

RESEARCH ARTICLE

# Family size preferences among women in a union in Nigeria and associated factors

Lorretta Favour Chizomam Ntoimo\*

Federal University Oye-Ekiti, Nigeria

---

**ARTICLE INFO**

**Received:** April 8, 2022

**Accepted:** August 8, 2022

**Published:** August 24, 2022

**\*CORRESPONDING AUTHOR**

Lorretta Favour Chizomam  
Ntoimo, Federal  
University Oye-Ekiti, Nigeria  
lorretta.ntoimo@fuoye.edu.ng

**CITATION**

Ntoimo LFC. (2021). Family size preferences among women in a union in Nigeria and associated factors. *International Journal of Population Studies*, 7(1):51-65. doi: [10.18063/ijps.v7i1.1318](https://doi.org/10.18063/ijps.v7i1.1318)

**Copyright:** ©2021 Ntoimo.

This is an Open-Access article distributed under the terms of the Creative Commons Attribution-Non-Commercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, which provided that the original work is properly cited.

---

**Abstract:** Nigeria's population is currently estimated at 216million and the country will be the third most populous in the world in 2050. A major driver of the high population growth is persistent high fertility. This study examined women's fertility preferences, which was measured with ideal family size (IFS) and the associated factors. Data were obtained from the 2018 Nigeria Demographic and Health Survey. The analysis consisted of a weighted sample of 13, 673 women in union, aged 15–49 years whose first marriage took place within 10 years before the survey. Descriptive and multinomial logistic regression analyses were conducted. The proportion of respondents whose IFS was 5+ was 65%. Slightly above one-quarter had IFS of four children, and 11% had IFS of 0 – 3. IFS of 5+ was significantly associated with women resident in the Northern and Southeast regions, rural residents, Muslims, women who had no education, women working in agriculture, sales/service jobs, those who participated in one or two out of four household decisions, justified wife beating, have 5+ siblings, experienced child death, and married before age 20. Efforts to achieve the target reduction in total fertility rate in Nigeria should be multi-sectoral targeting these subpopulations of women.

**Keywords:** Fertility preferences; Ideal family size; Fertility; Women; Family size preferences

---

## 1. Introduction

Globally, sub-Saharan Africa has the highest total fertility rate (TFR) of 4.6 in 2021 (United Nations, Department of Economic and Social Affairs, Population Division, 2022). The decline in TFR in many sub-Saharan African countries has been either slow or stalled (United Nations, Department of Economic and Social Affairs, Population Division, 2022). For instance, the decline in Nigeria's TFR has been slow for many years. The country's TFR declined by 13.7% within 10 years from 7.3 in 1972 to 6.3 in 1982. The ensuing decade witnessed a decline of just 6%, from 6.3 in 1982 to 5.9 in 1992. During the following decade, the pace of decline reduced to 3% from 5.9 in 1992 to 5.7 in 2003 and slightly decreased by 4% from 5.7 in 2003 to 5.5 in 2013, and 5.3 in 2018 (National Population Commission (NPC) [Nigeria] and ICF, 2019; NPC and ICF International, 2014; NPC and ICF Macro, 2009; United Nations, Department of Economic and Social Affairs, Population Division, 2022). Of note also is that the decline in Nigeria's TFR continues to fall short of the numeric target of at least 0.6 reduction every 5 years as stipulated in the country's 1988 population policy, and the revised versions of 2004 (Federal Republic of Nigeria, 1988; 2004) and 2021 (Federal Government of Nigeria, 2021; Federal Republic of Nigeria, 1988; 2004). The rate of decline has consistently fallen short of the target with a decline of only 0.2 over 10 years from 2003 to 2013 and between 2013 and 2018. The failure to achieve this target and the targets of the other components of the policy has been attributed to structural issues, inadequate funding, and lack of political will, among others (National Population Commission of Nigeria and Health Policy Project, 2015).

Similarly, individual and couples' ideal family size (IFS) in Nigeria show no consistent pattern of decline and exceeds TFR consistently. Ideal number of children for all currently married women aged 15–49 years was 6.2 in 1990, 7.3 in 2003, 6.7 in 2008, 7.1 in 2013, and 6.6 in 2018 (National Population Commission (NPC) [Nigeria] and ICF, 2019; NPC and ICF International, 2014; and NPC, and ICF Macro, 2009). In contrast to the Nigerian situation, some sub-Saharan African countries, such as Ghana and Rwanda, have made better albeit slow progress in fertility decline. In Ghana, the mean ideal number of children among currently married women declined from 5.5 in 1988 to 4.7 in 2014, and TFR declined by 34.4% from 6.4 in 1988 to 4.2 in 2014, and 3.8 in 2019, 40.6% in slightly over three decades (ICF International, 2021). In Rwanda, IFS declined from 4.4 in 1992 to 3.7 in 2019, and TFR declined from 6.2 in 1992 to 4.1 in 2019, a 33.9% decline in nearly three decades, whereas Nigeria's TFR only declined by 11.7% within the same period (ICF International, 2021). The high IFS and TFR in Nigeria are indicative of a persistent pronatalist norm and highlight a demographic future that is of concern, given the slow pace of socioeconomic development in the country.

Nigeria's population is estimated at 216 million on January 1, 2022, and the country will be the fourth most populous in the world in 2050, next to India, China, and the United States (United Nations, Department of Economic and Social Affairs, Population Division, 2022). Although the country's gross domestic product (US\$432.3 billion) is the largest in Africa (The World Bank, 2021), 82.9 million of her population are considered poor by national standards (National Bureau of Statistics (NBS), 2020). Among other factors, the high level of poverty is partly attributed to large and growing population, due to persistent high fertility (Adebowale, Fagbamigbe, Akinyemi, *et al.*, 2020; Bongaarts, 2001; United Nations, Department of Economic and Social Affairs, Population Division, 2022).

Past studies attributed the slow and stalled trend in fertility in Nigeria to diverse factors, such as cultural and religious beliefs, high values about marriage and children, early marriage, low contraceptive prevalence rate, and high fertility desires (Alaba, Olubusoye, and Olaomi, 2017; Caldwell, Orubuloye, and Caldwell, 1992; Feyisetan and Bankole, 2009; Isiugo-Abanihe, 1994; Izugbara and Ezeh, 2010; Olaseinde, Owagbemi, Aruna, *et al.*, 2022; Smith, 2005). However, there have been limited scholarly attempts to identify the drivers of women's IFS desire. IFS is indicative of actual fertility behavior. Studies conducted in sub-Saharan African countries indicate that women's reproductive preferences and decisions are constrained by culture (Dodoo, Horne, and Biney, 2014) and that men prefer more children than women (Bankole and Audam, 2011; Isiugo-Abanihe, 1994). However, women's fertility preferences in many situations are more predictive of actual fertility than men's desired family size.

