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Internal migration and health: Premarital sexual initiation 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, have raised intricate social policy challenges in developing countries. Using the 2008 Nigeria Demographic and Health Survey data, descriptive statistics, Kaplan–Meier survival curves and discrete-time hazard regression models, this study examines the patterns of internal migration and sexual initiation among never-married Nigerian youth aged 15–24. We find that migrants generally show stronger association than non-migrants, and urban–rural and rural–rural migrants particularly show the strongest independent association with premarital sexual initiation. Other significant covariates are age, religion, ethnic origin, educational attainment, independent living arrangement, formal employment and exposure to the mass media. The findings highlight the direct importance of youth migration in understanding and addressing the challenges of premarital sexual behavior and the need for behavior change policies and programs to be sensitive to the complex contextual nuances across youth groups in one country.

Introduction

Due largely to the high prevalence of HIV/AIDS, other sexually transmitted diseases (STIs), unwanted pregnancy, unsafe abortion and childbearing among young people, the increasing prevalence of early sexual relationships in sub-Saharan Africa (SSA) has continued to attract research attention (Adedimeji, 2005; Blanc & Way, 1998; Gage, 1998; Isiugo-Abanihe & Oyediran, 2004; UNFPA, 2003). The increased sexual activity of young people 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). While, migration, particularly towards urban areas, is often implicated in this shift, there is a dearth of population-based research in sub-Saharan Africa that directly connects increased youth migration to young people's sexual behavior. However, evidence from other regions of the world, particularly the United States has underscored the strong linkages between youth geographical mobility, problematic sexual behaviors, and health outcomes (Landsdale & Oropesa, 2001; Stack, 1994). These studies emphasize the social disruptions, which characterize migration and the relationships between migration and behavioral change. In particular, studies on the impact of social control factors, such as religious systems (Beck et al. 1991; Davidson & Leslie, 1977), and socioeconomic position, and family bonds (Clayton & Bokemeir, 1980; Miller & Moore, 1990), on young people's sexual involvements, have identified 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 non-traditional behavior (Sampson & Laub, 1993; Vold & Bernard, 1986).

Migration is also a central theme in the discussion of the HIV/AIDS epidemic in Africa (Brockerhoff & Biddlecom, 1999; Hunt, 1989; Lurie, 2006). 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 HIV seroprevalence levels observed in urban than rural areas (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 migrants in the region (Geschiere & Gugler 1998; Gugler, 1991; Smith, 1999). This pattern of circulation complicates the direction of the influence of migration on seroconversion, in both urban and rural areas, since it is also suggested that migrants themselves engage in sexual practices that elevate their risk of acquiring HIV/AIDS (Caldwell et al. 1997; Chirwa, 1997; Lurie et al. 1997). Migrants with previous exposure to urban environments are linked to increased likelihood of

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high-risk sexual behavior in rural areas through socialization into less restrictive sexual norms or acquisition of enabling characteristics such as wealth in cities (Brockerhoff & Biddlecom, 1999). Nigeria's estimated 150 million population is youthful, with a median age of about 19 years, and about 65 percent under 25 years of age (U.S. Bureau of the Census, 2010). The United Nations estimates the population living in urban areas in 2000 at 42.5 percent of the total. This was projected to increase to 49 percent in 2010 and 53.4 percent by 2015 (UN, 2009). Young men and women aged 15–29 were identified as the most likely to migrate from rural areas to Nigeria's economic centers in search of livelihood opportunities (Adedimeji, 2005; NISER, 1997; Smith, 2004a). Research evidence has shown that premarital sexual relationships are increasingly common in contemporary Nigeria and unmarried youth are increasingly engaging in risky sexual behaviors such as multiple sexual partnerships, casual and unprotected sex, sometimes involving sex workers (Arowujolu et al. 2002; Isiugo-Abanihe, 2003). The countries current HIV/AIDS prevalence rate is 5 percent, but that translates to about 3 million adults living with HIV/AIDS, which ranks Nigeria third after India and South Africa, in terms of the number of people infected with HIV (UNGASS, 2010). 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).

