ETHNIC DIFFERENTIALS IN CHILDHOOD MORTALITY IN NIGERIA

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Abstract

This study hypothesized that specific socio-cultural practices vary among different ethnic groups and could affect childhood mortality. Secondary data from Nigeria Demographic and Health Survey (NDHS) 2003 were complemented with 40 focus group discussions and 40 in-depth interviews among selected ethnic groups in Nigeria. An examination of the Direct Estimates and Cox regression on childhood mortality indicate significant difference with ethnic groups in the northern part of Nigeria having the highest risk. There is also a significant effect of demographic and socioeconomic variables on childhood mortality. The values placed on children among all ethnic groups are reflected in different socio-cultural beliefs and practices with significant influence of urban residence and education of mothers. Although, the assumption that specific socio cultural practices might be salient to exposure of children under-five to health childhood mortality was supported in the study, the differences observed are more of a reflection of mother's socioeconomic variables.

Childhood mortality in Nigeria

In Africa, decline in childhood mortality has been slow despite broad approaches toward improving child's health (WHO 2005). Although, approximately 11 million infants and children under five years of age die each year, with large variations across regions and countries in the developing world, mortality rates among children under five years in African countries are higher when compared with other developing countries. Out of 20 countries identified as having high under-five mortality, 19 are in Sub-Saharan Africa (United Nations 2002; Mutunga, 2004; Balk *et al*, 2004, Mason 2004; WHO 2005). Although, in the 1990s, there has been a remarkable decrease in infant and child mortality in developing countries, sub-Sahara Africa under-five mortality rate have slowed down or increased in some countries (Rutstein, 2000). In particular, West African countries experience mortality up to three times higher than neighbouring countries in Northern and Southern Africa (Balk et al, 2004).

Childhood mortality, an indicator of health status of a country, is very crucial and researchers have therefore attempted to identify factors that contribute to high childhood mortality and its slow decline in developing countries. Factors such as maternal, demographic and socio-economic were found to be important determinants of childhood mortality. Nutritional deficiencies, illness such as malaria, diarrhea and acute respiratory infection as well as vaccine preventable diseases are also recognized as causes of under-five mortality in most countries in sub-Sahara Africa (Caldwell, 1979; Mosley & Chen, 1984, Boerma & Bicego, 1993, Rustein 2000, Gyimah 2002). Although disease oriented

intervening programmes put in place to enhance child survival, it has been observed that these have not been effective alone (Claeson & Waldman 2000; Policy Project, 2002; Murray et al 2007).

The rates of infant, child and under-five mortality in Nigeria (100,112 and 201 respectively) fall short of the World summit for children national goal of reducing infant mortality rate to 50/60 per 1000 and the under-five mortality rate to 70/80 per 1000 (NPC, 2004). The reduction of the child mortality rate is one of the eight-millennium development goals. The target of this goal is to reduce under-five mortality rate by two thirds between 1990 and 2015 (Policy Project, 2002). This high rate of childhood mortality is alarming despite government and international agencies efforts at reducing it. The country has adopted and implemented a number of major global initiatives affecting children such as the Safe Motherhood Initiatives and its follow-up Making Pregnancy Safer, Baby-friendly Hospital Initiatives (BFHI) among others. In spite of these initiatives and programmes in Nigeria, the under-five mortality rate is still high (Policy Project, 2002).

Although, various causes affecting under-five mortality in Nigeria have been identified by many studies, most of these causes are related to maternal situation (Ogunlesi, 1961; Animashaun, 1977; Caldwell, 1979; Orubuloye and Caldwell, 1975; Tawiah, 1979; Meegama, 1980; Ayeni, 1980; Tankins, 1981; Adewuyi and Feyisetan, 1988; Jinadu et al 1991; Iyun, 2000; Policy Project 2002). More recently, mother's ethnic group membership has attracted the attention of scholars as it affects child mortality. Perception, attitudes and behavioural practices toward childhood morbidty and mortality would be better understood by examining the mother's ethnic membership. In Nigeria, there are diverse ethnic groups, cultures, values, beliefs, practices and household environments. Consequently, there are various adaptive mechanisms relating to childhood morbidity and mortality.

Ethnicity and Childhood Mortality
Ethnicity is the basis of social organization in the traditional context. It encompasses a mosaic of observable and unobservable norms, beliefs and rituals that govern various life events (Gyimah, 2002b). It distinguished groupings of people who for historical reasons have come to be seen as distinctive by themselves and other on the basis of location origins and series of cultural markers (Otite, 1990). The most widely used markers is language; people who spoke a distinct language having separate terms for that language and/or its speaker saw themselves or were viewed by others as ethnically different (CISRR, 2004). In virtually all societies, ethnic differences are associated with variations in power and material wealth (Giddens, 1993)

Brockerhoff and Hewett (1998) found that where heads of state since independence have come from one or two ethnic groups—as in Côte d'Ivoire, Kenya, and Niger—these groups have experienced levels of early child mortality at least one-third lower than those of other groups. In other countries where there have been several transitions in state control, as in Ghana and Uganda, descendants of pre-colonial kingdoms such as Ashanti and Buganda have experienced much lower mortality than others. In most countries, the lower mortality of potent ethnic groups—who typically represent small proportions of national populations—is strongly related to economic privilege. Gyimah (2002) also observed that ethnic differences in infant mortality in

Ghana mainly reflect socio-economic disparities among groups rather than intrinsic cultural norms; each ethnic group has its own corpus of knowledge and practices in the sphere of health and child care.

