Ethnic Differentials in Male Fertility Behaviour in Nigeria: A multilevel analysis

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Abstract

The level of male fertility is still high among Nigeria men and it varies with culture. Hence, this study employed a multilevel model approach to examine the influence of ethnicity differential on male fertility behaviour and identify the underlying contextual factors for the number of children born among men. The ethnic differentials in male fertility behaviour in Nigeria were investigated using a multilevel model approach of 2013 data from the Nigeria Demographic and Health Survey (NDHS). The study revealed that among the three major ethnic groups in Nigeria, the Hausas have the highest number of children ever born, next, followed by the other tribes, and then, followed by the Yorubas and lastly the Igbos. Ethnicity significantly influenced male fertility behaviour in Nigeria ($p<0.05$). Findings of this study thus established ethnic background as important factors that must be taken into consideration in the efforts to reduce the fertility level in Nigeria.

Keywords: Demography and Health Survey; male fertility behaviour; ethnicity, single level analysis, direct and indirect determinants.

Introduction

African men play an important role in fertility decisions and in matters affecting marriage and family life. Also, Nigerian men value children as a source of satisfaction, success and means of preservation of the lineage. The level of male fertility is still high among Nigeria men and it varies with culture. Some are higher than the other. According to Isiugo-Abanihe's (1993) who worked on fertility, family size, preferences and value of children and considering three zones (Ibadan, Owerri and Zaria) among Nigerian men. He found out that the number of actual children was significantly inversely related to marriage age, monogamy, high education, interspousal discussion of family size, and intention to rely on personal resources for old age support. Also, a positive and significant relationship was found with the use of family planning and being in a male-dominated family setting.

