Published in final edited form as:
Afr J Reprod Health. 2012 September ; 16(3): 57–67.

Community, social group, and individual level correlates of rural Malawian men's and women's reproductive health intentions and practices

Valerie A. Paz-Soldan[*,1], **Thomas Bisika**[2], **Joseph deGraft-Johnson**[3], and **Amy O. Tsui**[4]

[1]Global Health Systems and Development, Tulane School of Public Health and Tropical Medicine; and Universidad Peruana Cayetana Heredia

[2]National AIDS Commission, Johns Hopkins Bloomberg School of Public Health

[3]Save the Children-USA, Johns Hopkins Bloomberg School of Public Health

[4]Population and Family Health Sciences Department, Johns Hopkins Bloomberg School of Public Health

Abstract

Using a sample of 656 men and 930 women from rural Malawi in 2000, the authors examined the association between various individual and community level factors, as well as participation in social groups, and four reproductive health outcomes: intentions to use any contraceptives in the next six months, current use of modern contraceptives, wanting an HIV test, and having had an HIV test. Women in social groups have higher odds of reporting intentions to use contraceptives, wanting an HIV test, and of having had an HIV test than those not in groups. Among men, social group participation is only slightly associated with having had an HIV test. For all, education is positively associated with all four outcomes, and number of children is associated with intentions to use and actual use of contraceptives. At a community level, proximity to a health center or school is positively associated with three outcomes for women and with use of modern contraceptive methods for men.

Keywords

Group membership; volunteer associations; reproductive health; HIV/AIDS; Malawi

Introduction

Malawi is one of the poorest countries in the world; Malawi's Human Development Index rank (based on health, education and standard of living) is 153 out of 169 countries[1]. HIV adult prevalence rates seem to be slowly declining, but are still high, estimated at 11%[2]. Use of modern contraceptives is increasing: 46% of currently married women report using contraceptives, and of this group, 42% report using a modern method[3]. However, there are still individual and community level factors influencing contraceptive use, as well as other reproductive health services, such as HIV testing[3]. High fertility expectations by

[*]For correspondence: vpazsold@tulane.edu Tel: +51-1-249-6830.

Contribution of Authors: All authors contributed to this study and its writing, and approved the manuscript. VPS conceived and designed the data collection and analysis associated to this manuscript, and took the lead in writing this article. AOT worked closely with VPS in the conception and design of this particular study. AOT, JdGJ and TB also conceived of, obtained funding, and lead the implementation and analyses associated to this study in Malawi, and all participated in the editing of this manuscript

community-members, combined with low access to modern contraceptives until the late 1980s, are also likely to influence people's fertility preferences to this day[4]. Though knowledge of HIV is high (~99%), it is likely that people's fear of having HIV combined with the unavailability of anti-retroviral therapy (ART) for HIV until 2004, when national ART roll out began (starting in the north and becoming accessible in the south by 2005), influenced people's motivation to being HIV tested[3,5].

Attitudes and practices related to one's sexual and reproductive health – including contraceptive use or HIV testing – are shaped by factors at multiple levels: society, community, family, and individual. Several studies have examined the role of contextual factors that could influence attitudes or practices associated to one's reproductive health, such as the predominant religion, or economic and education levels of community members, or the community's values regarding family size[6-8]. In this study, we examined various community characteristics that we hypothesized might influence diffusion of reproductive health ideas and practices within the community.

In addition, various studies have documented the role of social interactions within one's networks or social groups in influencing people's sexual behaviors, fertility ideas, and contraceptive use[6-20]. Several studies have found an association between membership in a social group and increased contraceptive knowledge or use[9-12]. Various diffusion mechanisms have been proposed, including information exchanges between people, observation of someone's adoption of a practice, perception of other's approval of a practice, and changes in social or group norms which make a practice more acceptable[19-25]. Various studies have also examined the association between social group participation and HIV prevention or HIV risk behaviors[26-29]. Though some of these studies have found a positive association between membership in specific community groups and HIV preventive behaviors, some of the literature also describes that some social groups may actually facilitate or promote HIV risk behaviors, such as seeking sexual services or consumption of drugs[26-29]. In other words, different social groups have different dynamics, some of which can lead to positive behavior changes, but others which can actually promote undesirable behaviors. For example, one review article examined the association between religious group membership and various HIV risk factors, and concluded the direction of the association varied based on the risk factor and the type of social group[29]. We are not aware of studies documenting social group membership and its association with increased desire for or actual HIV testing, but based on the discussed mechanisms – social interactions that lead to diffusion of ideas and practices in these groups – we hypothesize that group membership could be associated with wanting HIV testing or having been tested.