The way in which children are exposed to the contaminants has great implication for the well-being of children in the years to come (Bearer, 1995). Exposure to an environmental agent is the first step in a sequence of environmentally related health effects. This exposure could be greatly influenced by various cultural norms and child care practices (Wahab 2004). In Nigeria, findings by Brockerhoff and Hewett (1998) revealed that children of the Hausa, Fulani, Tiv, and northern plateau groups of Nigeria have had greatly elevated child mortality odds as compared to other children in the country. The increasing disadvantage of these children with age— from 29 percent higher mortality during infancy to 73 percent higher mortality among children under age five— points to an accumulation of disease assaults and nutritional deficiencies over time resulting from the harsh epidemiological environment of Hausaland and other parts of northern Nigeria.

Ethnicity is one of the keys to understanding Nigeria's pluralistic society. Within the boundary of Nigeria, there are many social groups with distinct cultural traits, which are reflected in the diverse behavior of the people. The need to study ethnic differentials on childhood mortality is pertinent in a country like Nigeria as a study carried out by Ogunjuyigbe (2004) revealed cultural beliefs and behavioural practices that have not been adequately integrated into health intervention programmes. As Gaisie (1990) asserts with respect to African cultures, ethnic frameworks are necessarily the most important determinants of the degree of adaptation to modern conditions including changes in health behavior. Although various studies have been carried out in childhood mortality, there are insufficient explanations of clear-cut ethnic disparities on childhood mortality in Nigeria. A cursory glace at available health statistics (i.e. NDHS: 2003) revealed that a systematic examination of ethnicity as it affects child survival chances across the Nigeria has not been made to date. From the foregoing, the following research questions are derived: What are the differences in risks to Childhood mortality among ethnic groups in Nigeria? What are the ethnic perceptions and attitudes towards childhood morbidity and mortality in Nigeria? How do the socioeconomic and demographic factors affect childhood mortality in among Nigerian ethnic groups?

Theoretical Framework

The Mosley and Chen model seeks to create a new multivariate model for studying childhood mortality. It is comprehensive and an improvement on past models from a variety of disciplines; it is, in itself, a multidisciplinary model. This is because past models in the social sciences have been lacking because of a narrow focus on the relationship between socioeconomic status and mortality while medical research models have been lacking because of a narrow focus on biological processes and overall-specific focus on the disease and nutritional status of survivors. The Mosley and Chen analytical model alleviates the common problem of looking at mortality from a single factor conceptualization to a multifactorial causality (Mosley and Chen 1984).

The basic framework of Mosley and Chen's model is based on the idea that the factors that affect childhood mortality work through a set of "proximate determinants." Five other premises were also suggested that lay the background for the model along with

the basic premises. These premises are: (1) under optimal conditions, child survivability rates for newborn infants can be expected to reach 97 percent. (2) In the real world, this rate is lowered by social, economic, biological and environmental factors. (3) Socioeconomic determinants must operate through the "proximate determinants" in order to influence disease and disease processes. (4) The proximate determinants can be indicated by the diseases and deficiencies of surviving population. (5) Child mortality is the result of the cumulative consequences of multiple disease processes. Proximate determinants, as defined by Mosley and Chen, are divided into five categories: maternal and demographic factors, environmental health factors, nutrient deficiency, injury and personal illness control. Maternal factors include age of the mother, parity and birth interval. The demographic factors include sex of child, multiple births, and previous child death.

Household environmental factors include the material of household construction, sources of water, and presence/types of toilet facilities as well as type of cooking facilities. Environmental contaminations which are routes of infection include a multitude of factors, such as air, food, water, fingers, skin, soil, inanimate objects and insects. Indicators of hygiene determining the transmission of infections can involve the use of soap, food handling practices and defecation habits. There are myriad of infectious agents whose transmission to infants and children is facilitated by unsanitary household conditions, overcrowding, and poor personal hygienic practices. Indicators of hygiene determining the transmission of infections can involve the use of soap, food handling practices and defecation habits. Nutrient deficiency comes from different sources: calories, protein and micronutrients are the major sources. The injury category includes both accidental and intentional injuries as well as burns and poisoning. Physical injuries in younger children are typically due to burns, falls, and poisoning, often related to household hazards. Among older children, outdoor injuries including motor vehicle accidents become more common, with higher frequencies among boys compared to girls.

Personal illness control includes personal preventative measures taken and medical treatment. The preventive measures are taken to avoid disease including traditional practices like observing taboos, as well as modern practices such as seeking qualified antenatal and childbirth care, receiving maternal tetanus toxoid immunization, and immunizing the children. The medical treatment includes both the use of traditional medical practices as well as acceptance of modern medicine like oral rehydration therapy and antibiotics. In addition to proximate determinants, Mosley and Chen (1984) discussed that socioeconomic determinants affect childhood mortality. They divide socioeconomic determinants into three major categories: individual-level, household level and community level. The effects of socioeconomic variables are enhanced as the child gets older (Manda, 1999). Variables such as Maternal Education, Paternal education, residence, occupation and assets are good measure of socioeconomic factors.

