

Futo Journal Series (FUTOJNLS)
 e-ISSN : 2476-8456 p-ISSN : 2467-8325
 Volume-3, Issue-1, pp- 200 - 208
 www.futojnls.org

Research Paper

July 2017

Intra – National Variations in Fertility Levels and Trend in Nigeria

Nwogu, E. C. and *Izunobi, C. H.

Department of Statistics, Federal University of Technology, Owerri, Imo State, Nigeria.

**Corresponding author email: chiyeaka2007@yahoo.com*

Abstract

This paper discusses the variation in levels and trend of fertility among the geographic regions in Nigeria and their implications for population policy implementation. The ultimate objective of this study is to determine the relationship between fertility and regions in Nigeria which may be relevant in formulation, implementation and monitoring of appropriate policy on population and assessment of achievements of the Millennium Development Goals as they concern fertility. The 1990, 1999, 2003, 2008 and 2013 Nigerian Demographic and Health Surveys (NDHS) data were analyzed using the methods of descriptive statistics and multiple regression analysis. The results of the analysis show that fertility levels and trend are not the same in the six regions of the country. While the Total Fertility Rate (TFR) for the North East (NE) and North West (NW) are significantly higher, those of the South East (SE), South South (SS) and South West (SW) are significantly lower than that of the North Central (NC) the Reference Category (RC). Therefore, it has been recommended that for any successful policy on population, the objectives, targets and implementation strategies should emphasize differences among the regions in the country.

Keywords: Fertility, level and trends, intra-national variation, region of study, population policy.

1.0 Introduction

The effects of high rate of population growth have been a source of great concern all over the world. Rapid population growth has been linked to food and water shortages, soil exhaustion, loss of forest, air and water pollution, and degradation of coastlines (Population Reports, 1997 and 2000). Other problems associated with rapid population growth include poverty, low savings and investment, unemployment, crimes, political instability and many other societal ills (Oladosu, 2001; Ohadike, 1988). Although, the problems of rapid population growth are felt all over the world, the effects appear worse in the developing than the developed countries.

Population changes through the interactions of fertility, mortality and migration (commonly referred to as components of population change). The rate and nature of population change depends on the magnitude and direction of changes in these components. However, fertility appears to be the ultimate determinant of population change. This is because, with improved health facilities and personnel, improved environmental conditions and nutrition, mortality levels have been reduced (Ohadike, 1988). Also the percentage of the total population of most countries accounted for by net-migration is negligible. This accounts for the emphasis on fertility in most studies.

Fertility levels and trend in any society affect and are influenced by the prevailing demographic, socio-economic and cultural characteristics of the society. Available evidence shows that such socio-economic and cultural characteristics as parents' level of education, employment status, occupation, rural-urban places of residence, geographic location, religious affiliation, cultural ideals and ethnicity affect the level of fertility in any society through their influences on such characteristics as the number of women in the childbearing age range, number of women entering into marital union, the age at entry into marital union, marital stability, use of modern methods of contraception, fertility preferences, age at first birth and birth spacing, (hereinafter referred to as proximate determinants (UN, 1973); Oladosu, 2001; Mbamaonyekwu, 2000; Lamleenn, 2000; Westoff, 2003). Fertility level has been shown to be higher in societies in which marriage is universal, early and stable (Westoff, 2003; Mahy and Gupta, 2002) and lower in societies in which the use of modern methods of contraception is high (Lamleenn, 2000; Westoff and Bankole, 2001). Fertility has been shown to be lower among women with at least a secondary education, resident in urban areas and currently employed in the skilled occupational areas than for others. (Mboup and Saha, 1998; Mbamaonyekwu, 2000; UN, 1973; Oladosu, 2001).

In Nigeria available evidence shows that these socio-economic and cultural characteristics as well as the proximate determinants, which are known to correlate with levels of fertility, vary widely among the geographic regions in Nigeria. Available evidence from the 2013 NDHS (NPC, 2014) shows that the percentage of women with no education ranged from about 5.0 in the South-South to about 69.4 in the North-West. The percentage with at least some secondary education ranged from about 19% in the NW to about 73.8% in the SE regions. The percentage of women aged 15 - 49 years currently employed varied from 45.8% in the North-East to 74.2% in the South-West. The percentage of women aged 15-19 years who are already mothers or are pregnant with first child ranged from about 8.2% in the South East (SE) and South-West (SW) to about 35.7% in the in the North West (NW) regions. Variations are also noticeable in other socio-economic and cultural characteristics among geographic regions in Nigeria.

