Effect of Education and Social Factors on Hygiene and Prevention Behavior of Women in Ghana

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Abstract

Women's hygiene and prevention behavior was analyzed using the 2003 Ghana Demographic and Health Survey (DHS) couple's dataset. Effects of education, residence, lineage, self-determination and social support networks were examined. Results revealed a consistent positive educational effect on hygiene and prevention behaviors. Urban living provided consistent positive results for hygiene and malaria prevention but did not significantly improve responsible sexual behavior. There were mixed results for matriliny. There was evidence that the self determination and social support variables added explanatory power in the models. For malaria prevention, these variables added explanatory power but did not mediate any effects of education, residence, or lineage. With hygiene behavior the, self determination and support network variables explained additional variance and mediated some of the effects of the demographic variables.

Keywords: Education, Residence, Self-Determination, Lineage, Social Supports.

1.0 Background

Literature from demographic discourse reveals that educated women are better than non educated ones in using contraception, reducing fertility and enjoying many reproductive and child health outcomes (Benefo, 2006). We also know that urbanization in sub-Saharan Africa could impact health behaviors in diverse ways, in the sense that gender norms in traditional communities which may compromise women's health (such as male abusive attitudes and behaviors) are challenged in new urban settings (Boateng, 2006). This study examines women's health behavior in Ghana with respect to hygiene, malaria prevention and responsible sexual conduct. We look at factors including the role of education, current residence in rural and urban contexts, self-determination, gender role norms with respect to women's rejection of domestic violence and social support networks as these affect women's health behavior in Ghana

Research on urbanization in developing countries suggests that when women move to urban areas they gain in reproductive self determination and also in financial autonomy over their reproductive and family health decisions. This increased self determination may well occur through the transformation of traditional attitudes to modern ones which endorse small family size and women's rights. It also is likely to be affected by changing social support networks and the attitudes about women's self determination encouraged in those networks. Women's autonomy is known to be positively related to education and is frequently assumed to increase if she lives in an urban area. Also in an urban area she is likely to be exposed to a broader range of information sources which should benefit health behavior. From literature, it is not clear whether differences between urban and rural women and educated and less educated women in health behavior may actually be due to differences in their self determination or in their support networks.

Much has been written about the proximate determinants underlying fertility decline in Ghana. However little is known about the socio-cultural factors that may be related to changes in women's attitudes and roles in household decision making which in turn impact their health access. It is possible that differences in self-determination factors and social support networks associated with living in urban areas would mediate the effects of urbanization and education on health access and behaviors. Alternatively, women's self determination and social support networks may have additive effects over the effects of various demographic factors on health behavior. This study will test these alternative hypotheses.

Using the 2003 Ghana Demographic and Health Survey, we first, look at the relationships between demographic factors (in particular, education level, rural/urban residence, age, number of children under six years (parity), lineage type, and self-determination factors and networks that support women's reproductive decisions. Second, we examine the impact of several demographic indicators (education level, age, current residence, lineage (patrilineal & matrilineal) and parity on health behavior outcomes. Following that, we test models predicting health behavior that include demographic, self-determination, and social support network indicators.

2.0 Methods

The data source for this study was the 2003 Ghana Demographic and Health Survey, GDHS, a nationally representative survey of 5, 691 women ages 15 – 49 and 5,015 men ages 15 – 59 from 6, 251 households covering 412 sample points throughout Ghana. Of the couple's dataset analyzed, consisting of 2132 couples,

only female respondents were considered. The survey used a two-stage sample based on the Ghana 2000 Population and Housing Census and was designed to produce separate estimates for key indicators for each of the ten regions in Ghana.

Data collection took place over a three-month period, from late July to late October, 2003 by the collaborative efforts of the Ghana Statistical Service (GSS) and the Noguchi Memorial Institute for Medical Research and the Ghana Health Service. Technical assistance was provided by ORC Macro through the MEASURE DHS program. Funding was provided by the U.S. Agency for International Development (USAID) and the Ghana Government. (GSS, 2004).