However, relative to its population size and composition, no national level research in Nigeria has simultaneously addressed the direct role of youth migration on reproductive behavior. The bulk of studies on the relationship between migration and reproductive behavior in sub-Saharan Africa, focus on countries of Eastern and Southern Africa, the so called "AIDS Belt" (Brockerhoff & Biddlecom, 1999; French & Dishion, 2003; Kaufman et al. 2002). Most of the studies undertaken in Nigeria are constrained by limited coverage. Some are based on data collected from school students, which exclude an estimated 60 percent of the youth population not at school (Amazigo et al. 1997; Arowujolu et al. 2002; Slap et al. 2003). Other studies are limited to urban Nigeria, excluding rural areas, where almost 60 percent of the population lives (Feyisetan & Pebley, 1989; Makinwa-Adebusoye, 1992; Smith, 2004b). Yet others focus on ever-married women or unmarried female adolescents, entirely leaving out young and adult men (Ajuwon et al. 2002; Isiugo-Abainihe & Oyediran, 2004). However, the importance of understanding men's reproductive motivations and behavior follows the considerable authority and power invested in men generally as decision makers in the African social context (Isiugo-Abanihe, 2003). Moreover, recent studies in 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 (Ajuwon, 2003; Ganju et al. 2004; Jejeebhoy & Bott, 2003).

In this paper, we examine the linkages between the internal migration of never married young men and women in Nigeria and their propensity to premarital sexual initiation, using data from the 2008 nationally representative Nigeria Demographic and Health Survey, with samples of school and non-school youth aged 15–24, from all the regions of the country, including rural and urban areas. Our focus on never married youth is premised on the fact that marriage protects sexual engagement of young people and its outcomes, primarily pregnancy and childbearing. In contrast, premarital sexual engagement and related outcomes are associated with particular health and psychosocial problems (Amobi & Igwegbe, 2004; Frautschi et al. 1994; Gorgen et al. 1993). In Nigeria, single and unmarried pregnant women suffer violence such as beating and verbal abuse from family members, with most young women experiencing major stressors as school and job termination, partner's negative attitudes, religious sanction, discrimination and stigmatization (Amobi & Igwegbe, 2004).

The social significance of our study relates to its potential to provide an evidence base for widening the scope of control of epidemics like HIV/AIDS to include the forces that generate the large streams of population movement of young people. With heterosexual contact as the primary mode of HIV/AIDS transmission in sub-Saharan Africa, the study provides new and nationally representative evidence that can inform policies and programs directed at behavior change, by identifying important differentials in the characteristics of young men and women who initiate premarital 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 Brockerhoff 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 (Hervitz, 1985; Lee & Faber, 1984).

The selectivity hypothesis posits that migrants are not randomly selected, but typically migration is selective with respect to personal characteristics such as higher education, young age, unmarried status, and desire for upward social mobility. These attributes predispose migrants to be different from non-migrants in risky behavior. 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 hypothesis proposes that migrants adapt to the new economic, social and cultural environment at the places of destination, resulting in behavioral changes.

Despite the import of these perspectives, the relationship between migration and behavior is modified in different contexts. A corpus of empirical research in Africa support 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 young people, moves are often with family members or close kin as business apprentices or house-helps (Smith, 1999). Consequently, the living arrangements of young migrants at destinations logically moderate the implications of migration for premarital sexual behavior.

Beyond migration, empirical studies have identified significant predictors of young people's sexual behavior in developing countries to include chronological age (Slap et al. 2003); gender (Brockerhoff & Biddlecom, 1999; Mensch et al. 2001); and family economic circumstances (Isiugo-Abanihe & Oyediran, 2004; Luke, 2003). Other predictors include the school environment (Feyisetan & Pebley, 1989; Kaufman et al. 2002); unemployment and nature of employment (Bledsoe & Cohen, 1993; NISER, 1997); religion and religiosity (Feyisetan & Pebley, 1989; Gupta, 2000; Slap et al. 2003); place of childhood residence (Gupta, 2000); and ethno-cultural values (APHRC, 2007; Bledsoe & Cohen, 1993; Gage, 1998).

Taken together, the above review underscores the importance of individual, family, community, and global forces in shaping young people's reproductive behavior. Consequently, this paper builds on

a multi-factor framework in seeking understanding of young people's transition to premarital sexual initiation in Nigeria.

Data and methods

Data

The analysis utilized data from the latest and significantly expanded 2008 Nigeria Demographic and Health Survey (NDHS), which provides the most up-to-date and nationally representative estimates of basic demographic and health indicators in Nigeria. The sampling frame used for the survey was the 2006 Population and Housing Census of Nigeria. Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities. During the 2006 Population Census, each locality was subdivided into census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a cluster, is defined on the basis of enumeration areas (EAs) from the 2006 EA census frame. The sample was selected using a stratified two-stage cluster design consisting of 888 clusters, 286 in the urban and 602 in the rural areas. A representative sample of 36,800 households was selected with a minimum target of 950 completed interviews per state. In each state, the number of households was distributed proportionately among its urban and rural areas. A complete listing of households and a mapping exercise were carried out for each cluster with the resulting lists of households serving as the sampling frame for the selection of households.