However, it is disturbing that despite these visible wide variations in the socio-economic and cultural characteristics as well as the proximate determinant which affect fertility among the regions in Nigeria, single measures (or estimates) of levels and trends of fertility are assumed in the formulation, implementation and monitoring of population policy and development plans for the entire country. Does this imply that levels and trends of fertility have remained the same all over the country despite the differences in the socio-economic and cultural characteristics and proximate determinants among the regions in Nigeria? How effectively do the single measures (or their estimates) of level and trend of fertility represent the true situation in the country? Is there any need to redirect strategies for policy implementation? These and other related questions are what this study intends to address. Therefore, the ultimate objective of this study is to determine the extent of uniformity in fertility levels and trend in Nigeria which may be relevant in formulation, implementation and monitoring of appropriate policy on population.

2.0 Methodology

The data for this study is a secondary data drawn from the 1990, 1999, 2003, 2008 and 2013 Nigerian Demographic and Health Surveys (NDHS) .(NPB, 1992); NPC, 2000, 2004 2009, & 2014). The surveys provide data on the current demographic situation in the whole country. Other surveys such as the 1981/82 Nigeria Fertility Survey (NFS) and the

1963 and 1991 census also provide demographic data on the entire country. However, for consistency of source and uniformity, data from only the NDHS have been used. Furthermore, Demographic and Health Surveys data (DHS) are usually of high quality because of the standardized and well tested procedure adopted in the collection, the representativeness of the sample (or enumeration) units in the general population and the ease of comparisons across countries over time. However, there are indications that the data contain some serious defects [Nwogu 2006 and 2011]. Therefore, estimates of demographic parameters based on them are used and interpreted with caution.

The methods of analysis used in this study are simple descriptive statistics and multiple regression analysis. The descriptive statistics are used to discuss the levels and trend of fertility, while regression analysis was used to determine the extent to which fertility varies according to the regions. The measures used to discuss fertility levels and trend in this study are the Age specific fertility rate (ASFR), Total Fertility Rate (TFR) and the Mean Completed Family Size (MCFS). Total Fertility Rate (TFR) provides a more reliable index for comparison of fertility levels in two or more populations.

In the regression analysis, TFR was used as the dependent variable while the regions (represented by dummy variables), were used as the independent variable.

The model for the regression is

$$y_i = \mu + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \ell_i \quad (1)$$

where $i = 1, 2, 3, \dots, 6,$

In the dummy variables, the North – Central (NC) region was used as the reference category (RC) since the fertility measures for the region appear to lie closer to the national average. Other dummy variables used are X_2 for the North-East (NE), X_3 for the North-West (NW), X_4 for the South- East (SE), X_5 for the South- South (SS) and X_6 for the South- West (SW).

3.0 Levels, Trends and Intra-National Variation of Fertility and Proximate Determinants in Nigeria

This Section examines the levels, trends and intra-national variation of fertility in Nigeria. Section 3.1 presents the estimates of fertility levels in Nigeria and some selected countries of the world while Section 3.2 considers the intra-national variation in fertility levels and trend in Nigeria.

3.1 Fertility levels in Nigeria and some selected countries of the World

The reported Age- Specific Fertility Rates (ASFR) and some other fertility measures in Nigeria and some selected countries of the world are shown in Table 3. Data from other countries have been included for comparison. The fertility level in any country is said to be high or low when compared with the available resources and fertility levels in other countries.