In a recent systematic review of longitudinal studies in 28 low- and middle-income countries in Asia and Africa, women's desire to stop childbearing was a strong predictor of subsequent fertility compared to the modest influence of the man's desire (Cleland, Machiyama, and Casterline, 2020). Women are likely to use contraceptives when there is a disagreement between their desired number of children and their partners'. Evidence from Bankole and Audam's (2011) study showed that in seven of nine sub-Saharan African countries higher fertility preference by wives was inversely associated with the use of contraceptives, relative to husbands' higher preference. In Bangladesh, the risk of having another pregnancy for women who wanted additional children when their husbands did not want them was 2.20 times higher than when it was the husband alone who wanted a child, compared to the group where neither couple wanted another child (Gipson and Hindin, 2009). In an Australian study, Fan and Maitra (2011) found that wife's fertility preference was more predictive of subsequent births than the husband's. A similar finding in Nigeria showed that where wives desired more children than husbands, fertility preference implementation is higher (Ibisomi, 2011). These findings underscore the crucial importance of women's family size preferences in predicting actual fertility. Scholars have argued that although family size desire is not always achieved, it is predictive of actual fertility (Bongaarts, 2001; Kodzi, Jonsone, and Casterline, 2010). In a study by Mberu and Reed (2014) in Nigeria, the ideal number of children was positively associated with fertility behaviour. Declining reproductive preferences indicate changing values about childbearing and fertility transition (Bongaarts, 2001; Feyisetan and Bankole, 2009; Mberu and Reed, 2014). Therefore, family size preference is vital for projections of fertility behaviour, planning, implementation and assessment of family planning programmes, and for population policies. As Nigeria renews her commitment to pursue a 0.6 reduction every 5 years until 2030 with a target TRF of 4.7 by 2025, it is important to provide some information on the population groups to target.

There have been studies on fertility preferences in Nigeria, but most of them had a focus on couple's fertility preferences or desire for more children (Oduşina, Ayotunde, Kunnuji, *et al.*, 2020; Oyediran, 2006; Oyediran and Isiugo-Abanihe, 2002), men's fertility preferences (Isiugo-Abanihe, 1994), the influence of fertility preference on achieved fertility, fertility preference implementation, (Bankole, 1995; Ibisomi, 2011), IFS without segregating by sex (Amusa and Yahya, 2019), and IFS among all women who currently had children aged 0–60 months (Akeju, Owoeye, Ayeni, *et al.*, 2021). The studies that also examined women's fertility preferences, such as Bankole (1995) and Umoh, Abah and Ekanem (2012) were either focused on couple's preferences or situated within a state in Nigeria. Furthermore, many of these studies

measured fertility preferences with a desire to have an additional child. Although the desire for an additional child is indicative of fertility preference, it is more of reproductive intention than family size preference (Bongaarts, 1992). The current research examined the family size preferences of women in a union, indicated by IFS and factors associated with their preferences. The results of this study contribute to the global discourse on sub-Saharan African fertility by examining factors influencing women's IFS. Furthermore, the study highlights changing values about childbearing and fertility preference transition in Nigeria. Bongaarts (2011) argues that persistent high fertility preference in sub-Saharan Africa is a strong factor that will keep TFR at a high level for some years to come even when the unmet need for contraceptives in the region is largely met.

IFS as an indicator of family size preference has two potential sources of bias – ex-post rationalization and non-response, but because its interpretation is straightforward it is still widely used as a standard indicator of lifetime fertility goal (Bongaarts and Casterline, 2015). Following Bongaarts and Casterline (2015), to overcome the bias that may arise from ex-post rationalization, the present study was limited to women whose first marriage took place within 10 years before the survey. Women whose marriages are of longer duration (more than 10 years) are likely to have completed childbearing or have had four or more children. To justify their number of living children, the reported IFS of such women is likely to be influenced by their current family size.

## 2. Data and Methods

### 2.1. Setting

This study was conducted in Nigeria. Administratively, Nigeria is made of up 36 States and the Federal Capital Territory, Abuja. The 37 States are further grouped into six geopolitical zones also called regions – Northcentral, Northeast, Northwest, Southeast, South-South, and Southwest. The Northern regions are predominantly Islam, whereas the South is predominantly Christian. The regions are culturally heterogeneous, with over 250 ethnic groups, and many Nigerian societies are largely patriarchal (Izugbara, 2004; Ntoimo and Isiugo-Abanihe, 2014). Men, and in some cases, the husband's extended family had the final say on family size (Isiugo-Abanihe, 1994; Izugbara, 2004). However, there has been improvement in factors that enhance women's control of their fertility behaviour. For instance, women's access to education and paid employment has continued to increase. The percentage of women who have no education declined from 42% in 2003 to 35% in 2018, and the proportion who are employed increased to 65% in 2018 from 59% in 2008 (National Population Commission (NPC) [Nigeria] and ICF, 2019).

### 2.2. Data source

Cross-sectional micro-level data were obtained from the 2018 Nigeria Demographic and Health Survey (NDHS). The DHS makes use of standardized questionnaires to obtain data on socioeconomic, demographic, and health characteristics from a nationally representative sample of women and men selected in households. The respondents were selected through a stratified multi-stage sampling technique. Data collection for the 2018 NDHS took place from August to December 2018 in 40,427 occupied households out of the 42,000 households in the sample. All women aged 15–49 who were either permanent residents or visitors who slept over the night before the survey in these households were eligible for interview. Men aged 15–59 in one-third of the 42,000 households were eligible to be included in the study. With a response rate of 99%, a total of 41,821 out of 42,121 eligible women, and 13,311 out of 13,422 men were successfully interviewed in the 40,427 occupied households (National Population Commission (NPC) [Nigeria] and ICF, 2019). The present study draws on data from the women's individual recode of the household survey. A weighted sample of 13,674 women aged 15–49 years who were in union (married or living together/cohabiting) at the time of the survey and whose first marriage took place within 10 years before the survey were selected for this study.

### 2.3. Dependent variable

The dependent variable was IFS, which was indicated by the ideal number of children in the DHS. Respondents who had living children were asked: "if you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" Those who had no living children were asked the number of children that they would have in their whole life-time if they could choose. The responses to these questions were both numeric and non-numeric. For descriptive and multivariable analyses, this variable was categorized into three: 0 – 3, 4, and 5+. The categorization into three was intended to highlight transitions in the desired number of children toward a lower fertility preference regime, preferences around Nigeria's recommended four children per woman (Federal

Government of Nigeria, 2021), and persistence of high fertility preference of five or more children. Non-numeric response (2.39%) was assigned the median value of 5 (IQR 4) as the IFS variable was not normally distributed. The median value after assigning it to the non-numeric response was similar to the median without the non-numeric response. Although Bongaarts (1992) argued that non-numeric responses are likely to be more than the population mean, it is anticipated that assigning the median value to such responses will not distort the result of this analysis given that the non-numeric responses were below 3%. Furthermore, in Dodoo and Seal (1994), non-numeric response in fertility preference was more likely among wives who are younger than their husbands by over 10 years, junior wives in a polygynous union, and those who have no or low levels of spousal communication on contraceptive use.

## 2.4. Independent variables

Drawing on past studies, socioeconomic and demographic characteristics of individual women were included as explanatory variables. Age was categorized in 5-year groups except age 35 – 49 which was recategorized into one group due to the few cases. A measure of place of residence was rural or urban. Region was measured based on the six regions in Nigeria: North-central, Northeast, Northwest, Southeast, South-south, and Southwest. The number of respondents' siblings was a measure of parents' family size, an indication of intergenerational transmission of family size preference. Other variables included in the analysis were age at first marriage, the number of co-wives, highest attained education, year of first cohabitation/marriage, occupation, participation in household decisions, religion, and experience of child death. Age at first marriage may indicate an inclination to a large or small family size (Mencarini and Tanturri, 2006). Furthermore, women who entered marriage late may be affected by their declining fecundity if they prefer fewer children or a desire to “catch up” if they prefer a large number of children (Mencarini and Tanturri, 2006; Upadhyay and Karasek, 2010). The number of co-wives (categorized into monogamy if one cowife, and polygyny for more than one co-wife) is associated with the desired number of children, due to co-wife competition for the number of children (Feyisetan and Bankole, 2009). The influence of education at all stages of fertility preference transition is shown in previous studies (Bongaarts, 2003; 2020), year of first cohabitation/marriage was included, because exposure to similar situations influences demographic and health behavior (Doctor, 2011). Women are likely to adopt the IFS prevailing among their peers and in their immediate communities at the time of marriage. The occupation of the respondents was categorised into five: not working, white-collar (those who worked in offices), sales/services, those engaged in agriculture as employers or employees, skilled and unskilled manual workers, and others.