Methodology
Nigeria is made up of 36 states and a Federal capital territory (FCT) and is grouped into six geopolitical regions: North Central, North East, North West, South East, South South and South West. Within the boundary of Nigeria, there are many social groups with distinct cultural traits, which are reflected in the diverse behavior of the people. There are about 374 identifiable ethnic groups but the Igbo, Hausa and Yoruba are the major ethnic groups. The other ethnic groups fall under the broadest groupings of linked ethnic unit by region and geo-political zoning of the country – Northern minorities (NM) ethnic group and Southern minorities (SM) ethnic group (Otite, 1990; NPC, 2004). For this study, population-based data obtained from Nigeria Demographic and Health Survey 2003 (NDHS 2003) were used for quantitative analysis as data on childhood mortality that covers the whole country are scarce because of poor record system. The study would consider all the ethnic groups interviewed by the Nigerian Demographic Health Survey 2003 at the quantitative data collection and analysis. Thus, ethnic membership was broadly categorized into Hausa-Fulani, Igbo, Yoruba, Southern minority ethnic groups and Northern minority ethnic groups as shown in Figure 1. Furthermore, qualitative data collection and analysis were based on selection of five ethnic groups representing the groupings at the quantitative analysis of the ethnic groups in Nigeria; Hausa-Fulani, Igbo and Yoruba were selected accordingly while the Tiv ethnic group was selected for the Northern minorities group and Ijaw ethnic group for Southern minorities. This is because they are the dominant minority ethnic groups in the Northern and Southern Nigeria respectively. Qualitative data collection was carried out in various states and locations as shown below. The purposive selection of these locations is as a result of the clustering of these various ethnic groups' members in the area and convenience purpose.

Table 1: State and location of qualitative data collection

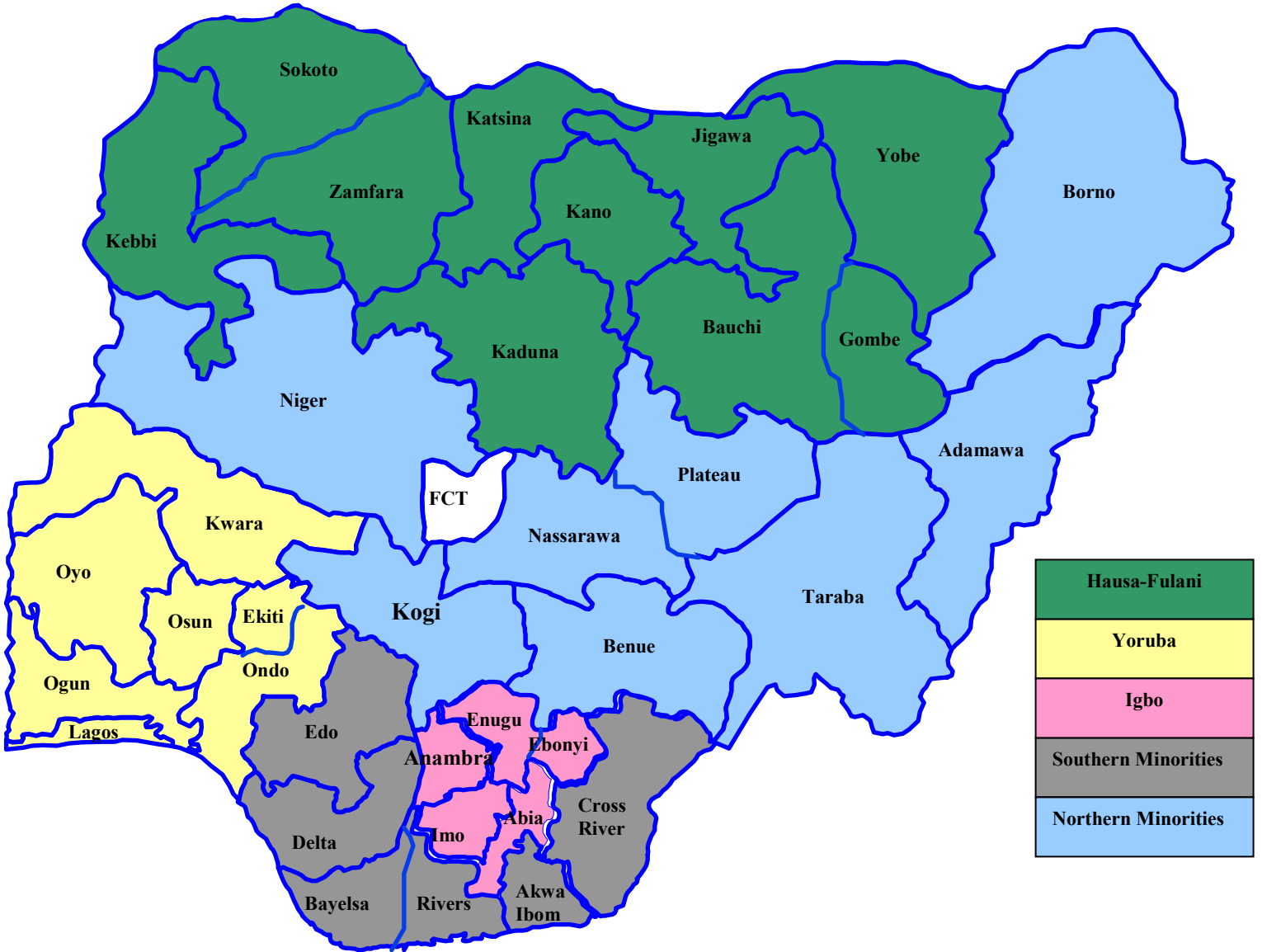| Ethnic group	Geo-political region	State	Location
Hausa-Fulani	North West	Kaduna	Zaria
Igbo	South East	Anambra	Awka
Yoruba	South West	Ondo	Akure
Tiv	North Central	Benue	Gboko
Ijaws	South South	Delta	Sagbama

Figure 1: A map of Nigeria showing the distribution and location of ethnic groups.

