Arch Sex Behav
DOI 10.1007/s10508-008-9395-0

ORIGINAL PAPER

Changes in the Timing of Sexual Initiation Among Young Muslim and Christian Women in Nigeria

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Received: 5 October 2007 / Revised: 17 April 2008 / Accepted: 17 April 2008

Abstract Sexual initiation during adolescence has important demographic and health consequences for a population, yet no systematic analysis of changes in the timing of sexual initiation has been conducted in Nigeria. Two rounds of national surveys conducted in 1990 and 2003 were used to examine changes in the timing of sexual initiation among female adolescents in Nigeria. Multivariate survival analysis using Cox proportional hazards models was used to assess changes in the risk of sexual initiation and to identify the correlates of first sex. Contrary to what has been reported in several Nigerian studies, there was no decline in age at first sex among Christian adolescents. Age at first sex did not change significantly for Christian adolescents, although premarital sex appears to have increased–primarily due to an increase in the age at marriage. Age at first sex did increase among Muslim women. Premarital sex remained low among Muslim women. A number of socioeconomic variables were associated with the timing of sexual initiation. Weekly exposure to the mass media was associated with earlier sexual initiation. The degree to which an environment was liberal or restrictive was a key determinant of the timing of sexual initiation in Nigeria. The findings also illustrate the important role of socioeconomic factors in determining the timing of sexual initiation in Nigeria. As secondary education increases in Northern Nigeria, additional increases in the age at sexual debut are likely among Muslim women. The study raises concerns about the influence of the mass media on the timing of first sex in Nigeria. The evidence of an absence of changes in the timing of sexual initiation among Christian women in more than a decade implies that programs which aim to delay the timing of sexual initiation in Southern Nigeria may have limited success. With age at marriage already high among Christian women, programs that focus on abstinence until marriage may also be pursuing an approach with limited chances of success.

Keywords Sexual initiation · Adolescents · Nigeria · Muslims · Christians

Introduction

The timing of sexual initiation has important demographic and health consequences. Early sexual debut increases the risk of unprotected intercourse, multiple partnerships, and sexually transmitted infections (Blanc & Way, 1998). Younger ages at sexual initiation are associated with a longer period of exposure to the risk of conception, higher fertility, and higher population growth rates (Menken, 1980; Senderowitz & Paxman, 1985). Adolescent pregnancy is associated with adverse health outcomes, including pregnancy-related complications, unsafe abortion and maternal death (McCauley & Salter, 1995). Multi-country studies that have examined changes in the timing of adolescent sexual initiation in sub-Saharan Africa have found a wide range of country experiences. In three studies, about half of the countries examined in sub-Saharan Africa showed declines in having had sexual intercourse by age 18, while the rest either showed no change or an increase in having had sexual intercourse by age 18 (Blanc & Way, 1998; Gupta & Mahy, 2003; Mensch, Grant, & Blanc, 2005).

Since the focus of most previous studies has been on overall changes in age at first sex, little attention has been paid to changes in the timing of sexual initiation among subpopulations within countries. One study, however, showed that differentials in the timing of first sex among sub-

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populations within a country may be profound (Meekers, 1994). In Nigeria, by 1990, there was a 3 year difference in the median age at first sex of Muslim and Christian women: in 1990, the median age at first sex was 15 years for women in the North and 18 years for women in the South (Federal Office of Statistics and Macro International, 1992).

Nigerian Muslim and Christian population are characterized by substantial differences in values, beliefs, family formation, and sexual behavior patterns (Barker & Rich, 1992; Makinwa-Adebusoye, 1992). It is known that cultural differences between Muslims and Christians lead to distinctly different patterns of early childbearing (Barker & Rich, 1992), yet no previous study has examined how the timing of sexual initiation has changed for Christians and Muslims. The Nigerian literature has focused predominantly on factors associated with sexual initiation among Christian women living in Southern parts of Nigeria (Makinwa-Adebusoye, 1992). This literature considers Westernization and the associated loss of community control over young women's sexuality as the primary force driving more liberal sexual attitudes and behavior including premarital sex. Surprisingly, a very different trend of increasing Islamization that has spread across the Northern Muslim states and its consequences has been almost entirely ignored in the demographic literature.

The effective implementation of reproductive health programs requires an understanding both of changes that have occurred in the timing of sexual initiation among Christians and Muslims and of the factors associated with early first sex. This study examined changes in the timing of first sex in Nigeria after taking into account a range of variables that influence sexual initiation. The study asked two main questions: Has the timing of sexual initiation among Muslims and Christians in Nigeria changed since 1990? Which are the correlates of sexual initiation among Muslims and Christians in Nigeria?