Participation in the household decision and attitude to wife beating was included in the analysis as indications of gender ideology and norms. Participation in household decisions was derived from responses to four questions on the final say in household decisions on respondent's health, making large purchases, visits to respondent's family and relatives, and how to spend husband's income. In each question, lone decision by the respondent, a joint decision with the husband or partner, a sole decision by the husband, and a decision by others were the responses. The four questions were recoded. Participation alone or joint participation with a partner was regarded as participation in household decision and coded 1, whereas decision by the husband alone or others was regarded as participation in none and coded 0. The dummy recodes were used to generate an index of participation in household decisions categorized as participation in none, participation in 1 – 2, and participation in 3 – 4. Missing values in the participation in the household decision variable (0.24%) were dropped. Attitude to wife beating was measured with five questions on whether beating a wife is justified when she goes out without telling her husband/partner, neglects the children, argues with her husband/partner, refuses to have sex with her husband/partner, and burns the food. The response options were yes (justified), no (not justified), and do not know. The response to the five questions was recoded to generate a composite index of attitude toward wife beating. A response of no in all the five questions was categorized as not justified, a response of yes and do not know in 1 – 4 questions was categorized as somewhat justified, and yes in all the five was justified.

Religious affiliation was measured as Catholic, other Christian, and Islam; traditionalist and others were dropped, because they were few (0.46%). Experience of child death was a dummy variable; experience of child death was coded 1 and no child death 0. Child death influences reproductive preference (Upadhyay and Karasek, 2010). Added as controls were partner or husband's family size desire; past studies show that a partner's desired number of children influences women's IFS (DeRose, Dodoo, and Patil, 2002; Izugbara and Ezech, 2010). Other controls were the partner's education and age and the number of living children which are related to fertility preference (Westoff, Bietsch, and Hong, 2013).

## 2.5. Analytic approach

All the variables were checked for multicollinearity, none of the variables had a variance inflation factor (VIF) of five and above, indicating that the multicollinearity is not a concern (Pallant, 2020). Description of the study population

was presented in weighted frequency and percentage. The distribution of the outcome variables by the independent variables was done using cross-tabulations, and a Chi-square test was conducted to establish an association. Given that the dependent variable was categorized into three, multinomial logistic regression was used for the multivariable analysis. The weighting factor provided in the DHS was used for the descriptive and multivariable analyses to adjust for representativeness. The `svy` command in Stata was used in both the cross-tabulation and regression analysis to adjust for the complex survey design of the DHS. All the analyses were two-tailed, the level of statistical significance was  $P < 0.05$ , and statistical analysis was conducted in Stata 13.0 for windows.

### 3. Results

#### 3.1. Description of the study population

A description of the study population is presented in Table 1. The median ideal number of children in the study population was 6 (IQR 4). For over 65% of the respondents, five or more children was their ideal number of children. This is a 5.7% decline from 69.41% in 2008. The number of respondents whose IFS was 0–3 and four increased by 28.2% and 4.97%, respectively, from 2008 (Figure 1). The median age of the respondents was 25 (IQR 9), with the majority aged 20–29. Most of the women were in a legal monogamous union, married before age 20, and had an average of 2 living children. The majority (61.5%) had five or more siblings. The distribution of the respondents by their places of residence showed that 57% resided in rural areas, and over 50% of respondents were Muslims. A larger percentage of respondents (67%) were working, particularly in sales and services jobs, and slightly above 65% attained any level of education. Many respondents (35%) participated in no household decision, and about 71% did not see wife beating as justified for any reason.

#### 3.2. Findings from bivariable analysis

The distribution of the three categories of ideal number of children by the potential explanatory variables is presented in Table 2. All the explanatory variables were significantly associated with IFS. The ideal number of children by birth cohort (age) showed that a larger proportion of younger women aged 15–29 desired 5+ children compared to their older counterparts aged 30–49. The ideal number of children for women who were living together with a partner was lower than for those in a legal union. There was a variation by region, 0–3 ideal number of children was more in the Southwest and South-south regions than other regions; IFS that corresponds with the country's recommended 4 is more in the southern regions than in the Northern regions. IFS for close to half of women in the urban area was <5 unlike those in the rural area. By religious affiliation, a larger percentage of Catholics and other Christians had IFS 0–3 and 4 in contrast with Muslims.

IFS declined with a higher household wealth index. Over 70% of women who were not working and those who had agricultural occupations had IFS of five and over. The majority of women in white-collar occupations had IFS of <5. Similar to the pattern in the household wealth index, IFS declined with a higher level of education. The majority of women who attained no education had IFS of five and over, whereas most of those who attained higher education had IFS <5. Close to 80% of women who participated in no household decisions had IFS of five and over in contrast with 47% for those who participated in 3–4 decisions. The majority of the respondents who justified wife beating for any reason also had large IFS of 5+. Respondents who have 7+ siblings were in the majority among those whose IFS was 5+. About 81% of women in the polygynous union had IFS 5+ compared to 61% of those in a monogamous union. Most of those who have experienced child death had IFS 5+. A larger proportion of the respondents who married before age 20 had IFS 5+ compared to 46% for those who married later. IFS seems to be decreasing with the younger marriage cohorts. Those who married between 2014 and 2018 had fewer IFS than their counterparts who married between 2008 and 2013.

#### 3.3. Results from multivariable analysis

The results of the multinomial logit model predicting the relative risk ratio (RRR) of IFS by the potential independent variables are presented in Table 3. An IFS of five or more children was the base outcome. Hence, the estimated RRR reflects the effect of an independent variable on the likelihood of preferring 0–3 or 4 relative to 5 or more children, given other variables in the model are held constant. Compared to the North-central which was the reference category, the risk of preferring 0–3 instead of 5 was significantly lower in the Northeast and Northwest, but 1.49 and 4.22 times higher in the South-south and Southwest regions. The relative risk of IFS of 4 was also significantly lower in the Northeast and Northwest, and the Southeast regions, but higher in the Southwest (RRR 2.35 CI:1.88-2.94). Compared to urban residents, the relative risk of IFS of 0–3 and 4 children instead of 5 or more was significantly lower for rural residents.

