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Religious Differences in Female Genital Cutting: A Case Study from Burkina Faso

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Abstract

The relationship between religious obligations and female genital cutting is explored using data from Burkina Faso, a religiously and ethnically diverse country where approximately three-quarters of adult women are circumcised. Data from the 2003 Burkina Faso Demographic and Health Survey are used to estimate multilevel models of religious variation in the intergenerational transmission of female genital cutting. Differences between Christians, Muslims, and adherents of traditional religions are reported along with an assessment of the extent to which individual and community characteristics account for religious differences. Religious variation in the intergenerational transmission of female genital cutting is largely explained by specific religious beliefs and by contextual rather than individual characteristics. Although Muslim women are more likely to have their daughter circumcised, the findings suggest the importance of a collective rather than individual Muslim identity for the continuation of the practice.

Keywords

female genital cutting; intergenerational transmission; convention theory; Burkina Faso

Introduction

Female genital cutting, also known as female genital mutilation or female circumcision[1], is a term used to describe operations on female genitalia ranging from a small nick in the clitoris to total removal of the clitoris and labia. In some cases the procedure is accompanied by infibulation, the sewing together of the labia. One form or another of female genital cutting is practiced in 28 African countries as well as in some parts of Asia and the Middle East (WHO 2008). Opposition to the practice, both from within Africa and on the international stage, dates back to European missionaries in the early twentieth century and coalesced around the 1995 United Nations Fourth World Conference on Women in Beijing (Shell-Duncan and Hernlund 2000). Currently, both local and international organizations advocate

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[1]For a discussion of the controversy inspired by the terminology, see Obermeyer and Reynolds (1999) and the responses to their article in the same issue of *Reproductive Health Matters*; see also Shell-Duncan and Hernlund (2000). We use the terms *female genital cutting*, *female circumcision*, *cutting*, and *circumcision* interchangeably in this article.

abandonment of female genital cutting, and most countries where it is prevalent have some form of legal prohibition against the practice (UNICEF 2005). Efforts to reduce the prevalence of female genital cutting have had mixed success, and, despite the long history of such efforts, the factors supporting or impeding cessation are not well understood.

We examine the role of religion in shaping circumcision practices through a case study of one West African country, Burkina Faso. Burkina Faso is a religiously and ethnically diverse country where approximately three quarters of adult women had been circumcised as of 2003 (INSD and ORC Macro 2004). Despite the comparatively low visibility of political Muslim identity in Burkina Faso, the prevalence of female circumcision is higher among Burkinabé Muslims than among adherents of either Christian or traditional religions. Its religious diversity and moderate prevalence of circumcision make Burkina Faso an ideal setting for examining how various aspects of religiosity – specific beliefs, individual religious affiliation, and collective religious identity – shape behavior related to female circumcision.

We use data from the 2003 Burkina Faso Demographic and Health Survey to examine religious variation in the intergenerational transmission of female genital cutting. Because decisions about whether to circumcise girls are usually made by mothers (CNLPE 2006), we focus on how the social and religious context shapes mothers' circumcision intentions. We leverage the DHS's two-stage sampling procedure to explore mothers' behavior and intentions with regards to the circumcision of their daughters. Multi-level models explicitly account for both individual and community characteristics and allow us to examine the extent to which well-documented religious patterns in cutting practices are contingent on both the local religious context and the local circumcision context. Results show that differences between Christians and practitioners of traditional religion are largely mediated by sociodemographic differences and specific religious beliefs. In contrast, Muslim distinctiveness persists after accounting for individual differences. Both religious composition of communities and circumcision context are associated with the intergenerational transmission of female genital cutting. Importantly, the magnitude of religious differences varies across these contexts.

Female Genital Cutting in Burkina Faso

According to the most recent DHS (2003), the most reliable source of national-level estimates of cutting prevalence, 77 percent of Burkinabé women age 15–49 have experienced female genital cutting (INSD and ORC Macro 2004). The practice is geographically distributed across the entire country and is practiced by all major ethnic groups. In most cases, girls are circumcised during infancy or childhood; the modal age at circumcision among circumcised adult women in the DHS was during infancy, and 90 percent of circumcised women had been cut at or before age 10 (INSD and ORC Macro 2004; U.S. Department of State 2001).

The government of Burkina Faso has opposed female genital cutting since the 1983 revolution that established the current republic. Early opposition consisted of efforts to educate the population about the negative consequences of the practice. In 1990, the National Committee Against the Practice of FGM/C (Comité National de Lutte Contre la

Pratique de l'Excision, CNLPE) was established as an NGO to promote abandonment of the tradition, and the CNLPE was integrated into the government as a funded secretariat in 1997 (Population Council 2008). In 1996, a law criminalizing female circumcision was passed in Burkina Faso. This law has been accompanied by public education and outreach campaigns through schools, community and religious leaders, and the media.

Opposition to female genital cutting is based in both human rights concerns and the health consequences of the practice. The human rights perspective has opposed cutting on several bases: gender equity, bodily autonomy (emphasizing the practice on children too young to consent), and "physical and mental integrity" (e.g., UNICEF 2005; WHO 2008). Research on the health consequences associated with cutting demonstrates negative effects, both immediate and long term. In the short term, female circumcision can cause severe pain, hemorrhage, and infection. The long-term effects of cutting include obstetric complications that are associated with higher risk of maternal and infant mortality, including scar formation, obstruction of the vaginal opening, fistula, chronic pelvic infections, and prolonged labor (WHO Study Group 2006), bringing female genital cutting to the forefront of efforts to reach the Millennium Development Goals (UNFPA 2009; Walsh 2010).

Explaining Religious Variation in Female Genital Cutting in Burkina Faso

Burkina Faso lies between the highly Islamized countries of the Sahel (e.g., Mali, Niger) and coastal West Africa, where Muslim populations are sizable but smaller. Approximately 60 percent of adult women in Burkina Faso are Muslim, 23 percent Catholic, 5 percent Protestant, and 10 percent belong to traditional (i.e., pre-Islamic) religions (INSD and ORC Macro 2004). The correlation between religion and ethnicity is low in Burkina Faso relative to other African countries, such as Kenya or Nigeria, where religious affiliation is closely linked to ethnic identity. Most of the major ethnic groups have at least a substantial minority of Muslims (ranging from 20 percent to 70 percent), and only the nomadic Peul and Touareg ethnic groups, which together make up only 7 percent of the population, are over 80 percent Muslim. Female genital cutting is most common among Muslims – about 82 percent of adult Muslim women are cut –but is widespread among Christians (68 percent) and practitioners of traditional religions (73 percent) as well.