Background

Several studies have suggested that a dramatic decline in age at first sex has occurred in Nigeria (Abdulkarim, Mokuolu, & Adeniyi, 2003; Orji & Esimai, 2005). These studies have been based on data from single-round cross-sectional samples of Christian adolescent women living in Southern Nigeria (e.g., Otoide, Oronsaye, & Okonofua, 2001; Owolabi, Onayade, Ogunlola, Ogunniyi, & Kuti, 2005). No analysis of changes in age at first sex that uses nationally representative data is available in the published literature. Moreover, there is no information on whether changes in age at first sex have been experienced by Muslim adolescent women. About half of the Nigerian population is comprised of Muslims, about 40% is comprised of Christians, and the remainder practice traditional religions or no religion (Nigeria, 2004).

In the last several decades, important social changes have occurred among the Christian population of Nigeria. Female education and exposure to Western values through mass media have increased (Owuamanam, 1982). There have been declines in the proportion marrying and increases in the age at first marriage (Isiugo-Abanihe, 2000; Omideyi, 1986; Otite, 1991). High levels of premarital sexual activity have been noted among Christian women (Oronsaye & Odiase, 1983; Ware, 1976) but it is not known whether this is because of a decline in age at first sex or a rise in age at first marriage (Isiugo-Abanihe, Ebigbola, & Adewuyi, 1993). The occurrence of unplanned premarital pregnancies has also been documented (Alade, 1989; Meniru, 1996; Oyedeji, 1984). Changes in the sexual behavior of young Christian women are thought to reflect a reduction in family control over young women's sexuality resulting from an erosion of traditional practices (Feyisetan & Pebley, 1989). Greater independence from family control is evident in urban areas, as influences outside the family have become particularly important in these areas (Barker & Rich, 1992; Isiugo-Abanihe et al., 1993).

By contrast with Christianity, Nigerian Islam is characterized by a high level of control over the sexual behavior of women. In Northern Nigeria, there is a long tradition of segregating schoolchildren by gender, although this has generally been enforced locally rather than at a statewide level. Low levels of enrollment of female children and subsequent low educational achievement of Muslim women has contributed towards the maintenance of gender segregation. Other aspects of social and cultural life have also been segregated along gender lines. The Islamic religious ideal of Muslim women marrying as virgins (Meekers, 1994) acts as a strategy which protects against premarital sex. Early marriage is seen as protection against the risk of having sex before marriage (Makinwa-Adebusoye, 1992). Opportunities for social interaction among unmarried or unrelated male and female adolescents are limited. Muslim codes of behavior prevalent in Northern Nigerian restrict indulgence in Western entertainment and fashion: nightclubs, movie theaters, and restaurants are rarely found in Northern Nigeria (Nigeria, 2006). In recent years, gender segregation has acquired a more formal overtone. After the introduction of *Sharia*[1] law in

[1] *Sharia*, or "the path to a watering hole," offers guidelines for everyday life, including prayers and donations to the poor. Sharia prescribes modesty in dress and behavior for both men and women and has been interpreted to insist on single-sex schools and transportation. Several factors determine the underpinnings of Islamic law. The Koran (the Islamic holy text), the Sunna (the prophet Muhammed's teachings), and Muslim scholars' legal rulings all contribute to the collective body of laws known as *Sharia*. The laws contain violations known as "Hadd" offenses, which include sexual intercourse outside of marriage, alcohol consumption, highway robbery, theft, and murder. With the proper evidence, sexual offenses can carry a sentence of stoning to death or flogging. Theft can be punished by the loss of a hand. In Northern Nigeria, the Islamic code had been practiced for centuries until the region came under British rule in the early 1900s. During colonial times, the British allowed the use of *Sharia* in Nigeria but did not permit the

Northern Nigeria in 2000, two out of 12 Northern states codified gender segregation in schools while a third state implemented the *hijab* (Nigeria, 2004). Under *Sharia* law, the lack of adherence to social and religious tenets of Islam regarding sexual behavior can be met with severe physical punishment. Although capital punishment in cases of adultery has not been carried out (Nigeria, 2004), it has contributed to an environment of greater restrictiveness in male and female interactions. The lack of information about their bodies and about reproductive processes is particularly pronounced among Muslim women. In focus group discussions with Muslims, adolescent girls reported not having known about menstruation prior to experiencing their first period (Barker & Rich, 1992).

Adolescents' access to information regarding sexuality and reproductive process is limited both in the North and the South and the information available is often incorrect (Arowojolu, 2002; Makinwa-Adebusoye, 1992). Peers are the primary source of information, followed by the mass media (Barker & Rich, 1992; Cole, 1998; Makinwa-Adebusoye, 1992). There are concerns that the quality of information provided on sexual behavior through the mass media is poor and encourages sexual experimentation and earlier initiation of sexual activity (Cole, 1998). Exposure to Western models of behavior through the mass media is an important influence on Nigerian adolescents (Barker & Rich, 1992).