**Table 1.** Percentage distribution of the study population by selected demographic and socioeconomic characteristics

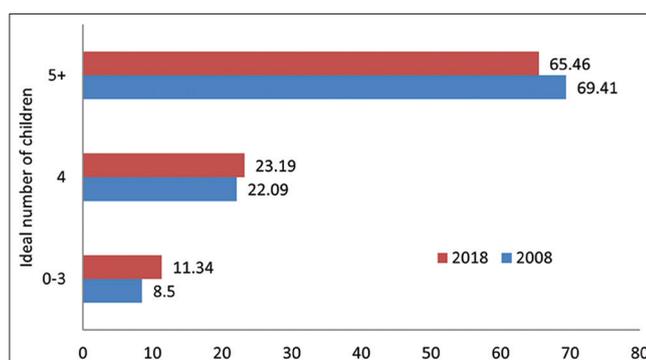
Characteristic	Frequency (N=13,674)	Percent (%)
Ideal number of children		
0 – 3	1,551	11.34
4	3,171	23.19
5+	8,951	65.46
Median 6 (IQR 4)		
Age		
15 – 19	1,927	14.09
20 – 24	4,282	31.32
25 – 29	4,228	30.92
30 – 34	1,980	14.48
35 – 49	1,256	9.19
Median 25 (IQR 9)		
Marital status		
Married	13,070	95.58
Living together	604	4.42
Region		
North-central	2,038	14.90
Northeast	2,137	15.63
Northwest	4,155	30.39
Southeast	1,499	10.97
South-south	1,408	10.30
Southwest	2,436	17.81
Place of residence		
Urban	5,814	42.52
Rural	7,860	57.48
Religious affiliation (N=13,611)		
Catholic	1,339	9.84
Other Christian	4,616	33.91
Islam	7,656	56.25
Household wealth index		
Poorest	2,394	17.51
Poorer	2,786	20.37
Middle	2,634	19.26
Richer	2,763	20.21
Richest	3,097	22.65
Occupation		
Not working	4,508	32.97
White-collar	1,133	8.28
Sales/services	5,639	41.24
Agriculture	1,761	12.88
Skilled/unskilled manual/other	633	4.63
Highest education		
No education	4,894	35.79
Primary	1,696	12.40
Secondary	5,321	38.91
Higher	1,763	12.89
Participation in household decisions (N=13, 641)		
None	4,794	35.14
1 – 2 decisions	3,918	28.72
3 – 4 decisions	4,929	36.14
Wife beating justified		
Not justified	9,693	70.88
Somewhat justified	2,298	16.81
Justified	1,683	12.31

*(Contd...)*

**Table 1.** (Continued)

Characteristic	Frequency (N=13,674)	Percent (%)
Number of respondent's sibling		
0 – 2	1,714	12.54
3 – 4	3,537	25.87
5 – 6	4,145	30.31
7+	4,278	31.28
Number of co-wives		
Monogamous	10,838	79.26
Polygynous	2,836	20.74
Experience of child death		
No	11,480	83.96
Yes	2,194	16.04
Age at first marriage		
<20	7,693	56.26
20+	5,981	43.74
Year of marriage		
2008 – 2013	7,902	57.79
2014 – 2018	5,772	42.21

The frequency may not equal the N due to rounding

**Figure 1.** Percentage of women in union by ideal number of children 2008/2018 NDHS.

The respondents who were affiliated with Islam were less likely to have IFS of 0 – 3 (RRR 0.47 CI: 0.33 – 0.66) and 4 (RRR 0.45 CI: 0.34 – 0.59) relative to Catholics. Occupation only predicted the relative risk for IFS 0 – 3 with women in sales/services and agriculture significantly less likely to have IFS 0 – 3. The relative risk for 0 – 3 and 4 IFS was significantly more for women who had attained any level of education compared to those who had no education. IFS of 0 – 3 was significantly higher among women who had attained secondary and higher education; whereas IFS of 4 was 40% higher among women who attained primary education, 93% higher for those who had secondary education, and 130% higher for women who attained higher education. Participation in 1 – 2 decisions predicted a lower risk of 0 – 3 IFS (RRR 0.58 CI: 0.47 – 0.72), whereas participation in 3 – 4 decisions increased the risk of 4 IFS compared to 5 by 51%. Relative to the respondents who did not justify wife beating, the respondents who somewhat justified or justified wife beating were significantly less likely to have IFS of 4 compared to 5. Respondents who have 5 – 6 siblings were less likely to have IFS of 0 – 3 children. Experiencing child death significantly lowers the relative risk of IFS 0 – 3 and 4 compared to 5. The relative risk of IFS of 4 was 25% higher among respondents who married at age 20 and above compared to those who married before age 20. Respondents who married between 2014 and 2018 were 19% more likely to have IFS of 4 instead of 5 compared to those who married between 2008 and 2013.

#### 4. Discussion

The objective of this study was to examine the family size preferences of women in a union, indicated by IFS and factors associated with their preferences. The proportion of respondents whose IFS was 5+ decreased by 5.7%, and IFS of 0 – 3

**Table 2.** Percent distribution of the outcome variable by the independent variables

Characteristic	Ideal number of children N (%)			Chi-square P-value
	0-3	4	5+	
Age				
15 – 19	120 (6.25)	224 (11.63)	1,582 (82.12)	<0.001
20 – 24	377 (8.79)	709 (16.55)	3,197 (74.65)	
25 – 29	468 (11.07)	1,088 (25.73)	2,672 (63.20)	
30 – 34	372 (18.79)	692 (34.96)	916 (46.25)	
35 – 49	214 (17.04)	458 (36.48)	584 (46.48)	
Marital status				
Married	1,412 (10.81)	2,965 (22.69)	8,692 (66.51)	<0.001
Living together	139 (22.96)	206 (34.18)	259 (42.86)	
Region				
North-central	168 (8.25)	547 (26.82)	1,323 (64.93)	<0.001
Northeast	104 (4.88)	128 (5.99)	1,905 (89.14)	
Northwest	222 (5.34)	274 (6.59)	3,660 (88.07)	
Southeast	106 (7.05)	557 (37.12)	837 (55.83)	
South-south	249 (17.67)	575 (40.86)	584 (41.47)	
Southwest	702 (28.83)	1,091 (44.8)	642 (26.37)	
Place of residence				
Urban	1,026 (17.64)	1,934 (33.27)	2,854 (49.08)	<0.001
Rural	525 (6.68)	1,237 (15.74)	6,098 (77.58)	
Religious affiliation				<0.001
Catholic	135 (10.05)	526 (39.32)	678 (50.63)	<0.001
Other Christian	850 (18.41)	1,747 (37.85)	2,019 (43.74)	
Islam	560 (7.31)	878 (11.46)	6,219 (81.23)	
Household wealth index				<0.001
Poorest	96 (4.01)	196 (8.18)	2,102 (87.80)	<0.001
Poorer	149 (5.34)	335 (12.03)	2,302 (82.64)	
Middle	206 (7.80)	541 (20.53)	1,888 (71.66)	
Richer	403 (14.59)	832 (30.10)	1,528 (55.31)	
Richest	698 (22.53)	1,268 (40.94)	1,131 (36.52)	
Occupation				
Not working	416 (9.22)	632 (14.01)	3,460 (76.76)	<0.001
White-collar	271 (23.90)	441 (38.97)	421 (37.13)	
Sales/services	673 (11.93)	1,510 (26.78)	3,456 (61.29)	
Agriculture	74 (4.22)	396 (22.51)	1,290 (73.27)	
Skilled/unskilled manual/other	117 (18.52)	192 (30.34)	324 (51.13)	
Highest education				<0.001
No education	214 (4.37)	317 (6.48)	4,363 (89.15)	<0.001
Primary	132 (7.80)	338 (19.91)	1,226 (72.30)	
Secondary	748 (14.05)	1,803 (33.89)	2,770 (52.06)	
Higher	457 (25.95)	713 (40.47)	592 (33.59)	
Participation in household decisions				<0.001
None	425 (8.86)	539 (11.24)	3,830 (79.91)	<0.001
1 – 2 decisions	327 (8.33)	816 (20.83)	2,776 (70.84)	
3 – 4 decisions	794 (16.11)	1,806 (36.64)	2,329 (47.24)	
Wife beating justified				<0.001
Not justified	1,262 (13.02)	2,729 (28.15)	5,702 (58.82)	<0.001
Somewhat justified	187 (8.12)	311 (13.55)	1,800 (78.33)	
Justified	102 (6.06)	132 (7.82)	1,449 (86.12)	
Number of respondent's sibling				<0.001
0 – 2	280 (16.35)	473 (27.59)	961 (56.06)	<0.001
3 – 4	571 (16.14)	997 (28.18)	1,969 (55.68)	
5 – 6	445 (10.75)	1,052 (25.38)	2,647 (63.87)	
7+	254 (5.95)	650 (15.19)	3,373 (78.86)	

(Contd...)