Most of the studies examining the association between social group membership and reproductive health outcomes in the literature focused on fertility control, and were conducted primarily with women (who mainly control individual contraceptive use). Due to the high rates of HIV and the need to determine strategies for increasing participation in voluntary counseling and testing for HIV, we examined the association between group memberships on a positive reproductive health outcome that was “gender-neutral”, such as HIV testing.

Social groups in Malawi

Through our research in a rural district of Malawi, we learned about a particularly strong social structure within these villages: social groups[24]. Though there is limited physical infrastructure in most villages, all villages in Mangochi were headed by a chief or headman, who had a council group with whom he or she met at least weekly[24]. The chiefs usually had monthly meetings with their village, during which time people were either nominated or asked to volunteer in various types of groups that were formed to carry out specific

functions within the village. For example, the manure group was charged with teaching others in the village how to use manure to fertilize their crops, whereas the fisheries group was responsible for monitoring that people were not fishing small fish[24]. In addition to these formal groups (i.e., formed by the chief or an external organization), there were many informal groups (e.g., people who regularly met for a specific activity, whether it was to play soccer or to fetch water from the well together)[24]. These groups play a vital role in the management of village life, as well as in the type of interactions that people within these villages have with one another and with people from other villages or cities. They are an informal infrastructure and important resource within these villages. Research conducted in 2002 in this district revealed that within all these groups, conversations related to health take place, including about family size and HIV/AIDS, and that these conversation topics vary by gender[23].

The objective of this study is to assess the association between social group membership, while adjusting for various individual and community level characteristics, with four reproductive health outcomes for individual women and men of childbearing age: 1) intention to use contraceptives (excluding those currently using a modern contraceptive in the analyses), 2) current use of modern contraceptives, 3) desire to be HIV tested, and 4) ever tested for HIV. Moreover, group membership studies have not yet resolved key methodological issues such as that arising from endogenous group participation, though various studies have examined this issue as related to social networks (vs. social groups)[15]. This study applies and describes the various methods to deal with specification errors related to potential endogeneity bias.

Materials and Methods

Study setting

This study took place in the Mangochi district, located in the southeastern lakeshore region of Malawi (estimated population of 15.9 million)[30]. The people of Mangochi district (approximate population of 600,000) are predominantly from the Yao ethnic group, mainly speak Chiyao (though most also spoke Chichewa), and most are Muslim[31]. Education levels and literacy in Mangochi are among the lowest in all of Malawi[32]. Most people living in Mangochi are subsistence farmers and fishermen; 94% of the people live in rural areas[31].

Key health indicators for Mangochi reveal that it is also disproportionately burdened compared to other regions of the country. Though there were three hospitals, 29 health centers, two health posts and 134 outreach clinics in the district at the time of the study, there was only one doctor and nine clinical officers for the region[31]. At that time, telephones and radios were available in very few health facilities and these were often out of service, and there was no cell phone accessibility in much of the eastern lakeshore region where this study took place.

Data

Data were obtained from the 2000 Malawi Pregnancy and Sexually Transmitted Infection (STI) Risk Perception and Avoidance Study, in which weekly interviews were conducted in Chichewa by research assistants for six consecutive weeks[33]. The main study objective was to assess people's perceived risk for getting pregnant or getting an STI, and their behaviors to avoid pregnancy or STIs[33].

Sample selection and eligibility criteria

Three of nine traditional authorities (TAs) in Mangochi were selected using probability proportional to size (PPS) sampling methods, and within these TAs, four enumeration areas

(EAs) per TA were selected with PPS[33]. After listing and mapping all households in the selected EAs, 1390 households were randomly selected. Through a household survey, all the people living in the household were identified and enumerated. All women between the ages of 15 and 34 and all men between the ages of 20 and 44 were consented to participate in the study.

In the first week, the survey was administered to 737 men between the ages of 20 and 44, and 1014 women between the ages of 15 and 34, gathering socio-economic and demographic information about the respondents, and their knowledge, attitudes and practices related to family planning. During the second week, 81 men and 84 women were lost to follow up (89% and 92% retention, respectively), and 656 men and 930 women responded to questions regarding their participation in social groups in their community – regardless of the nature of the group. Those in groups were then asked about its type and composition.

Variables

Outcomes—The four outcomes examined are: 1) contraceptive intentions (respondent or respondent's partner intends to use contraception, whether traditional or modern, in the next six months, and those already using a modern method are excluded from the analysis), 2) current modern contraceptive use, 3) wanting an HIV test, and 4) having had an HIV test. All of these are dichotomous variables. As a note, contraceptive intentions and wanting an HIV test were both used as a dependent outcome as a measure of potential attitude change. Due to the cross sectional nature of this data, we do not examine whether or not the individuals eventually started using a method or obtained an HIV test.