The most basic approach to religious differences in Africa focuses on identifying distinctions between practitioners of traditional religion[2], Muslims, and Christians. There are three main approaches to identifying and explaining the observed religious differences in cutting practices. The first focuses on compositional differences, noting that socioeconomic characteristics may be responsible for what appear to be religious patterns. A second approach examines particularized theologies to examine how specific beliefs about circumcision may influence intentions and behaviors. A third approach views religion not primarily as a definable set of beliefs and practices but as a collectively constructed group identity.

[2]Traditional religion is often referred to as animism, but that term is technically inaccurate for describing the most common forms of pre-colonial religion. Pre-colonial West African religions tended to be monotheistic, focused on a single creator that later assumed a position of neutrality vis-à-vis humans.

The histories of both Christianity and Islam in West Africa are complex, and their trajectories have had important implications for the distribution of resources within the societies they met. Though far from static, economic and educational opportunities in Africa have long been funneled through religious channels. Early on (circa 1000 AD), for example, associating with Islam offered black African merchants clear advantages for engaging in commerce with their North African counterparts. Islam was a bridge to commerce and literacy; it was connected to urban life and the rule of law. When French colonizers arrived in Burkina Faso in the nineteenth and early twentieth centuries, Catholicism was the religion of the colonial government, and Catholic schools were the primary path to social mobility.[3]

These facts are relevant for female circumcision practices today because religiously-based differences in socioeconomic status may account for some of what appear to be religious differences in female genital cutting practices. Previous research has consistently found a negative relationship between education and various dimensions of circumcision. Women with higher levels of education are more likely to report that they oppose the continuation of female genital cutting and less likely to have circumcised daughters (Boyle, McMorris, and Gómez 2002; Caldwell, Orubuloye and Caldwell 1997; El-Gibaly et al. 2002; Hayford 2005; Yount 2002). This negative relationship between education and female genital cutting has been documented across East and West African countries and in Egypt; it is present both in countries where cutting is prevalent and where the practice is rare. The relationship between other socioeconomic characteristics and behaviors and attitudes related to female genital cutting is less clear. While some studies show that girls in wealthy households are less likely to be circumcised, others show no relationship between economic status and female genital cutting (Boyle, McMorris, and Gómez 2002; Hayford 2005; Yount 2002). Findings regarding urban residence are similarly variable (Caldwell, Orubuloye, and Caldwell 1997; Carr 1997; Yoder, Abderrahim, and Zhuzuni 2004; Yount 2002).

Religious doctrine specific to female genital cutting may contribute to differences in circumcision practices, but the determination of religious doctrine is not always straightforward. With regard to Islam, for instance, some readings of the hadith suggest that Islam requires female genital cutting. However, this interpretation is debated by contemporary religious leaders who disagree about whether Islam requires, encourages, permits, or discourages the practice (Gruenbaum 2001; Yount 2004). Christian views on female circumcision are also contentious. The Bible provides neither prohibitions against nor support for the practice. Institutionally, however, Christian missionaries have been waging campaigns against female circumcision for more than a century – a focal point of their broader opposition to a host of “unchristian” traditional practices (West and Dube 2000). In many parts of Africa, missionaries made converts promise not to circumcise their daughters as a pre-requisite for full-membership or baptism (Murray 1976). Despite strong informal (and predominantly western) opposition to cutting, female circumcision is practiced among Christians across Africa, for example in Egypt, Ethiopia, Sudan, and throughout coastal West Africa (Yoder, Abderrahim, and Zhuzuni 2004).

[3]Note that these patterns differ between French West Africa and the former British colonies of the region, where Protestant mission stations controlled most of the educational opportunities and had a more sweeping impact on the religious landscape.

Because indigenous West African religions are not based on founding texts, determining "formal" doctrine is difficult. "Tradition" and "religion" have been reported as local explanations for the continuation of female genital cutting (e.g., Gruenbaum 2001; Orubuloye, Caldwell, and Caldwell 2000). Whether and to what extent particular traditional religions in Burkina Faso mandate female genital cutting, however, remains unknown.

Towards a Contextual Approach to Religion and to Cutting

The distribution of female genital cutting across African countries demonstrates that the association between religion and circumcision varies across nations (Carr 1997; PRB 2001; Yoder, Abderrahim, and Zhuzuni 2004). Prior research identifies variation in circumcision norms at much smaller levels of aggregation as well; even neighboring villages may have different values and practices regarding female genital cutting (e.g., Gruenbaum 2001: Ch. 4; Leonard 2000). Female genital cutting is, fundamentally, a collective practice tied to goals like maintaining identities and regulating a marriage market (Mackie 1996, 2000). Thus, the persistence of female genital cutting is likely to be determined by a combination of individual characteristics and group-level properties.

In line with the characteristics and beliefs hypotheses discussed in the previous section and evidence from prior empirical research, we expect to observe the following associations between individual-level factors:

> H1: Circumcision of daughters will be more prevalent among Muslims and practitioners of traditional religion in Burkina Faso than among Christians.
>
> H2: Apparent religious differences in the intergenerational transmission of circumcision are partially explained by socioeconomic characteristics.
>
> H3: Beliefs that circumcision is a religious requirement will positively predict this practice.

Additionally, we borrow from theories that emphasize the salience of context to hypothesize about the role of religion as a motivation for female genital cutting in Burkina Faso. Theories about the construction of group identity hold relevance for understanding why religion matters for female genital cutting. Distinctions between groups are created through boundary-setting practices that define who is in and who is out (Schwalbe and Mason-Schrock 1996). Social interactionist perspectives on industrialized societies focus on boundaries that are largely symbolic, but other boundaries are material in nature. Female circumcision, for example, is a physical marker of a social community as defined by a marriage market. Thus, the presence of a circumcising group may increase the likelihood that women will circumcise their daughters, even for individuals who do not belong to the circumcising group(s) themselves. While beliefs need not be dismissed as completely immaterial in this perspective, their salience is secondary.

> H4: Living in communities with high proportions of Christian women will be negatively associated with daughters' circumcision, and living in communities with high proportions of Muslims will be positively associated with daughters' circumcision.

