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Internal Migration and Sexual Initiation among Never Married Youths in Nigeria

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Abstract

The high rates of youth migration to urban and economic centers, in the context of persistent poverty and devastating HIV/AIDS burden, raises intricate social policy challenges in developing countries. This study examines patterns of internal migration and sexual initiation among Nigerian youths, using the 2003 Nigeria DHS data, descriptive statistics, Kaplan-Meier survival curves and discrete-time hazard regression models. Migrants generally show stronger association than non-migrants, and urban-urban migrants show the strongest independent association to early sexual initiation. These outcomes underscore that loss of social capital and exposure to sexually lenient urban environment increase youth's propensity to sexual engagement. Other significant covariates are age, gender, ethnic origin, education, independent living arrangement and formal employment. The findings highlight the inadequacy of policy perspectives that neglect complex contextual nuances across groups and the need to address limited livelihood opportunities that fuel youth migration to urban destinations.

Keywords

Internal Migration; Sexual Initiation; Youths; Nigeria; sub-Saharan Africa

INTRODUCTION

Background to the study

A corpus of research in Africa has drawn attention to the increasing prevalence of early sexual relationships over time (Adedimeji, 2005; Isiugo-Abanihe & Oyediran, 2004; Blanc & Way, 1998). Issues relating to early initiation of sexual activities have generated particular interests following findings that the timing of first sexual intercourse is highly associated with exposure to sexually transmitted diseases (STDs) and HIV/AIDS, human papilloma virus (HPV) and precancerous changes of the cervix, use of contraception, pregnancy and pregnancy complications (Gage, 1998; Blum, 2002, Isiugo-Abanihe &

Oyediran, 2004). It is estimated that as many as 60 per cent of all pregnancies and births by adolescents in developing countries are unintended and early pregnancy can compromise young women's health through childbearing or unsafe abortion (Onifade, 1999). Researchers report of millions of young people contracting sexually transmitted diseases annually, which lead to decline in health, possible infertility, and a cofactor in HIV transmission (CDC, 2007; Fleming and Wasserheit, 1999). Further, HIV/AIDS is seen as a disease of young people, with approximately half of all HIV infections shown to occur in men and women less than 25 years of age. In many developing countries, recent evidence indicate that up to 60 per cent of all new HIV infections are among 15-24 year olds, with females outnumbering males by a ratio of 2 to 1 (UNFPA, 2003).

The increased sexual activity of youths in developing countries is explained as a logical consequence of rising age at marriage, increased schooling rates, the falling age at puberty, the penetration of Western mass media and entertainment, increasingly common ideas about individualism, and the erosion of traditional social controls (NCRIM, 2005; Bongaarts & Cohen, 1998). There is however, a dearth of nationwide research in sub-Saharan Africa that directly connects youth migration to their reproductive behavior. But evidence from other places, particularly the United States, has underscored the linkages between youth geographical mobility, problematic sexual behaviors, and health outcomes (Stack, 1994; Landsdale & Oropesa, 2001). Central to this linkage are the social disruptions, which characterize migration and the relationships between migration and behavioral change for migrants and non-migrants. In particular, studies on the impact of social control factors on young people's sexual involvements, such as religious systems (Beck et al. 1991; Davidson & Leslie, 1977), socioeconomic class position, and family bonds (Miller & Moore, 1990; Clayton & Bokemeier, 1980; Davidson & Leslie, 1977), have argued for migration as an index of weakened social control, which can fracture bonds of integration at family and community levels (Stack, 1994). The weakening of bonds to conventional institutions is in turn associated with enhanced probability of deviant behavior (Sampson & Laub, 1993; Vold & Bernard, 1986). Further, population migration has been a strongly implicated theme in the discussion of the HIV/AIDS epidemic, and a few but growing body of studies, mostly in Eastern and Southern Africa, have recognized geographic mobility as one of the main facilitating conditions for HIV transmission (Lurie, 2006; Brockerhoff & Biddlecom, 1999; Hunt, 1989). Moreover, the massive migration of young and unmarried adults from presumably conservative rural environments to more sexually permissive African cities in recent years has been suggested as partly responsible for the much higher AIDS seroprevalence levels observed in urban than rural areas (Brockerhoff & Biddlecom, 1999; United Nations, 1994). The dynamics of transmission becomes more complex as frequent movements between cities, towns and the home villages remain the norm for many urban migrants in the region (Andersson, 2001; Gugler, 1991; Smith, 1999). This pattern of circulation complicates the direction of the influence of migration in both urban and rural areas, with migrants' status associated with higher propensity to engage in sexual practices that elevate their risk of acquiring HIV/AIDS (Lurie, 2006; Lurie et al. 1997; Caldwell et al. 1997; Chirwa, 1997). Migrants exposed to the urban environment are associated with increased likelihood of high-risk sexual behavior when they return to rural areas following

their urban socialization to less restrictive sexual norms or through their acquisition of enabling characteristics such as wealth (Brockerhoff & Biddlecom, 1999).

Building on the foregoing, we examine the linkages between the internal migration of never married Nigerian youths and their propensity to engage in early sexual initiation. The significance of understanding these linkages in Nigeria is premised on its demographic profile, whose key features include an unprecedented growth of young people, their high rate of migration to urban and economic centers, the rapid pace of socio-cultural change, and the increased policy and program attention on young people in the wake of the devastating effects of the HIV/AIDS epidemic in the region (NRCIM, 2005; Isiugo-Abanihe & Oyediran, 2004; UN-HABITAT, 2003). The focus on never married youths is premised on the fact that marriage remains the socially approved point of entry into a sexual union in the country. Consequently marriage protects sexual engagement of young people and potential aftermaths, primarily pregnancy and childbearing. In contrast, premarital sexual engagement and related outcomes have been associated with particular health and psychosocial problems (Amobi & Igwegbe, 2004; Frautschi et al. 1994; Gorgen et al. 1993; Lema et al. 1991). In Nigeria for instance, single and unmarried women disproportionately suffer violence such as beating and verbal abuse from family members, with most young women experiencing major stressors as premature school and job termination, partner's negative attitudes, religious sanction, discrimination and stigmatization (Amobi & Igwegbe, 2004).

Nigeria, Migration and Reproductive Behavior of Youth

Nigeria, with a population of 140 million, is the most populous country in Africa and the tenth most populous in the world (Population and Development Review, 2007). The median age of the country's population is about 17.4 years, with over 45 percent aged 0-14, and about 63 percent less than 25 years (Isiugo-Abanihe, 2003). Data on migration in Nigeria is generally scanty, but estimates indicated that about 44 per cent of the population live in urban areas in 2006, and projected to reach 55.5 per cent by 2015 (PRB, 2006; United Nations, 2003). Ekpunobi (2003) suggests that the population of Abuja the national capital triples every year, in the fastest process of urbanization in West Africa. Similarly, Lagos, with an estimated population of 13.2 million in 2003 and an estimated annual growth rate of 4 percent is projected to have 24 million persons by 2020 (World Bank, 1999). Evidence from Nigeria identified young men and women aged 15-29 as the most likely to migrate from rural areas to economic centers in search of livelihood opportunities (Adedimeji, 2005; NISER, 1997; Smith, 2004a). A 1993 national representative migration survey identifies about 58 per-cent of the 85,777 sample population as lifetime migrants (defined as those who have lived or are living outside their places of origin for at least six months), with 28 percent of all migrants aged 15-24 (NISER, 1997).