**Table 2.** (Continued)

Characteristic	Ideal number of children N (%)			Chi-square P-value
	0-3	4	5+	
Number of co-wives				<0.001
Monogamous	1,329 (12.26)	2,851 (26.31)	6,657 (61.43)	
Polygynous	222 (7.83)	320 (11.29)	2,294 (80.89)	
Number of living children				<0.001
4 – 10	96 (6.59)	220 (15.03)	1,146 (78.39)	
0	246 (11.86)	392 (18.88)	1,437 (69.26)	
1	562 (14.43)	987 (25.32)	2,348 (60.26)	
2	433 (11.28)	1,057 (27.56)	2,346 (61.16)	
3	214 (8.90)	517 (21.48)	1,675 (69.62)	
Experience of child death				<0.001
No	1,398 (12.17)	2,843 (24.77)	7,239 (63.06)	
Yes	154 (7.00)	328 (14.96)	1,712 (78.04)	
Age at first marriage				<0.001
<20	506 (6.58)	1,013 (13.17)	6,173 (80.25)	
20+	1,045 (17.47)	2,158 (36.09)	2,778 (46.44)	
Year of marriage				<0.001
2008 – 2013	769 (9.73)	1,664 (21.06)	5,469 (69.21)	
2013 – 2018	782 (13.55)	1,507 (26.12)	3,482 (60.33)	

**Table 3.** Multinomial logistic regression of ideal number of children and selected characteristics of the study population

Variable	RRR (95% Confidence Interval)	
	0 – 3 versus 5	4 versus 5
Age		
15 – 19 (Ref)		
20 – 24	1.07 (0.78 – 1.48)	0.81 (0.65 – 1.00)
25 – 29	0.99 (0.67 – 1.47)	0.83 (0.63 – 1.08)
30 – 34	1.16 (0.73 – 1.83)	0.81 (0.59 – 1.13)
35 – 49	0.91 (0.54 – 1.51)	0.75 (0.51 – 1.12)
Marital status		
Married (Ref)		
Living together	1.28 (0.93 – 1.76)	0.94 (0.72 – 1.23)
Region		
North-central (Ref)		
Northeast	0.64 (0.45 – 0.90)*	0.28 (0.22 – 0.37)***
Northwest	0.71 (0.52 – 0.96)*	0.34 (0.26 – 0.45)***
Southeast	0.38 (0.26 – 0.54)***	0.65 (0.53 – 0.80)***
South-south	1.49 (1.09 – 2.03)*	1.15 (0.94 – 1.41)
Southwest	4.22 (3.24 – 5.48)***	2.35 (1.88 – 2.94)***
Place of residence		
Urban (Ref)		
Rural	0.70 (0.57 – 0.87)**	0.81 (0.70 – 0.95)*
Religious affiliation		
Catholic (Ref)		
Other Christian	0.97 (0.73 – 1.30)	0.83 (0.68 – 1.00)
Islam	0.47 (0.33 – 0.66)***	0.45 (0.34 – 0.59)***
Household wealth index		
Poorest (Ref)		
Poorer	1.04 (0.72 – 1.50)	0.98 (0.77 – 1.25)
Middle	1.04 (0.73 – 1.48)	1.04 (0.80 – 1.35)
Richer	1.24 (0.87 – 1.78)	1.07 (0.80 – 1.42)
Richest	1.45 (0.98 – 2.14)	1.26 (0.95 – 1.69)

(Contd...)

**Table 3.** (Continued)

Variable	RRR (95% Confidence Interval)	
	0 – 3 versus 5	4 versus 5
Occupation		
Not working (Ref)		
White-collar	0.86 (0.65 – 1.15)	0.91 (0.71 – 1.17)
Sales/services	0.75 (0.61 – 0.93)**	0.93 (0.80 – 1.09)
Agriculture	0.37 (0.26 – 0.51)***	0.87 (0.72 – 1.06)
Skilled/unskilled manual/other	1.17 (0.80 – 1.71)	1.01 (0.76 – 1.34)
Highest Education		
No education (Ref)		
Primary	1.15 (0.79 – 1.66)	1.40 (1.12 – 1.75)**
Secondary	1.64 (1.18 – 2.26)**	1.93 (1.53 – 2.45)***
Higher	2.86 (1.99 – 4.13)***	2.30 (1.66 – 3.19)***
Participation in household decisions		
None (Ref)		
1 – 2 decisions	0.58 (0.47 – 0.72)***	1.15 (0.98 – 1.36)
3 – 4 decisions	0.90 (0.73 – 1.12)	1.51 (1.24 – 1.84)***
Wife beating justified		
Not justified (Ref)		
Somewhat justified	1.14 (0.87 – 1.48)	0.68 (0.58 – 0.80)***
Justified	1.36 (0.95 – 1.93)	0.76 (0.59 – 0.98)*
Number of respondent's sibling		
0 – 2 (Ref)		
3 – 4	0.97 (0.77 – 1.22)	0.97 (0.79 – 1.18)
5 – 6	0.69 (0.52 – 0.92)*	0.88 (0.70 – 1.12)
7+	0.45 (0.34 – 0.60)***	0.69 (0.55 – 0.85)**
Number of co-wives		
Monogamous (Ref)		
Polygynous	1.11 (0.87 – 1.41)	0.87 (0.72 – 1.06)
Experience of child death		
No (Ref)		
Yes	0.74 (0.58 – 0.95)*	0.80 (0.67 – 0.95)*
Age at first marriage		
<20 (Ref)		
20+	1.18 (0.93 – 1.50)	1.25 (1.05 – 1.48)**
Year of marriage		
2008 – 2013 (Ref)		
2013 – 2018	1.17 (0.91 – 1.51)	1.19 (1.01 – 1.40)*

Base outcome 5 + children, RC: Reference category; RRR: Relative risk ratio. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$

increased by 28% between 2008 and 2018, indicating some transition in preferred family size. There was evidence of IFS lower than 5 among some sub-groups such as women in the South-south and Southwest regions, women who had attained any level of education, women who participated in decisions in the household, those who married at age 20 and above, and between 2014 and 2018.

The above findings point to issues that would require close programmatic and policy attention if Nigeria would achieve her population policy target for fertility. For instance, attainment of any level of education increased the likelihood of lower IFS. Women who have attained some education, particularly secondary education or more would be more likely to understand the health and economic value of small households and have life aspirations beyond the dual roles of wife and motherhood (Akeju, Owoeye, Ayeni, *et al.*, 2021; Mohanty, Fink, Chauhan, *et al.*, 2016; Testa, 2014). Educated women are also more likely than their illiterate counterparts to participate in household decisions, another predictor of lower IFS (Upadhyay, Gipson, Withers, *et al.*, 2014; Upadhyay and Karasek, 2010). Although female enrolment in primary, secondary, and tertiary education in Nigeria has continued to improve relative to male enrolment (UNDP, 2014; 2020), there is the need to encourage women to attain at least secondary education to increase the proportion of women who desire smaller family size. Education, particularly university education, is inversely related to high fertility (Kumar,

Bordone, and Muttarak, 2016; Mencarini and Tanturri, 2006). Significant variation in IFS by region was observed in a similar study in Nigeria (Akeju, Owioye, Ayeni, *et al.*, 2021). The lower IFS in the South-south and Southwest regions could be associated with the higher number of women in the southern regions compared to the Northern regions who are educated and participate in household decisions (National Population Commission (NPC) [Nigeria] and ICF, 2019). However, of note is that the Southeast has more pervasive norms of son preference, and pockets of localities, where large family size was traditionally celebrated, this culture has continued to wane, but the TFR in Southeast region remains the highest (4.7) compared to 4.0 in the South-south and 3.9 in the Southwest (Isiugo-Abanihe and Nwokocha, 2008; National Population Commission (NPC) [Nigeria] and ICF, 2019; Nwokocha, 2007).