2.1 Operational definitions of variables

There are three dependent variables that are run in three different models using Logistic Regression. The dependent and independent variable definitions are summarized in Tables 1 and 2. The first table shows the descriptive information for the variables and the second table shows the information for the recoded (collapsed) variables. For categorical variables, the percentages in each category are presented.

Items were selected based on their face validity and were recoded and summed to form scales. The following summary of constructs presents information about the items, response format, Cronbach's alpha (a measure of the scale's internal consistency) where applicable and the numbers of respondents with valid data. It should be noted that all scales were created such that high scores reflected behaviors that promoted women's health (i.e., that a woman respond yes to a question that ensures responsible or positive hygiene, malaria and sexual behavior).

2.2 Dependent variables

Malaria prevention behavior: Two questions investigating whether: 1. Women used bed net in the household and 2. Women slept under bed net, were asked. No responses were coded 0 and yes responses were coded 1. The two items were summed to form a scale with values ranging from 0 – 2

2.2.1 Hygiene behavior

Three questions exploring whether women practiced hygiene behavior in the household were asked: 1.Whether women used soap and cleansing agents in household, 2. whether there is water for cleaning in the house and 3. Whether there is basin for cleaning in the house. No responses were coded 0 and yes responses were coded 1. The three items were summed up to form a scale (hygiene behavior) with values ranging from 0 – 3.

2.2.2 Responsible sexual health behavior

Two questions assessing whether women behaved responsibly in sexual health were asked. 1. Learned about ways to avoid AIDS 2. Reduce AIDS by using condoms. No responses were coded 0 and yes responses were coded 1. The two items were summed to form a scale (responsible sexual health behavior) with values ranging from 0 – 2.

2.3 Independent variables

Independent variables were classified under three blocks demographic, self-determination characteristics and support networks. Demographic variables included education level, age, number of children aged five years and below, current residence in rural or urban area and lineage as patrilineal or matrilineal. Self-determination variables included women's final say in family matters, final say in purchase decisions and rejection of domestic violence. Support network variables included, reproductive help supports, familial support for family planning and network sources for condom supply.

2.4 Statistical procedures

Descriptive univariate analyses of the background characteristics, including educational level, age, number of children, current residence, lineage, along with measures of self-determination including women's final say in family matters, final say in purchase decisions and rejection of domestic violence were carried out first. In the second stage, zero order correlations among the dependent and independent variables were assessed and in the final stage, a binary logistic regression models were used to examine the effects of demographic and self-determination variables on women's physical and psychological access to health care.

3.0 Results

3.1 The Demographic Characteristics of Ghanaian Women

Descriptive information about the dependent and independent variables are summarized in Tables 1 and 2. Based on the analysis of the 2003 GDHS couples dataset, 66% of women aged 15-49, lived in rural areas. The mean age of women in the sample was 32.33 with the youngest aged 15 and the oldest 49. On average, women had between one and two children under six years old with six children as the largest family size reported. On average women in the sample completed primary schooling. Forty-three percent of women have no education, 18% have primary education, 37% have secondary (junior & senior secondary) and 2% have higher education. Four percent of women aged 15-49 are in the age group 15-19 years, 37% are aged 20-29 years and 38% and 21% respectively for women aged 30-39 years and 40-49 years. Those who lived in urban areas make up 34%

(Boateng, 2006).

3.2 Multivariate Analysis

3.2.1 Women's self determination

In Table 3, the three multivariate OLS regressions show how demographic factors influence women's self-determination. It is clear from the first of the three models that, women's educational level, age and matrilineal lineage are important determinants of whether a woman would have a say in purchase decisions in her household. The older and more educated the woman is, and having a matrilineal lineage, the more likely she would have purchase power at home. These demographic factors explain nearly 13% of the variance in women having a say in purchase decisions.

