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Infant Mortality, Access to Primary Health Care and Prospects for Socio-Economic Development in Bwari Area Council of Niger State, Nigeria

By: Dr. Charles Onuora Okwuwa¹ and Simon M. Adejo²

Abstract

Infant mortality, ineffective ante- and post-maternal healthcare and stagnated development in Nigeria are decades old concerns that need urgent redress. High rates of infant mortality and inability of pregnant women to access healthcare implicate children's life chances, maternal psychosocial and economic wellbeing, future family welfare, community and national development prospects. Healthcare practices of the present constitutes the foundation for future child, family and overall development. Principally, this empirical research examines Nigeria's critical dimensions of infant mortality and access to primary health centers (PHCs) as behavioral tendencies capable of shaping the present and future of infancy, childhood, the family and the nation, using Bwari community as a case study. Thus, the emphasis is on the environment, attitudes and behaviors that shape the present and prepares the future development of children and society. The research employed qualitative and quantitative methods with testable hypotheses. Findings reveal that respondents' socio-economic characteristics intermediate on extent of accessing available health care facilities. The respondents' relatively high literacy, urban residency and civil service jobs, health talks from medical professionals, free medical treatment and, very importantly, zero infant mortality outcome, suggest that environment, human capital quality and health outcomes have relationships. Yet, Nigeria records one of the worst global health indices, suggesting a scenario of two nations, driven by an exclusive governance model that perpetuates social inequality, and glaring rural neglect. To meet its health, hence development needs, Nigeria should summon the political will and eliminate its extant exclusive governance model which, with inherent impunity, opaqueness, narrowness and inequity, manifests high infant mortality and under-five deaths, stunting, wasting, low intelligent quotient, low human development index, and other issues. Government should apply political will, improve health budget and engage inclusive model for enhanced social justice, opportunities for individual and national development.

Keywords: Infant, Mortality, Access, Primary healthcare and development

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Introduction

Globally, infant mortality decreased from an estimated rate of 56 deaths per 1000 live births in 2005 to 35 deaths per 1000 live births in 2015 (WHO, 2016). Developing countries continue to face challenges in meeting their health needs and in achieving the Millennium Development Goals (UN, 2015). Infant mortality has become more prevalent due to lack of access to health care before, during and after delivery. This contributes to high infant mortality rates both in developing and under-developed country (WHO, 2017).

Every day, Nigeria loses about 2,300 under-five year olds and 145 women of child-bearing age, making the country the second largest contributor to under-five and maternal mortality rate in the world. Many lives can be saved if global inequalities are reduced (UNICEF, 2017). Today, 89,700, day-old babies die in Nigeria yearly (State of the World's Mother's, 2016). Nigeria has the 12th highest rate of first day deaths in the world, making it one of the riskiest places to be born. Nigeria is one of the ten countries with highest infant mortality rates in Africa (UNICEF, 2016). Nigeria ranked 152nd out of 176 countries and among the 10 worst countries to be a pregnant woman or a child (Save the Children International, 2016).

Infant mortality rate symbolizes a measure of a country's health policy, systems and practices, an aspect of its national development. It is often associated with socio-economic factors of unemployment, poverty, income disparity, among others, in a polity. Infant and maternal challenges should be contextualized in overall national development policies and practices. High rates of infant and maternal mortality express low social integration of children and women. It symbolizes low female gender participation and inclusion in socio-economic processes. Nigerian women generally lack the power to determine child spacing, access and choice of modern healthcare, among others. This is a denial of women human rights, and remotely, children's survival rights and a backward step towards high birth and death rates.

The United Nations Population Fund (UNPF) (2019) observes that Nigeria's population is 201 million, with average growth rate of 2.6 percent from 2010 to 2019, meaning that an average Nigerian woman gives birth to at least five children, against global 2.5 percent in 2019. The report states: Contraceptive prevalence rate among Nigerian women aged 15-49 is only 19 percent, decision-making on sexual and reproductive health and reproductive rights among these women averaged 51 percent between 2007 and 2018. This symbolizes women marginalization, powerlessness and exclusion in the Nigerian social structure and governance processes. It functionally reflects two worlds; the decision-making, superior and more mentally developed men's world and the deprived, depraved, inferior and low mentally created women's world, a near master servant social construct, immanent, and beyond re-ordering. This is a retardant to human and national development.

This can partly be explained by rooted cultural practices, including primordial skepticism on western education and culture, religious observances that limit expectant mothers' ante and post-natal behavioral choices on food and drug intake, activities of traditional birth attendants and absence of trained healthcare service providers particularly in rural areas. Porter (2017) opines that 3 Million children need emergency education support in North-East Nigeria. The UNICEF (2017) notes that poverty, low children school attendance, maternal mortality and low-level development are more in the North than in the South of Nigeria. Logically, infant mortality can be holistically addressed with well-organized regular immunization, daycare and preparatory education, under government regulation.