Second, we build on convention theory (Mackie 1996, 2000) – one of the leading theories for understanding change in cutting practices. Convention theory holds that changes in the practice of female genital cutting can only take place collectively. Because cutting is seen as a prerequisite for marriage, individual parents who buck local circumcision norms exclude their daughters from the marriage market. This outcome will be seen as unacceptable as long as marriage is necessary for full social adulthood. Through this view, circumcision practices can only change when there is a critical mass of local support – enough to ensure that uncircumcised daughters will be able to find willing husbands. According to convention theory, the circumcision context is fundamental to an individual woman's decision about whether or not to circumcise a daughter. Furthermore, this line of thinking leads us to expect the impact of context to be non-linear in nature.

> H5: Women living in communities with high prevalence of circumcision will be more likely to circumcise their daughters, net of their own characteristics. The effects of community circumcision norms will be strongest at high prevalence levels.

Importantly, this line of thinking also implies that the association between individual characteristics and the intergenerational transmission of female genital cutting is a contingent one. Convention theory implies that circumcision only becomes subject to individual decision-making when prevalence is low enough to allow social acceptance of uncircumcised daughters (Mackie 1996, 2000). In particular, religious identity may be more salient in communities where some daughters are not circumcised. Yount (2004) argues that cutting, like veiling, is a strategic use of gender symbols to articulate the religious identity of a group. In Egypt, her empirical case, Yount concludes that during the past 30 years, Islamic ideology hindered the declines in cutting, while sustained Christian opposition to the practice had the opposite effect. According to this view, collective identities defined in opposition to non-circumcising groups are the motor propelling the practice of female genital cutting forward despite widespread discouragement of the practice.

> H6: The relationship between individual religious identity and female circumcision is stronger in communities with low circumcision prevalence than in communities with high circumcision prevalence.

We focus on individual interpretations of religious prescriptions as a key measure of religious doctrine and measure the contribution of these interpretations to religious differences in female genital cutting. In addition to assessing compositional explanations for religious differences in circumcision practices, we examine local variation in differences, with a focus on the conditions under which beliefs are differently associated with intentions.

Methods

Data

We use data from the 2003 Demographic and Health Survey for Burkina Faso. The DHS are a set of nationally-representative surveys of women of reproductive age conducted in more than 75 countries worldwide. The surveys are largely standardized across countries and include information on household structure and sociodemographic characteristics,

reproductive history, child health, and health knowledge and behaviors. The most recent Burkina Faso DHS was conducted in 2003 by the National Institute of Statistics and Demography (Institut National de la Statistique et de la Démographie, INSD) with support from the Ministry of Health, financing from the Ministry of the Economy and Development, and technical assistance from ORC-Macro. Like other DHS surveys, the 2003 DHS in Burkina Faso used a two-stage sampling procedure. Using data from the national census conducted in 1996, the country's thirteen regions were divided into urban and rural areas. Within each of the resulting 26 enumeration zones, sample areas ("clusters") were selected with probability proportional to size. Sample households were then randomly selected within clusters. Of the 9470 selected households, 9149 were located during data collection. Ninety-nine percent of located households were surveyed for an N of 9097. In each household, all women between the ages of 15 and 49 were eligible for the survey, a total of 12,952 women. The response rate for women in surveyed households was 96 percent, resulting in a final sample size of 12,477 women in the 400 sample clusters. All interviews were conducted in person by trained interviewers. Further information and details of the questionnaire are available at http://www.measuredhs.com/pubs/pdf/FR154/FR154.pdf.

Because the DHS sample clusters may include more than one village, cluster-level measurements may not accurately represent community effects. This distortion would bias the community effects found in these analyses toward zero. Thus, findings on the magnitude of correlation within communities are conservative. However, previous research suggests that the DHS sample clusters do allow for meaningful analysis of community effects. For instance, Kravdal (2002), using DHS data to analyze the influence of community-level education on fertility, tested and confirmed the hypothesis that cluster averages can be used as proxies for community levels of various characteristics. Kohler and colleagues (2000) found qualitatively similar results for community effects on family planning using data from the Kenya DHS and from a village-based survey. We therefore treat cluster-level measures as approximations of community characteristics.

We focus primarily on the module of the DHS devoted to female genital cutting. In this section, women were first asked whether they had ever heard of genital cutting. They were then asked whether they themselves had been circumcised, and if so at what age. Women with living daughters were asked whether their daughters were circumcised. Unlike previous DHS, where women were asked about the circumcision status of a reference daughter (usually the youngest daughter), respondents in the 2003 Burkina Faso survey were asked about all daughters. Women with living daughters were asked if any of their daughters were circumcised; if they responded affirmatively, they were asked how many were circumcised as well as details about the most recent circumcision. If no daughters were circumcised, they were asked if they planned to have their daughters cut in the future. Women who had some circumcised daughters were not asked if they planned to have their remaining daughters cut. After these specific questions a more general set of questions was asked regarding attitudes toward circumcision, in particular about religious requirements for circumcision, and positive and negative aspects of the practice.

In general, DHS data are regarded as highly reliable. To our knowledge, however, there has been no systematic review of the quality of data collected by DHS on female genital cutting,

either in general or specifically for Burkina Faso.[4] Few women refused to answer the question, suggesting that the subject matter was not seen as an especially sensitive issue. Only 3 percent of the sample reported never having heard of female genital cutting; of women who had heard of it, only two women (0.02 percent) had missing responses for the question about their own circumcision. Qualitative research conducted in Burkina Faso suggests that secrecy surrounding genital cutting has increased as a result of the law against the practice passed in 1996 (Population Council 2008), so women may underreport daughters' circumcision for fear of legal repercussions. However, comparison of data from the 2003 DHS and the 1998 DHS conducted in Burkina Faso shows generally higher reported levels of circumcision for both mothers and daughters in the 2003 survey than in the 1998 survey. It may be that concern about the repercussions of reporting female circumcision diminished after high levels shortly after the law was passed in 1996; a full comparison of data from the two surveys is outside the scope of this analysis. No evidence suggests that underreporting varies by religion. Therefore, estimates of religious differences in transmission should be unbiased.

Sample construction and dependent variable

The primary outcome variable in this analysis is whether a respondent has circumcised or plans to circumcise her daughters. We concentrate on daughter's circumcision rather than respondent's circumcision to allow for better understanding of the context surrounding circumcision decisions. Since the DHS provides little information about the respondents' natal families or place of childhood residence, the impact of these characteristics on respondent's own circumcision cannot be analyzed.