Similarly, a women's assertive attitudes about rejecting domestic violence and abuse is very much influenced by her educational level, age, current urban residence and matrilineal lineage. The higher her education level, the older she is, being resident in a city and having a matrilineal lineage, the more assertive she would likely be regarding rejecting domestic violence and other abusive situation that undermines women's right to self-determination and autonomy. This set of variables explains 12% of the variance in women's attitudes towards domestic violence as an acceptable norm. With respect to women's autonomy over family matters, a woman's education level and the number of children she has who are under six years are positive predictors, although this set of variables explains just under 4% of the variance.

3.2.2 Women's participation in social support networks

Table 4, reveals that a woman's education level and current residence in an urban area are each positive predictors of her participation in reproductive health support networks (i.e., that she has sources of condoms and health workers with whom to discuss family planning). Age is negatively related which may reflect the fact that younger women in the sample are still living with their parents. These predictors explain nearly 22% of the variance in supports for women's family planning/reproductive health. With respect to discussing family planning with members of her family or close neighbors, women who are more educated and those who live in urban areas appear to be more open to this. Again, age is negatively related which may have to do with younger women in the sample less likely to be married. Together, this set of variables explains 17.8% of the variance in discussing family planning with family and close friends.

Finally, women are more likely to report a higher number of health facilities or health workers that support family planning and are a source of condoms if the woman is more educated, older, and is a member of a matrilineal group. Interestingly, urban residence did not predict a greater number of family planning sources of support. Together, this set of variables explains 9.1% of the variance in networking for condoms supply and resources for family planning.

The beta values suggest the strength with which, matrilineal lineage, followed by age and her education level influences woman's purchase power at home. Regarding assertive attitudes about rejection of domestic violence, woman's education level is the strongest factor followed by her current urban residence, her age and matrilineal lineage. For a woman's say in issues affecting the family, matrilineal lineage is the strongest followed by her age and the number of children she has who are under six years. Education level is the strongest predictor of participation in social support networks followed by her current urban residence. Similarly, educational level was the strongest predictor of woman's participation in reproductive health support and family support networks followed by urban residence and age. In the case of networks that support condom supply, education was followed by matrilineal lineage and age.

3.3 Malaria Prevention

In table 5, education level, age, current residence and matrilineal lineage all had significant impact on malaria prevention behavior. Having at least primary education increased the odds of enforcing malaria prevention by 1.46 times or by 46%.

Being older reduced the odds by 2% and living in urban area reduced the odds by about half (50.6%) while having a matrilineal lineage reduced it by 62.4%. Perhaps malaria prevention is more likely to be enforced by younger women likely to have more children less than six years of age. Model 1 also reveals that malaria prevention behavior occurs most among women currently living in rural areas. This confirms an earlier statement that malaria may be more prevalent in rural areas than in urban ones. A one unit increase in having a final say in family matters increased a woman's odds of enforcing malaria prevention by 26% and one unit increase in rejecting domestic violence increased the odds of malaria prevention by 6%. Results confirm that a woman's educational level and her role in family decisions and assertive attitudes, increase her odds of enforcing malaria prevention while her older age, current residence in urban area and her matrilineal lineage reduced the odds of malaria prevention efforts. The variance explained with the inclusion of the family /social support network variable was negligible.

3.4 Hygiene

In model 1 of table 6, only urban residence predicts hygiene behavior. For a woman living in an urban area, her odds for enforcing hygiene behavior would be 1.73 (73%) greater or more than that of a woman living in a rural area, which may be due to availability of water sources. A one unit change in having a final say in family matters was related to an increase in the odds of enforcing hygiene behavior of 28.2%. In model 3, a one unit increase in network sources ensuring supply of condoms increased the odds for hygiene enforcement by 26%. This suggests that, apart from condoms, the networks may be providing materials and information for good hygiene practice.