Women whose occupations were in sales/services and agriculture were significantly less likely to have IFS 0 – 3 versus 5 compared to women in other occupations. This is expected considering that 95% of Nigerian women work in the informal sector, where they dominate in sales and services (International Labour Organization, 2018; National Population Commission (NPC) [Nigeria] and ICF, 2019). Small-scale agriculture, sales, and services constitute a large part of the informal economy in Nigeria. Women who work in these occupations are more likely to have attained no formal education or primary education, which have low income, and perceive children as old age security. These factors have been shown to predict high fertility preferences in Nigeria and other countries (Akeju, Owioye, Ayeni, *et al.*, 2021; Hilgeman and Butts, 2009; Mberu and Reed, 2014; Muhoza, Broekhuis, and Hooimeijer, 2014).

Being a Muslim was a strong predictor of IFS of five and above. Preference for larger family size among Muslim than Christian women in Nigeria is consistent with past studies in Nigeria and India (Murthi, 2002; Isiugo-Abanihe, 1994). However, the large family size preference among Muslim women may be more of a function of other factors, not the Islamic religion. Many Islamic countries have achieved sustained transition in fertility, and being a Muslim did not significantly predict larger family size in Ghana holding the husband's religion constant (Gyimah, Takyi, and Tenkorang, 2008). Polygyny and early marriage in the predominantly Muslim Northeast and Northwest regions in Nigeria may be the drivers of large family size desire among Muslim women. Early marriage was significantly associated with IFS of 5 and over in this study, and in many previous studies, polygyny and early marriage were strongly associated with large family size desire and lifetime fertility (Ariho and Kabagenyi, 2020; Izugbara and Ezeh, 2010; Yaya, Odusina, and Bishwajit, 2019). The Nigerian population policy for sustainable development also stipulates the age of 18 for marriage. There is a need to enforce this policy as well as discourage polygyny and serial remarriage by women in these regions.

Women who lost a child were more likely to report IFS five or more than women who never lost a child. This result demonstrates the strong link between child death and fertility and confirms the replacement fertility hypothesis (Westoff, Bietsch, and Hong, 2013). Given that women are likely to achieve their IFS (Fan and Maitra, 2011), where there is no supply constraint, the Nigerian Government needs to intensify its effort to implement strategies stipulated in the country's national population policy to lower under-5 mortality to achieve the target reduction in TFR. As mortality declines, particularly under-five mortality, one of the responses is a decline in fertility as people are now sure their children would survive to old age (Mohanty, Fink, and Chauhan, *et al.*, 2016; Pullu, Shoumaker, and Becker, *et al.*, 2013).

Another interesting finding in this study is the strong evidence of an intergenerational effect. The respondents who have five or more siblings also are more likely to have IFS of 5 and above. The previous studies have documented intergeneration transfer of fertility behavior (Booth and Kee, 2009; Kumar, Bordone, and Muttarak, 2016; Morosow and Trappe, 2018; Silalahi and Setyonaluri, 2018; Isiugo-Abanihe, 1994; Mencarini and Tanturri, 2006). This speaks to the impact of family-level socialization in shaping behavior, and the need to engage behavior change models in the country's programs to achieve a lower fertility preference regime.

Gender norms and ideology as indicated by participation in four household decisions and attitude to wife beating were predictive of IFS. Women who participated in no household decisions and justified wife beating for any reason were more likely to have IFS of five and above. This affirms the critical role of gender in fertility choices and health outcomes (Rossi and Rouanet, 2015; World Health Organization, 2021). A multi-sectoral approach to addressing norms that reinforce male dominance and superiority are recommended, and the existing policies in Nigeria on gender equality and equity should be enforced to facilitate lower IFS among women.

Marital status, household wealth index, and type of marriage were not statistically significant predictors of IFS among women aged 15–29. Given the close relationship between household wealth and education (although there was no multicollinearity problem between them in this study VIF <5), the result was not unexpected in a model that has the two variables. That women in a cohabiting union desired fewer children was expected. Although it was not statistically significant, previous studies link consensual/cohabiting unions with fewer children and low fertility desire than formalized marital unions (Hiekel and Castro-Martín, 2014; Laplante, Castro-Martin, and Cortina, *et al.*, 2016). In a previous Nigerian study, women in polygynous unions in Northern Nigeria had many children to avert divorce and retain their husband's

favour (Izugbara and Ezech, 2010). Thus, it was expected that women in a polygynous union would be significantly more likely to have IFS five and above, but the present study proved otherwise, confirming that the high fertility among them is contrary to their desired family size. We welcome more research to shed light on this theme.

This study has limitations. One, the data are cross-sectional, thus, the estimates are for a particular time, and causal inference cannot be made. A study that is based on a follow-up on the same respondents over time will provide more precise insight into IFS as it changes over time, and mitigate bias arising from post rationalization. Furthermore, a qualitative study will be useful to uncover some of the sociocultural and other reasons for large family size preferences in Nigeria. However, this study contributes to the existing body of literature on fertility preferences, many of the findings support past scientific research on family size preference. Furthermore, the findings elicited new insights on fertility preference among sub-populations of women in Nigeria, areas for further research, and useful information for policy and program.

## 5. Conclusions

The results of this study show that there are signs of transition to four children as recommended in Nigeria's population policy and to lower family size regime of 0 – 3 children among women of higher socioeconomic status, women with more positive gender ideology, residents in urban areas, and the South-south and Southwest regions. Given that women's IFS predicts realised fertility, there is a need to strengthen the factors that are associated with lower IFS and intervene in the population groups that have high IFS for Nigeria to achieve her fertility reduction target.

## Acknowledgments

I acknowledge the advice of Dr. Sunday Adedini during the initial conceptualization of this paper.

## Funding

The author received no funding for this research.

## Conflicts of Interest

The author declares no conflicts of interest.

## Authors' Contributions

There is only one author for this work.

## Ethics Statement

The secondary data used for this study were accessed with the permission of ICF Macro International. All identifiers were removed and ethical approval for the conduct of the surveys was granted by the National Ethics Committee in the Federal Ministry of Health, Abuja, Nigeria, and the Ethics Committee of the Opinion Research Corporation of Macro International Inc. Calverton, MB, USA.

