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Denominational Affiliation and the Risk of Pregnancy Loss Among Ghanaian Women

Studies in sub-Saharan Africa have consistently factored in the socio-cultural environment in explaining women's reproductive health behaviour and choices. Using data from Ghana, and guided by the particularized theology and selectivity hypotheses, we investigate whether there are denominational differences in pregnancy loss among Christian and non-Christian Ghanaian women. We found that Christian women, particularly those belonging to the Penteco-Charismatic (other Christian) category had a greater likelihood to have experienced a terminated pregnancy compared to their non-Christian counterparts (Muslims and traditionalists). Though this was mainly found to reflect differences in socioeconomic characteristics such as their place of residence, age, and educational attainment; the association between religion and pregnancy loss could still be discerned. We highlight certain doctrinal norms and practices among followers of the other Christian category as possible explanation for their relatively elevated risk of experiencing a pregnancy loss.

The discourse on the reproductive-health needs of women in the developing world in general, and those in sub-Saharan Africa in particular, has recently shifted from its predominant focus on HIV/AIDS and other STD-related issues to those bordering primarily on maternal health outcomes (Gyimah, Takyi, and Addai,). This change in emphasis stems in large part from the high prevalence of pregnancy-related fatalities in the developing world which are mainly preventable through early diagnosis and intervention (see, e.g., Mavalankar and Rosenfield; Ross, Campbell, and Bulatao; Rutstein). These adverse pregnancy outcomes including pregnancy loss (termed variously as miscarriage, termination, ectopic pregnancy, and stillbirth) generally reflect the poor state of maternal health care services in much of the region, and are often exacerbated by cer-

tain socio-demographic and cultural factors such as the relatively early age at conception, illiteracy, and inadequate spacing between pregnancies (Banerjee and Hazra, 2004). Other studies have also found poor nutritional status of women—as defined by a low BMI—as having a negative effect on pregnancy outcomes (Ogunyemi et al.; Helgstrand and Andersen).

While there is substantial literature on the impact of these socio-demographic factors on pregnancy outcomes, there is a paucity of research that examines the link between religious affiliation and its possible association with pregnancy-related outcomes. We contend that such an omission is unfortunate given the centrality of religion in the African social fabric. In much of sub-Saharan Africa, religion plays a central role in human affairs as it permeates all aspects of social life (Assimeng 1995; Mbiti). Thus, as the lens through which events are interpreted, differentials in religious worldviews may correspond with varying attitudes towards pregnancy outcomes and perceptions of their causes. As Rachel Tolhurst and colleagues observed among the predominantly traditional believers in Southern Malawi, perceptions about the causes of miscarriage are mostly attributed to the machinations of witchcraft. While such a perspective toward pregnancy loss could gravely suppress the role of human agency, it is expected that religions such as Protestantism which are firmly attached to formal education and perhaps more adaptive to orthodox medicine, may hold different perceptions concerning the causes and management of pregnancy-related issues.

A survey of the literature on sub-Saharan Africa indicates that women's religious affiliations are associated with a host of demographic and health outcomes such as the adoption and use of family planning (Yeatman and Trinitapoli; Agadjanian; Addai 1999), maternal health service utilization (Gyimah, Takyi and Addai; Addai 2000), child mortality (Gyimah; Kirby), as well as HIV/AIDS protective and preventive behaviour (Takyi; Gyimah et al. 2010). Some findings from the West also relate religion to overall health (for a review of this work, see Chatters; Levin and Chatters; Ellison and Levin; Krause; Ellison). The implication, therefore, is that religion may account for the differentials in pregnancy loss among Ghanaian women, and we argue that its underrepresentation in the discourse on pregnancy loss could potentially cloud our understanding of the socio-cultural context within which intervention strategies could be maximized whenever necessary.

The association between religion and pregnancy loss is also worthy of examination within the Ghanaian socio-cultural environment where childlessness is frowned upon, and in particular among traditional believers for whom bearing large numbers of children fulfills one's obligations to the ancestors (Caldwell and Caldwell). A Muslim woman's experience with pregnancy loss could also be quite unsettling given the fact that some Islamic jurists advo-

cate for higher population growth rate within the Muslim communities as a means of enhancing their power and influence (Roudi-Fahimi). In Ghana for instance, the Muslim desire for larger representation was demonstrated when the Coalition of Muslim Organizations in Ghana rejected the final figures of the 2000 Population and Housing Census released by the Ghana Statistical Service, claiming that the figures for the number of Muslims in Ghana was under-reported (Safo). Thus, given their pronatalist ideals, we expect Muslim women and women belonging to the traditional religion to be less likely to have a terminated pregnancy (either induced or spontaneous) compared to women who belong to what Isaac Addai described as “liberal religious groups” (2000: 331) such as Protestants.