An average of 41 households was selected in every cluster, by equal probability systematic sampling. All women aged 15–49 who were either permanent residents of the households in the 2008 NDHS sample or visitors present in the households on the night before the survey were eligible to be interviewed. In a random subsample of half of the households, all men aged 15–59 who were either permanent residents of the households or visitors present in the households on the night before the survey were eligible to be interviewed. Using the household, women and men's questionnaire, the survey collected information on background characteristics of listed persons and household's dwellings, Family Planning/Reproductive Health information as well as malaria prevention and treatment; awareness and behavior regarding AIDS and other STIs; adult mortality including maternal mortality; and domestic violence. In all, a nationally representative sample of 33,385 women aged 15–49 and 15, 486 men aged 15–59 were interviewed in the 2008 survey. Key individual and household information relevant for this study were all collected by the survey.

Methods

Definition of variables

This paper seeks to determine the factors predicting initiation of premarital intercourse by never married youth aged 15–24 at the time the survey. Male and female questionnaires used for the survey asked respondents about their age at first sex. The survey response categories were coded as: 0 for not had intercourse; real age at first intercourse was provided for those who initiated premarital sex, and 96 was the code for men and women who initiated intercourse at first marital union. From this category of responses never married youth who had initiated premarital sex relative to those who abstained were determined. To account for exposure time and censored cases, the data set was further restructured following the event history framework, into person–year format, in which each young person 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 to 24. The period before premarital sexual initiation is interpreted as survival time until premarital sex is initiated. Young people are right-censored if they never initiated premarital sex throughout the observation period. The outcome variable is treated as a series of dummies at each age and coded 1 if the event occurs at a given age and 0 if otherwise. The series of data management operations yielded 91,354 person years (from 10,865 youth aged 15–24) that were analyzed for premarital sexual initiation.

The key independent variable is migration status. The 2008 NDHS has no direct questions on migration status of respondents. However there are questions on previous place of residence, 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, the migrant status, origin and destinations of respondents were determined. This operation yields six migrant categories: Rural and Urban Non-migrants, Rural–Rural Migrants, Rural–Urban Migrants, Urban–Urban Migrants and Urban–Rural Migrants. Non-migrants are young people who have always been residing in their current place of residence and therefore have no place of previous residence. Migrants are those who moved to current place of residence from a different previous place of residence, confirmed by information on duration of stay in current place of residence and whether the previous place of residence is a city, a town or in the countryside. Visitors were not included in the analysis.

To explore the multi-factor predictors of premarital sexual behavior, the empirical and theoretical literature reviewed informed the selection of other predictor variables. In particular, the study examined the relationships between premarital sexual initiation and young people's individual characteristics: years of exposure to the risk of premarital sex, gender, educational attainment, and religious affiliation. The information on current age and age at sexual initiation 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, Other Christian, Muslim and Traditional/Other religions.

In examining the role of the nature/status of employment, young people are classified on the basis of the degree of independence from parental supervision, which each employment status implies: formal employment, self/agricultural employment, and the unemployed.

The association between household characteristics and premarital sexual initiation is examined using living arrangements (household structure) and household socioeconomic status. The surveys provided information on the relationship between members and the head of household. Young people 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 with their parents or relatives. In determining household economic status, the 2008 NDHS constructed a wealth index and quintiles through principal components analysis of household possessions (see Mberu, 2007; Montgomery et al. 2000).

The role of community-level variables in predicting premarital sexual debut is examined through place of current residence (rural or urban), place of previous residence, and ethnic origin. While place of current residence is categorised in the survey as urban or rural, place of previous residence is provided in three response categories: *"City", "Town",* and *"Countryside*". The countryside is defined as rural following other studies in the region, and the

complementary categories were defined as urban. *Given significant correlation between place of current and previous residence, and evidence* that place of current residence is not a significant predictor of youth sexual behavior (Gupta, 2000), we dropped place of current residence from the final multivariate regression models.

The survey provided information on 169 of Nigeria's ethnic groups. 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 ethnicities of Central Nigeria and those of the Niger Delta were respectively grouped into two cultural zones. Finally the myriads of other ethnic groups were grouped together as "*Others*". In terms of the religious composition of the sample by their ethnic origins, it is important to note that the Hausa/Kanuri/Fulani are 98 percent Muslim, young men and women of the Niger Delta and the Igbo are 98 percent Christian; the Yoruba in the sample are 61 percent Christian and 38 percent Muslim. The amalgam of young people from ethnic groups in North Central Nigeria is composed of 73 percent Christian and 25 percent Muslim. The ethnic groups labeled "Other" are made up of 67 percent Christian and 31 percent Muslim. Apart from the Hausa/Fulani/Kanuri and the Yoruba that have less, all other ethnic groups have at least one percent of young people who belong to traditional/other religions.