As Table 3 shows all the fertility measures except the MCFS indicate that Nigeria has the second highest fertility level among the countries under consideration. The TFR is well above the four (4) children per woman (the target figure of the Nigeria population policy (FGN, 2004)). Except in Malawi, the ASFR is, for almost all age groups, higher in Nigeria than in the other countries listed, at the onset, fertility is higher in Nigeria than in the other countries listed. The peak (0.253) for Nigeria is only lower than that of Malawi (0.269). Towards the end of the reproductive age range (40 - 49) the contributions of Nigerian women to TFR remained higher in Nigeria than those of other countries except Malawi and

Yemen which have the same contribution as Nigeria women. Thus, in comparison, fertility level appears higher in Nigeria than in the developed and in some developing countries thus, justifying the adoption of population control measures in Nigeria.

3.2 Intra-National Variation in Fertility Levels and Trend.

As was noted in the preceding section, the fertility level in Nigeria is relatively high when compared with the levels in the developed and some developing countries and also when compared with the target of the National Policy on Population (FGN, 2004). Is this situation the same all over the country? In this Section the consistency of this observation among the geographic regions in the country has been examined. The result will enable the development planners and policy implementation agencies to consider redirecting their programmes and strategies appropriately. The results from the previous surveys are also presented to discuss the trend over the years and assess the prospects of fertility decline in Nigeria.

The estimates of TFR and MCFS by year and regions of residence in Nigeria are shown in Table 1

Table 1: Some Fertility Measures for Nigeria and some selected countries of the world.

Age Group	Nigeria	Egypt	Malawi	Bangladesh	Pakistan	Yemen
	2013	2014	2010	2011	2012-2013	2013
15-19	0.122	0.056	0.152	0.118	0.044	0.067
20-24	0.235	0.213	0.269	0.153	0.190	0.191
25-29	0.253	0.200	0.238	0.107	0.224	0.208
30-34	0.234	0.134	0.206	0.056	0.181	0.177
35-39	0.160	0.069	0.162	0.021	0.091	0.142
40-44	0.078	0.016	0.082	0.006	0.030	0.071
45-49	0.029	0.004	0.033	0.003	0.007	0.029
No of women	38,948	29,349	23,020	20,797	20,321	25,434
TFR	5.5	3.5	5.7	2.3	3.8	4.4
CBR(‰)	39	29.1	39.2	22.6	30.3	33.4
GFR(‰)	190	127	202	91	131	146
MCFS	6.3	3.8	6.6	4.2	4.5	6.7

Sources: NPC (2014), EI – Zanaty and Associate (2015), NSO (2011), NIPORT (2012), NIPS(2013) PAPFAM (2015)

As Table 1 shows, the result of the most recent survey (the 2013 NDHS) shows that TFR varies from about 4.3 children per woman in the South West (SW) to about 6.7 children per woman in the North West (NW) region of Nigeria.

Table 2: Estimates of TFR and MCFS by year and regions of residence in Nigeria.

Fertility Measure	Region						Nigeria
	North central	North East	North West	South East	South South	South West	
Year							
TFR							
1990	na	6.5	6.6	5.6	na	5.5	6.01
1999	4.49	6.79	6.45	4.64	na	4.50	5.15
2003	5.7	7.0	6.7	4.1	4.6	4.1	5.7
2008	5.4	7.2	7.3	4.8	4.7	4.5	5.7
2013	5.3	6.3	6.7	4.7	4.3	4.6	5.5
MCFS							
1990	na	5.6	5.8	6.9	na	5.8	6.49
1999	5.81	6.37	5.64	6.92	na	5.79	6.12
2003	7.4	7.4	6.7	6.6	6.9	5.5	6.8
2008	6.4	7.5	7.7	5.8	6.2	5.0	6.5
2013	5.8	7.1	7.6	5.7	5.4	4.8	6.3

Sources: NPC (1992, 2000, 2004, 2009 and 2014), where na means not available

These indicate that TFR have dropped below five children per woman in the South (i.e. South-East, South-South and South West) regions of Nigeria, while remaining higher than five in the regions in the North (NE, NW, NC). This appears to be the same on the previous surveys except the 1990 NDHS. The MCFS also varied from about 4.8 children per woman in the SW to about 7.6 children per woman in the NW regions. Except the SW region, MCFS remains clearly above five children per women in the current and previous surveys.