Covariates—The main covariate of interest is participation in any type of group (member of a group versus not a member), treated as a dichotomous variable. Groups were defined broadly by the individuals interviewed, and included political, religious, sports, work-related (i.e., funeral digging group, manure group), women's, sports, and youth groups.

Individual-level control variables included age (using 5 year age groupings), education (none, at least some primary, or at least some secondary/higher), number of live children (0 children, 1 to 2, or 3 or more), partnership status (married/regular partner or not), and household assets (continuous weighted variable created using factor analysis based on ownership of radio, bicycle, car, boat or canoe, and fishing net; material of roof, walls, and floor).

Three community characteristics were also included in the models. The four data collection team captains and five supervisors from the same project were asked to rank each EA on a scale of 1 to 5 for six different characteristics that were identified as distinguishing the various communities: proximity to a health center (highest if close to a hospital/health center), proximity to a school (highest if close to a school), proximity to a market (i.e., some EAs hosted a market for exchanging goods every week, ranking highest), proximity to a road (all roads in the study area were made of dirt, but proximity to the road that could be used by vehicles was ranked highest), density of the EA (how spread out the households are), and mobility of the population in the EA (e.g., in some EAs, the men are regularly gone for weeks or months at a time for fishing or business reasons). An average of the numbers was taken once all EAs had been rated for each variable, and these numbers were used in the models. Because there was high multi-collinearity between some variables, only three community characteristics were included in the final models.

Multivariate methods and endogeneity bias

Multivariate logistic models were estimated, stratified by gender. For each of the four outcomes, the covariates included any group membership, the five individual level characteristics, and three community characteristics.

These cross-sectional logistic models are susceptible to a variety of biases from unobserved heterogeneity, however, thus we further explored several alternative modeling approaches. One concern was possible omitted community-level variables, such as norms (i.e., some communities may be more accepting of fertility control, and these same communities may also be more welcoming of women's participation in social groups). In this scenario, failure to control for such norms might cause upward bias in the estimated coefficients. To check whether our constructed set of community variables sufficiently controlled for community level influences, we tested a community fixed-effects model versus a community random effects model. The Hausman tests could not reject random effects, thus we conclude that there are no important omitted community-level confounders. Further examination of the random effects model using Breusch-Pagan tests found no evidence of error clustering within communities, thus we concluded that random effects were not necessary and that the simple logistic model was appropriate despite potential community-level unobservables.

A second concern was regarding individual-level unobserved heterogeneity, as that arising from endogenous group participation. Individuals with liberal norms or household structures may be both more receptive to fertility control or getting HIV tested and be more likely to join groups, which again could bias results. Although difficult to definitively test and control for, we estimated two-stage least squares (2SLS) models using the best a priori instruments available for addressing this individual-level heterogeneity: community-level (enumeration area) means of group participation and membership duration (months in group, logged). This strategy is equivalent to the approach of instrumenting with community dummies, and the instruments will be valid under the assumption of no remaining omitted community-level variables correlated with group membership rates. In first stage regressions these instruments are significant, yielding acceptable partial F-statistics for identification. However, the results from the 2SLS were not very different from those of the logit models. Moreover, the 2SLS standard errors are also relatively large, and Hausman exogeneity tests cannot reject OLS models in favor of 2SLS. Thus we conclude that with this instrument set we do not find evidence of endogenous group participation from unobserved individual heterogeneity, and use and present the logistic results.

Results

Descriptive

Table 1 presents socio-demographic and economic background information about the sample in our survey, as well as a breakdown of these characteristics based on group membership. Reported intentions to use contraceptives are higher among men (38.3%) than women (25.5%), but current use of modern methods is the same for both groups (11.6%). Only 11% of men and 6.5% of women had been HIV tested, but of those not tested, 78.4% of men and 62% of women desired testing. All those who had been tested before reported wanting to be HIV tested in the future – among men and women. About 30% of both men and women reported being in a social group.

When examining contraceptive intentions and modern method use by gender and group participation, there is a statistically significant higher percentage of women in groups reporting that they intend to use contraceptives compared to those not in groups (Table 1). The opposite was the case in men, though not significant. Also, a higher percentage of women and men in groups report using modern methods than those not in groups; the

difference is only statistically significant among men. Women and men in groups are more likely to report wanting to get HIV tested than those not in groups - this difference is statistically significant among women. Moreover, women and men in groups are also twice as likely to have had HIV tests as those not in groups ($P < .05$ for women and men).