Statement of the Problem

Infant health is a key indicator of a society's level of development, additional to its health care delivery performance. Infant mortality revolves around primary care and primary healthcare inadequacies, and are largely poverty, illiteracy, and unemployment driven, generally centering on low maternal welfare. It generally manifests childhood stunting due to household poverty induced malnutrition. Childhood may be devoid of physical, mental and psychological wellbeing, acceptable intelligence quotient, cognitive ability, good education and expected psycho-social development. The future implication is the manifestation of the aggregate effects of the foregoing challenges and may include low human development index, frustration, rebellion, crime, social conflicts as Nigeria is presently facing. They reflect a disjointed healthcare system. A healthy nation is a wealthy nation. Every human life, infant or child, is precious. Nigeria needs to create wealth through good health policies and programmes.

These social problems endanger infancy and childhood with children invariably facing early death, compromised life chances and stagnated national development. The concern therefore is improved infancy, childhood, motherhood and Nigeria.

Objectives of the Study

The research aims at investigating the relationships between environmentally determined attributes of nursing mothers and child survival, and hence, socio-economic development.

The specific objectives are to:

1. Assess mothers' education and related attributes.
2. Assess parents' socio-economic status.
3. Establish nursing mother's attributes and adoption of modern maternal healthcare nexus.
4. Suggest ways of reducing infant mortality for the development of Bwari Area Council.

Research Hypotheses

In order to establish the foregoing objectives, three hypotheses are proposed:

1. The higher the mothers' education, the more they are likely to access primary health care.
2. The higher the parental socio-economic status, the more likely they access primary health care.
3. Urban parents are more likely to access primary health care than rural parents.

Significance of the Study

Childhood survival, nurturing and wellbeing symbolize a country's socio-economic development. Failure in nurturing and establishing sound childhood is a threat to children and national development. Nigeria's situation is critical and invites interrogation of the dimensions of under-five mortality and children's survival challenges. With Nigeria's demographics: very high population of 201 (UNPF, 2019), global poverty capital (Brookings Institution, 2018), one of the eight global hungriest (UN, 2019) and very high maternal and infant mortality rates (UNICEF, 2017), attention to the research problem can identify the research area's healthcare quality, access and related life challenges towards determining and delivering effective healthcare of globally acceptable standards, for a better-quality population. The study can identify means and direction to create a healthy mother and children population, capable of driving an acceptable

human development index and national development, where economic growth will equal or exceed population growth rate.

The significance of this research is in its attempt to establish relationships between the characteristics of mothers, including education, and their childcare behaviors, specifically with respect to accessing healthcare services for child survival. These have significant impacts on the future of individuals and on national development. The article identifies women's status and empowerment levels, relative to men, their decision-making powers on matters that concern their lives, self-esteem, emotions, and the life chances of their children, which depend highly on their mothers' well-being. Nigeria's gender disparity commands urgent remediation.

The findings will enrich the literature on this phenomenon, and policy options towards improving child survival and development in Bwari and beyond. It identifies the dangers of Nigerian women's low status and empowerment, including child vulnerability, and seeks to guide social policies on closing the gender gap to accrue wider benefits to society.

The findings can supplement baseline data for related research, permit comparisons of health systems, and may highlight populations in need of particular health services.

Scope of the Study

This study investigates mothers' attitudes towards accessing primary health care services on the basis of their personal attributes and infant mortality and survival strategies in Bwari Area Council, Abuja. The outcome could be extrapolated as Nigeria's healthcare situation.

Conceptualization and analyses of infant mortality in primary healthcare setup

Children have rights enshrined in the United Nations Convention on the Rights of the Child (1989) and the African Charter on the Rights and Welfare of the Child/African Union (1990). The rights principally include survival, protection, education, emotional care, among others, for better future, but Nigeria's childhood is under threat, fueled principally by conflicts, poverty and hunger. Under-nutrition is a major public health problem in Nigeria. The Demographic and Health Survey (2013) states that about 36.8 percent of children under five in Nigeria are stunted, 18.5 percent are wasted, and 29 percent are underweight. Half of children in the B40 of the wealth distribution are stunted, and 37 percent in the B40 are underweight, and with rural urban variations in wealth and demographic characteristics.

Concept of Primary Health Care (PHC)

The concept of PHC was formulated by 134 countries at the Alma Ata Conference in Russia in 1978, (WHO, 1978). Primary care is a constituent of Primary Health Care, distinct from PHC. It is the provision of essential primary care as an integral component of an inclusive PHC strategy (Tarlier, Johnson and Whyte, 2003). It is the first level contact of the individual and community in the National Health System, thus bringing health care as close as possible to where people live and work (Akinsola, 1993). Absence of primary care predisposes infants to mortality.