Moreover, Mustapha (2006) studied the Hausa people, a dominant ethnic group in northern Nigeria on their male knowledge, attitudes and family planning practices. He examined the linkages between socioeconomic characteristics, attitudes, and familial contraceptive use. He explained that the choice of this ethnic group was largely predicated on the traditional character of the patriarchal group and its high fertility. However, because northern Nigeria (and to a slightly lesser extent all of Nigeria) remains a patriarchal society characterised by early age at marriage for women, men at present continue to determine familial fertility and contraceptive decisions.
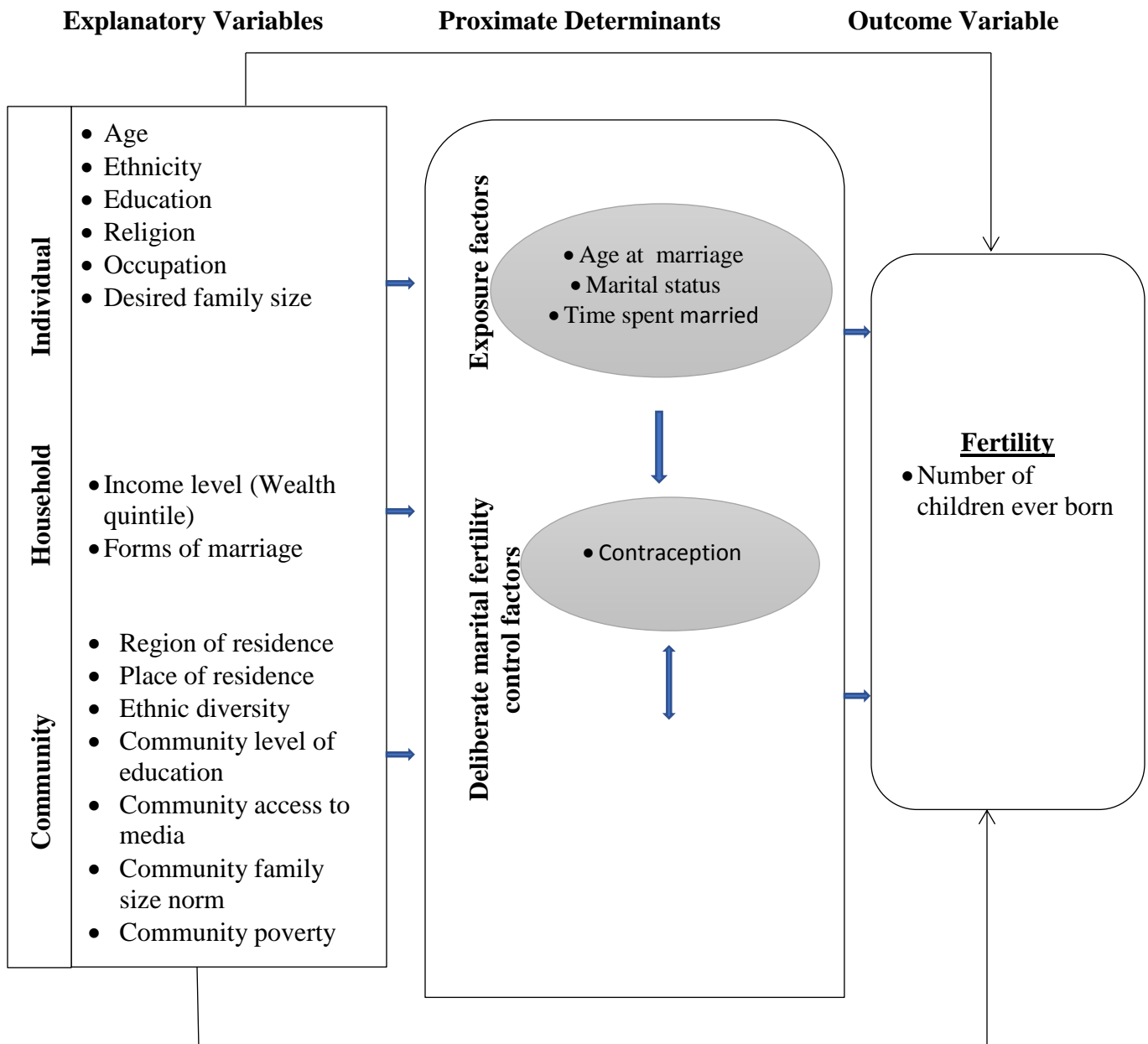
Consequently, at least for the time period relevant for current policy planning purposes, the willingness of husbands to adopt or allow their spouses to use family planning practices will determine the pace of fertility reduction in Nigeria. The results suggest that there is high knowledge of contraceptives, a generally negative attitude towards limiting family size for economic reasons,

and consequently low rates of contraceptive use. Respondents who were willing to use contraceptives were more willing to use them for child spacing purposes than explicitly for limiting family size. As a result, family planning programmes that continue to focus solely on women will continue to achieve only limited successes in northern Nigeria (and likely in the many patrilineal societies where a similar program is pursued) as compared to southern and western Nigeria.

In Nigeria, there are ethnicity differentials in male fertility behaviour. Therefore, culture must be taken into consideration in the efforts to reduce the fertility level in Nigeria. The neglect of these differences in fertility behaviour in research agenda could result in persistent high fertility which in turn will lead to public health problems like high childhood mortality and high maternal mortality. Other problems could be socio-economic problems associated with high fertility (e.g. low per capita income, high poverty level, and high unemployment rate, among others.) This study seeks to examine ethnicity differentials in male fertility behaviour in Nigeria.

Theoretical Framework

This study was guided by both the reviewed literature and theoretical Bongaarts model. Bongaarts model framework for analysing the proximate determinants of fertility. Social, cultural and economic factors that influence fertility must work through the intermediate variables or proximate determinants that directly affect reproduction (Khan & Shirmeen, 2007). The following diagram summarises the relationships among the determinants of fertility.

| Explanatory Variables | Proximate Determinants | Outcome Variable |

Individual
- Age
- Ethnicity
- Education
- Religion
- Occupation
- Desired family size

Household
- Income level (Wealth quintile)
- Forms of marriage

Community
- Region of residence
- Place of residence
- Ethnic diversity
- Community level of education
- Community access to media
- Community family size norm
- Community poverty