Over the years, the TFR for the entire country appears to have declined from a value of about six children per woman in 1990 to a little less than six children per woman in 2013 while MCFS appears to have dropped from about 6.5 children per woman in 1990 to about 6.3 children per woman in 2013. Thus, the rate of fertility decline in Nigeria appears quite low.

3.4 Fertility and Regions in Nigeria

In this section, an attempt was made to determine the extent to which fertility level (TFR) depends on the regions of Nigeria using regression analysis. The results of the analysis of the regression of TFR on the regions are shown in Tables 3 and Equation (2). As Table 3 shows, the effect of region on TFR appears to be significant, with p-value equal to zero and R square equals 94.1%. Further breakdown, shown in Table 4, indicates that TFR for all the other regions are significantly different from that of the reference category (the NC region). While the TFRs for the Northern regions (NE and NW) are significantly higher, the TFR for the Southern regions (SE, SW and SS) are significantly lower than the reference category (the NC region).

Table 3: Anova table

Source	DF	SS	MS	F	P
Regression	5	20.3978	4.0796	38.05	0.000
Error	12	1.2867	0.1072		
Total	17	21.6844			

S = 0.3274 R-Sq = 94.1% R-Sq(adj) = 91.6%

Table 4: Test of significance of the factors

Predictor	Coef	StDev	T	P
Constant	5.4667	0.1891	28.92	0.000
X2 (NE)	1.3667	0.2674	5.11	0.000
X3(NW)	1.4333	0.2674	5.36	0.000
X4(SE)	-0.9333	0.2674	-3.49	0.004
X5(SS)	-0.9333	0.2674	-3.49	0.004
X6(SW)	-1.0667	0.2674	-3.99	0.002

$$TFR = 5.47 + 1.37 X_2 + 1.43X_3 - 0.933 X_4 - 0.933X_5 - 1.07X_6 \tag{2}$$

For the NE

$$TFR = 5.47 + 1.37 X_2 \tag{3}$$

For the NW

$$TFR = 5.47 + 1.43X_3 \tag{4}$$

For the SE and SS

$$TFR = 5.47 - 0.933 X_4 \tag{5}$$

For the SW

$$\text{TFR} = 5.47 - 1.07X_5 \quad (6)$$

The intercept appear to be measuring the national average TFR (5.5) or the TFR of the reference category.

4.0: Policy Implications and Recommendations.

From the foregoing, it is clear that fertility levels and trend are not the same in the six regions of the country. The observed differences in the TFR among the regions may be attributable to the differences in the effects of proximate determinants. (Current use of modern methods of contraception, Age at First Marriage (AFM) and Median Birth Interval (MBI) etc) as earlier noted. Therefore, the use of a single value or pattern of fertility in population policy formulation and implementation for the entire country may not be appropriate.

Therefore, it is recommended that for any successful policy on population, the objectives, targets and implementation strategies should emphasize differences among the regions in the country. Until this is achieved, it seems unrealistic to use a single estimate of fertility level or to assume a common pattern of fertility trend in any development plan or to formulate a common population policy for the entire country. Any plan or policy which is intended to succeed should not ignore these variations in levels and trend of fertility, their determinants and consequences in its objectives, targets and implementation strategies, or in the monitoring of progress of any future population policies in the country.

This variation in population characteristics among regions in Nigeria may not be limited to fertility alone but may have affected the mortality and migration as well. This also should be investigated. These recommendations may lead to a more realistic and realisable development plans if considered and implemented.

References

- El-Zanaty, F & Way, A (2015). EDHS (Egypt demographic and health survey 2014), Cairo, Egypt.
- FGN (Federal Government of Nigeria, 1988), National policy on population for development, unity, progress and self-reliance.
- FGN (Federal Government of Nigeria, 2004), National policy on population for sustainable development.
- FOS (Federal Office of Statistics, 1992), Nigeria demographic and health survey (NDHS), Lagos.
- Lamlenn, S. B. (2000). Issues relating to the measurement of determinants of fertility: The goodness-of-fit of the Bongaarts Studies Model on Cameroonian Data: *African Population Studies*, 15 (1).
- Mahy, M. & Gupta, N. (2002). Trends and differentials in adolescent reproductive behavior in sub-Saharan Africa, *DHS Analytical Studies*, 3.
- Mbamaonyekwu, C.J (2000). Signs of fertility transition in Nigeria, *African Population Studies*, 15(1).
- Mboup, G. & Saha, T. (1998). Fertility levels, trend and differentials: Demographic and health surveys comparative studies No 28, Maryland, USA.