Both among men and women, those in groups are significantly more likely to have had some primary and secondary education than those not in groups. There are not large age differences between those in/not in groups, except in the case of the youngest age group for men (20-24 years): there is a larger percentage of young men in groups than not in groups. Also, only 73.7% of women in groups have partners, whereas 79.8% of those not in groups have partners.

Multivariate Logistic Regression

The association between participation in groups and the outcomes was different between women and men. In the first model for intention to use contraceptives in the next six months (see Table 2), after adjusting for individual and community characteristics, we find the odds that women in groups are 1.5 times more likely to report intending to use contraceptives than women not in groups, though this is only marginally significant ($P < .1$). No significant differences are observed in the association between women in groups and modern method use. The odds for women in groups who want to be HIV tested are 1.8 times greater compared to those not in groups ($P < .05$), and two times as high with regards to having been tested than those not in groups ($P < .05$). Among men, after adjusting, group membership was only marginally significant in its association with having been HIV tested (see Table 3).

The most significant association for contraceptive intentions or modern method use and the various individual level characteristics was having children (compared to those who do not have any), for both men and women. Compared to the youngest age groups (15-19 among women, and 20-24 among men), the odds for use of modern methods were lower for older individuals. Any education for women and secondary education or more for men is also positively associated with all four outcomes. One difference observed between women and men is the association between having a stable partner and modern method use: among women, there is no significant association, but among men, the odds of using modern methods are 6 times higher among those with stable partners than those without.

Regarding community level characteristics, proximity to a health center was significantly associated to two of the dependent outcomes, modern method use and wanting HIV test, and marginally associated to having had an HIV test among women. Proximity to a health center was only significantly associated with modern method use among men. Proximity to a school was also positively associated with wanting an HIV test among women, and with modern method use among men.

Discussion

Factors at different levels were found to be associated with our outcomes of interest. We observe a marginal association between women's participation in groups and contraceptive intentions, but not use; this association is not evident for men's participation in groups. We also find a significant positive association between group membership and wanting an HIV test or having had one among women, and a marginal positive association between membership and having had an HIV test among men. At the community level, for both women and men, proximity to a health center or to a school was significantly and positively associated with some of the contraceptive and HIV testing outcomes.

There are various explanations for these gender differences in the association between group membership and contraceptives. First, there may be a lagged effect of this outcome for men. Though women in the sample were younger than the men by study design, 77.6% of the women in our sample already had children, compared to 58% of the men. It is possible that as these men start having children, contraceptive use among them will go up in their attempts to space their children. In addition, contraceptive use is mostly women-controlled (especially since less than 5% of men and 1% of women report using condoms). In many of these communities, men may decide on issues related to family size, but women are the ones who seek family planning services[12].

Behrman, Kohler and Watkins (2002) found in Kenya the social network effects on men's contraceptive practices were as strong as those for women[15]. They suggested that this may be related to the practice of women moving into their spouse's village upon marriage: men's social networks have been lifelong and possibly carry more weight than women's[15]. Another possibility for the gender difference observed is that since this region in Malawi is matrilineal, where men move in to their wife's village at marriage, men have not known their network partners or have as strong ties to people in the community as women do. And, as a result, it is possible the effects of the social networks are not as strong on men as on women.

Among men, the association between group membership and the various outcomes examined was only significant for having had an HIV test. A similar analysis that focuses on the association between group membership and different male-centered outcomes might reveal other ways in which group membership may be, or not, associated with certain behaviors among men. Though this manuscript did not examine the possible diffusion mechanisms, qualitative research related to this study revealed that women were more likely to discuss in detail issues related to experiences with contraceptive use, whereas men's “C” about others' contraceptive use was based on what they perceived[22]. Relating this to HIV testing, future research could explore what women and men talk about with regards to HIV and getting testing. Most people in Malawi know about HIV, but who talks about getting tested, and what do those conversations focus on? Moreover, understanding how ideational change is shaped by group membership and gendered and how it influences subsequent behaviors is important. In addition, since this study took place, ART has become available nationwide: with this additional incentive to know one's HIV status, what types of discussions, if any, do individuals have about this topic with members of their social groups? The results from this study associated to having been HIV tested or wanting HIV testing cannot be extrapolated to the current stage of the AIDS epidemic in Malawi.

Finally, it is possible that membership in some groups was associated negatively with the outcomes, and membership in other groups was associated positively, and that by grouping all of the different groups together, it changed the extent or type of association between group membership and the various outcomes in this study. Future research should examine the association between these (or other behavioral outcomes) and different *types* of groups[25].