Competing traditional and modern values have created strong contentions around premarital sexuality in Nigeria. Ethnographic and demographic studies have shown significant variation between parental, family, and religious assertions that premarital sexual intercourse is immoral and perspectives of peers and broader social forces that equate premarital sexual engagement with modern, educated, and sophisticated lifestyles (Smith, 2000, 2003). While these views will continue to generate wider discussions about social

change and sexuality, the reality is that premarital sexual relationships are increasingly common in contemporary Nigeria. Unmarried youths in the country are increasingly linked to risky sexual behaviors such as casual sex and multiple partnerships, some of whom may include commercial sex workers (Isiugo-Abanihe, 2003; Arowujolu et al. 2002; Smith, 2000). Such behaviors carry significant implications for reproductive health in the country and current prognosis of the situation is hardly optimistic. The current HIV/AIDS prevalence rate is 5 percent with about 3 million adults living with HIV/AIDS. Other estimates confirm rising rates of HIV prevalence in the country, from 1.8 percent in 1992 to 3.8 percent in 1994, 4.5 percent in 1996, 5.4 percent in 1999 and 5.8 percent in 2001, with most of new cases found among youths (Federal Ministry of Health, 2001; NIC, 2002). Other problems linked to young people's sexual activities in Nigeria include unwanted pregnancies and clandestine abortions by untrained or poorly trained providers (Aja-Nwachuku, 2004; Aziken et al. 2003; Bankole et al. 2006; National Population Commission & ORC/MACRO, 2003; Otoide et al. 2001).

The Federal Government of Nigeria launched a new national policy on population for sustainable development in January 2004. This seeks to integrate youths into the development efforts and effectively address their reproductive health needs, among other objectives. It follows similar population policies in 1988 and 2000. However, the dearth of research and scientific evidence informing most reproductive health policies and programs continues to hinder the achievement of government stated objectives. Obono (2003) attributes the failure of the 1988 policy to its implicit assumption of a single, monolithic cultural reality and its disregard of male reproductive motivation. Slap et al. (2003) pointed out that the 2000 national policy on reproductive health that focused on preventing risky behaviors during adolescence was particularly hampered by outdated and incomplete information on the sexual knowledge, attitudes and behaviors of Nigerian adolescents. Therefore, achieving the objectives of the most recent population policy requires an updated understanding of factors that influence reproductive behavior of Nigerian youths.

The bulk of studies on the relationship between migration and reproductive behavior in sub-Saharan Africa, focuses on countries of Eastern and Southern Africa, the so called "AIDS Belt" (Kaufman et al. 2002; French & Dishion, 2003, Brockerhoff & Biddlecom, 1999). Relative to its population size and composition, very little is known about Nigeria. Most of the studies undertaken in the country, are largely constrained by limited coverage. Some are based on data collected from youths in schools, leaving off non-school youths, who are estimated to constitute over 60 per cent of all youths in the country (Slap et al. 2003; Amazigo et al. 1997; Arowujolu et al. 2002). Other studies are limited to urban Nigeria, leaving off the rural areas where an estimated 65 per cent of the population lives (Smith, 2004b; Makinwa-Adebusoye, 1992; Feyisetan & Pebley, 1989). Still others are constrained by a focus on ever-married women or unmarried female adolescents, entirely leaving out male youths (Isiugo-Abanihe & Oyediran, 2004; Ajuwon et al. 2002). Such efforts fail to incorporate the increased recognition of the need to involve men in sexual and reproductive health initiatives and to understand their needs, perceptions and motivations in reproductive health matters. The importance of involving men is linked to their considerable role in decision making in the African social context (Isiugo-Abanihe, 2003). Reports from other countries in the region indicate that the neglect of men/boys in this context is a costly

omission. For instance, despite age asymmetry among sexual partners (Luke, 2003), the Kenyan Ministry of Health reports that school boys are responsible for most school girls' pregnancies in that country (Bledsoe & Cohen, 1993). Further, recent studies from a spectrum of developing countries including South Africa, Nigeria, and Cameroon suggest the vulnerability of young men to some of the problems faced by young women such as sexual coercion, unwanted sexual touch, penetrative sex and being "rented" as prostitutes by older men and women (Ganju et al. 2004; Jejeebhoy & Bott, 2003; Ajuwon, 2003).

Further, no national level research in Nigeria has simultaneously addressed sexual behavior of never married men and women, particularly the direct role of migration on premarital sexual behavior of Nigerian youths. Consequently most of what we know about the relationships between youth migration and reproductive behavior, as well as the social and behavioral mechanisms underlying these linkages is based on small-scale studies on small geographical areas and distinct local groups (Aja-Nwachuku, 2004; Oladele & William, 1994; Smith, 2000, 2003, 2004_a, 2004_b).

This paper aims to address the foregoing gaps, using data from the 2003 nationally representative Nigeria Demographic and Health Survey, with samples of school and non-school youths aged 15-24, from all the regions of the country, including rural and urban areas. The study specifically examines the relationships between migration status of never married Nigerian youths and the prevalence of first sexual engagement, accounting for the roles of individual, household and community factors.

The social significance of focusing on migration and early sexual initiation is predicated on the opportunity to widen the scope of control of epidemics like HIV/AIDS to include the forces that generate the large streams of population movement of youths in the country. With heterosexual contact as the primary mode of HIV/AIDS transmission in sub-Saharan Africa (Caldwell & Caldwell, 1993; Isiugo-Abanihe, 2003; Orubuloye et al. 1991), the study also provides new and nationally representative evidence that will inform behavior change policies and programs, by identifying important differentials in the characteristics of youths who initiate premarital sexual intercourse and those who abstain.

THEORY AND LITERATURE

Theoretical and empirical research has associated migrants with riskier heterosexual behavior than non-migrants. This difference in behavior is attributed to three broad factors summarized by Brockhoff and Biddlecom (1999: 835) as: "1) predisposing individual characteristics; 2) changes in individual attributes due to migration, notably separation from a spouse or partner; and 3), exposure to a new social environment, featuring different sexual norms, opportunities and constraints that result in behavioral modification." These perspectives are linked to concepts used by demographers to account for fertility differences between migrants and non-migrants: selectivity of migration, life disruptions associated with moves, and migrants' adaptation to life norms in places of destination (Goldstein & Goldstein, 1983; Lee & Faber, 1984; Hervitz, 1985). In brief, the selectivity hypothesis posits that migrants are not reflective of the entire population, but are typically selected for personal characteristics such as higher education, young age, and desire for upward social

mobility. These traits may predispose them to be different from non-migrants in risky behavior. Migrants also possess distinct marital and occupation characteristics.

The disruption hypothesis usually associates the period immediately following migration with both physiological stress due to moving and the loss of social capital due to separation from spouses or significant others. The adaptation principle proposes that migrants adapt to the new economic, social and cultural environment at the places of destination, resulting in behavioral changes. These perspectives are consistent with theories and empirical research findings that cover individual, family, and community level explanations of the relationships between migration and risky reproductive behavior.