To capture the intergenerational transmission of cutting for women with daughters, a single dichotomous outcome variable was constructed from questions about daughters' circumcision. Women with any circumcised daughters and women with daughters they planned to circumcise are combined into one group and assigned a value of one for the outcome variable. Women with no circumcised daughters and who did not plan to circumcise their daughters were assigned a value of zero. Counting women with some daughters cut among women who had all of their daughters cut may overstate the transmission of female genital cutting if these women had in fact changed their minds about the practice after having their older daughters cut. However, examining the distribution of the age and number of daughters for these women showed that the majority had only one daughter who was not circumcised, and that in most cases the remaining uncircumcised daughter was very young. These patterns are more consistent with the scenario that the daughters would be circumcised in the future than with the possibility that women had changed their minds. More generally, planning to have one's daughter circumcised is not an ideal measure of the intergenerational transfer of female genital cutting, since some mothers may not carry out their plans to cut and others may have their daughters cut despite their

[4]In Egypt, a follow-up study to the Egypt DHS compared women's responses to survey questions with the results of pelvic exams given by gynecologists. This study of 1,339 women found over 90 percent agreement between women's reports of their circumcision status and doctors' assessments (El-Zanaty et al. 1996; cited in Carr 1997). This study, however, was not nationally representative; the women were clients of one of a set of hospitals and clinics. It is not clear whether results from the study can be generalized to other women in Egypt or outside of Egypt.

plans not to. However, the item is a more precise measure than the more general attitude questions asked by the DHS, because it asks respondents specifically about their own daughters. In exploratory analysis, we tested multinomial logit models using "have circumcised" (about 75 percent of women who had or planned to circumcise) and "planned to circumcise" (about 25 percent of women who had or planned to circumcise) as distinct outcomes. The determinants of these two outcomes were essentially the same; we therefore use the combined dependent variable in the analyses presented here.

Because of the nature of the dependent variable, women without daughters (N=4927)[5] are excluded from the analysis. Of the 7,550 women with daughters, 294 were excluded due to missing data on dependent (N=91) or independent (N=203) variables. The final analytic sample size was 7,256 women.

Religion measures

The DHS asks only limited questions about religious affiliation. Respondents are divided into five groups: Catholics, Protestants, Muslims, traditional religions, and no religion. Separating mainline Protestants from evangelical or indigenous Christian churches is not possible; distinguishing between different Muslim brotherhoods is also not possible. Data on attendance and strength of religious belief are also not available. There are relatively few Protestants in Burkina Faso, and exploratory analyses showed no substantive differences between Catholics and Protestants in either main effects or interactions. We therefore combine Catholics and Protestants in all analyses, and use a set of four dummy variables for our primary measure of religious affiliation: Christian, Muslim, traditional religion, and no religion.

The module on female genital cutting also asks specifically about religious beliefs regarding the practice: respondents are asked whether their religion requires female circumcision[6]. Possible responses are yes, no, and don't know. We treat "don't know" responses as a distinct category, rather than combining them with either yes or no responses or excluding them as missing values. This approach posits that uncertainty about religious beliefs is a meaningful category; that is, uncertainty about doctrine leads to different behavior than either positive or negative certainty. In exploratory analysis, we tested this classification and found that modeling "don't know" responses separately increases the explanatory power of the models.

Community context

Some models also incorporate measures of community normative context related to female genital cutting and religious affiliation. The prevalence of genital cutting among adult women is an indicator of the strength of local circumcision norms and is a strong predictor

[5]Recall that the DHS interviews women age 15–49. The mean age at first birth in the sample is 19 years old. The mean age of women who do not have daughters is 19; 64% of women with no daughters have no children.

[6]Respondents who reported belonging to no religion (220 women) were also asked this question, and 7 percent of women who reported no religion also reported that their religion requires female circumcision. Respondents may answer the question about religious requirement with regard to a religion they were raised in but no longer practice. It is also possible that adherents of traditional religions may interpret the question about religious affiliation as referring to codified religions and report traditional beliefs as "no religion."

of the intergenerational transmission of female genital cutting in Kenya (Hayford 2005). The proportion of respondents in a sample cluster who had been cut is calculated as a measure of community prevalence of female circumcision. A squared term is also included to account for nonlinear effects of community circumcision prevalence. Community religious context is operationalized as the proportion of women in each cluster who report Christian, Muslim, or no religious affiliation. Models testing for nonlinear effects were estimated, but no curvilinear effects were evident. For clarity, final models do not include nonlinear terms for community religious context.

Control variables

Models include measures of individual and community sociodemographic characteristics. Previous research has shown that these sociodemographic characteristics are associated with the prevalence of female genital cutting. As a primary determinant of women's perception of the necessity of the procedure, the respondent's circumcision status is included as a control variable. In exploratory analysis, models were estimated using data only from women who were themselves circumcised; results did not differ substantively. Other controls include measures of respondent's age, education level, and household wealth; the proportion of women in the community who have gone to school; and whether the community is urban or rural.

Household wealth in poor countries is notoriously difficult to measure in large-scale surveys. In the absence of more appropriate alternatives, we use the DHS constructed wealth index score as a rough estimate of household economic status. The DHS collects data on a series of household characteristics (e.g., water supply, housing material, electricity) and possessions (e.g., bicycle, car, television) and uses these data to construct a weighted index representing household wealth (Rutstein and Johnson 2004). The resulting index score can be used to compare households' overall economic well-being. This index has been criticized for overrepresenting factors that indicate connections to a market economy while devaluing traditional sources of wealth such as land and livestock, and for neglecting intrahousehold dynamics related to the control of household resources (Bingenheimer 2007).

Model testing

Hierarchical models, also known as multilevel models, provide a framework for simultaneous estimation of both effects that are specific to individuals and effects that are common to a community. Multilevel models also estimate unbiased coefficients and standard errors; standard linear and logistic regression techniques produce biased results when observations are not independent, as is likely the case when community effects are strong. The dependent variable, whether a mother has her daughters circumcised, is dichotomous. We therefore use multilevel logistic regression methods to model categorical outcomes. For a general discussion of multilevel models, see Bryk and Raudenbush (1992) or Goldstein (1995); Guo and Zhao (2000) describe the particular case of multilevel models for dichotomous outcomes.

The statistical model used in multilevel analysis of dichotomous variables closely resembles the standard logistic regression model. As in the logistic regression model, the observed

outcome variable y_{ij}, whether respondent *i* in cluster *j* has circumcised her daughters, is assumed to have a Bernoulli distribution, with underlying probability of circumcision p_{ij}. (That is, p_{ij} is defined as the probability that $y_{ij} = 1$.) The logit function is used to relate p_{ij} to the explanatory variables:

$$\log[p_{ij}/(1-p_{ij})]=\beta_j+\beta_1 x_{1ij}+\ldots+\beta_k x_{kij}, \quad (1)$$

where β_j is the intercept, x_{kij} are the explanatory variables, and β_k are the coefficients for these variables.