Regarding the finding that proximity to a health center or school was significantly associated with various outcomes for both men and women, it is possible that individuals in these communities may have more access to information and resources through events organized at these settings, or through the individuals (i.e., teachers, health workers) living in the community associated with the health facilities or schools that expose individuals to new ideas about contraceptives, family size, or HIV testing. School teachers or health professionals working in these rural villages are likely to have more education than those in the communities they are working at, and either through conversation, through organized events, or even through “example” (i.e., people see their family size), may influence the

health related attitudes and behaviors of those around them. More research would be needed to determine the mechanism for this association.

Methodologically, we investigated potential biases in cross-sectional group membership analyses due to omitted individual and community confounders. The community fixed effects analyses found no evidence of bias from omitted community variables after controlling for observables. Similarly, the 2SLS models failed to find significant evidence of bias from individual-level unobserved heterogeneity. While an expanded set of plausible instruments to enable testing for over-identification and reduced standard errors would have been preferred, the available instrument showed the main findings to be relatively robust. Likewise, it is important to point out that one of the outcomes, having had an HIV test, was a past event, whereas individuals were asked about current characteristics and group membership – with this type of data, it is impossible to tease out the order of events or whether one influenced the other. Future analysis of endogeneity in group participation is warranted, such as the work by Behrman, Kohler and Watkins (2002) using longitudinal data[15].

In conclusion, this paper assesses the associations of rural Malawi women's and men's group membership, while controlling for other individual and community level factors, with contraceptive intentions and modern method use, as well as desire for HIV testing and having been HIV tested. Explicit attention is given to testing for potential biases from unobserved individual and community heterogeneity. The findings support previous research related to participation in social groups and the selected outcomes among women. Several explanations are offered regarding why this association was not observed among the outcomes for men.

References

1. United Nations Development Programme (UNDP). International Human Development Indicators, HDI value. UNDP; 2011. http://hdrstats.undp.org/en/indicators/49806.html [Accessed July 12, 2011]
2. Joint United Nations Programme on HIV/AIDS (UNAIDS). Malawi: HIV and AIDS Estimates 2009. UNAIDS; 2011. http://www.unaids.org/en/regionscountries/countries/malawi/ [Accessed June 22, 2011]
3. National Statistical Office. Malawi Demographic and Health Survey 2010 Preliminary Report. Zomba, Malawi: National Statistical Office; 2011. http://www.measuredhs.com/pubs/pdf/PR4/PR4.pdf [Accessed June 22, 2011]
4. Zulu, E. The role of men and women in decision-making about reproductive issues in Malawi. Nairobi, Kenya and New York, New York: African Population Policy Research Center and Population Council; 1998. Working Papers No. 2
5. Lowrance DW, Makombe S, Harries AD, Aberle-Grasse J, Hochgesang M, Libamba E. A public health approach to rapid scale-up of antiretroviral treatment in Malawi during 2004-2006. J Acquir Immune Defic Syndr. 2008; 49(3):287–93. [PubMed: 18845953]
6. Stephenson R. Community factors shaping HIV-related stigma among young people in three African countries. AIDS Care. 2009; 21(4):403–410. [PubMed: 19283643]
7. Stephenson R, Beke A, Tshibangu D. Contextual influences on contraceptive use in the Eastern Cape, South Africa. Health Place. 2008; 14(4):841–852. [PubMed: 18308611]
8. Stephenson R, Baschieri A, Clements S, Hennink M, Madise N. Contextual influences on modern contraceptive use in sub-Saharan Africa. Am J Public Health. 2007; 97(7):1233–1240. [PubMed: 17538071]
9. Barber JS, Pearce LD, Chaudhury I, Gurung S. Voluntary associations and fertility limitation. Soc Forces. 2002; 80(2):1369–1401.
10. Boulay M, Valente TW. The relationship of social affiliation and interpersonal discussion to family planning knowledge, attitudes and practice. Int Fam Plan Perspect. 1999; 25(3):112–118. 138.