Exposure factors
- Age at marriage
- Marital status
- Time spent married

Deliberate marital fertility control factors
- Contraception

Fertility
- Number of children ever born

Figure 1.   Conceptual Framework on the Relationship between Contextual Determinants and Male Fertility (Adapted from Bongaart, 1978)

Data source and Method

The study employed data from NDHS which is an analytical cross-sectional study of secondary data from 2013 NDHS. The sample size is 17,359. This data is nationally representative and covered the entire population residing in non-institutional dwelling units in the country. The survey used as a sampling frame the list of enumeration areas (EAs) prepared for the 2006 Population Census of the Federal Republic of Nigeria, provided by the National Population Commission. The sample was designed to provide population and fertility indicator estimates at the national, zonal and state levels. The sample design allowed for specific indicators to be calculated for each of the six zones, 36 states and the Federal Capital Territory, Abuja.

Variables measurements

Outcome variable

The dependent variable in this study was the number of children ever fathered. Questions were asked on the number of sons and daughters the men have fathered with any woman whether living with them or living elsewhere. And whether the man has ever fathered a child that was born alive but later died. Responses – yes or no – were given to the question – 'is child dead?' Other information obtained include the number of children born alive but now dead.

Explanatory variables

The independent variables in this study included important characteristics which are the individual and community determinants known to have an influence on fertility in the literature. The selection of independent variables in this study was guided by proximate determinants propounded by Bongaart (1978). The direct determinants which are of three levels (individual, household and community characteristics) are ethnicity, age, educational level, religion, occupation, ideal number of children, wealth index, type of marriage, place of residence (Rural/urban residence), region of

residence, ethnic diversity (The extent of diversity in the community where respondents live in terms of ethnic composition), community poverty, community level of education (Proportion of men who had at least secondary education in the community), community family size norm (proportion with high family-size norm in community), community media access (Proportion of men who had access to newspaper/magazine, radio and television), and the indirect determinants which are marital status, age at first marriage, time spent married and contraceptive use.

Statistical analysis

Three levels of analysis were done for this study. At the first level, the variables were described using frequency and percentage. Charts were done at the bivariate level to show the mean CEB of the men according to their ethnic groups. Lastly, multilevel binary logistics regression was done. Four models were fitted in the multilevel analysis with each set of models examining the influence of ethnicity on CEB.

Model 0- The first model is the empty model. It contained no explanatory variable and it focused on decomposing the total variance into individual and community-level components

Model 1- This model only considered ethnicity in the model

Model 2 - This model measured only the individual-level variables. It combined both the household and the intervening variables into the multilevel analysis.

Model 3 – This model is the full model that incorporated all variables (ethnicity, individual/household and community variables) into the multilevel analysis.

Results

Univariate result

Table 1 presents the individual level characteristics. Only a few of the 11.9% of the respondents said the ideal number of children is less than four children. On average the ideal number of children is 7.9 children with a standard deviation of 6.6 children. A bulk of the respondents (87.4%) desired child(ren) either now or after two years while about one out of ten men. More than half of the respondents (51.6%) were Muslims. Two-third of the men (62.1%) have secondary or higher education and a quarter of them (25.0%) are in the richest category. Also, most of the respondents (38.6%) are in another category of the ethnic group followed by the Hausas about 34.5% and half of the respondents were married.

Table 2 described community-level variables. The indicators of community-level influences, which were selected based on the research literature and data availability, are listed as follows; region, place of residence, ethnic diversity, community poverty, community level of education, the proportion with high family-size norm in the community and community media access. The region of residence as shown in the table, 29.9% were from the North West region of Nigeria whilst, only 9.7% of the survey were from the South East. More than half of the respondents were rural dwellers (56.2%) while 43.9% were residing in the urban. An examination of ethnic diversity showed that the study sample was fairly heterogeneous as almost 2 in 5 men (34.9%) were men residing in heterogeneous communities while 31.2% were men residing in homogeneous communities.