Individual level theories such as the Health Belief Model (HBM) posit that an individual's characteristics, prior experiences and current surroundings shape perceptions concerning the risks and severity of behavioral outcomes - such as contracting the AIDS virus through sexual conduct – and thereby influence behavior (Brockhoff & Biddlecom, 1999). Migration over long distances between radically different sociocultural environments and with uncertain consequences and social support networks at destinations have helped define migrants as innovators or risk-takers (Peterson, 1958; Massey et al. 1994; Brockhoff & Biddlecom, 1999).

Individual characteristic models are however limited by scant attention to broader social, environmental and economic forces that may influence individual behavior. Moreover, non-significant effects of individual characteristics on risky behavior derived from empirical evaluations of interventions based on Health Belief Models strengthen the criticism that the individual is not an adequate unit of analysis (Auerbach et al. 1994). Consequently, a number of theories such as the social control and social support theories offer further explanations on risky sexual behavior beyond individual actors.

Social control theory posits that ties to conventional institutions lower the probability of deviant behavior, and a stake in conformity to behavioral norms can be enhanced through bonds to school, family and career (Liska, 1981; Vold & Bernard, 1986). Researchers within this framework have shown that the process of migration weakens such bonds and increases the probability of deviance (Stack, 1994; Sampson & Laub, 1993; Vold & Bernard, 1986). Accordingly, migration can weaken bonds to familiar institutions such as schools and significant others who would normally act as mechanisms of control (Sampson & Laub, 1993). Long distance migration can sever ties to the extended family, limiting the influence of older kin who might provide negative definitions and negative reinforcements of premarital sexual activity (Clayton & Bokemeir, 1980). Similarly, social support theory reiterates that longstanding social ties are broken when migrants leave their home communities (Portes, 1998), and migrants lose a major source of social capital –the network of social relations that entail reciprocal commitment, social support and control (Zhou, 1997). Coleman (1990) has insisted that social capital is dependent on stable social relationships and migration reduces both the size of the social network and the level of support potentially available through it (Vega & Amaro, 1994). Overall these arguments suggest that migrant youths will have lower levels of social support in destinations than non-migrants in places of origin (Landsdale & Oropesa, 2001).

None the less, researchers have frequently indicated strong family bonds among immigrant groups, and portrayed migration as a family-related process that is often undertaken either by family groups or by individuals joining family members in the destination area (Watts, 1984; Landsdale & Oropesa, 2001). In developed and developing countries, there is evidence that family connections form the backbone of the networks that link origin and destination areas and facilitate migration (Rambault, 1997; Fix & Zimmerman, 1997; Watts, 1984). The shared adversity of migration and subsequent adaptation experiences can motivate the family to close ranks cohesively and productively, honing in group solidarity (Rambault, 1997). A corpus of empirical research in Africa supports that migration takes place within family and community networks, affording migrants some of the support they need to adjust to life in a new environment. For Nigerian youths, moves are likely with family members or close kin as business apprentices or house-helpers (Chukwuezi, 2001; Smith, 1999). It follows therefore that migration may not create high levels of social disruption and anonymity postulated for developed societies. The logical expectation is that living arrangements of young migrants at destinations and the structure of migrant households may mediate the relationship between migration and premarital sexual behavior of the young.

Social control and social support theories are also limited by their lack of emphasis on the behavioral role of forces beyond the social environment of migrants. Moreover these perspectives have only been applied in developed countries such as the United States. Consequently, the life-course perspective, which promotes a holistic understanding of young peoples' lives over time and across changing social contexts (Elder et al. 2003), offers further explanations of sexual behavior beyond individual characteristics of migrants and their disconnections from social control and support mechanisms. The life-course perspective emphasizes the social structural hindrances that not only deny access to knowledge through lack of education, but also the social inhibitions like poverty and powerlessness that leave youths no option than to engage in sexual activities. The perspective points to the globalized world of culture and communication that transmits sexual stimuli worldwide, as well as the economic stipulations such as Structural Adjustment Programs (SAP) in many developing countries linked to economic downturns in many urban centers, with implications for migration, unemployment, urbanization of poverty and deviant behavior.

In sum, the life course perspective help us view reproductive behavior of youths less as a discrete set of experiences, but more as an integral part of a biography that reflects the early experiences of youth and also that shapes the later life (Shanahan, 2000). It not only incorporates the view that "youths exercise agency in the construction of their biographies," but also that national and global forces beyond the rational calculations of individuals are important influences in shaping behavior.

Beyond migration, empirical studies have identified other significant predictors of young people's sexual behavior. Among key independent predictors identified in developing countries are chronological age, gender, family economic situation particularly household poverty, the school factor, status of employment, religion and religiosity, place of childhood residence and ethno-cultural values (Isiugo-Abanihe & Oyediran, 2004; Luke, 2003; Slap et

al. 2003; Kaufman et al. 2002; Mensch et al. 2001; Gupta, 2000; Brockerhoff & Biddlecom, 1999; Gage, 1998; Konde-Lule et al. 1997; Meekers, 1994; Gage-Brandon & Meekers, 1993; Kiragu & Zabin, 1993; Feyisetan & Pebley, 1989; Hollos and Reis, 1989).

Despite the limitations of most of the studies reviewed (limited coverage of most studies in Nigeria and the implications of different cultural and institutional settings of those done outside Nigeria), they offer relevant insights into the multi-factor predictors of adolescent sexual behavior. Though available Nigerian data would not allow for an examination of all the theoretical and empirical predictors identified in the review, this paper builds on the multi-factor approach in seeking understanding of young people's transition to first premarital sexual engagement beyond the limitations of previous studies.

DATA AND METHODS

Data

The analysis utilized data from the 2003 Nigeria Demographic and Health Survey (NDHS). The survey followed a probability representative sample of eligible respondents within all regular households in the entire country. The sampling frame used for selecting primary sampling units was the enumeration areas (EAs) into which the country was delineated for the 1991 national population census. The EAs were classified into one of the two strata - rural and urban. An urban EA is defined as a locality having a population of 20,000 and above, while rural EA is a locality with a population of less than 20,000. The primary sampling units allocated to a state were selected by a systematic sampling procedure, which is followed by the second stage sampling of households and eligible women. All eligible women within selected households were included in the sample. From every three households selected for the women's interview, a sub-sample of one household was systematically selected for the men's interview.

The survey used household questionnaires to obtain information on housing characteristics, living facilities and household composition. Individual questionnaires for men and women provided information on current and previous places of residence, duration of stay in current residence, respondent's age, education, religion, ethnic origin, nature of employment and reproductive behavior.

Methods

Definition of Variables

This paper seeks to determine the incidence of initiation of premarital sexual intercourse by youths aged 15-24 at the time the survey. Male and female questionnaires used for the survey asked respondents about their age at first sex, from which never married youths who initiated premarital sex relative to those who did not were determined.

To account for exposure time and censored cases, the data set was restructured into person-year format, in which each youth contributes one record each year he/she is exposed to the risk of premarital sexual initiation. The retrospective nature of the survey enables the observation period for premarital sexual initiation from ages 10 - 24. The period before

premarital sexual initiation is interpreted as survival time until premarital sex is initiated. Youths are right censored if they never initiated premarital sex throughout the observation period from ages 10 through 24. The outcome variable is coded 1 if the event occurs at a given age and 0 if otherwise. The data management yield 21, 913 person years (from 2,602 youths) that were analyzed for premarital sexual initiation.