This research therefore aims to contribute to the literature on religion and reproductive health in sub-Saharan Africa by investigating whether the religious influence that had been reported on some demographic and health outcomes such as contraceptive use behaviour, HIV/AIDS, and maternal health care utilization could apply to the discourse on pregnancy loss among women in Ghana. We ask whether there are denominational differences in the likelihood of having a terminated pregnancy among Ghanaian women, and if these could be explained through other characteristics. Given the pervasiveness of religion in Ghana, our findings could provide useful insights for improving safe motherhood and pregnancy outcomes.

Theoretical Framework

Prior research investigating the link between religion and demographic and health outcomes in Africa has not yielded a consistent theoretical framework. On the one hand of the theoretical divide, some researchers have drawn attention to religion as a salient factor that could either facilitate or constrain the utilization of maternal health services (Gyimah, Takyi and Addai; Addai 2000), and to which by extension, has the potential to affect the outcomes of pregnancy. This perspective, popularly termed the particularized theology thesis, contends that specific doctrinal teachings, beliefs and values of the various religious groups by themselves may influence reproductive health choices and hence affect pregnancy outcomes. In more general terms, it points particularly to the overriding influence of religion and cultural processes on overall reproductive-health outcomes independent of socio-economic processes (Addai 1999; Caldwell and Caldwell ; Lesthaeghe).

In much of sub-Saharan Africa, the preponderant believe in faith healing particularly among followers of faith-based churches, as seen in a BBC report (“Ghana tumor girl ignites debate”), could prevent an expectant mother from availing herself to antenatal health care facilities even in the face of imminent

pregnancy complications. In Ghana, Kwadwo Asenso-Okyere and colleagues found that although cost was an important factor, the dominant belief that some health problems have spiritual and religious undertones was an equally important determinant for the non-use of modern health care services. This finding re-echoed Jon Kirby's observations concerning the determinants of child mortality in Northern Ghana. Studies that investigate the determinants of maternal health service utilization have also consistently found religion as an important factor. Addai (2000) and Stephen Gyimah, B. Takyi and Addai, for instance, have reported that Ghanaian women who identified themselves as traditionalist were not only less likely to seek antenatal services, but were also less likely to deliver in a health facility than their Christian counterparts. Thus, as an institution of structured doctrinal and moral codes, organized religion is more likely to influence the behavioural choices of its adherents especially when the members feel a strong sense of attachment to the religious community (Hummer et al.; Bongaarts and Watkins; Ellison and George; McQuillan). The particularized theology thesis therefore provides a framework for situating our contention that religion may be relevant to our understanding of the differentials in pregnancy outcomes among Ghanaian women.

At the other end of the theoretical spectrum, the research on religion and health outcomes suggests that any variation that exists in behaviour may be due to the interplay of socioeconomic forces rather than religion per se. Proponents of the selectivity or socioeconomic thesis, often referred to in the literature as the "characteristic hypothesis," have argued that socioeconomic processes rather than religion may be more important in predicting demographic and health related outcomes. According to this view, any observed differentials in pregnancy outcomes can be fully explained by individual level attributes, including variations in socioeconomic characteristics such as educational attainment, income, place and region of residence, and that these factors need to be controlled statistically to be able to isolate the residual effect of religion. Thus, in essence, it maintains that variations in observed pregnancy outcomes between religious groups mainly reflect differential access to social and human capital.

Data and Measures

We assessed the links between religious affiliation and the likelihood of having a terminated pregnancy among Ghanaian women by analyzing pooled data from the 2003 and 2008 Ghana Demographic and Health Surveys (GDHS). The 2003 and 2008 GDHS are the fourth and fifth, respectively, in a series under the worldwide Demographic and Health Surveys (DHS) programme. These are the most recent in a series of standardized national-level surveys

that have been carried out in Ghana during the past 20 years and document the demographic and health situation in the country. As the case is with the earlier surveys (i.e., the first, second and third waves), these surveys are based on nationally representative samples of reproductive women, aged 15-49 years. Sampling was based on census enumeration areas (EAs), from which households were then selected using stratified sampling techniques. Samples of women were then drawn from the selected households, with a response rate of about 97 percent. From the pooled 2003 and 2008 GDHS, 10,607 women in their reproductive years (15-49) were interviewed on their socio-demographic characteristics, fertility, reproductive health, and childhood mortality histories.