The study also considered the role of exposure to the mass media on premarital sexual debut, using an 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,* youth with the highest exposure to the mass media relative to those with lower exposure were determined.

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, the 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 $S(t)$, the probability of survival past time t. The estimate at any time t is given by

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

where n_j is the number of youth 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 (durations) by which a given proportion of young people initiated premarital sex. The procedure accounts for right censoring in the data, and therefore yields unbiased probability estimates of the timing of premarital sexual initiation.

For examining the role of migration on first premarital intercourse, net of other covariates, discrete-time hazard regression models were employed. 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. $h_{t1} = \Pr(y_{ti=1} | y_{si} = 0, s < t)$, which is the usual response probability for a binary variable and essentially a logistic regression model. The event indicator is analyzed using appropriate models for binary responses, specified as a logit model:

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

Where the covariates X_{ti}, may be fixed or time-varying and $\alpha(t)$ is some function of t, which is the baseline logit-hazard. The form of $\alpha(t)$ is approximately linear, and the linear function fitted is of the form: $\alpha(t) = \alpha_0 + \alpha_1 t$, including t as an explanatory variable in the model. This parameterisation leads to a piecewise-constant hazards model where the hazard is assumed constant within each category of the independent variables. A coefficient β is interpreted as the effect of a 1-unit change in a covariate x on the log-odds of an event in interval t. The exponent of β is interpreted as the multiplicative effect of x on the odds or an *odds ratio*. Following the complexity of the DHS sample design, we account for survey design errors in our regression models by adjusting for sample weights. Following multiple records for a single person, we adjust for inflated standard errors in each model by applying the Huber–White clustering correction with individual identification number as a clustering variable. 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 measure of migration in the NDHS data. It is important to recognize that following 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 migration histories (Chattopadhyay et al. 2006). It is important to note that the migration variable defined only reflects the last move, which is migration between current and previous place of residence. Following a history of step-wise migration and multistep moves in Nigeria (see Afolayan, 1985), the migration streams defined may not account for migration experiences prior to the last move and therefore limits our estimation of the migration effect beyond the last move. While this limitation may affect distinctions among migrant streams, it does not hinder the clear distinction between migrants and non-migrants. Moreover, despite the concern about how migration status was derived, the magnitude of migration categories obtained through this process, is consistent with previous estimates of the volumes of migration streams for sub-Saharan Africa generally and Nigeria in particular (see Chattopadhyay et al. 2006; Lacey, 1985; Mberu, 2005).

Defining some predictors at the time of premarital sexual initiation highlighted a key limitation of using cross-sectional data in studying time-variant outcomes. For variables like religion that are mostly determined by parental background, we assume an intergenerational transmission of social status and such are likely to stay stable over time. For other 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. In recognition of this shortcoming, the outcomes of the analysis were treated with caution, limiting interpretation of results of time-variant predictors to correlational associations rather than drawing causal inferences.

There is long standing evidence that sexual activity, particularly sexual intercourse outside marriage, is normally underreported by women, more so by young people (Adegbola and Babatola, 1999; Mensch et al. 2001). However, since the goal of this study does not include establishing absolute levels of premarital sexual initiation and given that there is no basis to think that under-reporting,

Table 1
Univariate characteristics of the study population and bivariate association with premarital sexual initiation.

Variable	All sample (%)	Sexual Initiates (%)	Total ($N = 10{,}865$)
Sexual initiation status			
Sexual initiates	35.4	–	3851
Sexual abstainers	64.6	–	7014
*Migration status***			
Urban–urban migrants	14.9	40.9	1615
Urban–rural migrants	9.1	46.4	989
Rural–urban migrants	3.4	37.7	369
Rural–rural migrants	7.6	46.4	823
Urban non-migrants	20.4	30.2	2211
Rural non-migrants	44.7	32.3	4858
Gender			
Female	59.3	35.5	6440
Male	40.7	35.4	4425
*Current age****			
15–16	29.6	12.3	3216
17–18	25.0	27.9	2717
19–20	21.0	43.4	2279
21–22	13.5	59.8	1467
23–24	10.9	70.1	1186
*Religion****			
Muslims	31.2	18.8	3393
Catholics	14.5	41.5	1577
Protestants/other Christians	53.2	43.5	5778
Traditional/others	1.1	39.3	117
Place of current residence			
Rural	61.4	35.8	6670
Urban	38.6	35.0	4195
*Previous residence***			
Rural	55.7	34.1	6050
Urban	44.3	37.1	4815
*Ethnic origin****			
Hausa/Fulani/Kanuri/Shuwa	16.0	7.6	1742
Igbo	18.0	37.1	1958
Niger-Delta groups[a]	17.6	55.9	1907
Middle-Belt groups[b]	15.7	36.7	1704
Yoruba	18.4	40.9	2047
Others	13.9	30.7	1507
*Education attained****			
No education	8.4	11.8	916
Primary level education	13.6	25.3	1479
Secondary education	70.5	37.5	7658
Tertiary education	7.5	61.3	812
*Nature of employment****			
Unemployed	59.3	31.1	6445
Formal employment	21.3	51.9	2309
Agriculture/Self employment	19.4	30.8	2111
*Living arrangements****			
Head of household	8.6	64.3	938
Child of head of household	67.7	31.2	7360
Relative of head of household	23.6	37.1	2567
*Household wealth index****			
Poorest	12.2	28.2	1325
Poor	16.1	30.8	1759
Middle	21.7	34.9	2359
Rich	26.5	40.5	2878
Richest	23.4	37.2	2544
*Index of media exposure****			
Lowest exposure	64.1	30.4	6966
Highest exposure	35.9	44.6	3899