The key independent variable is migration status. The Nigeria Demographic and Health Survey has no direct questions on migration status of respondents. However there are questions on childhood place of residence before age 12, current place of residence, duration of stay in current residence, and type of previous and current places of residence (rural or urban; city, town or countryside). Using responses to these questions (which are available on request), the migrant status, origin and destinations of youths were determined. This operation yields six migrant categories: Rural Non-migrants and Urban Non-migrants, Rural-Rural Migrants, Rural-Urban Migrants, Urban-Urban Migrants and Urban-Rural Migrants. Non-migrants are youths whose childhood place of residence remains their current place of residence. Migrants are those whose current places of residence are outside their places of childhood residence prior to the survey. To account for the timing of migration relative to the timing of sexual initiation, migrant youths who initiated sex prior to migration were identified through a three step process: migrants were first selected; age at migration was determined as the difference between current age and duration of stay in current residence; and for those who have initiated sex, the difference between age at migration and age at first sex was calculated and if its > 0 the migrant initiated sex after migration, but if the difference is $= 0$ the migrant initiated sex before or on the year of migration. This process identified 138 migrant youths who initiated sex before or on the year of migration. Keeping them in the analysis did not significantly affect the results, but they were dropped from the analysis for correctness of the estimates.

The information on current age and year of premarital sexual debut are used to define the number of years of exposure to the risk of premarital sex. Gender is coded 0 if male and 1 if female. The survey provided information on highest educational attainment of respondents in four attainment categories: No education, primary education, secondary and higher. There are four categories of religious affiliation of respondents: Catholic, Protestant/Other Christians, Muslim and Traditional/Other. In examining the role of the nature/status of employment, youths are classified on the basis of the nature of independence from parental supervision, which each employment status confers: formal employment, self/agricultural employment, and the unemployed.

The association between household variables and premarital sexual initiation is examined using living arrangements (household structure) and household socioeconomic status. The surveys provided information on the relationship between youth members and the head of household. Youths who are heads of households are defined as having transited into independent living outside the authority and supervision of their parents. They are compared to those who are living under their parents as children, or with a relative. In determining household economic status, the 2003 Nigeria DHS provided wealth index quintiles through principal components analysis of household possessions (see also Montgomery et al. 2000; Gwatkin et al. 2000; Filmer & Pritchett, 1999; Mberu, 2006, 2007).

The role of community-level variables in predicting premarital sexual debut is examined through place of current residence (rural or urban), place of childhood residence before age 12, and ethnic origin. While place of current residence is provided in the survey as urban or rural, place of childhood residence is provided in four response categories: “Capital, large city”, “City”, “Town”, and “Countryside”. The countryside is defined as rural following other studies in the region, and the complementary categories were defined as urban. Following significant correlation between current place of residence and place of childhood residence and empirical findings supporting place of childhood residence as a significant predictor of youth sexual behavior (Gupta, 2000) current place of residence was dropped in the final multivariate models.

The survey provided information on 112 ethnic groups in Nigeria. To assess variations in premarital sexual behavior among these diverse cultural groups, they were classified into six major cultural categories, approximating the nation's geopolitical zones and following similar categorizations by NISER (1997). The three main groups (Hausa-Fulani/Kanuri, Yoruba and Igbo), represent the core North, South West and South East cultural regions respectively. The Minority tribes of Central Nigeria and those of the Niger Delta were respectively grouped into two cultural zones. Finally the myriads of groups that could not fit into these five clear categories were grouped together as “Others”. The other control variable included in the analysis is the index of media exposure. The survey asked whether respondents listen to radio every day, read newspaper and magazines once a week and watch television every week. Using the simple summation of frequency method, 1 for yes and 0 for no, three mass media exposure categories were determined: lowest exposure, medium exposure, and highest exposure.

Statistical methods and models

The analysis of data employs frequency tables, cross-tabulations and χ^2 tests of associations to identify the distribution of premarital sexual debut among migrants of all streams and non-migrants, and by individual, family and community variables. Following the transformation of the data into an event history framework, Kaplan-Meier estimates of the survival curves for premarital sexual initiation were generated. The Kaplan-Meier estimator is a non-parametric estimate of the survivor function. The estimate at any time t is given by

$$\hat{S}(t) = \prod_{j|t_j \leq t} \left(\frac{n_j - d_j}{n_j} \right)$$

where n_j is the number of youths at risk of premarital sexual initiation at time t_j and d_j is the number of failures or events occurring at time t_j . The Kaplan-Meier estimator generates the ages by which a given percentage of youths have initiated premarital sexual intercourse. The procedure accounts for right censoring in the data, and therefore yields unbiased probability estimates of the timing of premarital sexual initiation.

We modeled the effect of migration on first premarital intercourse, net of other covariates, with a discrete-time hazard model. The discrete-time hazard for interval t is the probability

of an event during interval t , given that no event has occurred in a previous interval, i.e. $h_{t|}$
 $= \Pr (y_{ti} = 1 / Y_{si} = 0, s < t)$. The event indicator is analyzed using a logit model:

$$\text{Logit} (h_{ti}) = \log \left(\frac{h_{ti|1}}{1 - h_{ti}} \right) = a(t) + \beta' X_{ti},$$

Where the covariates X_{ti} may be fixed or time-varying and $a(t)$ is some function of t , which is the baseline logit-hazard. The form of $a(t)$ is approximately linear, and the linear function fitted is of the form: $a(t) = a_0 + a_1t$, including t as an explanatory variable in the model. This parameterization leads to a piecewise-constant hazard model. We adjust for inflated standard errors following multiple records for a single youth by applying the Huber-White clustering correction within individuals. All discrete-time hazard models were estimated using the STATA statistical package.

Limitations of the study

One key limitation of the study is the lack of direct measures of migration. Based on how migration status was derived from a series of indirect questions, the results of this study may be sensitive to alternative definitions of migration status that could be derived from direct and more detailed data sets with migration histories (Chattopadhyay et al. 2006). For variables like ethnicity and religion that are mostly determined by parental background, we assume that they are likely to stay stable over time. But for time-variant covariates like education, household wealth, living arrangement and nature of employment, the lack of time-series data was a key limitation as they could only be measured at the time of the survey. Consequently, the outcomes of the analysis were treated with caution, limiting interpretation of results to correlational associations rather than drawing causal inferences. Further, there is evidence that sexual activity outside marriage is normally underreported by women and young people (Mensch et al. 2001; Mensch et al. 1998; Adegbola and Babatola, 1999). However, the goal of this study does not include establishing absolute levels of premarital sexual initiation and there is no evidence that under-reporting if it exists, varies systematically across settings. Finally, we recognize the point made by Fletcher (2007) that in empirical work on young people's choices, omitted variables are ubiquitous and because youth data in our study mostly focus on current ages 15-24, preadolescent factors cannot be taken into account.

Despite identified limitations, the use of the NDHS data in this study represents a pragmatic and innovative way of getting some handle on issues of national research, policy and program importance, which otherwise will be hampered. The national representativeness of the data is an invaluable strength in a country where nationwide studies are rare and difficult, following the lack of infrastructure to cover such a huge land area and population.