Multilevel analysis differs from standard logistic regression in that community effects are explicitly represented separately from individual effects. Instead of a fixed intercept, each level two unit (here, the sample cluster) has its own intercept, β_j. This cluster-specific intercept is determined by community characteristics, but it also includes a random component:

$$\beta_j=\beta_0+\beta_1 x_{1j}+\ldots+\beta_q x_{qj}+\alpha_j. \quad (2)$$

Here, β_0 is a fixed intercept, the overall population intercept. As indicated by the *j* subscripts, the explanatory variables x_{qj} are characteristics of communities, not individuals. In this case, for example, the community-level intercept may be influenced by the average education level in the community, or by the proportion of women circumcised in the community. The coefficients for these variables are represented by β_{qj}.

The random component of the cluster intercept is α_j, a cluster-specific random variable with mean 0. There is also a random component at the individual level, ε_{ij}, associated with the binomial distribution of the dependent variable. The two random components α and ε are assumed to be uncorrelated.

The DHS sample included 12,477 women in 400 clusters. The largest cluster had 69 respondents and the smallest cluster had ten. The analytic sample consists of 7256 women. The median cluster size of respondents in the sample is 20 women. The largest cluster had 44 women, and the smallest had three women. Theoretically, the size of clusters does not matter for multilevel analysis. Individual respondents are a sample of their community; even respondents in clusters with few respondents are influenced by other (unmeasured) community members. In practice, some estimation methods can produce biased results when level two units have few individuals. To avoid this problem PROC NLMIXED in SAS is used to estimate all models. NLMIXED maximizes the actual likelihood function rather than an approximation of the likelihood function. It therefore provides accurate estimations of random effects, as well as accurate likelihood statistics that can be used to judge goodness of fit (Guo and Zhao 2000; Rodríguez and Goldman 1995; Wolfinger 1999).

Results

Descriptive statistics

Table 1 shows religious variation in the intergenerational transmission of circumcision as well as in selected sociodemographic characteristics in the analytic sample. In this population, Muslim women are more likely to circumcise their daughters than women with other religious affiliations. Of Muslim respondents, 49 percent reported that they had circumcised or planned to circumcise their daughters, compared to 38 percent of women in traditional religions, 32 percent of women reporting no religion, and 28 percent of Christian women. Muslim women are also more likely to be circumcised themselves and more likely to believe that their religion requires circumcision. Note that although these differences are substantial, religious affiliation is far from an absolute predictor of behavior. In all religious groups, less than half of daughters will be circumcised, and in all religious groups, the majority of adult women are cut. Burkina Faso is in the midst of a period of social change which will produce much lower prevalence of female genital cutting among younger generations than among their mothers.

There is also variation across religious groups in sociodemographic characteristics. Here, both Christian and Muslim women are more advantaged than women reporting traditional religion or no religion. Twenty-two percent of Christians and 17 percent of Muslims live in urban areas, compared to 1 percent of traditional religionists and 2 percent of women with no religion. More Christians (21 percent) and Muslims (11 percent) have attended school than women in traditional religions (3 percent) or women with no religion (2 percent)[7]. Christian and Muslim women also have higher than average levels of household wealth.

Associations between sociodemographic characteristics and daughters' circumcision are shown in Table 2. As with religious variation, there is substantial variation across sociodemographic characteristics in the likelihood that a woman will continue the practice with her daughters. Notably, uncircumcised women are far less likely to have their daughters cut than women who are circumcised (11 percent vs. 49 percent). Educated women are less likely than women with no education to have their daughters cut (15 percent of women with secondary education or more and 34 percent of women with primary education, compared to 44 percent of women who never attended school). Household wealth and urban residence are also negatively associated with the intergenerational transmission of female circumcision. Multivariate analyses assess the contribution of sociodemographic variation to the association between religious affiliation and circumcision practices.

Multivariate results

Multivariate results are shown in Tables 3, 4 and 5. The first three models (Table 3) show the association between individual-level characteristics and women's plans to circumcise their daughters. These nested models assess the role of individual and community socioeconomic characteristics and individual interpretations of religious doctrine related to

[7]Note the overall low levels of school attendance in this sample; Burkina Faso has one of the lowest levels of school attendance in the world (Lloyd 2005: Appendix Table 3-1). In addition, the sample is primarily composed of adult women who were school-age in earlier time periods. Schooling levels for these cohorts are lower than for children currently enrolled in school.

female genital cutting in explaining religious differences in the circumcision of daughters (Hypotheses 1, 2, 3). The second set of models (Table 4) adds measures of local context related to religion and circumcision (Hypotheses 4, 5), and the final models (Table 5) test interactions between individual and community-level characteristics (Hypothesis 6).

Table 3 presents a series of three nested models: Model 1, a baseline model including only religious affiliation; Model 2, which controls for individual and community-level sociodemographic characteristics; and Model 3, which adds individual religious beliefs. Model 1 shows the bivariate association between religious affiliation and the likelihood that a circumcised woman will pass the practice on to her daughters. Consistent with the descriptive results, this regression shows a negative association between Christian affiliation and circumcision of daughters; the odds of daughter's circumcision are 40 percent lower for Christian women than for women who practice traditional religion (the omitted category; $OR = e^{-0.47} = 0.6$). Women with no religious affiliation are less likely than women who belong to traditional religions to circumcise daughters, but this difference is not statistically different from zero. The difference between Muslim women and traditional religionists is also not statistically significant. This baseline model, then, suggests that the most salient differences in the transmission of female circumcision are between Christian women and non-Christian women, and provides only partial support for Hypothesis 1.

Model 2 adds basic sociodemographic characteristics (circumcision status, age, education, household wealth, community education, urban residence) to see if religious differences in the intergenerational transmission of female genital cutting are the result of sociodemographic differences between adherents of different religions. The relationship between sociodemographic controls and daughters' circumcision is largely consistent with the bivariate relationships shown in Table 2. Older mothers are more likely to have their daughters cut, suggesting a process of change over time as well as change across generations. In addition, women with some education are less likely to have their daughters cut. Once these characteristics are accounted for, the coefficient for Christian women is reduced in magnitude, from −0.47 (Model 1) to −0.27 (Model 2). That is, some but not all of the differences in circumcision practices between Christian women and adherents of traditional religions can be attributed to the greater wealth and higher education levels of Christian women. In contrast, we find that the sociodemographic differences between Muslim women and practitioners of traditional religion suppress the actual difference between these two groups. Muslim women, on average, are better educated, wealthier, and more likely to live in urban areas than women who belong to traditional religions (Table 1). Controlling for these differences, Muslim women are more likely to circumcise their daughters than comparable women who belong to traditional religions (b=0.34, OR=1.4). Hypothesis 2, that religious differences in daughters' circumcision are primarily due to socioeconomic characteristics and not religious beliefs or identity, is supported for differences between Christian women and practitioners of traditional religion, but not for differences between Muslims and traditional religion.