The table also revealed that 31.2% were men residing in communities with a low proportion of men who had a secondary or higher level of education while about 2 in 5 men s(39.8%) were men residing in communities with a high proportion of men who had a secondary or higher level of education. As Table 1 show, 40.8% were men residing in the community with a high proportion of men who had high family size norm while 23.9% were men residing in the community with low family size norm.

Consideration of community poverty indicates that 40.1% were men residing in communities with a high poor household while 29.5% were in communities with a low concentration of poor households. Finally, for community-level variables, the survey indicated that 27.8% were men residing in the community with the proportion of men with low media access whilst, 38.1% were men residing in the community with the proportion of men with high media access.

Bivariate analysis

The chart in Figure 1 above shows the mean CEB of men among the three ethnic groups in Nigeria. The Hausas had the highest CEB across the year (3.2 in 2003, 3.1 in 2008 and 2.7 in 2013), followed by the other tribes (1.9 in 2003, 1.7 in 2008 and 1.8 in 2013), the Yorubas 1.7 in 2003 and 2008, 1.8 in 2013 and then the Igbos had the least CEB (1.2 in 2003, 1.4 in 2008 and 1.3 in 2013).

Multivariate analysis

To examine how variation was built up from various levels (Individual and community-level); separate analysis was done examining the relationships among children ever born and characteristics at various levels of operations. Generalized linear and latent mixed models (GLLAMM, downloadable program and implementable in Stata version 13.0) were used to conduct the multilevel analysis. Fixed effects and random effects which are important concepts in the multilevel analysis were employed in results interpretation. While fixed effects are used to model associations, random effects are useful in modelling variations (Merlo, Chaix, Ohlsson, *et al*., 2005; Merlo, Chaix, Yang, *et al*., 2005). Measures of association (i.e. fixed effects) were expressed in this study as the exponential coefficient. The random effects which were regarded as measures of variations in children ever born across communities were expressed in this study as

intra-class correlation (ICC) (or variance partition coefficient (VPC), and proportional change in variance (PCV).

Tables 3 present the effects of ethnicity on fertility behaviour among men in Nigeria. Model 0: the empty model which contain no explanatory variables; Model 1: only the ethnicity and fertility behaviour; Model 2: ethnicity with individual characteristics on fertility behaviour; Model 3: full model, this model examined the effect of ethnicity and individual variables with community-level factors on fertility behaviour.

The results presented in the empty model, which contains no explanatory variables, (Model 0, Tables 3) indicated a significant variation in male fertility behaviour with variances ranging from 0.05 to 2.51 across individual levels, and variances ranging from 0.02 to 0.28 across communities; thereby justifying the use of multilevel modelling in this chapter. The results from analysis indicated that the between communities variance (expressed as variance partition coefficient – VPC or intra-class correlation coefficient – ICC) in the number of children ever born in 2013 was larger in Model 0 (7.8%) than the between communities variance estimated for the other Models. This suggests that intra-community variations associated with the number of children ever born in) was larger in the empty model than the observed variations associated with a number of children ever born in Model 1, 2 and 3.

As for model 1, the measures of variation, fitting individual level variables into Model 1 (in Tables.3) did yield significant variance across individuals (with variance ranging from 0.05 to 2.50) and across communities (with variance ranging from 0.02 to 0.22).

The proportional change in variance (PCV) in Model 1 indicated that 21.4% of the variance associated with the number of children a man has ever fathered across communities was explained

by ethnicity variable. The estimated PCV in Model 2 and 3 was 96.4%. This suggests that more variations in the number of children ever born were explained by individual and community variables in Model 2 and 3 compared to Model 1.

A consideration of the measure of variation in model 2 and 3, fitting individual/household level variables into the model did not yield a significant variance across individuals (with variance ranging from 0.00 to 0.01) and across communities (with variance ranging from 0.00 to 0.01). The proportional change in variance (PCV) in Model 2 indicated that 96.4% of the variance associated with the number of children a man has ever fathered across communities was explained by individual variables.