Results

Migration status, adolescent characteristics, and premarital sexual initiation

The univariate characteristics of the study population indicated in Table 1 column 1 show that 36.2 per cent of the 2, 602 youths aged 15-24 had initiated premarital sex by the time of the survey. The data indicate a modest level of mobility, with 36 per cent of all youths no

longer residing in their places of birth. It is important to observe that the urban-urban migration stream is quantitatively more important than rural-urban migration, which is often the focus of attention (Oucho, 1998; Mberu, 2005). Despite the concern on how migration status was derived in this study, the observed distribution here is consistent with findings on migration patterns observed in previous estimates for sub-Saharan Africa generally and Nigeria in particular (Chattopadhyay et al. 2006; Lacey, 1985; Mberu, 2005). The mean age of the study population at the time of the survey was 18.7 years and the mean age of premarital sexual debut for all youths is 16.7 years, with no significant gender difference.

The bivariate relationships between migration status, other characteristics and premarital sexual debut are summarized in the rest of Table 1. In accounting for censoring in the data, the cross-sectional data set is restructured into person-year format and the ¹Kaplan-Meier survival curves were fitted for sexual initiation by all independent variables. The fitted survival curves provide clearer details of the bivariate outcomes at the end of the observation period, but generally they reiterate the relationships already presented in Table 1.

Discrete-Time Hazard Multivariate Analyses: Premarital Sexual Initiation

We now examine discrete-time hazard regression models. Table 2 presents the estimated odds ratios for the covariates included in the analysis. Model 1 includes only migrant status as a predictor of premarital sexual initiation. Gender, years of exposure to the risk of premarital sex and religion (key individual time-invariant factors) are included in Model 2. Model 3 controls for the effects of ethnic origin (a key social identity covariate) and place of childhood residence. The full model includes time-variant individual characteristic: educational attainment and household-level variables such as current household living arrangements, household wealth status, and the index of media exposure.

Model 1 shows a strong relationship between migration status and initiation of premarital intercourse among never married Nigerian youths. Urban-urban and urban-rural migrants are 1.45 times as likely as rural non-migrants to initiate premarital sexual intercourse. Rural-urban migrant youths are 1.20 times as likely as rural non-migrants to initiate premarital intercourse, while urban non-migrants are 14% less likely to initiate premarital intercourse than rural non-migrants. Never married rural-rural and rural nonmigrants are not statistically different in their propensity to initiate premarital sex.

In Models 2 and 3, controlling for individual and community-level time-invariant covariates respectively, the statistically significant variation between urban-urban, urban-rural, rural-urban and urban non migrant categories and premarital sexual debut disappeared except for the urban-urban migrant category, which remains significant at this stage. In the full model, the significant relationship between urban-urban migration and sexual debut disappears.

On gender and premarital sexual initiation, the results suggest that female youths are marginally but consistently less likely to initiate premarital sexual intercourse than male

¹Graphs 1 and 2 showing the survival curves for all youths from age 10-24 and by migration status respectively are presented in appendix 1. Others are available on request.

youths. In the full model female youths are 16% less likely to initiate premarital sex than male youths.

Consistent with the proposition that biological and social maturity increases the risk of exposure to premarital sexual activities; the number of years of exposure to the risk of premarital sex significantly predicts premarital sexual initiation across all models.

One outcome of note is that the effects of years of exposure to the risk of premarital sexual debut is not monotonic, but represents an inverted U-shaped effect that peaks at ages 19-20 (representing 10-11 years of exposure) but continually decreases after that threshold until the end of the observation period. Notwithstanding, the propensity for premarital sexual initiation at higher ages remain significantly higher than the youngest reference group.

In line with expectations, religious affiliation is significantly associated with premarital sexual initiation. In Model 2, Catholic and Protestant Christians are more likely to initiate premarital sexual intercourse than Muslims. However, when ethnic origin was controlled for in Model 3, the significant difference is negated. In general, the result is consistent with strict sexual behavioral norms for youths generally associated with Islamic cultures and enclaves, relative to other religious groups.

One key outcome of the analysis is the marked variation in the association between ethnic origin and premarital sexual initiation. In Model 3, relative to the Hausa/ Fulani/ Kanuri of the core north of Nigeria, Igbo youths are 3.5 times more likely to initiate premarital intercourse. For other groups, the corresponding odds ratios are: the Urhobo/Isoko/Edo/ Itshekiri/Annang/Efik/Ijaw/Ogoni/Ibibio of the Niger Delta, 6.2; the Tiv/Igala/Idoma/Nupe/ Kamberi/Gwari/Ibira of Central Nigeria otherwise called the Middle Belt region, 4.7; the Yoruba of Western Nigeria, 4.2; and "Others", 4.1. These outcomes identify youths from the Niger-Delta and the Middle Belt with the highest propensity to premarital sexual initiation in Nigeria. These effects remain very strong with minor changes after controlling for all defined covariates including education and household wealth status in Model 4, suggesting the important independent role of socio-cultural context in our understanding of sexual norms and behavior in Nigeria.

Among time-variant covariates, the level of education attained is significantly associated with the likelihood of initiating sexual intercourse. This outcome is consistent with expectations in the literature on Nigeria (Fatusi, 2004; Okonkwo et al. 2005). Youth employment in the formal sector, which confers the highest level of physical and financial independence, indicates a significant association with premarital sexual initiation. Youths employed in the formal sector are 1.35 times as likely as the unemployed to initiate premarital intercourse.

Consistent with the proposition that young people's transition to independent living increases their risk of exposure to premarital sex, youths who are heads of own households are 1.60 times as likely as those who live under the authority of their parents to initiate premarital sexual relationships in the full model. This outcome contrasts with those who live under their relatives, who are only 1.13 times as likely as those living with parents to initiate

premarital sex. These estimates strongly reinforce the behavioral conformity roles of authority figures in the lives of young people.

The association between household wealth and premarital sexual initiation is generally weak and statistically not significant. The estimate here indicated on average a 10% difference in the propensity for sexual debut between youths from poorest households and all others from richer backgrounds.

Following suggestions from the literature that girls from poor backgrounds use sexual intercourse as an economic survival strategy (Luke, 2003; Fatusi, 2004; Okonkwo et al. 2005) and the expectation that ethnicity affects men and women differently, interaction terms were utilized to verify the differential effects of ethnicity and household wealth on sexual debut of male and female youths. As in Model 4, there is no significant variation between household wealth and sexual initiation for either males or females (estimates are therefore not presented but available on request). The estimates of the relevant variables that included interaction terms for ethnic origin are presented in Table 3. With Hausa/Fulani/Kanuri males as the reference group, male youths from all other groups are generally about 3.0 times more likely to initiate premarital sex, with Yoruba and Niger Delta males the most likely to initiate premarital intercourse, with odds ratios of 4.09 and 3.16 respectively. By the same token, female youths from all ethnic groupings are more likely to initiate premarital sex than the reference group, with strongest outcomes associated with female youths from the Niger Delta and Middle Belt regions. The most distinctive aspect of the result is that female youths from the Niger Delta ethnic groups are 1.47 (4.08 X 0.36) times as likely as the Hausa/Fulani/Kanuri male youths to initiate premarital sexual intercourse, identifying them as the most vulnerable to premarital sexual initiation among Nigerian female youths. Relative to the reference category, the odds are lower for female Yoruba and Igbo youths with odds of 0.60 (1.66 X 0.36) and 0.70 (1.94 X 0.36) respectively. However, the strongest impact of ethnicity is located in the lowest odds of premarital sexual debut recorded for never married Hausa/Fulani/Kanuri female youths. This result is consistent with expectations of stricter sexual restrictions of females among the groups, reinforced in recent years by the imposition of *Sharia* Law in most areas of Northern Nigeria.