χ^2 ***$p < .001$ **$p < .01$ *$p < .05$.
[a] The Niger-Delta includes the Urhobo, Isoko, Edo, Itshekiri, Annang, Efik, Ijaw, Ogoni, Ibibio, Ukale, Kwale, Ekoi, Yakurr, Ogoja, Oron, and the Ika of the South–South geopolitical zone.
[b] The Middle-Belt is an amalgam of ethnic groups of Central Nigeria: the Tiv, Igala, Idoma, Nupe, Kamberi, Gwari, Ibira, Jukun, Berom, Bogom, Bassa, Kaninko, Ninzom, Kataf, Eggon, Angas, Mambilla, Kutep, Jonjo, Mumuye, Tarok, Auchi and the Kabba.

if it exists, varies systematically across settings, the study compares the relative occurrence of premarital sexual debut across all migration categories and other covariates as reported.

Despite the limitations identified, the use of the 2008 NDHS data in this study represents a significant step forward and an innovative way to study issues of national research, policy and program importance. Also the large sample size, the currency and national representativeness of the data are very valuable in a country where nationwide studies, especially on migration are very rare and difficult, given the lack of infrastructure.

Results

Migration status, youth characteristics, and premarital sexual initiation

The univariate characteristics of the study population indicated in the first column of Table 1 show that 35.4 per cent of all youth aged 15–24 had initiated premarital sex at the time of the survey. Despite the attention and concerns focused on migration and its consequences, the data indicates high level of immobility, with 65 per cent of all youth currently 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, and rather than urban areas, the primary destination of rural out-migrants is other rural areas (see also Mberu, 2005; Oucho, 1998). The mean age of the study population at the time of the survey is 18.5 years and the mean age of premarital sexual debut for all youth is 16.9 years (16.7 years for young men and 17.0 for young women).

The bivariate relationships between migration status, other characteristics and premarital sexual debut are summarized in the complementary columns of Table 1. The results show a general higher proportion of premarital sexual debut among migrants of all streams than non-migrants and mostly among urban–rural, rural–rural and urban–urban migrants. In accounting for censoring in the data, the cross-sectional data set is restructured into person-year format and the Kaplan–Meier survival curves were fitted for premarital sexual initiation by all independent variables. The fitted survival curves provide details of the bivariate outcomes across each year of the observation period, but generally they reiterate the cross-sectional bivariate relationships presented in Table 1. For instance, by the end of the observation period (ages 10–24) Fig. 1 shows that about 26 percent of young people in the study remained sexual abstainers.

On the relationship between migration and premarital sexual initiation, Fig. 2 confirms that over the observation period sexual initiation is generally higher among migrants than non-migrants; and among urban–urban, rural–rural and urban–rural migrants relative to other migrant categories.

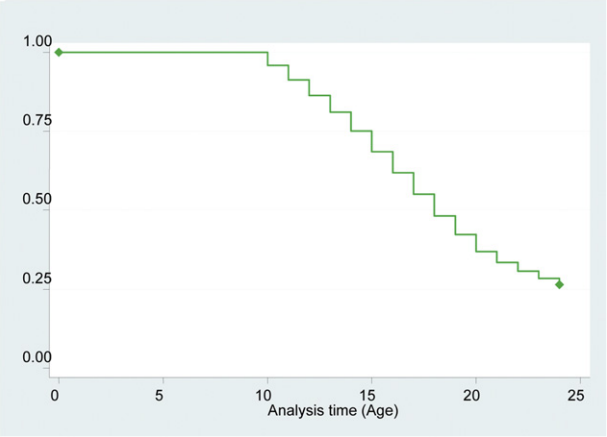

Fig. 1. Kaplan–Meier survival estimates showing age of premarital sex initiation for all youth from ages 10–24.