Changes in attitudes towards sexual behavior have moved in opposite directions in Northern and Southern Nigeria. Attitudes towards premarital sex have become less restrictive among Christians and more restrictive among Muslims. Because of high levels of female school attendance and more liberal social mores, opportunities for interaction between unmarried males and females are considerably greater in Christian areas, leading Christian school teachers to be supportive of the teaching of sex education in schools (Olukoya, Oyedeji, & Johnson, 1992). An important reflection of more liberal attitudes towards sexual behavior in Christian communities is the attitudes and beliefs of respective religious leaders: most Christian religious leaders support contraception while most Muslim religious leaders oppose it (Orubuloye, Caldwell, & Caldwell, 1993). In general, Christians have more liberal attitudes towards the use of contraception than Muslims (Owie, 1983).

Footnote 1 continued
enforcement of amputations or executions as punishments. After independence from Britain, Nigerian leaders suppressed the use of *Sharia* penalties, fearing they would inflame tensions between Muslims in the north and Christians in the south. In general, Nigerian military leaders established secular courts with British common law as their foundation. Although Christians are not subject to *Sharia* law, its use in the northern states has created an atmosphere of unease and intimidation among religious groups, often leading to violence (Hoch, 2003).

Adolescents' surroundings can have a profound influence on their reproductive health behavior (Gupta & Mahy, 2003). This study evaluated changes in the timing of sexual initiation among Christians and Muslims in Nigeria in light of the different patterns of social change that have occurred among these communities. The study takes into account a range of factors which have been identified as being associated with sexual initiation in Nigeria, including region of residence, residence in urban/rural areas, female headship of households, poverty, educational achievement, work status, ethnicity and mass media exposure (Abdulkarim et al., 2003; Amoran, Onadeko, & Adeniyi, 2005; Barker & Rich, 1992; Cole, 1998; Isiugo-Abanihe, 1994; Makinwa-Adebusoye, 1992; Slap et al., 2003).

Method

Participants and Procedure

The data for this analysis come from two national surveys implemented in 1990 and 2003. Both surveys were implemented as joint projects of the Federal Government of Nigeria and the United States Agency for International Development (USAID), as part of USAID's efforts to assist countries worldwide in conducting surveys to obtain key population and health indicators.

The 1990 Nigerian Demographic and Health Survey (1990 NDHS) is a nationally representative sample survey designed to collect data on the socioeconomic characteristics and reproductive behavior of Nigerian women aged 15–49. The national master sample used by the Federal Office of Statistics was used to draw 299 sample enumeration areas (EA) for the NDHS. Urban areas were over-sampled twofold and weights were created to adjust the sample. A complete listing of households was conducted in each selected EA. A total of 9,200 eligible women were identified from the 8,999 households interviewed. A total of 8,781 eligible women were successfully interviewed, with a response rate of 95% (Federal Office of Statistics and Macro International 1992). Fieldwork was conducted from April to October 1990. Women aged 15–19 in the 1990 NDHS were included in this analysis.

The 2003 Nigeria Demographic and Health Survey (2003 NDHS) is the most recent nationally representative reproductive health survey conducted in Nigeria. The 2003 NDHS also collected information on the reproductive behavior of Nigerian women aged 15–49. The composition of the field teams was similar to that in 1990. The National Population Commission (NPC) used a list of EAs developed from the 1991 population census to select 365 EAs. Urban areas were over-sampled and weights were created to adjust the sample. A total of 7,985 eligible women were identified from 7,225 households interviewed. Interviews were successfully completed with 7,620 eligible women, with a response rate of 95%

(National Population Commission (NPC) Nigeria and ORC Macro, 2004). The field work for the 2003 NDHS was conducted between March and August 2003. Women 15–19 in the 2003 NDHS were included in this analysis.

Measures

The instruments used for the 1990 and 2003 surveys were adapted from the DHS model B questionnaires, used for countries with low levels of contraceptive use. Both surveys included the household questionnaire and the individual woman questionnaire. The purpose of the household questionnaire was to identify women eligible for the individual questionnaire. Both questionnaires were translated and pre-tested in the major local languages prior to survey implementation.

The variables of interest for this study were obtained from the individual questionnaire. The dependent variables for this analysis were obtained from a question in the section on marriage in the individual woman's questionnaire: "How old were you when you first had sexual intercourse (if ever)?" Participants who had never had sexual intercourse were coded as "0". Participants were permitted to report that their first sexual intercourse occurred at first union. Ages at first union were obtained from an earlier question: "How old were you when you started living with your (first) husband or partner?" For a participant whose first sexual intercourse occurred at first union, age at first sex was taken from age at first union. The continuous variable, age at first sex, was used as the dependent variable.