Our outcome variable of interest is a woman's experience with pregnancy loss which is captured from the DHS question of whether a woman has "ever had a pregnancy that was terminated or aborted." Being the only question that was asked concerning pregnancy termination or abortion, the data do not allow for a distinction between those pregnancies that were terminated or aborted spontaneously and those that were induced. Our analysis is therefore based on terminations that resulted either deliberately or not. However, either induced or spontaneous, a pregnancy that did not result in live birth, according to the medical jargon, is technically regarded as being lost. While no religious body in Ghana openly endorse deliberate pregnancy termination, the laws of Ghana do not entirely criminalize it. Until 1985, when Ghana's criminal code was amended, Ghanaian law prohibited induced abortion except when a woman's life was endangered by her pregnancy. The law now says that abortion is not an offense if it is supervised by a medical practitioner specializing in gynecology or other registered practitioner in a government hospital or registered private hospital or clinic; if the pregnancy is as a result of rape, incest or reduced mental ability; if the pregnancy poses a risk to her physical or mental health, and if the unborn child might suffer an abnormality or disease (Cook and Dickens; Ahiadeke). In spite of this relaxation of abortion restrictions, its cultural sensitivity (see, e.g. Bleek), perhaps explains why most surveys like the DHS do not ask women to distinguish between pregnancies that were terminated spontaneously and those that were induced. While we recognize this data limitation in the interpretation of the results, we proceed to examine the attributes of Ghanaian women who are likely to have an experience with pregnancy loss, and to attempt an explanation for the plausible reasons.

Also, because it is possible for the respondents to have switched religions, a phenomenon not captured by the DHS, a woman's ever experience with pregnancy loss may not correspond with her current religious affiliation. To minimize this bias, efforts have been made to restrict the analysis to women who had a pregnancy that was terminated or aborted during the year of the survey. This restriction resulted in an analytic sample of 255 as against a total

of 1757 women who have ever had a terminated pregnancy from the pooled data. We then created a binary variable for whether a pregnancy has been terminated in the year of survey or otherwise. In the analysis, women who have had a pregnancy that did not end in a live birth in the year of the survey are coded as 1; all others are coded as 0. Even though the outcome variable is dichotomous, the cases are unevenly distributed among categories meaning that the logit or probit link function which assumes a symmetrical distribution could produce biased estimates (Long,). Given this, we used a complementary log-log (clog-log) function which is better suited for asymmetrical distributions. The model has the form:

$$\ln(-\ln[1-\Pr(Y_i=1/x_i)]) = x_i\beta_i$$

where Y is the likelihood of having a terminated pregnancy. While x_i denotes each predictor variable, β_i represents the coefficient associated with each predictor variable. For a more intuitive understanding, the estimated coefficients were exponentiated through the function: $\Pr(Y_i=1/x_i) = 1 - \exp[-\exp(x_i\beta_i)]$.

The results are then interpreted as odds ratios. Odds ratio higher than one indicates that women with that attribute have a higher likelihood of experiencing a pregnancy loss than those in the reference category, while the reverse is true if the ratio is less than 1.

The main independent variable of interest is religious affiliation. In prior research that examined the interrelationship between religion and reproductive health outcomes, religion has been measured in several ways including the frequency of church attendance (religiosity), subjective views about God, and interaction between clergy and lay (see, for example, Krause; Yeatman and Trinitapoli). This study is constrained, however, by the lack of multiple measures of religion in the GDHS dataset since there is no other information on other aspects of religion besides denominational affiliation. While we acknowledge the inherent limitations in using only denominational affiliation in exploring its complex connection with pregnancy loss, some studies have indicated that denominational affiliation is a valid measure because affiliates of a particular religious subculture exhibit differentiated behavioural outcomes that revolve around the tenets of their central ideals (Gay and Ellison; Gay, Ellison, and Powers; Hoffman and Miller; Kiecolt and Nelsen; Goldscheider and Mosher).

The GDHS asked respondents to indicate their religious affiliation. Drawing on past research and taking into consideration theological differences and practices, we distinguished between two main groups of women: Christians and non-Christians. The Christian women were further categorized into those belonging to the mainline Christian denominations (Protestant and Catholics)

and the non-mainline groups (other Christians). The other Christians category is a collection of Evangelical, Charismatic, and Pentecostal groups theologically homogenized by their born-again experience as typified by tongue-speaking, prosperity messages, and divine healings (Meyer; Gifford; Sackey). The non-Christian group, on the other hand, is composed of the Muslims, Traditional believers and those with no formal religious affiliation. In the variable categorization, however, because women who profess no religion and those who practice Traditional religion constitute about nine percent, they were combined and treated as one category with the aim of enhancing statistical analysis.

Earlier research suggests that other processes besides religion influence reproductive health outcomes (Gyimah, Takyi and Addai; Takyi; Agadjanian; McQuillan). Consequently, we control for the following variables in the multivariate models: the respondents' age, place of residence (urban versus rural), contraceptive use history, and marital status. Other control variables include respondents' educational attainment which had the following categories: no education, primary, secondary (high school) or higher.

Results

We present percent distribution of all the variables used in the study in Table 1. The results indicate that in terms of religious affiliation, women who affiliate with the other Christian category are comparatively more (43 percent) in number than their other religious counterparts. This observation generally reflects the growing influence of the new religious movements such as the Penteco-Charismatic and Evangelical groups throughout Africa (Gyimah, Takyi and Addai). It is also consistent with the literature on the shifting religious landscape in Ghana, which appears to suggest that the prosperity messages frequently accentuated by these new movements within the Christian ambit have become more appealing to the mostly impoverished population dissatisfied with their current living conditions (Meyer; Yirenyki; Gifford). Those belonging to traditional/no religion constitute the least, representing about nine percent, while the Catholics and Protestants represent approximately fifteen percent each.