Discussion and Conclusion

This paper addresses sexual initiation among never married migrant and non-migrant youths, accounting for the net effects of individual, household and community variables. The results indicate that urban-urban migrants show the highest propensity to premarital sexual initiation in all models, net of other traits. The outcome as it relates to urban-urban migrant youths suggests that dual exposure to the urban environment in places of origin and destination heightens the risk of youth's premarital sexual engagement. For other migrant streams, the results suggest combined but marginal roles for migration and linkage to the urban environment. Migrant youths from urban to rural destinations and those from rural origins to urban destinations show stronger propensities for premarital sexual initiation relative to non migrant youths. What is observed may also be a pointer to the level of independence or autonomy of migrant youths relative to their rural non-migrant peers in exercising agency in matters relating to premarital sexual engagement. For urban-rural

migrants, the outcome is consistent with earlier reports that migrants with previous exposure to urban environments have increased likelihood of high-risk sexual behavior in rural areas through socialization to less restrictive sexual norms or acquisition of enabling characteristics such as wealth in cities (Brockerhoff and Biddlecom, 1999).

In general, the association between migration and premarital sexual initiation in this analysis is weak and this may be related to the fact that youth migration in Nigeria, contrary to what obtains in developed countries of North America and Europe, does not generally involve a significant loss of primary social capital. In the study sample, 93% of migrant youths and 97% of non-migrants live with their parents or relatives at the time of the survey. Consequently, while migrant youths are more likely to live independent of parents and relatives compared to non-migrants, the overall level of independent living among both groups is substantially low. This outcome reinforces previous findings in Senegal, Mali, Togo, Ethiopia, Nigeria and other African countries, which generally conclude that in seeking to diversify their risk and improve their odds of survival, migration in the region is undertaken as a family survival strategy (Casacchia et al, 2001; Gugler and Ludwar-Ene, 1995; Lockwood, 1990; Trager, 1995). In Nigeria in particular, migration for marriage and for business apprenticeship under a relation are significant reasons for young peoples' migration (Chukwuezi, 2001; Watts, 1984; Trager, 1995). In this context therefore, the weak association between migration and premarital sexual initiation may be linked to the likelihood of the presence of authority figures (parents or relatives) in migrant and non-migrant households. Consequently, it is plausible to expect that as long as migration remains family-based, and not *sine-qua-non* to youth independent living, the loss of social capital occasioned by such movements will be minimal and the independent effects of migration on premarital sexual engagement may remain as marginal as found in this study.

One important dimension of the result is evidence that migration alone is not a sufficient explanation for premarital sexual initiation in Nigeria; rather personal, household and community level characteristics mediate this association, supporting a multi-factor approach in the study of premarital sexual behavior. Our analysis identified gender, years of exposure to the risk of premarital sexual initiation, religious affiliation, ethnic origin, employment in the formal sector, and early transition to independent living as strong independent predictors.

On years of exposure to the risk of premarital sex, the finding is consistent with the proposition that biological and social maturity increases the risk of exposure to premarital sexual activities. However, years of exposure do not have a monotonic effect, but rather peak at ages 19-20 and continually decrease to lower propensities until the end of the observation period. While the odds of premarital sexual initiation did not decrease to levels as low as it was for those exposed for only few years (1-5 years), the outcome does suggest that youths who successfully abstain from premarital sexual intercourse may face lower risks of initiation after a certain threshold. While further analysis with data beyond this study may be needed for further validation of this threshold effect, the outcome here suggests the possibility that youths who successfully abstained from sexual engagement across their teenage years, may have developed some defense mechanisms and therefore able to exercise more agency against the so called over-powering peer-pressures to initiate premarital sexual

intercourse. From the perspective of protecting the next generation from sexually transmitted diseases and preparing them for a successful transition to adulthood, identifying the factors that slow the propensity for sexual initiation after a certain threshold may be an important step in promoting the postponement of premarital sexual engagement until desirable ages are attained. The Kaplan-Meier survival curves (indicating levels of “survival” at every point of the observation period), show that at 18 years² of age about 43% of the sample has not initiated premarital sexual intercourse and at 24 years of age about 30 % of youths remain primary sexual abstainers.

Further, transition to independent living exposes youths to significant risks of premarital sexual initiation. Unlike youths who live under the supervisory authorities of parents, young people who are heads of their immediate households are 1.6 times as likely to initiate premarital intercourse. Similarly youths in formal employment are 1.4 times as likely to initiate premarital sex as unemployed youths. It is important to note that formal employment is the livelihood opportunity that gives young people physical and financial independence from their parents and relatives than other employment categories. In fact while 10% of youths in formal employment have transitioned to independent living arrangements, only 2% of unemployed youths are living independent of parents or relatives.

A key outcome relates to the cultural dimension of premarital sexual behavior. Cultural identity factors of religion and ethnic origin stood out among key independent predictors of premarital sexual initiation. On religion, as expected Christian youths are more likely to initiate premarital sexual intercourse than Muslims, but the strength of this covariate disappears when we control for ethnic origin of youths. On ethnicity, the independent effect is the strongest in the full model with Niger-Delta youths over five times more likely to initiate premarital sex than the Hausa/Fulani/Kanuri. For the Yoruba, Middle-Belt and Igbo, relative to the Hausa/Fulani/Kanuri youths, the corresponding odds ratios are 3.9, 4.4, and 3.2 respectively. That these effects remain very strong after controlling for all defined covariates including education and household wealth status in Model 4, are empirical pointers to the important independent role of socio-cultural context in our understanding of sexual norms and behavior in Nigeria. The validity of this finding is supported by the continued potency of ethnicity in the definition of identity, interaction and behavioral boundaries in the socio-economic and political spheres of modern Nigeria.

Among ethnic groups, an outstanding variation in sexual initiation is found among youths from the Niger-Delta and the Middle-Belt regions, which have the highest propensities for premarital sexual initiation in the analysis. A peculiar characteristic common to the two geopolitical regions relates to their composition by a complex amalgam of heterogeneous Nigerian ethnic minorities, a situation which a recent study of six representative sub-Saharan African countries has shown, determines the formation of strategic sexual networks, promotes sexual infidelity and positively affects the spread of HIV/AIDS (Pongou, 2008). The underlying explanation is that ethnic groups in a community constitute exogenous and

²International conventions established 18 years as the legal age of consent to a sexual union (see The Universal Declaration of Human Rights (1984); The Convention on the Elimination of All Forms of Discrimination Against Women (1979); The convention on the Rights of the Child(1989); and The African Charter on the Rights and welfare of the Child (1990).