A total of 9 independent variables were included in the analysis. A majority of the independent variables were obtained from the section on participant's background characteristics. Current place of residence in urban or rural areas was used. Region of residence identified the geographic region in which the participant was interviewed. This was coded as North or South for the analysis. A variable measuring sex of the head of the household was available in the individual woman's data file from a question asked in the household questionnaire. Participants were asked whether they were currently working, aside from their housework. Educational level was determined by asking a participant if they had ever attended school and the highest level of school attended. To determine religious affiliation, participants were asked what religion they belonged to. The response options included Muslim, Catholic, Protestant, traditional religion, and other.

To measure household wealth, an index was created from amenities (the availability of piped water, flush toilet, electricity, cement floor) and possessions (refrigerator, bicycle, motorcycle, car). There was a slight change between the two surveys in the questions on women's work. In the 1990 questionnaire, women were asked "As you know, many women work, I mean aside from doing their own housework. Some take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. Are you currently doing any such work?" In 2003, women were asked "Aside from your housework, are you currently working?"

Less than 3% of participants belonged to a traditional or other religion. Since the focus of the study was on Muslims and Christians, participants who reported traditional religions/other were not included in the analysis. Cases with missing information on the dependent variable, age at first sex, were removed from the analysis. In total, this meant that about 5% women 15–19 were not included in this analysis. The analysis presented in this paper is based on a total of 1,495 Muslim and 1,824 Christian female adolescents.

Both surveys were subject to some of the same limitations that are inherent to other large scale surveys, including concerns about the validity of self-reports of sexual initiation. Consistency checks, such as between age at first sex and age at first conception, were applied to the data. The data were examined for consistency in the patterns of relationships between the dependent and independent variables across both survey rounds and by Muslim and Christian strata. Overall, the data appeared to be of fairly good quality.

Statistical Analysis

Several studies have examined changes in the timing of sexual initiation across age cohorts using one round of a cross-sectional data set (e.g., Blanc & Way, 1998; Mensch et al., 2005). A superior approach is to use data from two rounds of national surveys and to control for a range of variables associated with sexual initiation (Gupta & Mahy, 2003).

The analysis was conducted at the bivariate and multivariate levels. Chi-square tests of independence were conducted for categorical variables and *t*-tests for continuous variables. For the multivariate analysis, current age was retained as a continuous variable and dummy variables were created from categorical independent variables. Cox Proportional Hazards was used to model age at first sex. The Cox Proportional Hazard model gives the relative hazard or the hazard ratio (HR). Age at first marriage was included in the analysis as a time-varying covariate. To adjust standard errors around parameter estimates for clustered data, the Huber-White estimator of variance was used. Confidence intervals around parameter estimates are shown in the tables. The proportional hazards assumption was tested using the scaled Schoenfeld residuals.

Results

Changes in Characteristics of the Christian and Muslim Populations

Changes in population characteristics, such as increases in urbanization, secondary education, work outside the house,

and exposure to mass media, may increase sexual initiation during adolescence. Table 1 shows characteristics of Christian and Muslim women aged 15–19 in 1990 and 2003. In 1990, 91% of young Christian women lived in the Southern half of Nigeria. Over time, the Christian population appears to have become more dispersed: by 2003, 74% of Christian women lived in the South. In other words, about a quarter of Christian women were living in Northern Nigeria by 2003. This is consistent with patterns of internal migration in Nigeria, which show that a large number of Southern migrants have settled in cities in Northern Nigeria (Nigeria, 2007). By contrast, Muslim women became more concentrated in the Northern half of Nigeria: 89% of Muslim women lived in Northern Nigeria in 2003, compared to 83% in 1990. The proportion of young Christian women who lived in urban areas did not change significantly, with about one-third of young Christian women living in urban Nigeria in 2003. Urbanization increased among Muslims, with the proportion of Muslim adolescents who lived in urban areas increasing from 28% to 34%. The mean ages of Christian and Muslim