Model 3 adds a measure of specific religious belief, whether the respondent believes that her religion requires female circumcision. We measure both a positive belief and uncertainty about religious tenets regarding female circumcision. As expected, and as predicted by

Hypothesis 3, believing that circumcision is required by religion positively predicts the likelihood that daughters are circumcised (b=1.18, OR=3.3). Relative to women who say their religion does not require circumcision, women who are uncertain about religious requirements are also more likely to have their daughters circumcised (b=0.44, OR=1.5). Additional tests show that the difference between "yes" and "don't know" responses to the question about religious requirements for circumcision is statistically significant. Controlling for specific religious beliefs attenuates some of the religion coefficients relative to Model 2. Differences between Christian women and women who practice traditional religion are reduced to near zero (b=−0.04) and are not statistically significant once religious beliefs about female circumcision are accounted for. Differences in the circumcision of daughters between non-Muslim religious groups in Burkina Faso can therefore be attributed to a combination of sociodemographic differences and religious beliefs relating to female circumcision.

However, differences between Muslims and those practicing traditional religion remain large and statistically significant even when religious beliefs are accounted for (b=0.35, OR=1.4). In fact, controlling for specific religious beliefs marginally *increases* the difference between Muslim women and practitioners of traditional religion. Although Muslim women are more likely than women who belong to traditional religions to say that their religion requires circumcision (Table 1), these beliefs do not explain their greater propensity to pass the practice on to their daughters.

Adding additional control variables in Models 2 and 3, including measures of community characteristics, somewhat reduces the level two (between-cluster) variance relative to the baseline model (0.55 in Model 3 compared to 0.78 in Model 1). In all models, the variance is statistically different from zero. Using the formula rho = $s^2/(s^2 + \pi^2/3)$ to calculate the intraclass correlation coefficient rho (Guo and Zhao 2000), this level two variance implies that about 16 percent of the remaining unexplained variation in Model 3 is between clusters rather than within clusters. The next set of models (Table 4) introduces community level measures of the religious composition of the community (Model 4) and prevalence of female genital cutting (Model 5). For ease of comparison, results from Model 3 are shown in Table 4 as well as Table 3. The level two variance continues to decrease as these additional community-level characteristics are added to the model, to .38 (10 percent of remaining unexplained variance between clusters) in Model 5.

Controlling for community religious context explains most of the difference in daughters' circumcision between Muslim women and traditional religionists. In Model 4, which controls for the percent of women in the community who are Christian, Muslim, and report no religion, the coefficient for individual Muslim affiliation is near zero and not statistically significant (b=.08). However, the community-level religious variables are related to women's plans for daughters' circumcision, as predicted by Hypothesis 4. As the proportion of Muslim women in a community increases, the likelihood that women will circumcise their daughters increases, regardless of women's individual religious affiliation and beliefs. For each 10 percent increase in the proportion of women who are Muslim, the odds that women will circumcise their daughters increase by about 10 percent (b=0.86; $e^{(0.86/10)}$=1.1).

Model 5 controls for the prevalence of circumcision as well as religious composition of the community. (The correlations between religious composition and circumcision norms in this sample are moderate. For example, the correlation between community proportion Muslim and community proportion circumcised is .35.) Results from this model suggest that the association between the proportion of women in the community who are Muslim and mothers' circumcision decisions is only partly mediated by circumcision norms in the community. When controlling for circumcision prevalence, the coefficient for percent Muslim drops by about one third, but is still statistically different from zero. Consistent with Hypothesis 5, Model 5 shows a strong but nonlinear association between community circumcision prevalence and individual women's behavior regarding their daughters' circumcision. Figure 1 shows this nonlinear relationship by graphing predicted probabilities for daughters' circumcision in communities with different levels of mothers' circumcision. (All other variables are set to the mean or mode in the analytic sample.) In communities where few women are circumcised, the probability of daughters' circumcision is low, and increases only minimally as the community circumcision prevalence increases. In communities where many women are circumcised, the probability of daughters' circumcision increases sharply with community prevalence.

To test Hypothesis 6, we estimated a model including interactions between individual-level religious affiliation and community circumcision prevalence. Results from this model are shown in Table 5 (coefficients) and Figure 2 (predicted probabilities; variables aside from religion and circumcision prevalence set to sample average). Hypothesis 6 proposed that the magnitude of the difference across individual religious affiliation would vary according to the community circumcision context. This hypothesis is supported for Muslim women and for women who report no religious affiliation, but interactions between religious affiliation and circumcision prevalence are not statistically significant for Christian women.

For Muslim women, the interaction between religious affiliation and proportion of the community that is circumcised is negative and large in magnitude relative to the main effect for Muslim affiliation. As shown in Figure 2, this interaction results in a larger difference between Muslim women and adherents of traditional religions in low-circumcising communities than in high-prevalence communities. More generally, religious differences in daughters' circumcision are larger in low-prevalence communities. In fact, there is little difference in the probability of daughters' circumcision between Christians, Muslims, and adherents of traditional religions in high-prevalence communities. For women who report no religion, the probability of daughters' circumcision changes little as community circumcision prevalence increases, and the probability decreases rather than increases. These interactions suggest that the intergenerational transmission of female circumcision is less sensitive to community circumcision norms for Muslim women and women with no religion than for adherents of traditional religions. Alternatively, the results also indicate that religious identity is more salient for circumcision decisions in low-prevalence communities than in high-prevalence communities.

Discussion and Conclusions

This article examines the relationship between religious affiliation and the intergenerational transmission of female genital cutting in Burkina Faso, a religiously diverse West African country. Because of its importance in the delineation of adult identity and of social group membership, and its history of appropriation in colonial conflicts in some places where it is practiced, female genital cutting has strong symbolic meaning both for those who practice it and those who do not. This symbolic meaning has been tied to religious identity – most commonly Muslim identity – in some countries (e.g., Yount 2004). But the connection is context-specific, and variation in the connection, like variation in female circumcision more generally, is not well understood.