11. Hammerslough, C. Women's groups and contraceptive use in rural Kenya. The Course of Fertility Transition in Sub-Saharan Africa, Harare, Zimbabwe. Presented at the International Union for the Scientific Study of Population (IUSSP) in Harare; Zimbabwe. November 19-22, 1991;
12. Valente T, Watkins SC, Jato MN, Van Der Straten A, Tsitsol LP. Social network associations with contraceptive use among Cameroonian women in voluntary associations. Soc Sci Med. 1997; 45(5):677–687. [PubMed: 9226791]
13. Montgomery MR, Casterline JB. The diffusion of fertility control in Taiwan: evidence from pooled cross-section time-series models. Popul Stud (Camb). 1993; 47:457–479. [PubMed: 11613198]
14. Watkins, SC. More Lessons from the Past: Women's Informal Networks and Fertility Decline. The Course of Fertility Transition in Sub-Saharan Africa, Harare, Zimbabwe. Presented at the International Union for the Scientific Study of Population (IUSSP) in Harare; Zimbabwe. November 19-22, 1991;
15. Behrman J, Kohler HP, Watkins SC. Social networks and changes in contraceptive use over time: evidence from a longitudinal study in rural Kenya. Demography. 2002; 39(4):713–738. [PubMed: 12471851]
16. Palmore, JA.; Freedman, R. Perceptions of contraceptive practices by others: effects on acceptance. In: Freedman, R.; Takeshita, JY., editors. Family Planning in Taiwan. Princeton, NJ: Princeton University Press; 1969. p. 224-240.
17. Rutenberg N, Watkins SC. The buzz outside the clinics: conversations and contraception in Nyanza Province, Kenya. Stud Family Plann. 1997; 28(4):290–307.
18. Avogo W, Agadjanian V. Men's social networks and contraception in Ghana. J Biosoc Sci. 2008; 40(3):413–29. [PubMed: 17988428]
19. Kohler HP. Learning in social networks and contraceptive choice. Demography. 1997; 34(3):369–383. [PubMed: 9275246]
20. Bongaarts J, Watkins SC. Social interactions and contemporary fertility transitions. Popul Dev Rev. 1996; 22(4):639–682.
21. Kohler HP. Social interactions and fluctuations in birth rates. Popul Stud (Camb). 2000; 54(2): 223–237.
22. Rosero-Bixby L, Casterline JB. Modelling diffusion effects in fertility transition. Popul Stud (Camb). 1993; 47:147–167.
23. Author. How family planning ideas are spread within social groups in rural Malawi. Stud Family Plann. 2004; 35(4):275–290.
24. Author. Diffusion of Contraceptive Intentions and Practices in Social Groups in Rural Malawi [dissertation]. Chapel Hill, NC: University of North Carolina; 2003.
25. Campbell C, Williams B, Gilgen D. Is social capital a useful conceptual tool for exploring community level influences on HIV infection? An exploratory case study from South Africa. AIDS Care. 2001; 14(1):41–54. [PubMed: 11798404]
26. Campbell, C. Social capital and health: contextualizing health promotion within local community networks. In: Baron, S.; Field, J.; Schuller, T., editors. Social capital: Critical perspectives. p. 182-196.
27. Campbell, C. Letting them die: why HIV prevention programmes fail. Oxford; James Currey: 2003.
28. Gregson S, Terceira N, Mushati P, Nyamukapa C, Campbell C. Community group participation: can it help young women to avoid HIV? An exploratory study of social capital and school education in rural Zimbabwe. Soc Sci Med. 2004; 58(11):2119–2132. [PubMed: 15047071]
29. Campbell C, Skovdal M, Gibbs A. Creating Social Spaces to Tackle AIDS-Related Stigma: Reviewing the Role of Church Groups in Sub-Saharan Africa. AIDS Behav. 2011; 15(6):1204–1219. [PubMed: 20668927]
30. US Census Bureau, US Department of Commerce. IDB Summary Demographic Data for Malawi. Washington, DC: US Census Bureau; 2011. http://www.census.gov/ipc/www/idb/country.php [Accessed June 22, 2011]
31. Malawi Government. Mangochi District Profile. Limbe, Malawi: Montfort Press; 1999.
32. National Statistical Office. Malawi: An Atlas of Social Statistics, 2002. Zomba, Malawi: National Statistical Office; 2003.

33. Centre for Social Research, Save the Children Federation USA, Malawi Ministry of Health and Population, MEASURE Evaluation. Avoiding Unwanted Pregnancy and Sexually Transmitted Infections: A Rural Malawi District Study. Chapel Hill, NC: MEASURE Evaluation; 2004.