Table 1 Characteristics of Christian and Muslim women aged 15–19

	Christian				Muslim			
	1990 (n = 873)	2003 (n = 951)	Chi-sq (df)	p-value	1990 (n = 726)	2003 (n = 769)	Chi-sq (df)	p-value
Region								
South	90.6%	73.9%	83.2 (1)	<.001	16.9%	11.4%	8.9 (1)	.003
North	9.4%	26.1%			83.1%	88.6%		
Place of residence								
Rural	69.4%	65.8%	2.5 (1)	ns	72.0%	65.7%	6.6 (1)	.010
Urban	30.6%	34.2%			28.0%	34.3%		
Mean age	16.9	17.1	2.0[a]	.049	16.7	16.9	2.2[a]	.024
Head of household								
Male	80.2%	77.9%	1.3 (1)	ns	94.0%	90.1%	7.4 (1)	.007
Female	19.8%	22.1%			6.0%	9.9%		
Number of Assets/amenities	2.2	2.6	5.2[a]	<.001	1.7	1.9	3.2[a]	.001
Education								
Less than secondary	49.9%	25.4%	111.7 (1)	<.001	84.5%	76.9%	13.3 (1)	<.001
Secondary or higher	50.1%	74.6%			15.5%	23.1%		
Currently working								
No	78.4	80.3	0.9 (1)	ns	68.0	70.2	.9 (1)	ns
Yes	21.6	19.7			32.0	29.8		
Weekly mass media exposure								
No weekly exposure	28.9%	29.9%	0.2 (1)	ns	48.1%	39.0%	12.3 (1)	<.001
Weekly television or radio exposure	71.1%	70.1%			51.9%	61.0%		
Ethnicity								
Yoruba	18.2%	11.6%	45.7 (4)	<.001	16.3%	10.6%	36.1 (3)	<.001
Hausa	–	–			50.0%	62.3%		
Igbo	28.5%	28.0%			–	–		
Efik	18.4%	13.3%			–	–		
Tiv	5.3%	3.7%			–	–		
Kanuri	–	–			4.2%	6.9%		
Other ethnicity	29.5%	43.3%			29.5%	20.2%		
Ever married								
No	84.2%	91.7%	23.4 (1)	<.001	34.8%	38.9%	2.7 (1)	.102
Yes	15.8%	8.3%			65.2%	61.1%		
Ever had sex								
No	60.8	61.9	0.2 (1)	ns	27.4%	34.7%	8.9 (1)	.003
Yes	39.2	38.1			72.6%	65.3%		

[a] t-test

women were about 17 years, with ages being slightly higher in the 2003 sample.

A substantial proportion of Christian adolescents, about one-fifth, lived in female-headed households. The proportion of Muslim adolescents who lived in female-headed households was 6% in 1990 and increased to 10% by 2003. The number of household assets/amenities, a crude measure of wealth, increased from 2.2 to 2.6 in Christian households and from 1.7 to 1.9 in Muslim households.

By 1990, secondary education was common among Christian women: about 50% of Christian adolescents had obtained secondary or higher education. The level of secondary education among Christian adolescents increased to 75% by 2003. By contrast, the level of secondary education was quite low among Muslim adolescents: only 15% of Muslim adolescents had obtained secondary or higher education by 1990. In spite of a significant increase between the two surveys, less than a quarter of Muslim adolescents had obtained secondary or higher education by 2003. Consistent with their higher educational achievement compared to Muslims, a lower proportion of Christian adolescents were employed at the time of the survey: one-fifth of Christian and about one-third of Muslim adolescents reported being employed.

There was no change in Christian adolescents' exposure to the mass media: weekly exposure to the radio or the television remained at about 70%. Muslim adolescents' weekly exposure to the mass media increased from 52% in 1990 to 61% in 2003. There were some changes in the ethnic composition of the Christian and Muslim samples. In 2003, a higher proportion of Christian adolescents belonged to "other" ethnicities, while a higher proportion of Muslims belonged to the Hausa ethnic group.

There were substantial differences between Christians and Muslims in the levels of adolescent marriage and premarital sex. About 16% of Christian adolescents were ever-married in 1990. This percentage dropped to 8% by 2003. About 40% of Christian adolescents reported having had sex, a proportion that was considerably larger than the proportion married. The gap between being married and being sexually active grew among Christian adolescents, indicating a rise in level of premarital sexual activity between 1990 and 2003. By contrast, more than 60% of Muslim adolescents were ever-married in both years. The proportion of Muslim adolescents who reported ever having sex declined from 73% in 1990 to 65% in 2003. This indicates that premarital sexual activity occurred to a lesser extent among Muslim women and declined between 1990 and 2003.

Premarital Sex

Figure 1 shows the percentage of Christian adolescents who were ever married and the percentage of adolescents who had ever had sex by single years of age in 1990 and in 2003. The line graphs shows that, between 1990 and 2003, there was a widening of the gap between ever having had sex and ever having been married at each year of age. This gap widened primarily because of the decline in the proportion of Christian women who were married at each year of age.