Model 3 which is the full model indicated that adding the whole variables (ethnicity, Individual and the community variables) into the multi-level model as presented in Table 3 did not significantly change the number of children ever born. For instance, the exponential coefficient of a number of children ever born slightly declined among the Igbo in Model 2 and Model 3 from 0.98 to 0.90 and 0.90 to 0.91 among the Yoruba; 1.00 to 0.98 among other tribes in the model. But there was a significant change from Model 1 to Model 2 and 3.

AIC and BIC are the Akaike and Schwarz's Bayesian information criterion. Models with smaller values of an information criterion are considered preferable. The model that was more preferable was Model 3 which is the full Model combining ethnicity, individual and community variable together.

Model 1 fixed effects result shows that the Yorubas were 0.70, Igbo were 0.43 and the other tribe were 0.75 as likely to have the number of children ever born as the Hausas. Ethnicity had a significant effect on the number of children a man has ever fathered.

Discussion, Conclusion and Recommendations

Among the three major ethnic groups in Nigeria, the Hausas have the highest number of children ever born, next, followed by the other tribes, and then, followed by the Yorubas and lastly the Igbos. Family size decision in Nigeria is often guided by normative principles, institutions, and beliefs that vary among ethnic groups. Further, the differences in the mean number of children ever born in each ethnic group can also be attributed to other factors.

From the literature, Theodore (2006) mentioned factors that have been noted to work simultaneously to inhibit population control which varies among the ethnic groups in Nigeria. The following factors amongst many are generally considered to be the most important. One of them is religion. The Islamic religion which is dominant among the Hausas in Nigeria promotes large families with the encouragement of early marriage and polygamous family system. The Christian religion, like the Catholics, in turn, prohibits the most effective forms of contraception.

Another factor is lack of education. Again, this is a major problem in the Northern part of the country. The lack of education especially is related to population education, sex education and the lowering of infant mortality and birth rates. Also, male-child preference influences population growth. In many cultures in Nigeria, predominantly, among the Igbos, male offspring are more highly valued than females for a variety of reasons (like carrying on the family name, greater upper-body strength for physical labour), which leads to the common practice of continuous childbirth in an attempt to have male children.

Moreover, old-age social security likewise encourages population growth. In many cultures in Nigeria, children are the only form of support for the elder generation. High infant mortality also perceived need to have many babies in order that some will survive, to work on the farm, support aged parents and so forth.

And lastly, the issue of demographic data. Most environmental scientists predict that the world's population will be between 10 and 20 billion, in which case, at the present growth rate of 1.4%, we will reach a carrying capacity within the next 50-100 years. What then will the population of Nigeria be, with a population growth rate of 2.56% and contributing 4% of the world's yearly population? The population of Nigeria is growing yearly. This calls for the attention of policymakers to find a means of curbing the population growth rate in the country.

This study also found that the characteristics of community contexts had a significant influence on the fertility behaviour of men. For instance, residents in communities with a high proportion of educated men and region were significantly associated with fertility behaviour

In conclusion, ethnicity significantly influences male fertility behaviour in Nigeria. The Hausas have high birth rates among the major ethnic group and there is a need to put the community variables in consideration in order to lower the total number of children ever born.

Limitations and strengths of the study

First, the process of generating community-level variables at the level of PSUs could lead to auto-correlation. Second, the study was limited to the use of the available variables in the DHS data of selected countries. Third, the PSU which was used as a proxy for communities may misclassify respondents into incorrect administrative boundaries. Notwithstanding these limitations, the present analysis provides empirical evidence that there is significant ethnicity effect on Nigeria fertility patterns.