## Availability of Supporting Data

The supporting data for this manuscript is available on DHSprogram.com

## References

- Adebowale AS, Fagbamigbe F, Akinyemi JO, *et al.* (2020). Dynamics of poverty-related dissimilarities in fertility in Nigeria: 2003-2018. *Scientific African*, 9:e00468. <https://doi.org/10.1016/j.sciaf.2020.e00468>
- Akeju K, Owoye T, Ayeni R, and Jegede L. (2021). Variations in desired fertility preferences among young and older women in Nigeria: Evidence from demographic health survey 2018. *The Open Public Health Journal*, 14(1):84-93. <https://doi.org/10.2174/1874944502114010084>
- Alaba OO, Olubusoye OE, and Olaomi J. (2017). Spatial patterns and determinants of fertility levels among women of childbearing age in Nigeria. *South African Family Practice*, 59(4):143-147. <https://doi.org/10.4102/safp.v59i4.4735>
- Amusa L and Yahya W. (2019). Stepwise geosadditive modelling of the ideal family size in Nigeria. *Turkiye Klinikleri Journal of Biostatistics*, 11(2):123-132. <https://doi.org/10.5336/biostatic.2019-66016>

- Ariho P and Kabagenyi A. (2020). Age at first marriage, age at first sex, family size preferences, contraception and change in fertility among women in Uganda: Analysis of the 2006-2016 period. *BMC Womens Health*, 20(1):8. <https://doi.org/10.1186/s12905-020-0881-4>
- Bankole A and Audam S. (2011). Fertility preferences and contraceptive use among couples in sub-Saharan Africa. *African Population Studies*, 25(2):556-586. <https://doi.org/10.11564/25-2-246>
- Bankole A. (1995). Desired fertility and fertility behaviour among the Yoruba of Nigeria: A study of couple preferences and subsequent fertility. *Population Studies*, 49(2):317-328. <https://doi.org/10.1080/0032472031000148536>
- Bongaarts J and Casterline J. (2015). Fertility Transition: Is sub-Saharan Africa Different? In: *Fertility Transition: A Selection from Population and Development Review*. Population and Development Review: A Commemoration of 40 Years, 1975-2015, p.381–396. <https://doi.org/10.1111/j.1728-4457.2013.00557.x>
- Bongaarts J. (1992). Do reproductive intentions matter? *International Family Planning Perspectives*, 18(3):102-108. <https://doi.org/10.2307/2133409>
- Bongaarts J. (2001). Fertility and reproductive preferences in post-transitional societies. *Population and Development Review*, 27:260-281.
- Bongaarts J. (2003). Completing the fertility transition in the developing world: The role of educational differences and fertility preferences. *Population Studies*, 57(3):321-335. <https://doi.org/10.1080/0032472032000137835>
- Bongaarts J. (2020). Trends in fertility and fertility preferences in sub-Saharan Africa: The roles of education and family planning programs. *Genus*, 76(1):1-15. <https://doi.org/10.1186/s41118-020-00098-z>
- Bongaarts, J. (2011). Can family planning programs reduce high desired family size in Sub-Saharan Africa? *International Perspectives on Sexual and Reproductive Health*, 37(4):209-216.
- Booth AL and Kee HJ. (2009). Intergenerational transmission of fertility patterns. *Oxford Bulletin of Economics and Statistics*, 71(2):183-208. <https://doi.org/10.1111/j.1468-0084.2008.00524.x>
- Caldwell J, Orubuloye I, and Caldwell P. (1992). Fertility decline in Africa: A new type of transition? *Population and Development Review*, 18(2):211-242. <https://doi.org/10.2307/1973678>
- Cleland J, Machiyama K, and Casterline JB. (2020). Fertility preferences and subsequent childbearing in Africa and Asia: A synthesis of evidence from longitudinal studies in 28 populations. *Population Studies*, 74(1):1-21. <https://doi.org/10.1080/00324728.2019.1672880>
- DeRose LF, Dodoo FN, and Patil V. (2002). Fertility desires and perceptions of power in reproductive conflict in Ghana. *Gender and Society*, 16(1):53-73. <https://doi.org/10.1177%2F0891243202016001004>
- Doctor HV. (2011). Intergenerational differences in antenatal care and supervised deliveries in Nigeria. *Health and Place*, 17(2):480-489. <https://doi.org/10.1016/j.healthplace.2010.12.003>
- Dodoo FN and Seal A. (1994). Explaining spousal differences in reproductive preferences: A gender inequality approach. *Population and Environment*, 15(5):379-394. <https://doi.org/10.1007/BF02208319>
- Dodoo FN, Horne C, and Biney A. (2014). Does education mitigate the adverse impact of bridewealth on women's reproductive autonomy? *Genus*, 70(1):77-97.
- Ezeh AC. (1997). Polygyny and reproductive behavior in Sub-Saharan Africa: A contextual analysis. *Demography*, 34(3):355-368. <https://doi.org/10.2307/3038289>
- Fan E and Maitra P. (2011). Women rule: Preferences and fertility in Australian households. *The BE Journal of Economic Analysis and Policy*, 13(1):1-30. <https://doi.org/10.1515/bejeap-2012-0021>
- Federal Government of Nigeria. (2021). *National Policy on Population for Sustainable Development*. Abuja, Nigeria: National Population Commission.
- Federal Republic of Nigeria. (1988). *National Policy for Population, Unity, Progress and Self-Reliance*. Federal Ministry of Health.
- Federal Republic of Nigeria. (2004). *National Policy on Population for Sustainable Development*. National Population Commission.
- Feyisetan BJ and Bankole A. (2009). Fertility transition in Nigeria: Trends and prospect. In: *Population Bulletin of the United Nations: Completing the Fertility Transition*. New York: Department of Economic and Social Affairs, Population Division. p.461-478.
- Gipson JD and Hindin MJ. (2009). The effect of husbands' and wives' fertility preferences on the likelihood of a subsequent pregnancy, Bangladesh 1998-2003. *Population Studies*, 63(2):135-146. <https://doi.org/10.1080/00324720902859372>
- Gyimah SO, Takyi, B, and Tenkorang EY. (2008). Denominational affiliation and fertility behaviour in an African context: An examination of couple data from Ghana. *Journal of Biosocial Science*, 40(3):445-458. <https://doi.org/10.1017/S0021932007002544>