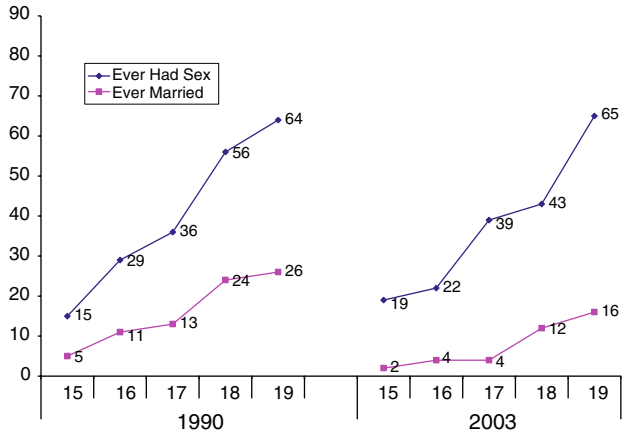

Fig. 1 Percentage of women ever married and percentage who have ever had sex, 1990 and 2003, Christian women

Figure 2 shows the percentage of Muslim adolescents who were ever married and the percentage of adolescents who had ever had sex by single years of age in 1990 and 2003. Among the youngest Muslim women, those who were age 15, there was a decline in the proportion who had ever had sex: 43% of 15-year old Muslim women had had sex in 2003 compared with 65% in 1990. The line graphs show that the gap between being ever-married and having ever had sex became slightly narrower between 1990 and 2003 for all age groups, suggesting a decline in premarital sexual activity among Muslim adolescents.

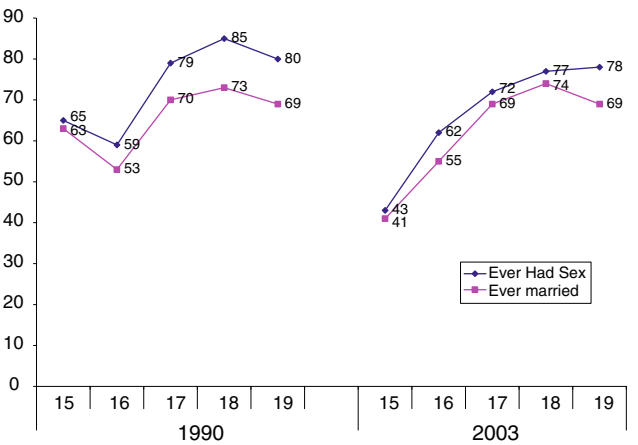

Fig. 2 Percentage of women ever married and percentage who have ever had sex, 1990 and 2003, Muslim women

Multivariate Analysis

Christian Women

Table 2 shows the relative hazard of sexual initiation for adolescent Christian women. HRs from Cox regression show the associations between region, urban residence, being part of a female-headed household, wealth, secondary education, current work status, ethnicity, exposure to mass media, age at marriage, and the time to sexual initiation.

The dummy variable for survey period was not significant, indicating that there was no significant change in the timing of sexual initiation among Christian adolescents. The variable for region showed a HR of 0.76. This indicates that living in the Muslim-dominated North was associated with a delay in Christian adolescents' time to first sex. Urban residence was associated with earlier sexual initiation (HR, 1.27). Living in a female-headed household was not associated with the timing of sexual initiation. Greater household wealth was associated with the delayed sexual initiation of young Christian women (HR, 0.91). Having secondary or higher education was not associated with the timing of sexual initiation. Working outside the house reduced the time to first sex (HR, 1.77). Ethnicity was associated with time to first sex: the Efik and Tiv were more likely to initiate sex at earlier ages than the Yoruba (HR of 2.11 and 2.88, respectively). Adolescents who were exposed to the mass media on a weekly basis were more likely to initiate sex at earlier ages (HR, 1.41). Age at marriage was associated with the timing of sexual initiation: adolescents who married later were more likely to delay sexual initiation (HR, 0.98).

Table 2 Relative hazard of sexual initiation for Christian adolescents (Cox regression results)

	Adjusted hazard ratio (n = 1,824)	95% CI for adjusted hazard ratio
Survey period		
Earlier survey (REF)	1.00	
Later survey	0.91	0.76–1.09
Region		
South (REF)	1.00	
North	0.76	0.59–0.98
Place of residence		
Rural (REF)	1.00	
Urban	1.27	1.04–1.55
Head of household		
Male (REF)	1.00	
Female	1.07	0.89–1.30
Number of Assets/amenities	0.91	0.86–0.97
Education		
<secondary (REF)	1.00	
Secondary+	1.03	0.84–1.25
Currently working		
No (REF)	1.00	
Yes	1.77	1.47–2.14
Ethnicity		
Yoruba (REF)	1.00	
Hausa	–	–
Igbo	1.05	0.80–1.39
Efik	2.11	1.52–2.91
Tiv	2.88	2.00–4.17
Kanuri	–	–
Other ethnicity	1.87	1.43–2.43
Weekly mass media exposure		
No weekly exposure (REF)	1.00	
Weekly television or radio exposure	1.41	1.16–1.72
Age at marriage	0.98	0.98–0.99

Note: REF is the reference value

Muslim Women

Table 3 shows the relative hazard of sexual initiation for Muslim women. The dummy variable for survey period showed a HR of 0.77, indicating that there was a significant delay in the timing of sexual initiation of Muslim women between the two surveys. Residence in the South or in urban areas was not associated with time to first sex. Being part of a female headed household was also not associated with the timing of sexual initiation.