The results in Table 1 also show that women aged 30 and over constitute about 45 percent while those under 20 and those between 20 and 29 years represent nearly 20 and 35 percent, respectively. Consistent with current spatial distribution in Ghana, more than half of the women reside in rural areas (57 percent) with 30 percent uneducated. Those with primary and secondary/higher levels of education constitute about 20 and 50 percent respectively. The relative higher percentage among those with secondary or higher levels of educational attainment could be a testament to the recent improvements in

Table 1: Descriptive statistics for variables in the analysis of religion and pregnancy loss among Ghanaian women, 2003–08.

Variable	Frequency	Percent of total women
<i>Religious Affiliation</i>		
No religion/Traditional	968	9.1
Catholic	1638	15.4
Protestant	1630	15.4
Other Christians	4526	42.7
Muslim	1845	17.4
<i>Age</i>		
Under 20	2150	20.3
20-29	3649	34.4
30+	4808	45.3
<i>Place of residence</i>		
Urban	4536	42.8
Rural	6071	57.2
<i>Educational attainment</i>		
No education	3160	29.8
Primary	2111	19.9
Secondary/Higher	5336	50.3
<i>Marital status</i>		
Never married	3055	28.8
Currently married	6644	62.6
Formerly married	908	8.6
<i>Ever used contraception</i>		
Never used	5544	52.3
Folkloric/Traditional	854	8.1
Modern method	4209	39.7
<i>Pregnancy history</i>		
Never terminated	8847	83.4
Ever terminated	1757	16.6
Pregnancy terminated during year of survey	255	2.4
Total	10607	100

Table 2: Bivariate statistics for variables in the analysis of religion and pregnancy loss among Ghanaian women, 2003–2008.

	Christians			Non-Christians		Total
	Catholic	Protes- tant	Other Chris- tian	Muslim	Traditional/ no religion	
<i>Pregnancy terminated during year of survey</i>						
Yes	2.14	2.27	2.96	1.79	1.65	255
No	97.86	97.73	97.04	98.21	98.35	10352
<i>Age</i>						
Under 20	23.93	21.93	20.46	20.49	10.43	2150
20-29	32.42	32.42	35.46	35.34	29.24	3649
30+	43.65	43.65	44.08	44.17	60.33	4808
<i>Place of residence</i>						
Urban	32.91	32.91	51.72	46.5	9.61	4536
Rural	67.09	67.09	48.28	53.5	90.39	6071
<i>Educational attainment</i>						
No education	26.43	12.39	18.18	53.88	73.14	3160
Primary	20.57	16.44	22.58	17.29	17.05	2111
Secondary/Higher	52.99	71.17	59.24	28.83	9.81	5336
<i>Marital status</i>						
Never married	31.5	35.52	30.89	24.82	10.74	3055
Currently married	60.62	53.5	59.3	70.51	82.02	6644
Formerly married	7.88	10.98	9.81	4.66	7.23	908
<i>Ever used contraception</i>						
Never used	51.1	46.75	46.77	63.52	67.77	5544
Folkloric/Traditional	8.36	8.22	8.88	5.75	7.75	854
Modern method	40.54	45.03	44.34	30.73	24.48	4209
Total	1638	1630	4526	1845	968	10607

χ^2 test of significance: ($p < 0.001$) unless otherwise stated.

women's enrolments rates at higher levels of education in Ghana probably due to the affirmative action programmes at work in most second cycle institutions in the country. With regard to marital status, the results indicate that almost two-thirds (63 percent) of the women are in marital unions with only about nine percent not currently married although they had been married before. Their never married counterparts constitute 29 percent of the distribution.

There is also an indication of a very low rate of contraceptive use among the women in the sample. A little over half (52 percent) of the women have never used contraception. About 40 percent of the women have used modern methods while about eight percent have only used folkloric or traditional brands of contraception. Concerning pregnancy history, the analysis indicates that a greater majority (83 percent) of the women have never experienced a terminated pregnancy before. In all, about 17 percent of the women have at a time experienced a terminated pregnancy, while 2.4 percent of the total women sampled had a pregnancy that was terminated or aborted during the year of the survey.