Quantitative data collection

The NDHS data included 7,620 women from whom information on birth history, household, health service usage and child health information were collected at the time of the survey (NPC, 2004). For this study, child record constitutes the basic analytical sample; a retrospective child file consisting of all children born to sample women was generated from the data. Although there are 23,038 births from 7620 women recorded in the survey, the analysis was restricted to births within five years of the survey, which gives 5,531 births from 3,688 women. This is to ensure that maternal characteristics relate to current situations.

Table 2: Distribution of births by mothers among Nigerian ethnic group (NDHS 2003)

Ethnic group	Mothers	Births
Hausa-Fulani	1440	2233
Igbo	440	660
Yoruba	394	530
Southern Minorities	562	826
Northern Minorities	852	1282
Nigeria (total)	3688	5531

Qualitative data collection

The attitudes, beliefs and perception of three major ethnic groups of the country (Hausa, Igbo and Yoruba) and two minority groups Ijaws and Tiv (Southern ethnic minority and Northern ethnic minority respectively) were investigated through Focus Group Discussion (FGD) and In-depth Interview (IDI). Eight in-depth interviews were carried out in each study location for different ethnic groups; informants were governed by the need to capture certain variables/ characteristics that are considered important. Respondents in each ethnic location comprise 4 rural and 4 urban mothers. On the overall, forty in-depth interviews were conducted for this study. The respondents for each Focus Group Discussion were homogeneous in characteristics as in the selection of in-depth interview informants. Eight FGDs were carried out in each of the aforementioned study locations of different ethnic groups. Each FGD comprises six to ten discussants. Therefore, for each location, there were four FGDs in rural area and four in urban area. The correct interpretation of the IDI and FGD guide into the local language was done with the help of research assistants from each of the ethnic group. This is to ensure that the research instruments elicit desired information and interviewer's biases avoided.

Variable Measurement

Demographic variables in this study are maternal age at birth, birth interval, sex of child, type of birth and birth order. Maternal age at birth is grouped into the conventional categories of fertility age of women as follows 15-19, 20-24, 25-29, 30- 34, 35-39, 40-44, 45 and above. Sex of child is either male or female while the type of birth could be single birth or multiple births as in the case of twins. Interval between births is grouped by months into, below 24, 24-36 and above 36 while the birth order is from first born to

fourth-born and above. The socioeconomic factor is measured with variables such as maternal highest educational level, paternal highest educational level, residence, employment status of mothers and wealth index of the family. Maternal and paternal highest educational levels are grouped into No education, Primary, Secondary and Higher education while the residence is categorized into rural and urban. Employment status of mothers is categorized into working and not working. The wealth index, based on assets information and household ownership of consumer item, as categorized in the 2003 NDHS is used with a little modification in the category; poorest and poorer is regrouped into poor, middle and richer and richest regrouped into rich.

RESULT
Background Characteristics of the study sample
　　　The distribution of children according to maternal and socio-demographic characteristics that can predispose them to childhood mortality is shown in Table 3 and 4. There are diversities in the distributions among Nigerian ethnic groups. The ethnic groups in the northern part of the country have the highest proportion of young mothers while Yoruba and Igbo mothers are older. Though, more than 50% of these children were born when their mothers were less than 29years, a substantial proportion of about 21% and 16% were born to mothers aged 15-19 among the Hausa-Fulani and the Northern minorities ethnic groups respectively. The cultural belief that a female child must go to her husband house after her first menstrual period and lack of education for girl child in the northern part of the country might be contributory to the higher proportion of young mothers among Hausa-Fulani and northern minorities. With the exception of the Hausa-Fulani in this study, there are more male births than female (slightly above 50%) across all ethnic groups in Nigeria. This is quite significant for a patriarchy society like Nigeria.

　　　The distribution of type of birth, a fertility behavior which predisposes both mother and child to risk, is as reported in other studies; there are more single births all over the country than multiple births. However, Yoruba have the highest proportion of multiple births. The significance of birth interval to maternal and child health has been established in the literature. For this study, birth intervals are relatively longer among the Yoruba when compared with other ethnic groups; over 50% percent children were born 36 months after the preceding birth by Yoruba mothers. More than half of the children in this study are third born and above with a slight deviation among the Yoruba.