Acknowledgement

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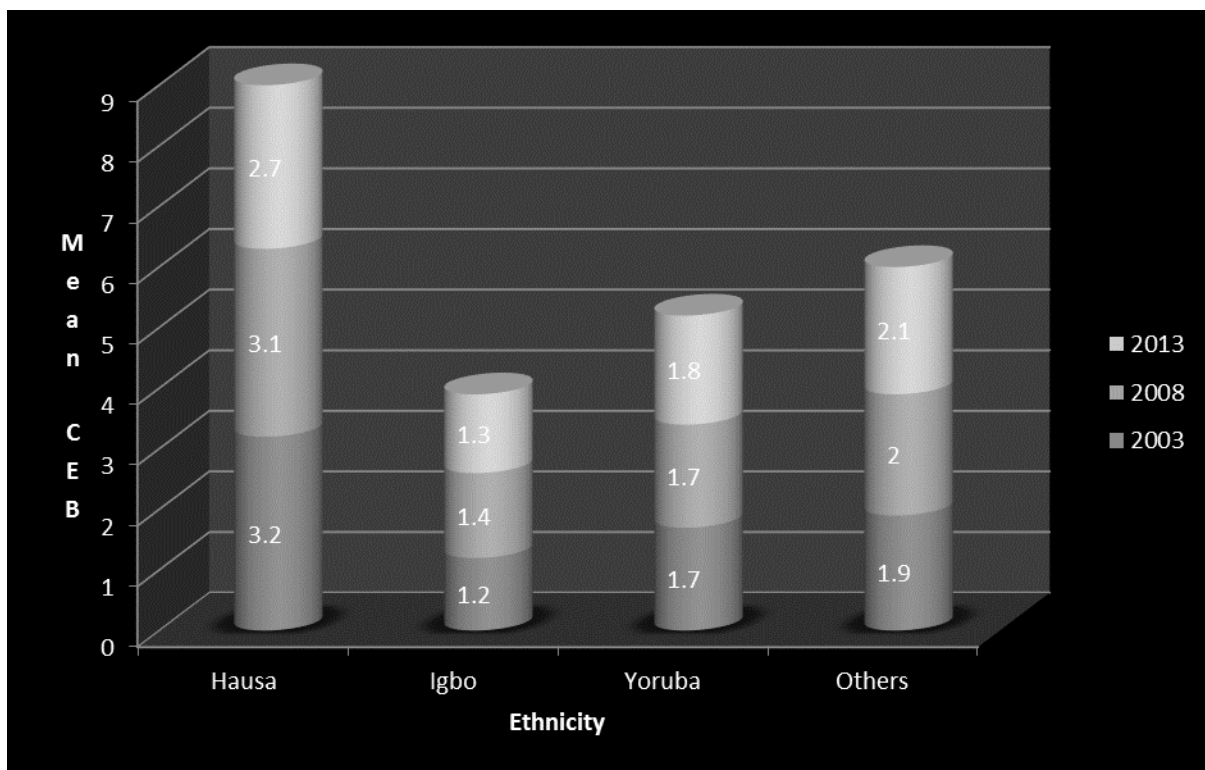Zhang, L., 2011. Male Fertility Patterns and Determinants, Dordrecht, Springer.

Figure 2: Mean CEB of Men by Ethnicity

Table 1 Percentage Distribution of Study Sample by Individual-Level Characteristics

	Frequency	**Percentage**
Ideal number of children { $\bar{X}$ (SD) = 7.9 (6.6)}		
< 4 children	1949	11.9

	4 children or more	14466	88.1
Education			
	None	3685	21.2
	Primary	2907	16.7
	Secondary or higher	10767	62.1
Religion			
	Christianity	8195	47.4
	Islam	8907	51.6
	Others	178	1.0
Wealth index			
	Poorest	2862	16.5
	Poorer	2992	17.2
	Middle	3338	19.2
	Richer	3835	22.1
	Richest	4332	25.0
Age			
	15-24	6511	37.5
	25-34	5171	29.8
	35 and above	5676	32.7
Ethnicity			
	Hausa	5963	34.5
	Igbo	2330	13.5
	Yoruba	2341	13.5
	Others	6676	38.6
Marital status			
	Married	8839	50.9
	Not married	8520	49.1

Table 2: Percentage Distribution of Study Sample by Community-Level Characteristics