Table 2 presents bivariate statistics of the relationship between religious affiliation and the other variables considered for the study. The results indicate some marked differences between the two main religious groups. Non-Christian women seem to be less likely to have had a terminated pregnancy (either deliberate or not), less likely to be users of modern contraception, and are more likely to be in marital unions. These findings are suggestive that among these non-Christian women, pronatalist ideals seem to be more pertinent. Christian women, on the other hand, appear to be more likely to be users of modern contraception, highly educated, and have a greater likelihood to have had a pregnancy that was terminated (either deliberate or not) at the year of the survey. As regards place of residence, the results show that the other Christian (Penteco-Charismatic and Evangelical) category is the only religious group with a little over half (51.7 percent) of its members residing in urban areas, while the overwhelming majority (90 percent) of women who belong to the traditional/no religion are based in rural areas. Not only is traditional/no religion predominantly rural based, it is also the only religious group with almost two-thirds of its members aged 30 years and above. Taken together, these bivariate results do suggest that the marked differences in socio-demographic characteristics may be important in accounting for the differentials in pregnancy loss among Ghanaian women.

Table 3 shows the results of the complementary log-log regression models on the likelihood of experiencing a pregnancy loss among Ghanaian women at the time of the survey. Model 1 reveals that compared to women who belong to traditional/no religion category, women who belong to the other Christian category are about 1.8 times significantly more likely to experience a pregnancy

loss. However, the difference between the no religion/traditional women and their Catholic, Protestants and Muslim counterparts is not statistically significant. The greater likelihood of other Christian women to experience pregnancy loss could perhaps be attributed to certain life style and doctrinal practices within which they are embedded. As earlier studies have demonstrated, (see, for example, Gyimah; Gyimah, Takyi and Addai), affiliates of these new Christian organizations often believe in the power of faith healing and therefore do not readily avail themselves to the utilization of maternal health services.

In model 2, we control for the effects of socioeconomic and demographic variables and observe that the effect of religion is muted after the controls are introduced. This observation suggests that reproductive health outcomes may mainly reflect differences in social and human capital and not religious affiliation per se. As was earlier observed from Table 2, there are marked differences in the socio-economic characteristics of the women belonging to the various religious groups, and these may account for the differentials in pregnancy loss among them.

The results indicate that age is significantly and inversely related to the likelihood of experiencing a pregnancy loss. Indeed every additional increase in a woman's age reduces the odds of having a terminated pregnancy by 2.8 percent. This finding is consistent with past research in Ghana that suggests that relatively younger women tend to attach less importance to the need to seek maternal health care during pregnancy compared to their older counterparts. For instance, Gyimah, Takyi and Addai found younger women to be consistently less likely to seek professional prenatal care during pregnancy and to have a baby delivered in a health facility. Predicted probabilities for the likelihood of having a terminated pregnancy from Model 2 are presented in Figure 1. The graph shows an inverse relationship between age and the likelihood of a pregnancy loss as indicated by the slopes of the regression lines for all the religious groups. Across different age trajectories, however, the risk of having a pregnancy loss is remarkably higher among Christian women than their non-Christian counterparts.

Consistent with the finding from Ingrid Rowlands and Christina Lee's study on the correlates of miscarriage among young women in Australia, we find that compared to currently married women, both never married women as well as women who were formally married are significantly less likely to experience pregnancy loss. Since pregnancy, and by implication, child birth, is culturally expected to occur within the context of wedlock, this finding could be justified on the grounds that married women have by far the greatest risk of being exposed to pregnancy and hence are more likely to experience any of its related outcomes. Also, compared with women with no educational attainment, those who have attained formal classroom education are significantly

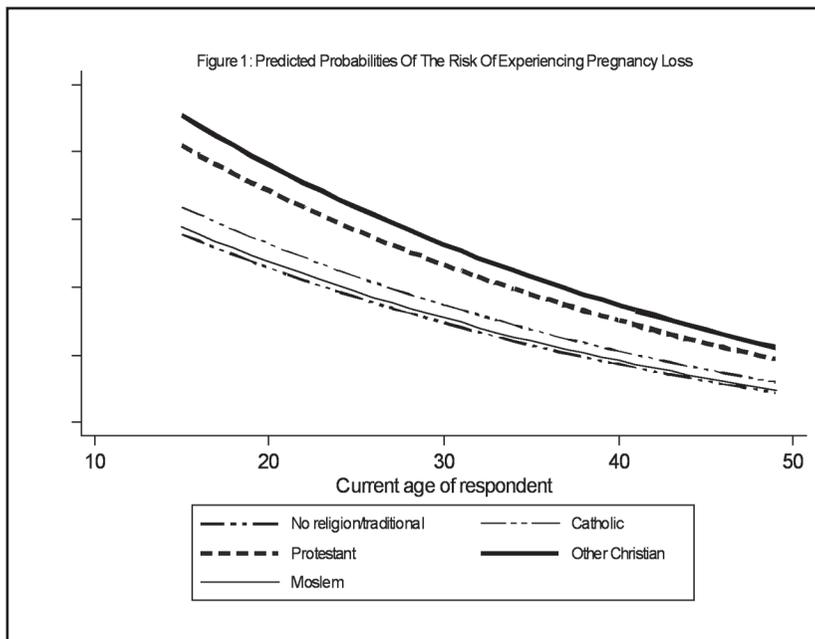
Table 3: Complementary log-log regression models of the risk of pregnancy loss among Ghanaian women, 2003-08