The substantial differences between Burkinabé Christians, Muslims, and adherents of traditional religions in education, wealth, and other sociodemographic characteristics do little to explain differences across religious groups in the practice of female circumcision. In fact, some religious differences in the transmission of female genital cutting are larger once sociodemographic differences are taken into account. Respondents' religious beliefs regarding female circumcision are more important than sociodemographic factors in explaining circumcision behavior. Controlling for these beliefs reduced differences between Christians and practitioners of traditional religions to a statistically nonsignificant level. That is, differences between Christians and traditional religionists are largely mediated by aspects of religious identity specific to genital cutting. It is striking that controlling for specific religious beliefs does not attenuate differences between Muslim women and women who belong to traditional religions. Among the religious affiliations included in this analysis, Islam has the strongest formal doctrinal support for female circumcision, and Muslim women in this sample are the most likely to report that their religion requires circumcision. Yet differences between Muslims and other groups are the least sensitive to controlling for specific religious beliefs.

The link between religious affiliation and female circumcision is neither clearly defined nor universal. There is debate over the origins of the practice, but the consensus is that female genital cutting did not originate as an Islamic practice and in fact predates Islam (see Shell-Duncan and Hernlund 2000 for an overview of origin theories). The variation we find in the strength and direction of the association between religious affiliation and female genital cutting indicates that the association between Islam and the practice of female genital cutting does not result from a universally applicable religious belief; rather, it exists and persists in part because of culturally specific interpretations of religious identity. Even in the absence of formal religious doctrine, female circumcision may be *understood* as a religious practice for those who practice it. Evidence suggests that some women who practice genital cutting interpret and explain it as a Muslim custom (Boddy 2007; Johnson 2000). Our findings, in particular the positive association between the proportion of Muslim women in a community and the likelihood that mothers in that community will have their daughters circumcised, suggest the importance of a collective rather than individual Muslim identity for the continuation of the practice.

Results demonstrate the importance of individual interpretations of religious doctrine. Individual respondents' belief in the religious requirement for female genital cutting explains circumcision of daughters even in the absence of consensus in religious beliefs. At the same time, the context-dependence of religious differences in circumcision behavior highlights the collective aspects of religious identity. In communities where a high proportion of adult women are cut, Muslim women are not more likely to circumcise their daughters than women with other religious affiliations. Religion's role in circumcision decisions is most salient in communities with lower circumcision prevalence. These findings provide support for convention theory. Local circumcision prevalence has a strong impact on both the intergenerational transmission of female genital cutting and religious differences; in fact, this impact is larger than some effects of other community characteristics, such as religious composition. Results also suggest that further development of convention theory is needed to fully account for heterogeneity in circumcision beliefs and practices. Female genital cutting appears to be more persistent among some groups than among others, and a generalized decline may not be sufficient to produce a "tipping point" among groups more attached to the practice. It is possible that female genital practices are important as a way of defining a distinct identity for Muslims in Burkina Faso, and that this role becomes more central as the prevalence of the practice declines among other groups. Institutional religious structures, such as schools and congregations, may also play a larger role in sustaining female genital cutting among Muslims than among other religious groups.

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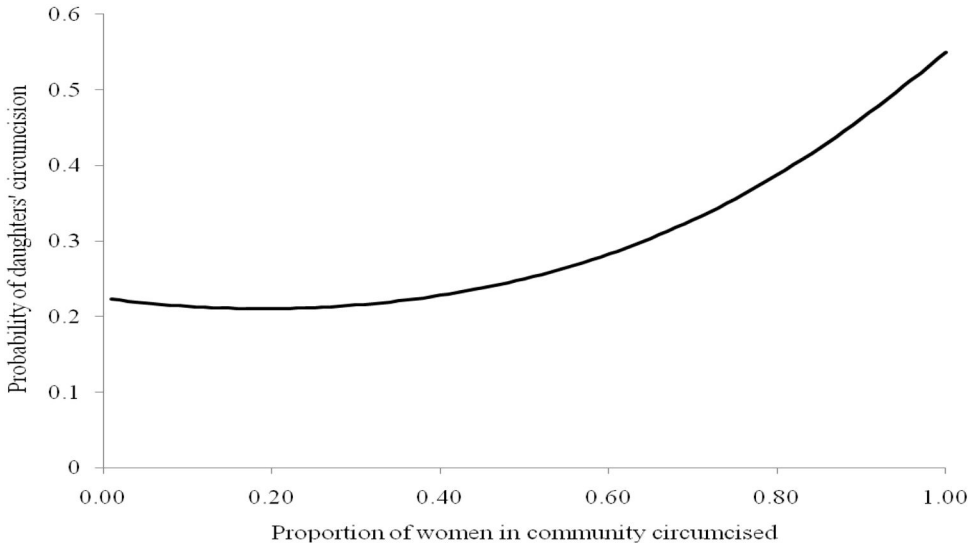

Figure 1.

Predicted probability of daughters' circumcision according to community circumcision prevalence

Source: Burkina Faso DHS, 2003. Predicted probabilities based on Model 5, Table 4. All characteristics besides community circumcision prevalence set at sample average.

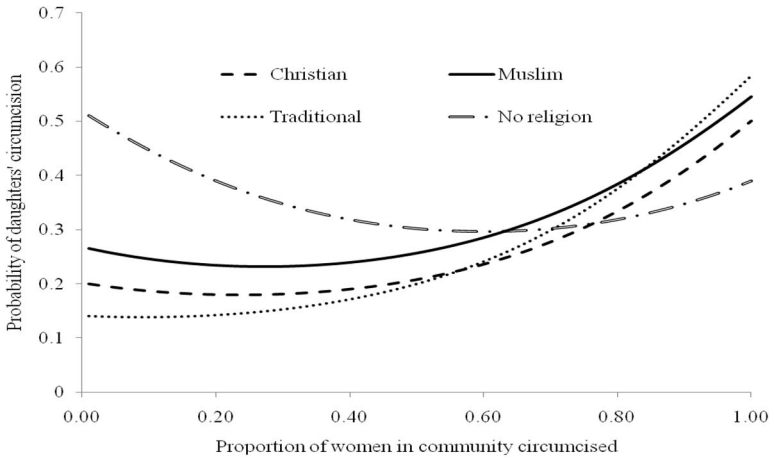

Figure 2.

Predicted probability of daughters' circumcision according to religious affiliation and community circumcision prevalence.

Source: Burkina Faso DHS, 2003. Predicted probabilities based on Model 6, Table 5. All characteristics besides religious affiliation and community circumcision prevalence set at sample average.