Variables	The year 2013	
Number of respondents	17,359	
	N	**%**
Regions		
North Central	2685	15.5
North East	2515	14.5
North West	5185	29.9
South East	1686	9.7
South-South	2445	14.1
South West	2844	16.4

Place of residence		
Urban	7611	43.9
Rural	9748	56.2
Ethnic diversity		
Homogenous	5630	31.2
Mixed	5670	32.7
Heterogeneous	6059	34.9
Community poverty		
Low	5123	29.5
Medium	5274	30.4
High	6962	40.1
Community level of education		
Low	5417	31.2
Middle	5040	29.0
High	6902	39.8
The proportion with high family-size norm in the community		
Low	4143	23.9
Middle	6132	35.3
High	7084	40.8
Community media access		
Low	4832	27.8
Middle	5919	34.1
High	6608	38.1

Table 3: Results from multilevel logistic regression showing the effects of ethnicity on children ever born among men in Nigeria

Characteristics	Model 0	Model 1	Model 2	Model 3
	Exp. Coefficient	Exp. Coefficient	Exp. Coefficient	Exp. Coefficient
Ethnicity				
Hausa		1.00	1.00	1.00
Igbo		0.43*	0.99	0.89*
Yoruba		0.70*	0.92*	0.89*
Others		0.75*	1.01	0.98
The ideal number of children				
<4 children			1.00	1.00
4+ children			1.15*	1.15*
Religion				
Christianity			1.00	1.00
Islam			1.04*	1.05*
Others			1.09*	1.11*
Current age				
15-24			1.00	1.00
25-34			2.43*	2.43*
35 and above			3.75*	3.75*
Marital status				
Never married			1.00	1.00
Married			0.97	0.96
Educational Level				
No education			1.00	1.00
Primary			1.03	1.02
Secondary			0.98	0.96
Higher			0.93*	0.91*
Age at marriage				
<18			1.00	1.00
18-24			0.97	0.97
25+			0.86*	0.85*
Type of marriage				
Monogamy			1.00	1.00
Polygamy			1.60*	1.60*
Wealth index				
Poorest			1.00	1.00
Poorer			0.97	0.96
Middle			0.95*	0.94*
Richer			0.94*	0.93*
Richest			0.82*	0.82*
Occupation				

Not working			1.00	1.00
Formal			1.10	1.11
Informal			1.07	1.08
Manual labour			1.06	1.07
Time spent married				
0-10 years			1.00	1.00
11-20 years			1.76*	1.76*
21 years and above			2.24*	2.24*
Current use of contraceptives				
Not currently using			1.00	1.00
currently using			1.09*	1.09*
Regions				
North Central				1.00
North East				1.06*
North West				1.01
South East				1.17*
South-South				1.02
South West				1.01
Place of residence				
Urban				1.00
Rural				0.99
Ethnic diversity				
Homogenous				1.00
Mixed				1.02
Heterogeneous				1.09
Community poverty				
Low				1.00
Medium				1.00
High				0.95
Community level of education				
Low				1.00
Middle				1.09*
High				1.10*
Community media access				
Low				1.00
Middle				0.97
High				0.98
The proportion with high family-size norm in the community				
Low				1.00
Middle				1.03
High				1.03

Random effects	Empty model	'Ethnicity'	'Ethnicity + Individual/household-level variables	'Ethnicity' + Individual/household-level variables and community level variables
Community-level				
Variance (SE)	0.28 (0.02)	0.22 (0.02)	0.01 (0.00)	0.01 (0.00)
VPC=ICC (%)	7.8	6.3	0.3	0.3
Explained variation (PCV) %	Reference	21.4	96.4	96.4
Individual/household-level				
Variance (SE)	2.51 (0.05)	2.50 (0.05)	0.01 (0.00)	0.01 (0.00)
Explained variation (PCV) %	Reference	0.40	39.3	39.3
Log likelihood	-3325.22	-33092.64	-17091.29	-17070.32
Model fit statistics				
AIC	66508.43	66197.29	34238.58	34228.65
BIC	66531.72	66243.84	34435.79	34538.55