Table 1

Background information about the sample, reported as percentages

	Men			Women		
Individual Characteristics	**Total**	**Not In a Group**	**In a Group**	**Total**	**Not In a Group**	**In a Group**
Percent (N)	**(N=656)**	**(N=446)**	**(N=210)**	**(N=930)**	**(N=634)**	**(N=296)**
Outcomes						
Intend to Use	38.3 (251)	39.9 (178)	34.8 (73)	25.5 (237)	22.4 (142) *	32.1 (95) *
Modern Method	11.6 (76)	9.9 (44) *	15.2 (32) *	11.6 (108)	10.7 (68)	13.5 (40)
Want HIV Test	78.4 (514)	77.8 (347)	79.5 (167)	62.0 (577)	56.2 (359) ***	73.7 (218) ***
Had HIV Test	11.0 (72)	8.5 (38) ***	16.2 (34) ***	6.5 (60)	4.6 (29) ***	10.5 (31) ***
Age						
15-19 [a]	--	--	--	22.6 (210)	22.2 (141)	23.2 (69)
20-24 [b]	34.0 (223)	30.0 (134) *	42.4 (89) *	28.5 (265)	29.2 (185)	27.0 (80)
25-29	26.4 (173)	28.5 (127) *	21.9 (46) *	29.6 (275)	28.4 (180)	32.1 (95)
30-34	15.4 (101)	15.3 (68)	15.7 (33)	19.4 (180)	20.2 (128)	17.6 (52)
35-39	14.0 (92)	15.9 (71) *	10.0 (21) *	--	--	--
40-44	10.2 (67)	10.3 (46)	10.0 (21)	--	--	--
Education						
None [c]	28.2 (185)	34.1 (152) *	15.7 (33) *	48.0 (446)	55.4 (351) *	32.1 (95) *
Primary	57.9 (380)	56.7 (253)	60.5 (127)	48.1 (447)	41.8 (265) *	61.5 (182) *
Secondary	13.3 (87)	8.3 (37) *	23.8 (50) *	4.0 (37)	2.8 (18) *	6.4 (19) *
Number of Children						
0 [c]	42.1 (276)	41.7 (186)	42.9 (90)	22.4 (208)	23.0 (146)	21.0 (62)
1-2	32.2 (212)	32.3 (144)	32.4 (68)	46.5 (432)	45.9 (291)	47.6 (141)
3 or more	25.6 (168)	26.0 (116)	24.8 (52)	31.2 (290)	31.1 (197)	31.4 (93)
Has partner[d]	69.2 (454)	69.3 (309)	69.1 (145)	77.9 (724)	79.8 (506) *	73.7 (218) *
Household Assets	2.49	2.55 *	2.37 *	2.5	2.57 *	2.31 *

* $P < .10$;

NIH-PA Author Manuscript
NIH-PA Author Manuscript

** $P < .05$;

*** $P < .01$

-- by study design, men ages 15-19 were not sampled and women 35-44 were not sampled

[a]Reference group for women's multivariate models.

[b]Reference group for men's multivariate models.

[c]Reference group for men's and women's multivariate models.

[d]Reference group for men's and women's multivariate models is having no partner.

Table 2

Multivariate Analysis of Reproductive Health Outcomes Based On Individual and Community Level Factors, and Social Group Membership among Women, Using Logistic Regression Models (N=930)

VARIABLES	Intend to Use FP in next 6 mos	Modern Method Use	Want HIV Test	Had HIV Test
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Member of Social Group	1.571 *	1.174	1.822 **	2.065 **
	(0.968 - 2.548)	(0.756 - 1.821)	(1.087 - 3.054)	(1.024 - 4.165)
Age				
20-24 years	1.062	0.549 *	1.349	1.776
	(0.584 - 1.933)	(0.284 - 1.061)	(0.815 - 2.234)	(0.775 - 4.070)
25-29 years	0.486 **	0.377 ***	1.362	2.763 *
	(0.273 - 0.866)	(0.182 - 0.781)	(0.841 - 2.206)	(0.985 - 7.752)
30-34 years	0.550	0.339 ***	1.164	5.937 ***
	(0.209 - 1.443)	(0.161 - 0.713)	(0.738 - 1.835)	(2.244 - 15.70)
Education				
Primary	1.854 ***	1.697 ***	1.813 ***	2.857 ***
	(1.321 - 2.602)	(1.199 - 2.401)	(1.382 - 2.379)	(1.612 - 5.063)
Secondary or more	3.533 **	2.359	2.814 **	5.129 ***
	(1.106 - 11.29)	(0.721 - 7.715)	(1.140 - 6.950)	(1.553 - 16.93)
Number of Children				
1-2 children	3.596 ***	13.77 ***	1.254	1.486
	(1.619 - 7.987)	(4.748 - 39.94)	(0.846 - 1.860)	(0.594 - 3.713)
3 or more	6.589 ***	22.36 ***	1.939 ***	0.908
	(2.494 - 17.41)	(5.284 - 94.61)	(1.303 - 2.887)	(0.293 - 2.815)
Has Partner	1.511	1.359	1.184	0.987
	(0.904 - 2.527)	(0.725 - 2.549)	(0.915 - 1.533)	(0.398 - 2.445)
Assets	0.871	1.097	1.141 **	0.967
	(0.728 - 1.042)	(0.978 - 1.232)	(1.021 - 1.276)	(0.759 - 1.231)
Community Characteristics				
Close to a School	1.034	0.960	1.256 ***	0.981
	(0.827 - 1.294)	(0.781 - 1.181)	(1.072 - 1.472)	(0.721 - 1.336)
Mobility of Population	0.932	0.914	0.915	1.255
	(0.616 - 1.409)	(0.760 - 1.099)	(0.654 - 1.281)	(0.831 - 1.897)
Close to a Health Center	1.065	1.193 **	1.225 **	1.363 *
	(0.858 - 1.322)	(1.019 - 1.396)	(1.007 - 1.489)	(0.983 - 1.889)
Constant	0.0592 ***	0.00851 ***	0.128 ***	0.00152 ***
	(0.00833 - 0.420)	(0.00163 - 0.0445)	(0.0313 - 0.526)	(0.000233 -0.00995)
Observations	822[a]	930	930	930