Table 3: Demographic characteristics of mother and child among Nigerian Ethnic Groups

Characteristics	Hausa-Fulani	Igbo	Yoruba	Southern Minorities	Northern Minorities
Maternal age at birth -15-19	21.0%	5.9%	6.0%	11.7%	16.1%
	470	*39*	*32*	*97*	*207*
20-24	27.1%	21.7%	23.4%	25.8%	27.1%
	605	*143*	*124*	*213*	*347*
25-29	22.6%	32.0%	30.4%	26.9%	26.1%
	504	*211*	*161*	*222*	*334*
30-34	16.0%	20.2%	19.6%	16.8%	14.7%
	357	*133*	*104*	*139*	*188*
35-39	9.4%	13.6%	13.8%	12.3%	11.1%
	209	*90*	*73*	*102*	*142*
40-44	3.3%	5.6%	5.7%	5.6%	4.1%
	74	*37*	*30*	*46*	*53*
45 and above	0.6%	1.1%	1.1%	0.8%	0.9%
	14	*7*	*6*	*7*	*11*
Sex of child - Male	48.9%	52.9%	51.5%	50.6%	52.3%
	1091	*349*	*273*	*418*	*670*
Female	51.1%	47.1%	48.5%	49.4%	47.7%
	1142	*311*	*257*	*408*	*612*
Type of birth- Single birth	95.8%	96.7%	95.1%	96.1%	95.6%
	2139	*638*	*504*	*794*	*1226*
Multiple birth	4.2%	3.3%	4.9%	3.9%	4.4%
	94	*22*	*26*	*32*	*56*
Birth intervals- Below 24 mths	25.2%	24.9%	14.0%	20.4%	23.6%
	457	131	55	133	246
24-35 months	40.2%	37.2%	32.4%	41.0%	37.6%
	731	196	127	267	391
36 months and above	34.6%	38.0%	53.6%	38.6%	38.8%
	629	200	210	251	404
Birth Order - First-born	18.6%	20.0%	25.8%	21.2%	18.7%
	415	*132*	*137*	*175*	*240*
Second-born	14.7%	15.2%	23.6%	15.5%	17.5%
	329	*100*	*125*	*128*	*224*
Third-born	13.5%	14.8%	17.7%	14.8%	15.2%
	301	*98*	*94*	*122*	*195*
Fourth-born and above	53.2%	50.0%	32.8%	48.5%	48.6%
	1188	*330*	*174*	*401*	*623*

Source: Raw data from NDHS 2003

Table 4: Socioeconomic characteristics of mothers among Nigerian Ethnic Groups

Characteristics	Hausa-Fulani	Igbo	Yoruba	Southern Minorities	Northern Minorities
Maternal Highest educational level					
No education	78.2%	17.0%	15.1%	26.3%	49.7%
	1746	112	80	217	637
Primary	12.7%	34.8%	30.0%	33.4%	30.4%
	284	230	159	276	390
Secondary	8.0%	41.4%	45.1%	35.4%	17.9%
	179	273	239	292	229
Higher	1.1%	6.8%	9.8%	5.0%	2.0%
	24	45	52	41	26
Paternal highest educational level					
No education	63.2%	17.2%	15.1%	19.2%	34.2%
	1395	109	77	146	424
Primary	16.3%	45.9%	22.5%	27.7%	25.9%
	359	290	115	211	322
Secondary	12.7%	28.8%	45.6%	38.0%	25.3%
	281	182	233	289	314
Higher	7.8%	8.1%	16.8%	15.1%	14.6%
	171	51	86	115	181
Place of residence - Urban	29.3%	50.0%	66.2%	29.3%	27.1%
	655	330	351	242	347
Rural	70.7%	50.0%	33.8%	70.7%	72.9%
	1578	330	179	584	935
Employment status - Not working	47.8%	27.3%	7.2%	29.4%	32.8%
	1068	180	38	243	421
Working	52.2%	72.2%	92.8%	70.6%	67.2
	1165	480	492	583	861
Wealth Index - Poor	53.2%	36.1%	17.2%	43.0%	49.3%
	1188	238	91	355	632
Middle	21.9%	17.3%	9.8%	17.7%	21.9%
	490	114	52	146	281
Rich	24.9%	46.7%	73.0%	39.3	28.8%
	555	308	387	325	369

Source: Raw data from NDHS 2003

Maternal education has been found to be strong correlates of fertility and maternal and child health. For this study, maternal education is high among the ethnic groups in the southern part of the country; large proportion of these mothers who gave birth within five years preceding the 2003 NDHS survey have at least secondary education. Conversely, most of the Hausa-Fulani children and Northern minorities' children belong to mothers with no education. Similarly on paternal education, more than 60% of the Hausa-Fulani fathers have no education while the reverse is the case among the Yoruba; above 50% of Yoruba fathers have secondary education. Majority of the fathers among the Igbo have primary education as the highest level of education attainment

On the pattern of residence among the mothers, the findings show that large proportion of Hausa-Fulani, NM and SM mothers are rural dwellers. Conversely, 50% and 66% of Igbo and Yoruba mothers respectively dwell in urban area. Wealth index is used to evaluate the influence of social class on fertility behavior and health of mother and child. Majority of Hausa-Fulani, SM and NM mothers are poor while fewer Yoruba and Igbo mothers are found in this category. This may be due to the basis of wealth classification as possession of some assets such as television, radio, bicycle and other consumable items used in the NDHS measure of wealth index.

Childhood Morbidity among Nigerian ethnic groups

The pattern of childhood morbidity, which could lead to childhood mortality, is examined among the ethnic groups in this study as shown in Table 5 below. Dehydration from diarrhea has been identified as major cause of death among young children in Nigeria. Responses on diarrhea incidence in the last two weeks preceding the survey revealed that children born to Yoruba women have the least episode of diarrhea. The incidence is higher among the Hausa-Fulani, Northern and Southern minorities' ethnic group. Contributory to this incidence is the source of drinking water for these two ethnic groups as literature has shown that the type of drinking water is a major determinant to diarrhea. This study shows that the ethnic groups with best source of drinking water have the least incidence of childhood diarrhea.