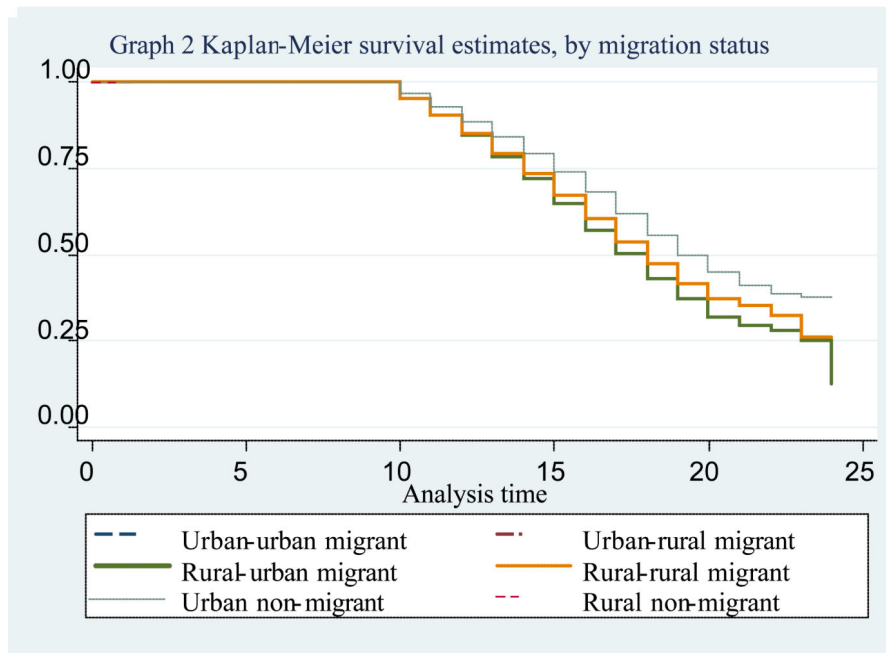
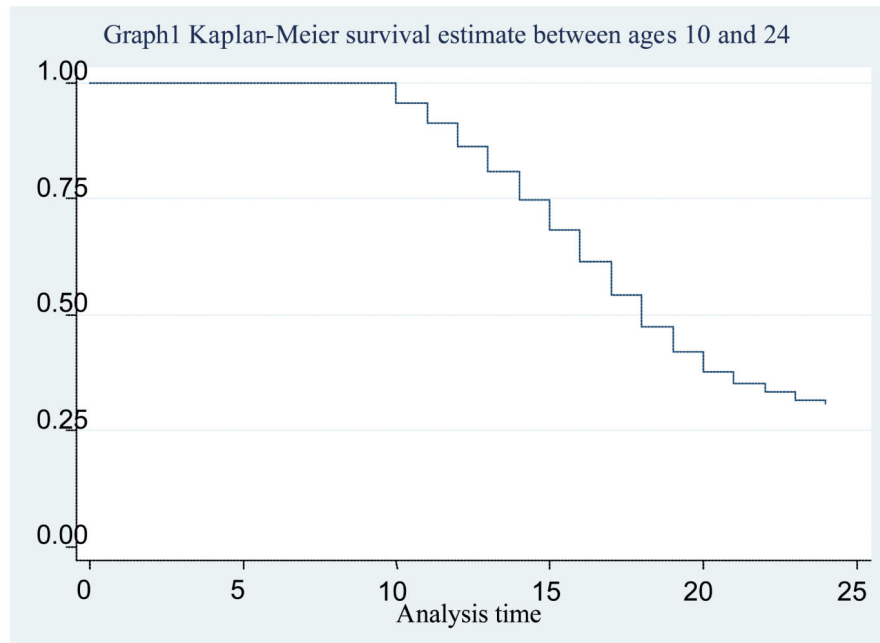
pre-defined communication networks, wherein information flows more easily within groups than across them. Consequently, communication across groups is limited, which fosters cross-group anonymity. Optimizing agents thus choose their sexual partners across ethnic groups rather than within them as a way to minimize infidelity detection, inducing a mechanism wherein ethnic heterogeneity encourages sexual infidelity and the formation of sexual networks that are propitious to the spread of HIV/AIDS (Pongou 2008). While further direct investigation of this explanation as it applies to sexual behavior of youths in the two Nigerian regions may be needed for a more firm conclusion, the congruency of the two findings provide at least a plausible window into the role of ethnic heterogeneity in the sexual behavior of young people. It also draws attention to the possible necessity to incorporate the goal of complete ethnic integration into policies that seek to halt risky sexual engagements.

Interaction terms on the gender dimension of ethnic origin yielded further intriguing results, which reinforce the need for particular attention on the role of social and cultural contexts in understanding youth reproductive behavior within a heterogeneous society like Nigeria. The general higher propensity of male adolescents to early premarital sexual initiation in most ethnic groups underscores the need for gender balance in research aimed at understanding premarital sexual behavior of young people and on programs to achieve their protection from the consequences of premarital sexuality. Beyond perspectives that boys have relatively few hazards and many potential benefits, including gratification and social prestige from engaging in early premarital sexual experience (Mensch et al, 2001), recent studies have identified the vulnerability of young men to some of the problems faced by young women (Ganju et al. 2004; Jejeebhoy & Bott, 2003; Ajuwon, A., 2003).

The finding of significant association between educational attainment and premarital sexual initiation is consistent with the consensus in theoretical literature and empirical findings in Nigeria that cumulative years of education, and being enrolled in school increase the risk of experiencing first sexual intercourse (Castro & Juarez, 1995; Jejeebhoy, 1995; Fatusi, 2004; Okonkwo et al. 2005). However, what this result did not address is the aspect of the education experience that actually exerts the observed influences. Youths in schools interact with a complex web of social forces, including school curricula, peers, teachers, and school regulations. They are simultaneously experiencing biological maturity and sexually stimulating influences from the mass media and the global culture, all of which are sensitive to duration of exposure and age. While age and the influence of the mass media are controlled in the analysis, data limitation on school variables hinders the control of relevant school-contexts generally clustered under educational attainment.

Several important implications for reproductive health policies and programs can be derived from this study. One of the key issues is the need to address youth-related livelihood opportunities in places of origin that have been identified to generally engender youth migration to urban centers and the consequent loss of social capital necessary for behavioral control. Another issue of particular importance is the evidence that generalized conclusions about young people's sexual behavior that neglect nuances of cultures even within a given region, may be overlooking or masking within-group variations necessary for pointed understanding of sexual behavior dynamics within a country.