- Hiekel N and Castro-Martín T. (2014). Grasping the diversity of cohabitation: Fertility intentions among cohabiters across Europe. *Journal of Marriage and Family*, 76(3):489-505. <https://doi.org/10.1111/jomf.12112>
- Hilgeman C and Butts CT. (2009). Women's employment and fertility: A welfare regime paradox. *Social Science Research*, 38(1):103-117. <https://doi.org/10.1016/j.ssresearch.2008.08.005>
- Ibisomi L. (2011). Ascertaining the level of fertility preference implementation in Nigeria. *African Population Studies*, 25(2):471-486. <https://doi.org/10.11564/25-2-242>
- ICF International. (2021). *The DHS STATcompiler. The DHS Program Statcompiler*. United States: ICF International. Available from: <https://www.statcompiler.com> [Last accessed on 2022 Mar 28].
- International Labour Organization. (2018). *Women and Men in the Informal Economy: A Statistical Picture*. Geneva: International Labour Office.
- Isiugo-Abanihe UC and Nwokocha EE. (2008). Prevalence and consequences of ewu-ukwu custom in Mbaise, Imo State, Nigeria. *The Nigerian Journal of Sociology and Anthropology*, 6(1):53-70.
- Isiugo-Abanihe UC. (1994). Reproductive motivation and family-size preferences among Nigerian men. *Studies in Family Planning*, 25(3):149-161. <https://doi.org/10.2307/2137941>
- Izugbara CO and Ezech AC. (2010). Women and high fertility in Islamic Northern Nigeria. *Studies in Family Planning*, 41(3):193-204. <https://doi.org/10.1111/j.1728-4465.2010.00243.x>
- Izugbara CO. (2004). Patriarchal Ideology and Discourses of Sexuality in Nigeria. In: *Understanding Human Sexuality Seminar Series, Department of Sociology and Anthropology*. University of Uyo, Nigeria, pp. 1-35.
- Kodzi IA, Johnson DR, and Casterline JB. (2010). Examining the predictive value of fertility preferences among Ghanaian women. *Demographic Research*, 22:965-984. <https://doi.org/10.4054/DemRes.2010.22.30>
- Kumar A, Bordone V, and Muttarak R. (2016). Like mother (in-law) like daughter? Influence of the older generation's fertility behaviours on women's desired family size in Bihar, India. *European Journal of Population*, 32(5):629-660. <https://doi.org/10.1007/s10680-016-9379-z>
- Laplante B, Castro-Martín T, Cortina C, et al. (2016). The contributions of childbearing within marriage and within consensual union to fertility in Latin America, 1980-2010. *Demographic Research*, 34:827-844. <https://doi.org/10.4054/DemRes.2016.34.29>
- Mberu BU and Reed HE. (2014). Understanding subgroup fertility differentials in Nigeria. *Population Review*, 53(2):23-46. <https://doi.org/10.1353%2Fprv.2014.0006>
- Mencarini L and Tanturri ML. (2006). High fertility or childlessness: Micro-level determinants of reproductive behaviour in Italy. *Population*, 61(4):389-415. <https://doi.org/10.3917/popu.604.0463>
- Mohanty SK, Fink G, Chauhan RK, et al. (2016). Distal determinants of fertility decline: Evidence from 640 Indian districts. *Demographic Research*, 34:373-406. <https://doi.org/10.4054/DemRes.2016.34.13>
- Morosow K and Trappe H. (2018). Intergenerational transmission of fertility timing in Germany. *Demographic Research*, 38:1389-1422. <https://doi.org/10.4054/DemRes.2018.38.46>
- Muhoza DN, Broekhuis A, and Hooimeijer P. (2014). Variations in desired family size and excess fertility in East Africa. *International Journal of Population Research*, 2014(1):1-11. <https://doi.org/doi.org/10.1155/2014/486079>
- Murthi M. (2002). Fertility change in Asia and Africa. *World Development*, 30(10):1769-1778. [https://doi.org/10.1016/S0305-750X\(02\)00062-1](https://doi.org/10.1016/S0305-750X(02)00062-1)
- National Bureau of Statistics (NBS). (2020). *2019 Poverty and Inequality in Nigeria: Executive Summary*. China: National Bureau of Statistics.
- National Population Commission (NPC) [Nigeria] and ICF. (2019). *Nigeria Demographic and Health Survey 2018*. United States: NPC and ICF.
- National Population Commission of Nigeria and Health Policy Project. (2015). *Nigeria's 2004 National Policy on Population for Sustainable Development: Implementation Assessment Report*. Mumbai: Futures Group, Health Policy Project.
- NPC and ICF International. (2014). *Nigeria Demographic and Health Survey 2013*. National Population Commission. United States: Nigeria and ICF International.
- NPC and ICF Macro. (2009). *Nigeria Demographic and Health Survey 2008*. United States: National Population Commission, Nigeria and ICF Macro.

- Ntoimo LF and Isiugo-Abanihe U. (2014). Patriarchy and singlehood among women in Lagos, Nigeria. *Journal of Family Issues*, 35(14):1980-2008. <https://doi.org/10.1177%2F0192513X13511249>
- Nwokocha EE. (2007). Male-child syndrome and the agony of motherhood among the Igbo of Nigeria. *International Journal of Sociology of the Family*, 33(1):219-234.
- Odusina EK, Ayotunde T, Kunnuji M, et al. (2020). Fertility preferences among couples in Nigeria: A cross sectional study. *Reproductive Health*, 17(1):92. <https://doi.org/10.1186/s12978-020-00940-9>
- Olaseinde OS, Owagbemi OG, Aruna JO, et al. (2022). Fertility intentions among high-parity women in Nigeria: How satisfying are four living children? *Journal of Population and Social Studies*, 30:488-507. <https://doi.org/10.25133/JPSSv302022.028>
- Oyediran K and Isiugo-Abanihe U. (2002). Husband-wife communication and couples fertility desires among the Yoruba of Nigeria. *African Population Studies/Etude de La Population Africaine*, 17(2):61-80.
- Oyediran KA. (2006). Fertility desires of yoruba couples of South-Western Nigeria. *Journal of Biosocial Science*, 38(5):605-624. <https://doi.org/10.1017/S0021932004026835>
- Pallant J. (2020). *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS*. England: Routledge.
- Pullu TW, Schoumaker B, Becker S, et al. (2013). *An Assessment of DHS Estimates of Fertility and under-five Mortality*. In: International Population Conference of the International Union for the Scientific Study of Population (IUSSP), Session 132: Data Quality in Demographic Surveys.
- Rossi P and Rouanet L. (2015). Gender preferences in Africa: A comparative analysis of fertility choices. *World Development*, 72:326-345. <https://doi.org/10.1016/j.worlddev.2015.03.010>
- Silalahi PC and Setyonaluri D. (2018). My mother, my role model: Mother's influence on women's fertility intention in Indonesia. *Malaysian Journal of Economic Studies*, 55(1):81-96. <https://doi.org/10.3316/informit.626563682534954>
- Smith DJ. (2005). Legacies of Biafra: Marriage, "home people" and reproduction among the Igbo of Nigeria. *Africa*, 75(1):30-45. <https://doi.org/10.3366/afr.2005.75.1.30>
- Testa MR. (2014). On the positive correlation between education and fertility intentions in Europe: Individual-and country-level evidence. *Advances in Life Course Research*, 21:28-42. <https://doi.org/10.1016/j.alcr.2014.01.005>
- The World Bank. (2021). *GDP (Current US\$) Nigeria*. Washington, DC: The World Bank. Available from: <https://www.data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2020andlocations=NGandstart=2017> [Last accessed on 2022 Feb 20].
- Umoh A, Abah G, and Ekanem U. (2012). A study of fertility intentions of women in Uyo, Nigeria. *Journal of Public Health and Epidemiology*, 4(1):14-18.
- UNDP. (2014). *Human Development Report 2014*. New York: United Nations Development Programme. Available from: <https://www.hdr.undp.org/content/human-development-report-2014> [Last accessed on 2022 Aug 08].
- UNDP. (2020). *Human Development Report*. New York: United Nations Development Programme. Available from: <https://www.hdr.undp.org/content/human-development-report-2020> [Last accessed on 2022 Aug 08].
- United Nations, Department of Economic and Social Affairs, Population Division. (2022). *World Population Prospects 2022: Summary of Results* (UN DESA/POP/2022/TR/NO. 3.). New York: United Nations Department of Economic and Social Affairs.
- Upadhyay UD and Karasek D. (2010). *Women's Empowerment and Achievement of Desired Fertility in sub-Saharan Africa* (DHS Working Papers No. 80). United States: ICF Macro. Available from: <https://www.dhsprogram.com/publications/publication-wp80-working-papers.cfm> [Last accessed on 2022 Aug 08].
- Upadhyay UD, Gipson JD, Withers M, et al. (2014). Women's empowerment and fertility: A review of the literature. *Social Science and Medicine*, 115:111-120. <https://doi.org/10.1016/j.soescimed.2014.06.014>
- Westoff CF, Bietsch K, and Hong R. (2013). *Reproductive Preferences in Cambodia* [Further Analysis of the Cambodia Demographic and Health Surveys]. United States: ICF International. Available from: <https://www.dhsprogram.com/publications/publication-fa87-further-analysis.cfm> [Last accessed on 2022 Aug 01].
- World Health Organization. (2021). *Health and Gender Equality* [Policy Brief]. WHO Regional Office for Europe. Geneva: World Health Organization
- Yaya S, Odusina EK, and Bishwajit G. (2019). Prevalence of child marriage and its impact on fertility outcomes in 34 Sub-Saharan African countries. *BMC International Health and Human Rights*, 19(1):33. <https://doi.org/10.1186/s12914-019-0219-1>