Table 1

Religious variation in circumcision behavior and selected characteristics

	Total sample	Christian	Muslim	Traditional	No religion
N	7256	2020	4084	1004	148
Proportion of women with daughters circumcised or planned	.42	.28	.49	.38	.32
Proportion of women circumcised	.83	.76	.87	.78	.74
Proportion believing a religious imperative for circumcision	.21	.06	.29	.18	.05
Proportion who don't know whether religion requires circumcision	.11	.07	.12	.11	.31
Proportion with any formal schooling	.12	.21	.11	.03	.02
Mean wealth index	−.93	.40	−.52	−5.51	−5.88
Proportion urban residents	.16	.22	.17	.01	.02

Source: Burkina Faso DHS, 2003. Analytic sample is women with at least one daughter and with non-missing values for independent and dependent variables. All proportions weighted.

Table 2

Proportion of respondents who have or plan to circumcise daughters, by specified characteristics

	N	Proportion of women with daughters circumcised or planned
	7256	.42
Religion		
Christian	2020	.28
Muslim	4084	.49
Traditional religion	1004	.38
No religion	148	.32
Circumcision status		
Uncircumcised	1367	.11
Circumcised	5889	.49
Age in years		
15–19	214	.37
20–24	997	.32
25–29	1420	.31
30–34	1290	.37
35–39	1302	.49
40–44	1092	.52
45–49	941	.58
Education		
No formal schooling	6319	.44
Primary school	640	.34
Secondary or higher	297	.15
Household wealth quintile		
Poorest	1285	.45
Poorer	1431	.43
Middle	1830	.42
Richer	1290	.46
Richest	1420	.34
Area of residence		
Rural	5854	.44
Urban	1402	.34
Religious imperative for circumcision?		
Yes	1406	.67
Don’t know	711	.46
No	5139	.34

Source: Burkina Faso DHS, 2003. Analytic sample is women with at least one daughter and with non-missing values for independent variables. All propotions weighted.

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Table 3

Multi-level models predicting daughters' circumcision based on mother's characteristics

	Model 1		Model 2		Model 3	
	b	**SE**	**b**	**SE**	**b**	**SE**
Intercept	−.50	.10***	−2.68	.15***	−2.97	.15***
Religion (omitted = traditional)						
Christian	−.47	.11***	−.27	.11*	−.04	.12
Muslim	.17	.11	.34	.11***	.35	.11***
No religion	−.09	.21	−.10	.22	.02	.22
Circumcised			1.80	.10***	1.70	.10***
Age (centered at 25)			.06	.00***	.06	.00***
Education (omitted = no formal schooling)						
Primary school			−.23	.11*	−.25	.11*
Secondary school or higher			−.89	.20***	−.81	.20***
Wealth index factor score			−.02	.01**	−.02	.01***
Proportion of women in community who ever attended school			−.03	.41	−.03	.40
Urban			.15	.22	.13	.21
Circumcision required by religion? (omitted = no)						
Don't know					1.18	.08***
Yes					.44	.10***
Level 2 variance	.78	.09***	.62	.07***	.55	.07***
−2 log likelihood	9002		8239		7991	

Source: Burkina Faso DHS, 2003. Women with at least one daughter and with non-missing values for independent variables. N=7256.

* p < .05;

** p < .01;

*** p < .001 (two-tailed tests).

Table 4

Multi-level models predicting daughters' circumcision based on mother's characteristics and community circumcision context

	Model 3		Model 4		Model 5	
	b	**SE**	**b**	**SE**	**b**	**SE**
Intercept	−2.97	.15***	−3.34	.25***	−3.85	.40***
Religion (omitted = traditional/animist)						
Christian	−.04	.12	−.12	.13	−.13	.13
Muslim	.35	.11**	.08	.13	.09	.13
No religion	.02	.22	−.01	.23	−.05	.23
Circumcised	1.70	.10***	1.69	.10***	1.47	.11***
Age (centered at 25)	.06	.00***	.06	.00***	.06	.00***
Education (omitted = no formal schooling)						
Primary school	−.25	.11*	−.27	.11*	−.27	.11*
Secondary school or higher	−.81	.20***	−.83	.20***	−.80	.20***
Wealth index factor score	−.02	.01***	−.02	.01***	−.02	.01***
Percent of women in community who ever attended school	−.03	.40	.24	.42	.67	.39
Urban	.12	.21	.03	.21	−.09	.19
Circumcision required by religion? (omitted = no)						
Yes	1.18	.08***	1.16	.08***	1.19	.08***
Don't know	.43	.10***	.43	.10***	.42	.10***
Religious composition of community (omitted=proportion traditional religion)						
Proportion Christian			.10	.32	.14	.30
Proportion Muslim			.86	.28**	.56	.27*
Proportion no religion			1.20	1.21	2.16	1.11+
Proportion circumcised					−.88	1.07
Proportion circumcised squared					2.32	.82**
Level 2 variance	.55	.07***	.53	.07***	.38	.05***
−2 log likelihood	7991		7969		7889	

Source: Burkina Faso DHS, 2003. Women with at least one daughter and with non-missing values for independent variables. N=7256.

+ p<.10;

* p < .05;

** p < .01;

*** p < .001 (two-tailed tests).

Table 5

Multi-level models predicting daughters' circumcision including interactions between individual and community characteristics

	Model 6	
	b	**SE**
Intercept	−4.29	.50***
Religion (omitted = traditional/animist)		
Christian	.43	.41
Muslim	.80	.42
No religion	1.88	.76*
Circumcised	1.46	.11***
Age (centered at 25)	.06	.00***
Education (omitted = no formal schooling)		
Primary school	−.27	.11*
Secondary school or higher	−.80	.20***
Wealth index factor score	−.02	.01***
Percent of women in community who ever attended school	.62	.39
Urban	−.06	.20
Circumcision required by religion? (omitted = no)		
Yes	1.18	.08***
Don't know	.41	.10***
Religious composition of community (omitted=proportion traditional religion)		
Proportion Christian	.11	.30
Proportion Muslim	.54	.27*
Proportion no religion	1.94	1.13
Proportion circumcised	−.47	1.16
Proportion circumcised squared	2.61	.84**
Religion x proportion circumcised interactions		
Christian	−.76	.53
Muslim	−.95	.52+
No religion	−2.66	1.04*
Level 2 variance	.39	.06***
−2 log likelihood	7881	

Source: Burkina Faso DHS, 2003. Women with at least one daughter and with non-missing values for independent variables. N=7256

+ p<.10;

* p < .05;

** p < .01;

*** p < .001 (two-tailed tests).