	Model 1 (Exp. B)	Model 2 (Exp. B)
<i>Religious Affiliation</i>		
Catholic	1.275	1.109
Protestant	1.559	1.350
Other Christians	1.820*	1.472
Moslems	1.131	1.029
No religion/Traditional (reference)		
<i>Age</i>		0.972**
<i>Place of residence</i>		
Urban		1.168
Rural (reference)		
<i>Educational attainment</i>		
Primary		0.662**
Secondary/Higher		1.330*
No education (reference)		
<i>Marital status</i>		
Never married		0.199***
Formally married		0.524**
Currently married (reference)		
<i>Ever used contraception</i>		
Modern method		1.551*
Folkloric/Traditional		1.402**
Never used (reference)		
Number of observations	10607	10607
Log likelihood chi-square	9.600	94.350
Log likelihood	-1038.446	-996.069
Constant	0.014***	0.042***
Significance: *** p<0.001; **p<0.05; *p<0.10		

more likely to have a terminated pregnancy. Consistent with Sinikka Shivo et al., we also speculate that most of these terminated pregnancies might have been induced since the educated women probably do not want to disrupt their educational career or that childbearing during the year of the survey may not fit their formal employment situation.

There is also evidence from the results in Model 2 that women who had ever used contraception have a higher risk of experiencing pregnancy loss as compared to those who have never used any method. Particularly, those who use traditional/folkloric methods of contraception have an elevated risk of having a pregnancy terminated. This observation contradicts the evidence from Rowlands and Lee that women who are not using contraception have higher odds (1.60) of experiencing pregnancy loss than their counterparts who do otherwise. In our case, we suggest two plausible explanations for this observation. Firstly, we argue that the considerable effect associated with use of the folkloric/traditional method of contraception (compared to the modern method) may be attributed to the risk of complications associated with their contents which are mostly medically uncertified. Secondly, we suggest that whether modern or traditional method of contraception, some contents of both methods may have the propensity of affecting normal foetal development, thereby increasing the chances of pregnancy loss.

Summary and Conclusion



Although several studies have suggested that religion may be relevant to the understanding of reproductive health outcomes among African women, empirical studies on the subject have yielded different conclusions. Using Demographic and Health Surveys data for Ghana, and guided by the particularized theology thesis and the characteristics hypothesis, we employed complementary log-log regression models to investigate how denominational affiliation associates with the risk of experiencing pregnancy loss among Ghanaian women ages 15–49 years.

In the absence of controls, religious affiliation was found to be a significant predictor of pregnancy loss with women belonging to the other Christian category being more likely to experience pregnancy loss at the year of the survey. Upon controls however, religion lost its predictive power thereby lending support to the characteristic hypothesis. The demographic and socioeconomic factors that significantly predict the likelihood of a woman experiencing pregnancy loss are age, marital status, education and contraceptive use.

Although not statistically significant, women belonging to the other Christian category seem to have an elevated risk of experiencing a terminated pregnancy which is about 1.5 times higher than their traditional/no religion counterparts. Given the results from Table 2, it appears most probable to speculate that since most of these other Christian women reside in urban areas and have attained higher levels of education, their higher likelihood to experience pregnancy loss could be a matter of choice since they may be deliberately deferring childbirth as a way of managing their professional careers. While this finding seems to lend credence to the characteristics hypothesis, the role of religion in our understanding of pregnancy loss could still be discerned from the relatively higher odds associated with the other Christian category, which could also be seen in the graph from Figure 1. Among these women, it is plausible that certain doctrinal norms such as the prevalent belief in faith healing may be a factor that undermines their utilization of maternal health care services (Gyimah, Takyi and Addai), and which could subsequently increase their likelihood of experiencing a pregnancy loss. The process of faith or divine healing, as described by Brigid Sackey among adherents of faith-based churches in Ghana, is often believed to be enhanced by fasting. The quest for this religious experience, involving periods of dietary deprivations, may affect health outcomes during pregnancy. As prior studies have amply demonstrated (see e.g. Metzger et al.; Prentice et al.), dietary deprivations during pregnancy could result in what is popularly referred to in the literature as “accelerated starvation.” This situation causes reductions in plasma glucose and could potentially result in poor pregnancy outcomes. While we recognize the significance of religious practices in an individual’s self-fulfillment, we however reiterate in this study that insofar

as it may be desirable to improve reproductive health outcomes, the practice of skipping meals whether by personal preference or for religious observance should not be encouraged among pregnant women.