- Oladosu, M (2001). Prospects for fertility decline in Nigeria: Comparative analysis of the 1990 and 1999 NDHS Data: Workshop on prospects for fertility decline in high fertility countries held in New York, 9-11 July, 201.
- NIPORT (National Institute of Population Research and Training, 2012), Bangladesh Demographic and Health Survey (BDHS). 2011, Dhaka.
- NIPS (National Institute of Population Studies, 2013). Pakistan Demographic and Health Survey (PDHS), 2012-2013, Islamabad
- NPB (National Population Bureau, 1984). The Nigeria fertility survey (NFS) 1981/82 Principal Report, Lagos.
- NPC (National Population Commission, 1998). 1991 Population census of Federal Republic of Nigeria, Analytical Report at National Level, Abuja.
- NPC (National Population Commission, 2000). Nigeria demographic and health survey (NDHS) 1999, Abuja.
- NPC (National Population Commission 2004). Nigeria demographic and health survey (NDHS), 2003, Abuja.
- NPC (National Population Commission 2009). Nigeria demographic and health survey (NDHS), 2008, Abuja.
- NSO (National Statistical Office, 2011). Malawi demographic and health survey (MDHS) 2010, Zomba, Malawi.
- Nwogu, E. C. & Iwueze, I. S. (2009), Introduction to Demography, Owerri: Supreme publishers.
- Ohadike, P.O. (1988). Development in Africa, a socio-economic and demographic perspective: An occasional publication of the regional institute for population studies, University of Ghana, Legon.
- PAPFAM (The Pan Arab Program for Family Health 2015). Yemen National Health and Demographic Survey (YNHDS), 2013, Cairo, Egypt
- Population Reports (1997). Population growth and Food Needs, Series M, Number 13.
- Population Reports (2000). Population and environment: The global challenge, Series M, Number 15.
- UN (United Nations, 1973). The determinants and consequences of population trends, new summary of findings on interaction of demographic, economic and social factor, Vol. 1, New York.
- Westoff, C. F. (2003). Trends in marriage and early childbearing in developing countries, DHS Comparative Reports No. 5
- Westoff, C. F. & Bankole, A. (2001). The contraception – fertility link in sub- Saharan Africa, DHS Analytical Studies No 4, Calverton, Maryland: ORC Macro.

Appendix A: Estimates of Proximate Determinants by year and regions in Nigeria

Median Age at First Marriage by year and region in Nigeria

Proximate Determinants	Regions						Nigeria
	North-central	North-East	North- West	South-East	South-South	South West	
Year							
Median AFM (in Years)							
1990	na	15.2	15.4	18.3	na	19.7	16.9
1999	17.9	15.0	14.6	20.2	na	20.2	17.9
2003	17.7	15.0	14.6	21.8	19.2	21.3	16.6
2008	18.3	15.6	15.2	22.8	20.9	21.8	18.3
2013	18.9	16.3	15.3	22.7	21.5	21.8	18.3
Median BI (in months)							
1990	na	31.1	30.8	28.6	na	31.5	30.2
1999	33.8	29.4	28.9	29.3		34.2	31.1
2003	33.2	29.4	31.3	27.2	30.9	36.5	31.2
2008	33.5	30.5	30.8	27.7	30.4	34.7	31.4
2013	32.3	30.2	31.6	28.4	32.4	35.1	30.5
C MC (in percentage)							
1990	na	1.3	0.7	3.9	na	10.5	3.5
1999	17.9	15.0	14.6	20.2	na	20.2	8.6
2003	10.3	3.6	3.3	13.0	13.8	23.1	8.2
2008	10.5	3.5	2.5	11.8	15.5	21.0	9.7
2013	12.4	2.7	3.6	11.0	16.4	24.9	9.8