Acute Respiratory Infection characterized by coughing or short rapid breath has been found to be one of the major causes of childhood mortality in developing countries. Incidence of cough or short rapid breath within two weeks preceding the survey is highest among SM group and lowest among the Yoruba. Although, acute respiratory infection is expected to be significant among the ethnic groups where biomass fuel (firewood, charcoal, straw) is used for cooking, it is surprising that the incidence is high among all ethnic groups irrespective of their type of cooking fuel aforementioned.   Fever is assumed to be common childhood morbidity in developing countries, especially Sub-Saharan Africa; the findings in this study did not deviate from this assumption. It is quite alarming that within two weeks preceding the survey, about 37 out of 100 children under five among Hausa-Fulani, 33 out of 100 among the Northern minorities, 31 out of 100 among the Southern minorities children under-five reported incidence of fever.

Table 5: Pattern of childhood morbidity among Nigerian ethnic groups

| Childhood morbidity	Hausa-Fulani	Igbo	Yoruba	Southern Minorities	Northern Minorities
Had diarrhea in the last 2wk					
No	76.8%	89.7%	92.4%	82.3%	76.9%
	1420	525	447	582	825
Yes	23.2%	10.3%	7.6%	17.7%	23.1%
	430	60	37	125	248
Had fever in the last 2wks					
No	62.9%	71.6%	80.6%	68.1%	66.8%
	1158	419	386	481	713
Yes	37.1%	28.4%	19.4%	31.9%	33.2%
	683	166	93	225	355
Had Cough/short breathe in the last 2 wks					
No	79.0%	75.6%	81.9%	68.4%	70.5%
	1455	442	394	483	756
Yes	21.0%	24.4%	18.1%	31.6%	29.5%
	386	143	87	223	316

Source: Raw data from NDHS 2003

Childhood mortality among Nigerian ethnic groups

An examination of the direct estimates for under-five mortality for all ethnic groups in the study indicates significant difference as shown in Figure 2. The theoretical assumption that the modernizing effect of formal education among some ethnic groups can affect the risk to childhood mortality is clearly supported in this study. Hausa-Fulani group has the highest number of deaths of children under-five among the ethnic groups in the country. From the direct estimates of under-five mortality for five years preceding the survey, there are about 157 and 140 deaths per 1000 live births among the Hausa-Fulani and Northern minorities respectively. Conversely, 77.4 and 98.5 deaths were observed out of 1000 live births among the Yoruba and Igbo respectively.

Further analysis with Cox regression reveals disparities in childhood mortality among Nigerian ethnic groups. The dependent variable is the event of death of a child. For this study, it is hypothesized that there is significant effect of mother's ethnic membership on childhood mortality in Nigeria. For interpretation of Cox regression result, a risk ratio significantly greater than one indicated that children with this attributes have a higher chance of death than the reference category while the relative risk ratio less than one indicated that children with this attribute are expected to have lower risk of death than those in the reference category. The result is shown in Table 6 below.

The Hausa-Fulani ethnic group is the reference category because it is the ethnic group with the highest incidence of childhood morbidity earlier examined. The result shows that the ethnicity variable on childhood mortality is significant ($p<0.05$) particularly among the Yoruba, Igbo and Southern Minorities ethnic groups with reference to Hausa-Fulani. The relative hazard of death is significantly lower among children born to Yoruba mothers (0.480) and Igbo (0.617) for under-five mortality. The

observed wide disparity between the Yoruba, Igbo, SM ethnic groups and the reference category (Hausa-Fulani) confirms NDHS 2003 findings on regional differences between mothers in the Southern part and those in the Northern part of the country. The NDHS report was based on region, whereas the present study is based on actual ethnic group membership in the region.
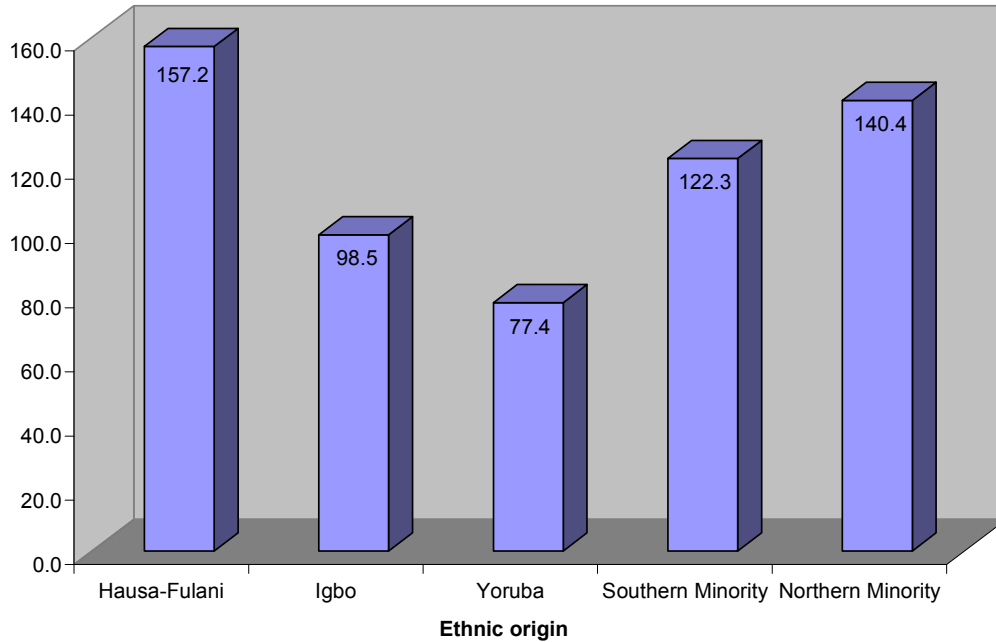
Figure 2: Under-five mortality estimates for five years preceding the 2003 NDHS survey among Nigerian ethnic groups