In concluding, the findings from this study suggest that although socio-economic factors are more important in understanding the differentials in the likelihood of experiencing a pregnancy loss among Ghanaian women, and that it is quite plausible that these terminations may result from individual choices, the residual effects of religion cannot be discounted. Since Ghanaian women spend a considerable amount of their time and efforts in church-based activities such as conventions, retreats, all nights, and cell meetings (Takyi; Assimeng 1981), an incorporation of safe motherhood awareness programmes into the mainstream doctrinal teachings may encourage positive attitudes towards reproductive health. Though this study has been constrained by the limitations in the data, particularly by its inability to distinguish between pregnancies that were terminated deliberately and those that were spontaneous, it has nonetheless contributed to the literature on religion and reproductive health outcomes among women in sub-Saharan Africa. Future surveys should endeavour to ask questions that would make such a distinction possible. Also, research utilizing a qualitative data would enhance our understanding of the women's own interpretations to their religious commitments and how they think that might have associated with their own reproductive histories.

References

- Addai, I. "Does Religion Matter in Contraceptive Use Among Ghanaian Women." *Review of Religious Research* 40.3 (1999): 259-278.
- Addai, I. "Religious Affiliation and Sexual Initiation Among Ghanaian Women." *Review of Religious Research* 41 (2000): 328-343.
- Agadjanian, V. "Religion, Social Milieu, and Contraceptive Revolution." *Population Studies* 55 (2001): 135-148.
- Ahiadeke, C. 2001. "Incidence of Induced Abortion in Southern Ghana." *International Family Planning Perspectives* 27 (2001): 96-101, 108.
- Assimeng, M. *Social Structure of Ghana: A Study in Persistence and Change*. Accra, Ghana: Ghana Publishing Corporation, 1981.
- Assimeng, M. *Salvation, Social Crisis and the Human Condition*. Accra: Ghana Universities Press, 1995.
- Banerjee, B. and S. Hazra. "Socio-Demographic Determinants of Pregnancy Wastage." *The Journal of Obstetrics & Gynecology of India* 54 (2004): 355-360.
- Bleek, W. "Lying Informants: A Fieldwork Experience from Ghana." *Population and Development Review* 13 (1987): 314-322.

- Bongaarts, J. and S. C. Watkins. "Social Interactions and Contemporary Fertility Transitions." *Population and Development Review* 22.4 (1996): 639-682.
- Caldwell, J. C. and P. Caldwell. "The Cultural Context of High Fertility in sub-Saharan Africa." *Population and Development Review* 13 (1987): 409-438.
- Chatters, L. M. "Religion and Health: Public Health Research and Practice." *Annual Review of Public Health* 21 (2000): 233-267.
- Ellison, C. G. "Religious Involvement and Subjective Wellbeing." *Journal of Health and Social Behavior* 30 (1991): 92-104.
- Ellison, C. G. and L. K. George. "Religious Involvement, Social Ties, and Social Support in Southeastern Community." *Journal for the Scientific Study of Religion* 33 (1994): 46-61.
- Ellison, C. G. and J. S. Levin. "The Religion-Health Connection: Evidence, Theory and Future Directions." *Health Education Behavior* 25 (1998): 700-720.
- Gay, D. A. and C. G. Ellison. "Religious Subcultures and Political Tolerance: Do Denominations Still Matter?" *Review of Religious Research* 34 (1993): 311-332.
- Gay, D. A., C. G. Ellison and D. A. Powers. "In Search of Denominational Subcultures: Religious Affiliation and Pro-Family Issues Revisited." *Review of Religious Research* 38 (1996): 3-17.
- "Ghana tumor girl ignites debate." BBC News. 2005. Web. <<http://news.bbc.co.uk/2/hi/africa/4469129.stm>>. Accessed April 25, 2005.
- Gifford, P. "Ghana's Charismatic Churches." *Journal of Religion in Africa* 24.3 (1994): 241-265.
- Goldscheider, C. and W. Mosher. "Religious Affiliation and Contraceptive Usage: Changing American Patterns." *Studies in Family Planning* 19 (1988): 48-57.
- Gyimah, S. O. "What Has Faith Got To Do With It? Religion and Child Survival in Ghana." *Journal of Biosocial Science* 39.6 (2007): 923-937.
- Gyimah, S. O., B. K. Takyi and I. Addai. "The Reproductive Health Needs of African Women: on religion and utilization of maternal health services in Ghana." *Social Science and Medicine* 62 (2006): 2930-2944.
- Gyimah, S. O., E. Y. Tenkorang, B. K. Takyi, J. Adjei and G. Fosu. "Religion, HIV/AIDS and Sexual Risk-Taking Among Men in Ghana." *Journal of Biosocial Science* 42 (2010): 531-547.
- Helgstrand, S. and A. Andersen. "Maternal Underweight and the Risk of Spontaneous Abortion." *Acta Obstetrica et Gynecologica Scandinavica* 84 (2005): 119 -1201.
- Hoffman, J. P. and A. S. Miller. "Social and Political Attitudes Among Religious Groups: Convergence and Divergence Over Time." *Journal for the Scientific Study of Religion* 36 (1997): 52-70.