Wealth was associated with time to first sex: Muslim women living in households with a larger number of assets/amenities were more likely to delay sexual initiation (HR, 0.95).

Secondary education had a powerful effect on a Muslim woman's hazard of having first sex: there was a substantial delay in the timing of sexual initiation among women with secondary or higher education (HR, 0.53). Working outside the house was associated with earlier sexual initiation (HR, 1.13). After controlling for other variables, ethnicity was not associated with the timing of first sex. Frequent exposure to the mass media was associated with earlier sexual initiation: adolescent women who were exposed to the radio or television on a weekly basis were more likely to initiate sex at earlier ages (HR, 1.17). An older age at marriage delayed the age at which an adolescent had first intercourse (HR, 0.93).

Discussion

Most previous studies of sexual initiation in Nigeria have been based on small samples and have examined the sexual behavior of Christian women living in parts of Southern

Table 3 Relative hazard of sexual initiation for Muslim adolescents (Cox regression results)

	Adjusted hazard ratio (n = 1,495)	95% CI for adjusted hazard ratio
Survey Period		
Earlier survey (REF)	1.00	
Later survey	0.77	0.68–0.87
Region		
South (REF)	1.00	
North	1.03	0.69–1.55
Place of residence		
Rural (REF)	1.00	
Urban	0.91	0.79–1.05
Head of household		
Male (REF)	1.00	
Female	1.12	0.87–1.44
Number of Assets/amenities	0.95	0.91–0.99
Education		
<secondary (REF)	1.00	
Secondary+	0.53	0.40–0.68
Currently working		
No (REF)	1.00	
Yes	1.13	1.00–1.27
Ethnicity		
Yoruba (REF)	1.00	
Hausa	1.20	0.79–1.84
Igbo	–	–
Efik	–	–
Tiv	–	–
Kanuri	1.30	0.79–2.16
Other ethnicity	0.98	0.63–1.52
Weekly mass media exposure		
No weekly exposure (REF)	1.00	
Weekly television or radio exposure	1.17	1.03–1.32
Age at marriage	0.93	0.92–0.94

Note: REF is the reference value

Nigeria (Makinwa-Adebusoye, 1992). This is perhaps the first study to use nationally representative data from Nigeria to examine changes in the timing of sexual initiation for both Christian and Muslim female adolescents. The context in which sexual initiation occurs in Nigeria is very different for Muslim and Christian women: marriage occurs early among Muslims and first sex occurs predominantly in the context of marriage; age at marriage is considerably higher among Christian adolescents and is rising, contributing to an increase in the initiation of first sex outside marriage. Social changes promoting more liberal attitudes towards sexual behavior have occurred in Southern Nigeria and community control over the sexual behavior of Christian adolescents has declined (Feyisetan & Pebley, 1989). By contrast, greater social control has been exercised over the sexual behavior of young Muslim women as the process of Islamization has unfolded in Northern Nigeria.

Contrary to the findings of several earlier studies which were not based on nationally representative samples, our findings show that there was no change in the timing of first sex among Christian female adolescents between 1990 and 2003. Due to the rising age at marriage and more liberal attitudes towards sexual behavior, however, premarital sexual activity appears to have increased among Christian adolescents. The timing of first sex did change among Muslim adolescents: by 2003, Muslim adolescents initiated sex at later ages. In addition, premarital sexual activity among Muslim adolescents appears to have declined between 1990 and 2003.

These findings can be interpreted in light of one of the dominant hypothesis explaining changes in sexual initiation among African adolescents. This hypothesis states that as exposure to Western values has increased, attitudes towards sexual behavior have become more liberal. At the same time, education has contributed to a rising age at marriage. With a decline in the degree of control exercised by elders and the community over female sexual behavior, and with an increase in the period between marriage and puberty premarital sexual activity has increased (Meekers, 1994). The "Westernization" hypothesis certainly explains the behavior of Christian adolescents in Nigeria who appear to engage in higher levels of premarital sex—largely due to the decline in age at marriage. The influence of liberal attitudes towards sexual behavior is particularly evident in urban areas of the South, where adolescent females initiate sex at earlier ages: opportunities for interaction with members of the opposite sex are higher and social controls more lenient in urban areas of Southern Nigeria.

By contrast, the context of sexual behavior has become more conservative in the predominantly Muslim North, which has experienced a growth in restrictive religious values. With the imposition of *Sharia* Law in Northern Nigeria, Muslim communities have exercised stricter control over the sexual behavior of adolescent women. Levels of marriage have remained high, with more than 50% of Muslim female adolescents married by age 16 and premarital sexual activity has remained low. However, some influence of exposure to Western values is discernible on adolescents in the North and is reflected in the effects of mass media on the timing of sexual initiation.