Discrete-time hazard multivariate analyses: premarital sexual initiation

While the bivariate cross-sectional analysis and the Kaplan–Meier survival curves provide general overviews of the repercussions of migration and other youth characteristics on premarital sexual initiation, these relationships are further refined (accounting for confounders), by the fitting of 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 previous residence. The full model includes time-variant individual characteristics: 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 youth. Compared with rural non-migrants, rural–rural migrants are 1.52 times as likely to initiate premarital sexual intercourse. The corresponding odds ratios for other migrant streams relative to rural non-migrants are: urban–rural 1.48; urban–urban 1.24; and rural–urban 1.18. Against expectations of urban–rural differences, urban non-migrants are not statistically different from their rural counterparts in premarital sexual debut.

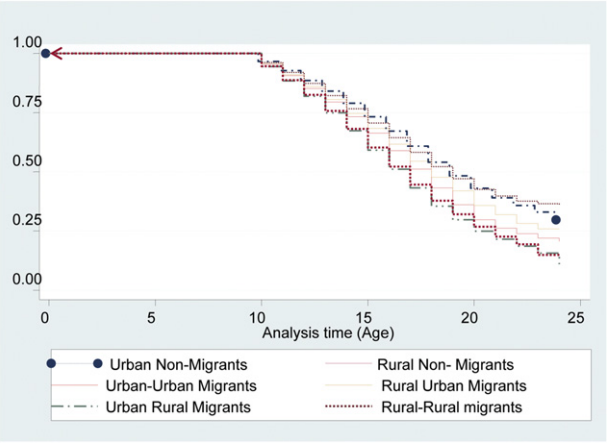

Fig. 2. Kaplan–Meier survival estimates of sexual initiation by migration status.

In Models 2 and 3, controlling for individual and community-level time-invariant covariates respectively, most notably age (exposure), the statistically significant variation between urban–urban and rural–urban migrant categories and premarital sexual debut disappeared, but the significant relationships between urban–rural and rural–rural migrant categories and premarital sexual debut remain. In the full model, Model 4, the strength of the migration measures are weakened further, but the relationship between urban–rural and rural–rural migration and sexual debut remained statistically significant.

On the effect of gender, the results suggest that young women are only marginally less likely to initiate premarital sexual intercourse than young men and this is only significant in Model 3, where young women are 11 percent less likely to initiate premarital sex than young men. In the full model there was absolutely no variation by gender.

Consistent with the proposition that biological and social maturity increases the risk of 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 consistently decreases after that threshold. Notwithstanding, the propensity for premarital sexual initiation at higher ages remain significantly higher than the youngest reference age group.

In line with expectations, religious affiliation is significantly associated with premarital sexual initiation. In Model 2, Christian groups are more likely to initiate premarital intercourse than Muslims and this relationship remains significant across Models 3 and 4. In general, the result is consistent with strict sexual behavioral norms for youth 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 youth are 6.0 times more likely to initiate premarital intercourse. For other groups, the corresponding odds ratios are: the Niger Delta groups, 11.6; the Middle Belt region, 6.8; the Yoruba, 8.4; and "Others", 5.7. These estimates show that youth from the Niger-Delta have 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.

Among time-variant covariates, the level of education attained is significantly associated with the likelihood of premarital sexual initiation, with the largest estimates among youth with secondary and tertiary education. Youth employment in the formal sector, which confers the highest level of physical and financial independence, indicates a significant association with premarital sexual initiation. Young people employed in the formal sector are 1.5 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 premarital intercourse, in the full model unmarried young men and women who are heads of households have an odds ratio for initiation of premarital sexual relationships of 1.6 relative to those who live with their parents. This outcome contrasts with those who live with relatives other than parents, for whom the odds ratios is 1.03 compared with those living with parents to initiate premarital sex. Despite this significant estimate, our analysis reinforced other findings that migration in the region takes place within family and community networks.

Table 2
Discrete-time hazard models predicting the odds of sexual initiation among never married Nigerian youth.