A look at the R^2 shows an increase from 9.3 to 11.3% between models 1 and 2 and an additional increase of 1.5 % when the support variables are entered in model 3. Model 3 confirms that education level, urban residence, final say in family decision issues and family planning support networks (networks for condom supply) are important predictors of hygiene behavior, suggesting that networks may be providing more than just condoms insofar as the hygiene measure is tapping behaviors such as hand washing.

Examining the relationship with the logistic regression reveals a similar but slightly different scenario. In model 3 a one unit increase in network sources ensuring supply of condoms increased the odds for hygiene enforcement by 26%. This suggests that, apart from condoms, the networks may be providing materials and information for good hygiene practice.

3.5 Sexual Health

Model 1 of table 7 shows that, matrilineal lineage increased a woman's odds of learning about and protecting against AIDS by 41% whiles her educational level increased it by 35%. Including the self determination variables reduced the odds for both educational level and matrilineal lineage by 6% and 12% respectively. At the same time a one unit increase of autonomy in purchase decisions increased woman's odds for responsible sexual behavior by 23%.

This is an important finding because when women control money they can dispense resources to purchase not just food but also medications and condoms for protection against STDs. In model 3 the important predictors of women's responsible sexual behavior are matrilineal lineage, autonomy in purchase decisions, belonging to or participating in a network that supplies or distributes condom and family planning information to its members. Notably, education is no longer a significant predictor in this model, suggesting that the combined effects of having a say in purchase decisions and having more sources for condoms and family planning information mediate the effects of education on responsible sexual behavior.

4.0 Discussion

As hypothesized, there was a consistent educational effect on hygiene and prevention behaviors. The results are thus consistent with a large body of scholarship showing the positive effects of women's education on her and her family's health (Gisselman, 2006; Akin, 2005, Onah et al., 2006). There may be different reasons underlying the effects of education on different outcomes. With respect to hygiene behavior an educated woman may be more aware of the importance of hygiene to safeguard the health of her family. In much similar ways women who have education should have more access to family planning information, more income to purchase condoms, as well as the confidence to use contraception and thus exercise responsible sexual behavior.

Like education, urban living provided consistent positive results for hygiene and malaria prevention. It did not significantly improve responsible sexual behavior which is surprising because urban women should have more information about and access to condoms and contraception as well as have support networks that would encourage responsible sexual behavior. The positive effects on women's health of urban living are consistent with other work. (Coast, 2006; Hoffman et al., 1997, House, 1987). Unlike education and urban living, there were mixed results for matriliny. It showed consistent positive effects on responsible sexual behavior. The reader must be reminded that in matriliny women's autonomy over resources and assets is assured. Women in this lineage control their own money and husbands have no right to dictate how a woman should spend her earnings. It could be that women's control of wealth this way makes it possible for them to implement their sexual health intentions. This observation is confirmed in previous research (Dodoo,1995; DeRose, 2003) which talks more about how the autonomy of women with matrilineal lineage translates into their preference for children in Ghana.

At the same time, matriliny reduced the odds for enforcement of malaria prevention. It is not clear why this is so but it could be that women with matrilineal lineage, because of their autonomy to control and manage resources, are able to manage well and tend to live under conditions that make enforcement of malaria prevention unnecessary. The lack of association between matriliny and malaria prevention also may simply reflect the geographical location of the matrilineal groups, which though is located in the forest areas are not in close proximity to very large water bodies as is found in the Volta region which is predominantly patrilineal. In Ghana, mosquitoes are very highly endemic in the Volta Region because of the location of a large body of water,

the Volta Lake, in this region. Since the anopheles mosquito does not travel more than 2 kilometers, most of the malaria related cases are located around that region. This region, identified as the number one region where mosquito nets are used (GSS, 2004), also is a patrilineal region.

The study consistently shows the importance of education in strengthening women's say in purchase decisions, rejection of domestic abuse, and say in family decisions. Educated women were more likely to participate in reproductive health support networks, were more likely to discuss family planning with networks of family and friends, and were more likely to participate in networks that provided condoms and resources for family planning. This observation is in line with findings from previous studies that have said that education enables women to be empowered and enhances their opportunities to reduce fertility and sexually transmitted diseases (Hervitz, 1985;Tawiah, 1984; Schultz, 1993; Haveman & Wolfe 1995; Duncan et al., 1996).