Table 6: Cox regression analysis on childhood mortality and mother's ethnic group membership

Variables	Childhood mortality	Infant mortality (0-12mths)	Child mortality (13-59mths)
Ethnic groups			
Hausa-Fulani (ref.)	1.000	1.000	1.000
Igbo	0.617*	0.848	0.171*
Yoruba	0.480*	0.529*	0.387*
Southern-minorities	0.771*	0.789	0.584*
Northern-minorities	0.897	0.954	0.606*

Source: Raw data from NDHS 2003

As expected, the NM group did not show any significant difference from the reference category; the relative hazard for the Northern Minorities ethnic group is closer to the reference category than other ethnic groups. This may be attributable to geographic location and cultural similarity with the reference category. Cox regression analysis of infant and child mortality shows differences among Nigerian ethnic groups. Infants generally have lower chances of survival than children above one year; once a child survives the first 12 months, the likelihood of living up to 59th month increases. This is because of children's critical physiological developmental stage before age 12 months. Children born to mothers in the Hausa-Fulani have relative high hazard to infant mortality compared to other ethnic group. However, there is a wide margin when all other ethnic are compared with the Yoruba on infant mortality. The findings further show that ethnic differential is significant for children aged 13-59 months. Those children within the age 13-59months in the ethnic groups in the Southern part of Nigeria can, on the average, survive child mortality than those in the Northern part.

On the overall, deaths among Yoruba children are lower than all other ethnic groups surveyed in Nigeria; at infancy, between age 13 to 59 months and under-five. Although, Yoruba, Igbo and SM are from the Southern part of Nigeria, which is presumably an enlightened part because of early impact of civilization, many Yoruba infants survive infancy than Igbo and SM ethnic groups.

Ethnic Groups Perception of Childhood Mortality in Nigeria
The value placed on child is a cultural phenomenon, which varies from one society to another, thus from one ethnic group to another. The findings from the qualitative study show that all the mothers linked childhood morbidity to mortality. It is generally believed that with the exception of some children, the general cause of death is from illness. Although, tradition demands that both mother and child should be taken care of pre and post natally, it is generally believed that illness is inevitable among children, especially those less than five years of age. Table 7 below is a summary of findings in the qualitative fieldwork among the selected ethnic groups on some childhood morbidity.

There are different perceptions on causes of childhood morbidity among Nigerian ethnic groups. Contaminated/dirty water and teething are generally perceived in all the ethnic groups as causes of diarrhea for children under-five. It was only the Igbo and Yoruba mothers that mentioned improper care of the feeding bottle as cause of childhood diarrhea. Measles is seen as normal for Tiv children therefore no precise cause was mentioned while the remaining ethnic group attributed incidence of measles to heat. Exposure to cold, smoke from firewood and bare floor were mentioned as causes of cough and catarrh among the children under-five in Nigeria. Even though the pattern of perceived causes of childhood morbidityvaries slightly, a higher proportion of mothers, irrespective of residence, mentioned modern treatment/curative measures in all the ethnic groups for this study. For instance, majority of the respondents in all the ethnic groups mentioned the use of oral rehydration therapy for home treatment of diarrhea (though called different names). The Igbo mother further mentioned Saint leaf/ Ugulu as a cure for diarrhea. However, diarrhea will not to be taken to hospital except in extreme cases of dehydration among the mothers in rural area. While there were no specified treatment mentioned for measles apart from traditional healer, health centre or hospital for Hausa-

Fulani, Tiv, Igbo and Yoruba, Ijaw mothers apply onions, cold water and squeezed sugar water. The Ijaw mothers also used long black bitter spice as cure for cold and catarrh, which they claimed, is effective. Chemist is mentioned so frequently among all the ethnic groups irrespective of the illness. This has implication on the survival status of child.

Having mentioned the various perceptions of causes on childhood morbidity, which could lead to childhood mortality, some children, are believed will die irrespective of treatment given when they are sick. This happens if the parent refuses to acknowledge a particular taboo or beliefs that the community value and adhere to concerning children.