*$P < .10$;

**$P < .05$;

***$P < .01$

[a]Women who were already using a modern contraceptive were not asked about contraceptive intentions

Table 3

Multivariate Analysis of Reproductive Health Outcomes Based On Individual and Community Level Factors, and Social Group Membership among Men, Using Logistic Regression Models (N=656)

	Intend to Use FP in next 6 mos	Modern Method Use	Want HIV Test	Had HIV Test
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Member of Social Group	0.834	1.304	0.902	1.546 *
	(0.493 - 1.412)	(0.761 - 2.233)	(0.568 - 1.431)	(0.975 - 2.452)
Age				
25-29 years	0.938	0.306 ***	0.994	1.453
	(0.538 - 1.636)	(0.125 - 0.748)	(0.534 - 1.851)	(0.619 - 3.415)
30-34 years	0.855	0.339 ***	1.012	1.077
	(0.490 - 1.492)	(0.151 - 0.759)	(0.448 - 2.286)	(0.441 - 2.632)
35-39 years	1.033	0.382 **	0.784	0.345
	(0.395 - 2.699)	(0.149 - 0.975)	(0.256 - 2.401)	(0.0831 - 1.430)
40-44 years	0.564 *	0.196 **	0.978	1.891
	(0.298 - 1.068)	(0.0436 - 0.881)	(0.356 - 2.686)	(0.518 - 6.906)
Education				
Primary	1.367 *	1.678	1.884 *	1.817
	(0.948 - 1.972)	(0.650 - 4.331)	(0.948 - 3.743)	(0.858 - 3.847)
Secondary or more	1.273	4.899 ***	2.742 ***	3.519 **
	(0.591 - 2.743)	(1.472 - 16.30)	(1.318 - 5.707)	(1.141 - 10.85)
Number of Children				
1-2 children	3.857 ***	4.150 ***	1.051	2.372 **
	(1.980 - 7.510)	(1.802 - 9.559)	(0.651 - 1.697)	(1.025 - 5.490)
3 or more	4.111 ***	7.517 ***	1.047	1.446
	(1.928 - 8.764)	(3.109 - 18.17)	(0.566 - 1.937)	(0.621 - 3.367)
Has Partner	1.457	6.287 ***	1.570 *	0.840
	(0.472 - 4.495)	(1.930 - 20.48)	(0.962 - 2.563)	(0.381 - 1.849)
Assets	0.971	1.092	1.033	1.122
	(0.823 - 1.146)	(0.895 - 1.333)	(0.858 - 1.244)	(0.829 - 1.517)
Community Characteristics				
Close to a School	1.022	1.653 ***	0.963	0.946
	(0.726 - 1.439)	(1.211 - 2.257)	(0.605 - 1.534)	(0.602 - 1.487)
Mobility of Population	0.789	0.736	1.080	0.774
	(0.547 - 1.138)	(0.462 - 1.173)	(0.675 - 1.730)	(0.475 - 1.264)
Close to a Health Center	1.268	1.404 ***	0.964	0.958
	(0.939 - 1.714)	(1.201 - 1.642)	(0.789 - 1.178)	(0.783 - 1.171)
Constant	0.201	0.00117 ***	1.584	0.102 *

	Intend to Use FP in next 6 mos	Modern Method Use	Want HIV Test	Had HIV Test
	OR (95% CI)	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
	(0.0260 - 1.546)	(2.59e-05 -0.0526)	(0.145 - 17.27)	(0.00815 -1.270)
Observations	580[a]	656	656	656

*$P < .10$;

**$P < .05$;

***$P < .01$

[a]Men who were already using a modern contraceptive were not asked about contraceptive intentions.