Unlike education, urban residence provided more mixed results. Whereas urban women were more likely to reject domestic violence, they were no more likely to report that they had a say in family or purchase decisions. This was quite unexpected as one would think that living in an urban area would open up more opportunities for the women to enable her to make appropriate contributions in her household which could give her the leverage she needs in purchase decisions and in other family matters and moreover when the bivariate zero order correlations have indicated that urban living was positively associated with higher education levels for women.

Since the items tapping family decisions concern visits by family and what food is cooked, the lack of urban effects may be less surprising. However, it is surprising that urban women do not report more autonomy in purchase power. As expected urban residence was positively associated with more open attitudes towards discussing family planning – urban women were more likely to report that they discussed family planning with family members and close friends. However, it is not clear to me at this time why urban living did not enhance women's access to workers that supplied condoms.

As expected, matriliny significantly predicted more autonomy in purchase decisions and in rejection of domestic violence. If a woman controlled money and had absolute authority over decisions about how to spend her earnings, she most definitely will be in position to assert her will and reject abuse from a partner who may be depending on her in some respects.

The study has provided partial support for mediation in some cases for the education and in other cases for the urban effects on the health behavior outcomes. The effects of education on physical health were reduced with the introduction of self determination and social supports. The effects of education on responsible sexual behavior were reduced when having a say in purchase decisions and network supports for condoms were introduced.

With respect to responsible sexual behavior, it is also noteworthy that the positive effects of matriliny are reduced when autonomy in purchase decisions and network supports for condoms are entered in the model. The effects of both education and urban residence on hygiene were reduced when having a say in family matters and network supports were added. However, additional statistical tests are required to determine whether, with the introduction of the self determination and support variables, any of these changes in the coefficients for education, urban residence, or matriliny are significant.

There was also evidence that the self determination and social support variables added explanatory power in the models (increasing pseudo R^2 values). For malaria prevention, these variables added explanatory power but did not mediate any effects of education, residence, or lineage. With respect to physical access and hygiene behavior the self determination and support network variables also explained more of the variance in the outcomes than did the demographic variables alone.

5.0 Conclusion and policy implications

The strong association between proactive social and familial support networks and health behaviors means that proactive social and familial networks that promote sharing of resources, financial assistance and self help initiative would enable women to improve upon their health behaviors. Similarly the strong association of proactive social and familial support networks with responsible hygiene and sexual behavior means that networks that facilitate discussion of condoms and provide education about ways to avoid health risks associated with poor sanitary conditions and unprotected sex may be helpful to encourage women to talk about their situations and take the necessary steps to address them. Policies that are affordable and increase education, access to resources, information and transportation are clearly called for.

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Table I: Description of variables before being collapsed