- Hummer, R. A., C. G. Ellison, R. G. Rogers, B. E. Moulton and R. R. Romero. "Religious Involvement, Social Ties, and Social Support in a Southeastern Community." *Journal for the Scientific Study of Religion* 33 (2004): 46-61.
- Kiecolt, K. J. and H. M. Nelsen. "The Structuring of Political Attitudes Among Liberal and Conservative Protestants." *Journal for the Scientific Study of Religion* 27 (1988): 48-59.
- Kirby, J. "White, Red and Black: Color Classification and Illness Management in Northern Ghana." *Social Science and Medicine* 44 (1997): 215-230.
- Krause, N. "Measuring Religiosity in Later Life." *Research on Aging* 15 (1993): 170-197.
- Lesthaeghe, R. "Social Organization, Economic Crisis and the Future of Fertility Control in Africa." *Reproduction and Social Organization in sub-Saharan Africa*. Ed. R. Lesthaeghe. Berkeley: University of California Press, 1989. 475-505.
- Levin, J. J. and L. M. Chatters. "Religion, Health and Psychological Well-being in Older Adults: Findings from Three National Surveys." *Journal of Aging Health* 10 (1998): 504-531.
- Long, J. S. *Regression Models for Categorical and Limited Dependent Variables: Advanced Quantitative Techniques in the Social Sciences Number 7*. Thousand Oaks, CA: Sage Publications, 1997.
- Maivalankar, D. and A. Rosenfield. "Maternal Mortality in Resource-Poor Settings: Policy Barriers to Care." *American Journal of Public Health* 95 (2005): 200-203.
- Mbiti, J. S. *African Religions and Philosophy*. London: Heinemann, 1992.
- McQuillan, K. "When Does Religion Influence Fertility?" *Population and Development Review* 30.1 (2004): 25-56.
- Metzger, B. E., V. Ravnkar, R. A. Vileisis and N. Freinkel. "'Accelerated Starvation' and the Skipped Breakfast in Late Normal Pregnancy." *Lancet* 1 (1982): 588-597.
- Meyer, B. 2004. "Christianity in Africa: From African Independent to Pentecostal-Charismatic Churches." *Annual Review of Anthropology* 33: 447-474.
- Ogunyemi, D., S. Hullett, J. Leeper and A. Risk. "Pre-pregnancy Body Mass Index, Weight Gain During Pregnancy, and Perinatal Outcome in a Rural Black Population." *The Journal of Maternal-Fetal & Neonatal Medicine* 7 (1998): 190-193.
- Prentice, A. M., A. Prentice, W. H. Lamb and P. G. Lunn. "Metabolic Consequences of Fasting During Ramadan in Pregnancy and Lactating Women." *Human Nutrition* 37 (1983): 283-294.
- Ross, J. A., O. Campbell and R. Bulatao. "The Maternal and Neonatal Program Effort Index (MNPI)." *Tropical Medicine and International Health* 6 (2001): 787-798.

- Roudi-Fahimi, F. 2004. *Islam and Family Planning*. Washington, DC: Population Reference Bureau, 2004.
- Rowlands, I. and C. Lee. "Correlates of Miscarriage Among Young Women in the Australian Longitudinal Study on Women's Health." *Journal of Reproductive and Infant Psychology* 27 (2009): 40-53.
- Rutstein, S. O. "Factors Associated with Trends in Infant and Child Mortality in Developing Countries during the 1990s." *Bulletin of World Health Organization* 78.10 (2000): 1256-1270.
- Sackey, B. M. "Faith Healing and Women's Reproductive Health." *Research Review NS* 18 (2002): 5-11.
- Safo, A. "Muslims cry foul over population figures." *New From Africa: Archive/News from Africa*. February 2002. Retrieved December 13, 2010, from <http://www.newsfromafrica.org/newsfromafrica/articles/art_7902.html>.
- Sihvo, S., N. Bajos, B. Ducot, M. Kaminski and the Cocon Group. "Women's Life Cycle and Abortion Decision in Unintended Pregnancies." *Journal of Epidemiology and Community Health* 57 (2003): 601-605.
- Takyi, B. K. "Religion and Women's Health in Ghana: Insight into HIV/AIDS Preventive and Protective Behaviour." *Social Science and Medicine* 56 (2003): 1221-1234.
- Tolhurst, R., S. Theobald, E. Kayira, C. Ntonya, G. Kafulafula, J. Nielson, FRCOG and N. Broek. "I Don't Want All My Babies to Go to the Grave': Perceptions of Preterm Birth in Southern Malawi." *Midwifery* 24 (2006): 83-98.
- Yeatman, S. E. and J. Trinitapoli. "Beyond Denomination: The Relationship Between Religion and Family Planning in Rural Malawi." *Demographic Research* 19.55 (2008): 1851-1882.
- Yirenkyi, K. "The Role of Christian Churches in National Politics: Reflections from Laity and Clergy in Ghana." *Sociology of Religion* 61 (2000): 325-338.