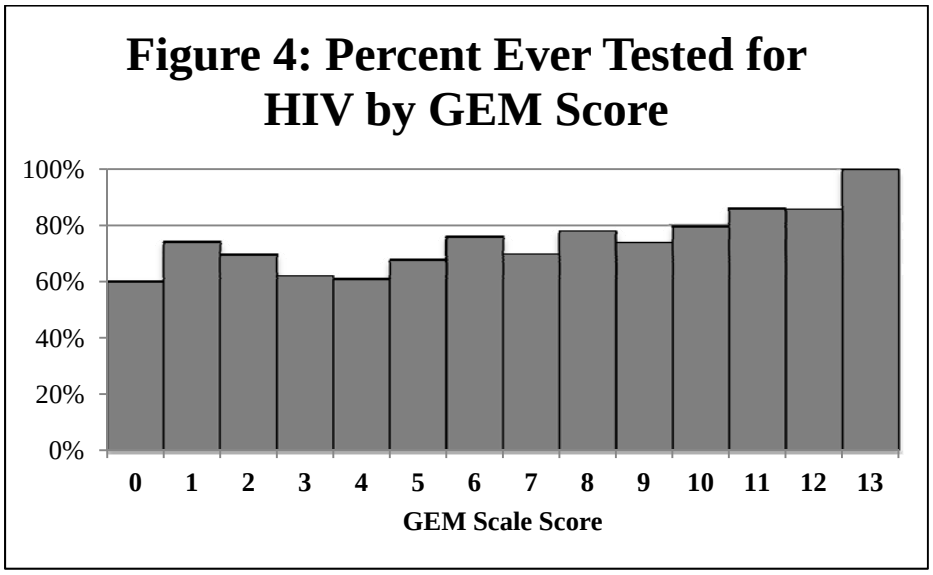
Figure 4: Percent Ever Tested for HIV by GEM Score
100%
80%
60%
40%
20%
0%
0 1 2 3 4 5 6 7 8 9 10 11 12 13
GEM Scale Score