Appendix



Appendix 1.
Kaplan-Meier survival estimates of age at premarital sexual initiation

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Table 1

Univariate characteristics of the study population and bivariate association with premarital sexual initiation

Variable	All Sample (N=2,602)	Sexual Initiates	Total (n)
Sexual Initiation Status			
Sexual initiates	36.2	-	941
Sexual abstainers	63.8	-	1,661
Migration Status ***			
Urban-Urban migrants	14.2	49.3	369
Urban-Rural migrants	4.7	49.6	123
Rural-Urban migrants	9.7	40.2	251
Rural-Rural migrants	7.4	40.1	192
Urban non-migrants	28.6	29.6	744
Rural non-migrants	35.5	32.5	923
Gender ***			
Female	68.6	34.0	1,786
Male	31.4	40.9	816
Current age ***			
15-16	27.1	10.8	705
17-18	26.6	29.3	693
19-20	23.0	48.0	598
21-22	14.1	60.4	366
23-24	9.2	64.2	240
Religion ***			
Muslims	29.6	24.0	770
Catholics	22.9	40.6	596
Protestants/Other Christians	46.7	41.7	1,215
Traditional/Others	0.7	41.2	17
Place of current residence			
Rural	52.5	35.0	1,366
Urban	47.5	37.5	1,236
Childhood place residence			
Rural	42.8	34.9	1,113
Urban	57.2	37.1	1,489
Ethnic origin ***			
Hausa/Fulani/Kanuri	13.3	10.4	346
Igbo	25.4	37.2	662
Niger-Delta groups ¹	10.5	52.2	274
Middle-Belt groups ²	10.0	43.9	260
Yoruba	18.3	38.8	477
Others	22.4	37.2	583

Variable	All Sample (N=2,602)	Sexual Initiates	Total (n)
Education Attained ***			
No education	7.4	13.5	193
Primary level education	20.3	30.0	527
Secondary education	65.5	38.9	1,707
Tertiary education	6.7	53.1	175
Nature of employment ***			
Unemployed	70.0	31.4	1,821
Formal employment	20.5	52.6	534
Agriculture/Self employment	9.5	35.6	247
Living arrangements ***			
Head of household	4.3	68.5	111
Child of head of household	70.3	33.4	1,827
Relative of head of household	25.4	38.3	660
Household wealth index			
Poorest	14.3	35.0	372
Poor	17.6	33.3	457
Middle	18.7	33.5	486
Rich	25.2	39.7	655
Richest	24.3	37.3	632
Index of media exposure ***			
Lowest exposure	37.6	29.9	979
Medium exposure	94.9	39.8	1,489
Highest exposure	5.2	41.0	134

p²

**p<.01

*p<.05.

¹The Niger-delta is composed of the Urhobo/Isoko/Edo/Itshekiri/Annang/Efikljaw/Ogoni/Ibibio of the South-South.

²The Middle-belt group is an amalgam of the Tiv/Igala/Idoma/Nupe/Kamberi/Gwari/Ibira of central Nigeria.

p<.001

Table 2

Discrete-time hazard models predicting the odds of sexual initiation among never married Nigerian youths

Variables	Model 1		Model 2		Model 3		Model 4	
	Odds ratio	RSE	Odds ratio	RSE	Odds ratio	RSE	Odds ratio	RSE
Migration Status								
Rural non-migrants	1.00	-	1.00	-	1.00	-	1.00	-
Urban-Urban migrants	1.45 ^{***}	.12	1.32 ^{**}	.13	1.31 [*]	.17	1.19	.16
Urban-Rural migrants	1.45 ^{***}	.17	1.23	.19	1.25	.19	1.04	.17
Rural-Urban migrants	1.20 ⁺	.12	1.09	.13	1.14	.17	1.11	.17
Rural-Rural migrants	1.16	.13	1.00	.14	1.04	.15	0.96	.14
Urban non-migrants	0.86 ⁺	.07	0.87	.08	0.95	.11	0.95	.11
Gender								
Male			1.00	-	1.00	-	1.00	-
Female			0.84 [*]	.06	0.79 ^{**}	.06	0.84 [*]	.06
Years of exposure to risk								
10-14 (1- 5 years)			1.00	-	1.00	-	1.00	-
15-16 (6-7 years)			5.98 ^{***}	.64	6.01 ^{***}	.64	6.03 ^{***}	.64
17-18 (8-9 years)			12.21 ^{***}	1.27	12.39 ^{***}	1.28	12.29 ^{***}	1.27
19-20 (10-11 years)			14.82 ^{***}	1.75	15.63 ^{***}	1.86	15.42 ^{***}	1.84
21-24 (12-15 years)			6.36 ^{***}	1.23	7.06 ^{***}	1.38	6.86 ^{***}	1.33
Religion								
Muslims			1.00	-	1.00	-	1.00	-
Catholics			1.68 ^{***}	.18	1.20	.16	1.16	.15
Protestants/Other Christians			1.79 ^{***}	.17	1.13	.11	1.10	.11
Traditional/Others			3.18 ^{***}	1.06	1.98	.72	2.61 ^{**}	.96
Ethnic origin								
Hausa/Fulani/Kanuri					1.00	-	1.00	-
Igbo					3.45 ^{***}	.75	3.17 ^{***}	.69
Niger-Delta groups					6.21 ^{***}	1.38	5.77 ^{***}	1.27
Middle-Belt groups					4.66 ^{***}	.99	4.39 ^{***}	.94
Yoruba					4.21 ^{***}	.82	3.88 ^{***}	.75
Others					4.10 ^{***}	.83	3.84 ^{***}	.78
Childhood place of residence								
Rural					1.00	-	1.00	-
Urban					1.03	.12	1.01	.12
Education Attained								
No education							1.00	-

Variables	Model 1		Model 2		Model 3		Model 4	
	Odds ratio	RSE	Odds ratio	RSE	Odds ratio	RSE	Odds ratio	RSE
Primary level education							2.02**	.47
Secondary education							2.10***	.47
Tertiary education							1.92**	.47
Status/Type of employment								
Unemployed							1.00	-
Formal employment							1.35***	.11
Agriculture/Self employment							1.22	.17
Living arrangement								
Child of head							1.00	-
Head of household							1.60***	.21
Relative of head							1.13	.09
Household wealth index								
Poorest							1.00	-
Poor							0.89	.11
Middle							0.90	.12
Rich							0.89	.11
Richest							0.90	.11
Index of media exposure								
Lowest exposure							1.00	-
Medium exposure							1.04	.09
Highest exposure							1.17	.18
Number of Youths 2, 602								
Number of observations (person years) =21, 913								
Wald Chi-Square (d.f.)	47.6*** (5)		780.9*** (13)		862.9*** (19)		913.5*** (32)	

+ p<.10

* p<.05

** p<.01

*** p<.001

Table 4

Odds Ratios for the Effects of the Interaction of Ethnic Origin and Gender on the Hazard of Sexual Initiation among Never Married Nigerian Youths.

Variables	Model 1	
	Odds ratio	RSE
Interaction Model 1: Gender × Ethnic Origin¹		
Male (reference)	1.00	-
Female	0.36 *	.17
Ethnic origin		
Hausa/Fulani/Kanuri	1.00	-
Igbo	2.97 ***	.76
Niger-Delta groups	3.16 ***	.91
Middle-Belt groups	3.06 ***	.78
Yoruba	4.09 ***	.92
Others	3.01 ***	.70
Ethnic origin × Female		
Igbo × Female	1.94	.98
Niger-Delta groups × Female	4.08 **	2.15
Middle-Belt groups × Female	3.13 *	1.65
Yoruba × Female	1.62	.82
Others × Female	2.55	1.29
Number of youths= 2,602		
Number of person years=21, 913	907.66 ***	
Wald Chi-Square (d.f.)	(37)	

¹ Interaction models include all variables from main effects models in Table 3.

* p<.05

** p<.01

*** p<.001