Statistics	Malaria Prevention (0-2)	Hygiene Behavior (0-3)	Respsible Behavior (0-2)	Ed Level (0-1)	Age	No of children	Current Residence (0-1)	Matri Lineage (0-1)	Family matters (0-2)	Purchase decision (0-3)	Domestic violence (0-5)	RHSN (0-2)	FSFP (0-5)	NSFCS (0-9)
Mean	.40	1.04	1.63	.57	32.33	1.27	.34	.43	1.2	1.77	3.45	0.81	0.43	1.03
Std Dev.	.74	1.05	.55	.50	7.87	.994	.47	.49	.88	1.15	1.81	0.77	0.73	1.25
skewness	1.48	.579	-1.17	-.281	.17	.622	.67	.299	-.426	-.261	-.725	.33	1.29	1.29
Kurtosis	.44	-.925	.375	-1.92	-.828	.472	-1.55	-1.91	-1.57	-1.40	-967	-1.24	3.26	2.21
Range	2	3	2	1	34	6	1	1	2	3	5	2	5	9
Minimum	0	0	0	0	15	0	0	0	0	0	0	0	0	0
Maximum	2	3	2	1	49	6	1	1	2	3	5	2	5	9
Frequency														
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	%	%
0	75.2	40.2	3.6	43.0	SC/R	23.9	65.9	57.4	30.1	18.2	10.6	40.7	68.4	50.4
1	9.4	28.2	29.8	57.0	SC/R	34.1	34.1	42.6	18.6	9.5	37.5	21.8	11.4	11.4
2	15.4	18.9	66.6	-	-	29.1	-	-	51.4	17.9	10.9	21.9	8.2	30.5
3	-	12.7	-	-	-	7.7	-	-	-	38.4	10.3	-	1.3	2.4
4	-	-	-	-	-	1.6	-	-	-	-	10.7	-	0.3	4.0
5	-	-	-	-	-	.4	-	-	-	-	48.0	-	0.0	0.4
6	-	-	-	-	-	.1	-	-	-	-	-	-	-	0.7
7	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
8	-	-	-	-	-	-	-	-	-	-	-	-	-	.0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	.0
Missing	0	43.8	0	0	0	0	0	0	0	0	1	0.1	.0	.1
	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Note: Data was weighted with the 2003 GDHS sample weight (V2005). RHSN = Reproductive health support networks; FSFP = Familial support for family planning; NSFCS = Network sources for condom supply

Table 2: Description of variables after being collapsed

Statistics	Malaria Prevention (0-1)	Hygiene Behavior (0-1)	Responble Behavior (0-1)	Education Level (0-1)	Age	No of children	Current Residence (0-1)	Matri Lineage (0-1)	Family matters (0-2)	Purchase decision (0-3)	Domestic violence (0-5)	RHSN (0-2)	FSFP (0-2)	NSFCS (0-3)
Mean	0.25	0.60	0.67	0.57	32.33	1.14	.34	.58	1.2	1.77	3.45	0.81	0.41	0.95
Std Dev.	0.43	0.49	0.47	0.50	7.87	.78	.47	.49	.88	1.15	1.81	0.77	0.66	1.06
skewness	1.17	-.40	-.71	-.281	.17	-.267	.67	-.315	-.426	-.261	-.725	.33	1.33	0.48
Kurtosis	-.64	-1.84	-1.5	-1.92	-.828	-1.31	-1.55	-1.90	-1.57	-1.40	-.967	-1.32	0.46	-1.29
Range	1	1	1	1	34	2	1	1	2	3	5	2	2	3
Minimum	0	0	0	0	15	0	0	0	0	0	0	0	0	0
Maximum	1	1	1	1	49	2	1	1	2	3	5	2	2	3
Frequency	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	%
0	75.2	40.2	33.4	43	-	23.9	65.9	42.2	30.1	18.2	10.6	40.7	68.4	50.4
1	24.8	59.8	66.6	57	-	37.2	34.1	57.8	18.6	25.5	9.5	37.5	21.8	11.4
2	-	-	-	-	-	38.9	-	-	51.4	17.9	10.9	21.9	9.8	30.5
3	-	-	-	-	-	-	-	-	-	38.4	10.3	-	-	7.7
4	-	-	-	-	-	-	-	-	-	-	10.7	-	-	-
5	-	-	-	-	-	-	-	-	-	-	48.0	-	-	-
Total	100	100	100	100	100	100	100	100	100	100	100	0.0	100	100

Note: Data was weighted with the 2003 GDHS sample weight (V2005). RHSN = Reproductive health support networks; FSFP = Familial support for family planning;
NSFCS = Network sources for condom supply.