Table 7: Perceived causes of childhood morbidity mentioned among Nigerian ethnic groups

Childhood morbidity	Hausa-Fulani	Igbo	Yoruba	Ijaw- SM	Tiv – NM
Diarrhea	Teething, untreated water, unripe fruit or change of water. Yam moi-moi, okro soup	Improper care of the feeding bottle, open food, not washing hands before eating, picking dirty things on the floor	Untreated/contaminated water, junk, sugary food, improper care of the feeding bottle, eating of contaminated food	Contaminated water; contaminated food	untreated water or uncooked food; teething; Mango; Untidy toilet facility
Measles	Hot season, from God	Heat	Too much heat, dry season		Measles is seen as normal
Cough /catarrh/ ARI	Exposure to cold	Exposure to smoke from firewood. Taboo on wearing cloth during "Ozu" festival can expose children to cold	Smoke from firewood, exposure to bare floor, improper care during rainy season	Exposure to cold; sleeping on bare floor; smoke from firewood	Exposure to cold
Fever	Mosquito especially during rainy season	Convulsion resulting from malaria is seen as attack from evil spirit	Mosquito bite, Improper care of feeding bottle	Dirty water; mosquito bite, child playing in the sun	Contaminated water, mosquito bite

The Effects of Socioeconomic and Demographic Factors on Childhood Mortality among Nigerian Ethnic Groups

The first model examines the mother's ethnic group membership and childhood mortality. This is the baseline model which is referred to as control variable. The result as shown in Table 8 is very similar to the pattern observed in the previous section. The relative hazard of death is significantly lower among children born to Yoruba mothers (0.461), southern minorities (0.674) and Igbo (0.673). The NM group did not show any significant difference from the reference category.

The second model includes the first model and demographic variables, the disparities in the risk to childhood mortality among the Yoruba, Igbo and NM ethnic group when compared to the reference category is not statistically significant though there is decrease in the differences. Children born five years preceding the 2003 NDHS to Yoruba mothers have significant lower risk to death than those born to Hausa-Fulani mothers.

Table 8: Relative hazards of childhood mortality among Nigerian ethnic groups

Variables	Model 1	Model 2	Model 3
Ethnic groups			
Hausa-fulani (ref.)	1.000	1.000	1.000
Igbo	0.673*	0.679*	0.866
Yoruba	0.461*	0.514*	0.708
Southern-minority	0.674*	0.687*	0.779
Northern-minority	0.894	0.922	0.976
Sex of child			
Male		1.094	1.096
Female (ref.)		1.000	1.000
Type of birth			
Single		0.331*	0.317*
Multiple (ref.)		1.000	1.000
Birth order			
Second-born (ref.)		1.000	1.000
Third-born		1.050	1.018
Fourth-born and above		1.196	1.093
Age of mother at birth			
15-19 (ref.)		1.000	1.000
20-24		0.822	0.939
25-29		0.844	0.942
30-34		0.934	1.052
35-39		1.098	1.204
40 and above		1.675*	1.736*
Birth interval			
Below 24 months (ref.)		1.000	1.000
24-35 months		0.760*	0.783*
36 months and above		0.429*	0.442*
Maternal educational level			
No education (ref.)			1.000
Primary			0.932
Secondary			0.750
Higher			1.067
Type of Residence			
Urban			0.858
Rural (ref.)			1.000
Work status			
Not working (ref.)			1.000
Working			0.936
Wealth Index			
Poor (ref.)			1.000
Middle			0.799*
Rich			0.581*

Source: Raw data from NDHS 2003

The findings in this study revealed a highly significant difference on childhood mortality because of the type of birth; the risk to childhood mortality is significantly lower (0.331) among births that are single when compared to multiple births.

Mother's age has been found in various studies to be important determinants of child's health. Children born five years preceding the survey to mothers age 20-29 have significantly lower risk than those of age 15-19. Adolescent motherhood is reflected in women aged 15- 19 while those of 20-29 years are in their early and mid reproductive years. Although, these two age groups grew up in a period of higher enrollment in formal education, higher participation in labor force and more campaign on maternal and child's health, the risk to under-five death is significantly higher among adolescent mothers. As expected in fertility behaviour, the risk to childhood mortality among births to mothers of age 30 and above increases when compared to reference category. Also children whose preceding birth interval is 2 years and above have lower chance of death than those below 2 years. The inclusion of socioeconomic variables in model 3 showed that there is no significant difference in ethnic group membership and childhood mortality in Nigeria. This is very pertinent as this last model includes all the variables mentioned in this study. This implies that the disparities in childhood mortality observed among the ethnic groups in this study could be controlled for if there is equality in demographic variables and socioeconomic variables. Overall, there is significant mediating effect of demographic and socioeconomic variables on childhood mortality and ethnicity. All these variables tend to lower the disparities noticed on under-five deaths among Nigerian ethnic groups.

CONCLUSION
There are large disparities in child survival chances among ethnic groups in Nigeria. These differentials observed are attributable to various locations of these ethnic groups in different geo-political regions of the country. Ethnic groups in the Northern region are less modernized than those in the Southern region. Thus as expected, less modernized groups have lower chance of child survival i.e. a higher risk of childhood mortality than that of the Southern region of the country. This expected differential in childhood mortality and survival among various ethnic groups in Nigeria also buttress findings by Brockerhoff and Hewett (1998) in Sub-Saharan Africa ethnic groups and childhood mortality. Studies have further shown that socioeconomic factors and maternal and demographic factors are strong predictors of childhood mortality in the developing countries (Mosley and Chen, 1984). It is observed in this study that the socioeconomic and demographic factor which varies among different ethnic groups affect childhood mortality in Nigeria.
The ethnic perception and attitudes towards child health, survival and mortality are quite different because of the culture of the people. The perception and attitudes of the ethnic groups from the southern region of the country were positively influenced by higher socio-economic development and higher levels of education than the Northern ethnic groups.

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