Variables	Model 1		Model 2		Model 3		Model 4	
	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	RSE
Migration Status								
Rural non–migrants	1.00	–	1.00	–	1.00	–	1.00	–
Urban–urban migrants	1.24***	.05	1.03	.05	.89*	.06	.92	.06
Urban–rural migrants	1.48**	.07	1.41**	.09	1.24**	.08	1.22**	.08
Rural–urban migrants	1.18*	.09	.98	.10	.96	.10	.95	.10
Rural–rural migrants	1.52***	.08	1.47***	.10	1.25***	.09	1.19*	.08
Urban non–migrants	.93	.04	.96	.05	.94	.05	1.00	.06
Gender								
Male			1.00	–	1.00	–	1.00	–
Female			.97	.04	.89**	.03	1.00	.04
Years of exposure to risk								
10–14 (1–5years)			1.00	–	1.00	–	1.00	–
15–16 (6–7years)			6.20.***	.35	6.39***	.35	6.31***	.36
17–18 (8–9years)			11.6***	.65	12.07***	.68	11.86***	.67
19–20 (10–11years)			17.14***	1.07	18.57***	1.16	18.01***	1.13
21–24 (12–15years)			12.12***	1.06	13.57***	1.20	13.24***	1.19
Religion								
Muslims			1.00	–	1.00	–	1.00	–
Catholics			2.30***	.15	1.28***	.09	1.26**	.09
Protestants/Other Christians			2.59***	.14	1.26***	.07	1.27***	.07
Traditional/Others			2.41***	.40	1.24	.22	1.38*	.23
Ethnic origin								
Hausa/Fulani/Kanuri					1.00	–	1.00	–
Igbo					6.04***	.74	5.75***	.72
Niger-Delta groups					11.64***	1.41	10.91***	1.35
Middle-Belt groups					6.83**	.80	6.24***	.75
Yoruba					8.43***	.99	8.32***	.97
Others					5.71***	.68	5.30***	.64
Previous place of residence								
Rural					1.00	–	1.00	–
Urban					.99	.07	1.02	.07
Education attained								
No education							1.00	–
Primary level education							1.46**	.19
Secondary education							1.65***	.21
Tertiary education							1.58***	.21
Status/type of employment								
Unemployed							1.00	–
Formal employment							1.50***	.06
Agriculture/Self employment							1.17**	.07
Living arrangement								
Child of head							1.00	–
Head of household							1.56***	.09
Relative of head							1.03	.05
Household wealth index								
Poorest							1.00	–
Poor							.82*	.07
Middle							.73***	.06
Rich							.72***	.06
Richest							.57***	05
Index of media exposure								
Lowest media exposure							1.00	–
Highest media exposure							1.14**	.05
Number of Youth = 10,865								
Number of observations (person years) = 91,354								
Wald Chi-Square (d.f.)	141.8*** (5)		3001.1*** (13)		3320.8*** (19)		3518.5*** (31)	

*$p < .05$, **$p < .01$, ***$p < .001$.

We identified very low levels of independent living among young people, with 93% of non-migrant and 88% of migrant youth living with their parents or relatives at the time of the survey.

The association between household wealth and premarital sexual initiation is generally consistent with the perspective that vulnerability to early sexual initiation is related to poverty. The propensity for sexual debut decreases as we move up the household economic ladder, with young people from richer backgrounds the least likely to initiate premarital intercourse. The odds ratio for initiation of premarital sex is .57 for youth from the richest households relative to those from the poorest households.

On the role of the mass media, the result shows a significant independent relationship between exposure to television, newspapers and radio and premarital sexual initiation. Young men and women who indicated simultaneous exposure to all three media outlets have an odds ratio for initation of premarital intercourse of 1.14 relative to those not so exposed.

Following suggestions from the literature that girls from poor backgrounds use sexual intercourse as an economic survival strategy (Fatusi, 2004; Luke, 2003; Okonkwo et al. 2005) and the expectation that ethnicity affects men and women differently, we utilized interaction terms to verify the differential effects of ethnicity and household wealth on sexual debut of young men and women. However, the two interaction models that include all variables from the main effects models in Table 2 and interaction terms for ethnic origin and household wealth by gender, found no significant variation on the effects of household wealth or ethnic origin by gender (estimates are therefore not presented).

Discussion and conclusion

This paper addresses sexual initiation among never married, migrant and non-migrant young men and women aged 15–24, accounting for the net effects of individual, household and community variables. Consistent with theoretical and empirical literature, our results show that migrant youth generally are more likely to initiate premarital sex than non-migrants. Relative to their rural non-migrant counterparts, urban–rural and rural–rural migrants show the most consistent propensity to premarital sexual initiation in all models. The outcome as it relates to urban–rural migrants is consistent with findings from the HIV/AIDS research in the region that identified the route of transmission as urban migrants returning to rural areas to infect their partners (Chirwa, 1997; Lurie et al. 1997). Migrants with previous exposure to urban environments have been linked to increased likelihood of high-risk sexual behavior in rural areas through socialization to less restrictive sexual norms and/or acquisition of enabling characteristics such as wealth in cities (Brockerhoff & Biddlecom, 1999).