Table 3. Multivariate OLS Regression describing the influence of women's demographic characteristics on their self-determination

Demographic variables used as predictors	Predictor variables											
	Say in purchase decisions				Reject domestic abuse				Say in family decisions			
Constant	T	b	Beta	Sig.	t	b	Beta	Sig.	t	b	Beta	Sig.
	4.17	.491		**.000**	10.44	1.97	-	**.000**	2.29	.157		**.022**
Demographic variables												
Education level (0-1)	6.56	.357	.154	**.000**	9.22	.802	.218	**.000**	7.14	.227	.176	**.000**
Age (I/R)	8.25	.025	.170	**.000**	4.66	.023	.097	**.000**	.917	.002	.020	.359
Number of children aged 5/below (I/R)	-.048	-.002	-.001	.961	-.896	-.046	-.019	.058	2.14	.040	.048	**.033**
Current residence (Urban)	1.67			.095	4.51	.399	.097	**.000**	1.08	.035	.024	.279
Matrilineal lineage	8.55	.092	.036	**.000**		.416	.108	**.000**	1.35	.043	.032	.179
		.463	.192									
R square	.127				.120				.038			
Adjusted R square	.125				.118				.036			
Model summary (p-value)	**.000**				**.000**				**.000**			
Difference in R square	-				-				-			
Df	5				5				5			
N	2132				2132				2132			

Note: p-values that are significant are bolded

Table 4. Multivariate OLS Regression describing the influence of women's demographic characteristics on their participation in familial and social support networks.

Demographic variables used as predictors	Predictor variables											
	RHSN				FSFP				NSFCS			
Constant	T	b	Beta	Sig.	T	b	Beta	Sig.	t	b	Beta	Sig.
	4.17	.740		**.000**	6.93	.525	-	**.000**	4.76	.438		**.000**
Demographic variables												
Education level (0-1)	6.56	.727	.342	**.000**	14.30	.502	.327	**.000**	3.41	.145	.082	**.001**
Age (I/R)	8.25	-.011	-.081	**.000**	-2.35	-.005	-047	.019	6.87	.016	.145	**.000**
Number of children aged 5/below (I/R)	-.048	-.013	-.010	.629	1.44	.029	.030	.151	-.344	-.009	-.008	.731
Current residence (urban)	1.67	480	204	**.000**	8.24	293	.172	**.000**	-	-	-	.415
Matrilineal lineage	8.55	062	028	**.190**	1.58	055	.034	.113	.815	.035	.018	**.000**
									9.17	.389	.210	
R square	.218				.178				.091			
Adjusted R square	.216				.176				.088			
Model summary (p-value)	**.000**				**.000**				**.000**			
Difference in R square	-				-				-			
Df	5				5				5			
N	2132				2132				2132			

Note: p-values that are significant are bolded

Table 5. Odds Ratios and standard errors for logistic regressions predicting enforcement of malaria prevention among Ghanaian women

	Model 1			Model 2			Model 3		
Demography	(B)	Odds Ratio	S.E.	(B)	Odds Ratio	S.E.	(B)	Odds Ratio	S.E.
Constant									
Education level (0-1)	-.252	.78	.248	-.281	.76	.256	-.279	.756	.259
Age (I/R)	.381	1.46***	.116	.376	1.44***	.015	.348	1.42**	.127
Number of children aged 5/below (I/R)	-.019	.982***	.007	-.016	.984**	.008	-.016	.984*	.007
Current residence (Rural-Urban 0-1)	.116	1.12 +	.069	.115	1.12 +	.085	.110	1.12	.069
Lineage (patrilineal/matrilineal) (0-1)	-.705	.494***	.129	-.731	.481***	.153	-.727	.483***	.134
	-.979	.376***	.126	-.924	.397***	.101	-.932	.394***	.129
Self Determination									
Final say, family matters (0-2)				.231	1.26**	.080	.235	1.26**	.081
Final say, purchase decision(0-3)				.001	1.001	.035	.007	1.01	.064
Rejects domestic violence (0-5)				.055	1.06*	.311	.055	1.06*	.029
Support networks									
Reprod health support network(0-2)							-.142	.868	.189
Family support for planning (0-2)							.248	1.282	.151
Network/sources for condom(0-2)							.053	1.054	.099
Model Summaries									
N	2133			2133			2133		
Improvement X^2 (-2 Log likelihood)	2369.52			2350.21			2344.91		
Degree of freedom	1			1			1		
Nagelkerke R^2	.082			.092			.095		
Significance	.000			.000			000		