The findings of this study suggest that being part of Muslim culture protects against the influence of a more liberal social environment on the timing sexual initiation. If the sexual initiation of Muslim adolescents were influenced by living in the more liberal environment of the South, we would have

expected differences in the timing of first sex between Muslims living in the North and Muslims living in the South. In actual fact, cultural ideals regarding the appropriate age for marriage may be more important in determining the timing of sexual initiation among Muslim females than social influences such as the availability of opportunities for interaction between members of the opposite sex. The lack of an association between urban residence and the timing of first sex among Muslim adolescents also suggests that social controls over female sexuality have remained strong in urban areas of Northern Nigeria.

Socioeconomic and mass media exposure variables had, in general, a similar direction of influence on the timing of first sex among Christians and Muslims. Higher household wealth was associated with a delay in the timing of first sex. This is consistent with the findings from previous studies. Work outside the home reduced time to first sex. This is probably because of the increased opportunity for interaction with members of the opposite sex in the work environment and because of reduced parental monitoring. Mass media is a major source of information regarding sexual behavior in Nigeria (Barker & Rich, 1992; Cole, 1998; Makinwa-Adebusoye, 1992) and appears to increase the likelihood of initiating sex at earlier ages among both Christians and Muslims. Studies have suggested the media exposure provides an important context for adolescent sexual socialization: adolescents who perceive greater support for adolescent sexual activity in the media or who are exposed to more sexual content in the media are more likely to report intentions to have sexual activity (L'Engle, Brown, & Kenneavy, 2006).

The effect of education on sexual initiation was different among Muslims and Christians. Secondary education had a powerful effect on the timing of sexual initiation of Muslim women, and delayed the time to first sex. Secondary education has remained relatively uncommon among Muslim women: in 2003 only 23% of Muslim women had obtained secondary education. Muslim adolescents with secondary or higher education probably belonged to households where opportunities for the development of personal capacities were more highly valued and where there was less emphasis on early marriage. Many parents in Northern Nigeria marry their daughters in the year following completion of primary school (Barker & Rich, 1992). The majority of Christian women had obtained secondary or higher education by 2003: secondary education did not differentiate Christian adolescents in terms of the timing of first sex.

An important finding of this study was the increase in age at first sex among Muslim women, independent of changes in age at first marriage. In order to ensure control and to prevent potential sexual misconduct, marriage usually occurs early for Hausa girls, frequently before menarche. Girls are commonly married between the ages of 12 and 14 (Longhurst, 1982; Rehan, 1984). The widespread introduction of western schooling in 1976, especially universal primary education, began to postpone marriage for girls (Callaway, 1984). Although religious marriage may occur very early, cohabitation may not take place until several months or years later, especially when the bride has not reached puberty (van de Walle & Lardoux, 2005). If she is still very young at the time that she begins living in her husband's home, an adolescent may spend nights with her mother-in-law for several months or years until she is considered old enough for the marriage to be consummated (Lardoux, 2005). It is probable that the increase in age at first sex among Muslim women is a function of universal primary education in Northern Nigeria changing attitudes towards the age at which it is appropriate for marriage consummation to take place.

Several important implications emerge for reproductive health programs as a result of this study. Evidence of stagnation in the age at first sex of Christian adolescents over more than a decade suggests that this variable may be a particularly difficult one for programs to influence. Given that the age at marriage is high and rising among Christian adolescents, programs may also be hard-pressed to convince adolescents to abstain from sex until marriage. These findings imply a very important role for programs that enhance the skills of adolescents to negotiate safer sex practices, including the use of condoms.

This study had the same limitations as other studies based on reports of sexual behavior. The lack of data on male sexual behavior is another important limitation of this study. Although the extent to which reports of sexual behavior are biased remains unknown (Singh, Wulf, Samara, & Cuca, 2000), some caution should be exercised in reviewing these findings. Several strengths of this study should be noted. The approach employed in this study is stronger than one used by many previous studies which have compared the timing of sexual initiation among different age cohorts by using a single cross-sectional data set. By using data collected 13 years apart, this study is more likely to reflect period effects. In addition, by limiting the analysis to adolescents 15–19, this study is much less likely to suffer from recall bias than studies that have looked at women 15–49. Recall bias is more prevalent among older age groups (Gupta & Mahy, 2003). Finally, the inclusion of age at first marriage as a time-varying covariate and a range of other variables enables the evaluation of changes in the timing of first sex that are independent of changes in other variables known to influence sexual initiation.

Acknowledgments This paper was made possible by support from the Agency for International Development (USAID) to MEASURE *Evaluation* under Cooperative Agreement No. GPO-A–00-03-00003-00. The author is grateful to Ilene Speizer and Dominique Meekers for reviewing an earlier version of this paper.

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