The findings for rural–rural migrants underscore the importance of this hitherto neglected migration stream, in terms of volume and impact on the reproductive behavior of young people in Nigeria. For urban–urban and rural–urban migration streams, the results suggest marginal differences compared with their non-migrant peers in premarital sexual initiation. This may be an empirical pointer to the increasing fusion of rural and urban norms in an era of globalized mass communication, which challenges the dichotomous model of urban versus rural areas in terms of conservative versus permissive sexual norms. The challenge is reinforced by the lack of significant variation between the premarital sexual engagement between rural and urban non-migrants.

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 mediates this association, supporting a multi-factor approach in the study of premarital sexual behavior. In general, years of exposure to the risk of premarital sexual initiation, religious affiliation, ethnic origin, employment in the formal sector, early transition to independent living and high exposure to the media are strong independent predictors.

The marginal difference between young men and women in Model 3 and the total parity in the propensity to initiate premarital intercourse in the full Model, reiterates the evidence that young men face challenges similar to those of young women on issues relating to early sexual engagement. Beyond empirical findings that young men face relatively few hazards and many potential benefits, including gratification and social prestige, from engaging in early premarital sexual experience (Mensch et al. 2001), our result 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 early sexuality.

On years of exposure to the risk of premarital sex, while the finding is consistent with the proposition that biological and social maturity increases the risk of exposure to premarital sexual activities, yet years of exposure do not have a monotonic effect, rather it peaks at ages 19–20 and consistently decreases after that threshold 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 young people who successfully abstain from premarital sexual initiation until after their teenage years may subsequently face lower risks of initiation after. While further analysis beyond this study may be needed for the validation of this threshold effect, the outcome suggests that those who successfully abstained from sexual engagement during their teenage years, may have developed some defense mechanisms and therefore able to exercise more agency against the so called over-powering peer-pressures. The Kaplan–Meier survival curves, (indicating levels of "survival" at every point of the observation period), show that at age 18, established by international conventions as the legal age of consent to a sexual union (see The Universal Declaration of Human Rights, 1984; The convention on the Rights of the Child, 1989; and The African Charter on the Rights and welfare of the Child, 1990), about 43 percent of the sample has not initiated premarital intercourse and at 24 years of age about 26 percent of the study sample remain primary sexual abstainers. 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 young people attain ages consistent with international conventions and healthy transition to adulthood.

Further, living arrangements and livelihood opportunities that give young people the most physical and financial independence from their parents and relatives expose them to significant risk of premarital sexual initiation. The strong estimates obtained for young heads of households and those in formal employment reinforce the traditional behavioral conformity roles of authority figures and gate keepers in the lives of young people. Given the very common presence of parents or relatives in migrant and non-migrant households, the number of young people living independently is quite small. Therefore, to the extent that youth migration remains family-based, and not a frequent precursor to youth independent living, the loss of social capital occasioned by such movements will remain minimal, with a potentially moderating effect of parental influence on the relationship between migration and premarital sexual engagement.

Cultural identity factors of religion and ethnic origin stood out among key independent predictors of premarital sexual initiation. The result for religion is consistent with expectations of stricter sexual restrictions and consistent emphasis on premarital virginity

among Muslims, reinforced in the last decade by the imposition of Islamic sharia law in most parts of the core north of Nigeria.

For ethnicity, the independent association stood out in the full Model as one of the strongest predictors in the analysis. That these relationships remain very strong after controlling for all defined covariates 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 continued potency of ethnicity in defining identity, interaction and behavioral boundaries in the socioeconomic and political spheres of modern Nigeria makes the result even more persuasive (Osaghae & Suberu, 2005).

The result showing significant association between educational attainment and premarital sexual initiation is consistent with findings that cumulative years of education, and being enrolled in school increases the risk of experiencing first sexual intercourse in Nigeria. The result support previous conclusions that the typical Nigerian higher education environment offers opportunities for high levels of sexual networking, and permissive sexual lifestyles (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. Young people in schools interact with complex social variables, 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, lack of data on school environment limits our ability to test associations with relevant school-contexts generally correlated with educational attainment.

Several important implications for reproductive health policies and programs can be derived from this study. One issue is the need to address lack of youth-related livelihood opportunities in places of origin that motivate youth migration to economic centers, with the consequent loss of social capital necessary for behavioral control. This may be important for HIV/AIDS control as migrant youth indicate higher propensity to premarital sexual engagement together with those who transited into independent living arrangements and into formal employment. Another important issue is 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 information on within-group variations necessary for precise understanding of sexual behavior dynamics within a country.

Finally, the mean age of premarital sexual debut in Nigeria is one year lower than the 18 years of legal consent to a sexual union established by international conventions. Policy and program initiatives targeted at those under 18 may be invaluable in addressing the challenges of early sexual engagement and achieving healthy transition to adulthood.

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