Significance levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$

Note: Values in brackets indicate how respective independent variables were coded

Table 6. Odds Ratios and standard errors for logistic regressions of hygiene behavior among Ghanaian women

	Model 1			Model 2			Model 3		
Demography	(B)	Odds Ratio	S.E.	(B)	Odds Ratio	S.E.	(B)	Odds Ratio	S.E.
Constant									
Education level (0-1)	.199	1.22	.287	.351	1.42	.299	.190	1.21	.305
Age (I/R)	.235	1.26+	.139	.346	1.41*	.144	.163	1.18	.151
Number of children aged 5/below (I/R)	.001	1.00	.007	.010	1.01	.008	.013	1.01	.008
Current residence (Rural-Urban 0-1)	-.038	.963	.079	-.025	.975	.081	-.017	.983	.082
Lineage (patrilineal/matrilineal) (0-1)	.549	1.73***	.159	.565	1.76***	.163	.403	1.496**	.169
	.226	1. 24+	.134	.052	1.05	.141	.048	1.05	.142
Self Determination									
Final say, family matters (0-2)				.248	1.282**	.098	.348	1.42**	.098
Final say, purchase decision(0-3)				.110	1.12+	.073	.115	1.12*	.074
Rejects domestic violence (0-5)				.004	1.01	.035	.013	1.013	.035
Support networks									
Reprod health support network(0-2)							.084	1.09	.228
Family support for planning (0-2)							.022	1.02	.182
Network/sources for condom(0-2)							.227	1.26*	.120
Model Summaries									
N	1228			1228			1228		
Improvement X^2 (-2 Log likelihood)	1651.80			1612.24			1593.20		
Degree of freedom	1			1			1		
Nagelkerke R^2	.025			.061			.080		
Significance	.000			.000			000		

Significance levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; + $p < 0.1$

Note: Values in brackets indicate how respective independent variables are coded

Table 7. Odds Ratios and standard errors for logistic regressions of responsible sexual behavior among Ghanaian women

	Model 1			Model 2			Model 3		
Demography Constant	(B)	Odds Ratio	S.E.	(B)	Odds Ratio	S.E.	(B)	Odds Ratio	S.E.
Education level (0-1)	.410	1.51	.264	.366	1.44	.274	.118	1.13	.280
Age (I/R)	.303	1.35**	.118	.253	1.29*	.122	.038	1.04	.129
Number of children aged 5/below (I/R)	-.003	.997	.007	-.007	.993	.007	-.003	.997	.007
Current residence (Rural-Urban0-1)	.018	1.018	.071	.019	1.02	.071	.013	1.01	.072
Lineage (patrilineal/matrilineal) (0-1)	.146	1.16	.118	.151	1.16	.120	.010	1.01	.125
	.343	1.41***	.117	.251	1.29*	.121	.266	1.31*	.123
Self Determination									
Final say, family matters (0-2)				.046	1.047	.085	.009	1.01	.086
Final say, purchase decision (0-3)				.206	1.23***	.067	.185	1.21**	.067
Rejects domestic violence (0-5)				.039	.962	.031	.049	.953	.032
Support networks									
Reprod health support network(0-2)							.053	1.05	.198
Family support for planning (0-2)							.180	1.20	.162
Network/sources for condom(0-2)							.281	1.32***	.103
Model Summaries									
N	1714			1714			1714		
Improvement X^2 (-2 Log likelihood)	2157.95			2128.90			2082.12		
Degree of freedom	1			1			1		
Nagelkerke R^2	.024			.043			.076		
Significance	.000			.000			000		

Significance levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; [+] $p < 0.1$

Note: Values in brackets indicate how respective independent variables are coded