Infant mortality is the rate at which babies die within the first year of life. It also measures trends in women and child health, the quality and availability of medical care, public health practices, and the economy overall (Barnett and Reece, 2014). It varies within and between countries. Ohio's infant Health mortality rate, especially among blacks, remains too high. The rate

of black dying before the first birthday is double the state rate and increased from 13.8 deaths per 1000 birth in 2013 to 14.3 in 2014 (ODHGOHT, 2016).

The WHO (1987) specified the aims and objectives of Primary Health Care as follows:

1. Make health services accessible and available to everyone wherever they live or work.
2. Tackle health problems causing highest mortality and morbidity at a cost community can afford.
3. Ensure that existing technology must be within the ability of the community to use effectively and maintain.
4. Ensure that in implementing health programme, the community must be fully involved in planning, delivery and evaluation of the services.

PHC essentially aims at: Promoting health; preventing and curing diseases and rehabilitating people (live full; normal lives after an illness or disability). This is achievable through the synergy of the local and state governments, and private participation of end-users and non-end-users.

History of Primary Health Care in Nigeria

The National Primary Health Care plan was launched by President Babangida in 1988 and involved collaborative efforts of the three tiers of government towards being people-oriented, to develop local capabilities, initiatives and to promote self-reliance (Adeyomo, 2005). Oyewo (2013) identifies Nigeria's PHC evolution with the First Ten Year National Plan (1946-1956) where health was in the concurrent legislative list. He traced its origin in West African Protectorates from the British Army Medical Services, as Christian Missionaries and private agencies established hospitals, dispensaries and maternity centers, in the South and Middle Belt.

Trends in Infant Mortality

The global Infant Mortality Rate (IMR=deaths/1000 live births) for both Less Developed Countries (LDCs) and More Developed Countries (MDCs), has declined from 198 in 1960 to 83 in 2001. However, IMR in 2001 remained 10 times higher in LDCs than in MDCs. In the LD C, the IMR is 17 times higher than in the MDCs. Infant mortality rates reductions among LDCs are much lower than in MDCs. Infant mortality remains disturbingly high in developing countries despite the significant decline in most parts of the developed world (Goutas *et al*, 2014).

Nigeria has the highest absolute number of newborn deaths in Africa, with 255,500 of the 912,000 neonates who die annually in Africa. About 5.9 million babies are born in Nigeria every year, and nearly one million children die before the age of five years. One quarter of all under-five deaths are newborns which accounts for 241,000 babies' death each year (Federal Ministry of Health, 2011). Despite the progress in reducing child mortality over the past decades, an estimated 5.4 million children under age 5 died in 2017- roughly half of them in Sub-Saharan Africa (UNICEF, 2018). Mortality indices for Nigeria's under-five years old are among the global worst. Rural areas recorded higher mortality rates than urban centers. In 2008, infant mortality rate was 70 deaths per 1,000 live births in the urban centers and 96 deaths per 1,000 rural live births. Also, infant mortality was 191 deaths per 1,000 live births in the rural areas as against 121 deaths per 1,000 live births in the urban area (NDHS, 2015).

The Northwest and Northeast had highest mortality rates in 2014 and 2015 respectively (Aigbe and Zannu, 2015). In 2010, North Central, North East, North West, South East, South-South and South West had 77, 107, 91, 95, 84 and 59 infant deaths per 1,000 birth respectively (NDHS, 2015). Only South-West recorded reduction (9 percent) in under-five mortality rates over ten years (2005 to 2015). This could derive from urbanization of the Lagos-Ibadan axis, with abundant non-tertiary and tertiary health and educational facilities.

Nigeria's under-five mortality ratio is 201 per 1000 live birth (one in five Nigerian children never reaches age five). Infant deaths, which account for half of child mortality increased from what they were in 1990 (WHO, 2017).

Causes of Infant Mortality

In a nutshell, the causes of infant mortality range from medical to socio-economic and cultural causes. Among others, medical causes include Low birth Weight (LBW), Sudden Infant Death Syndrome (SIDS), lack of Vitamin A intake, HIV/AIDS, malaria and diarrhea. Socio-economic and cultural causes include low education, harmful traditional values, religion, and social class status, among others.

Low Birth Weight and Infant Mortality

The Agency for Healthcare Research and Quality (AHRQ) (2016) study report states that black mothers had a higher percentage of infants of lower birthrights than other races between 2007 and 2015 in the United States. Also, of the 5.7 million births in the United States in 2016, approximately 7.8% (324,750) were diagnosed with low birth weight. The incidence could result from unemployment, poverty and large households which are demographic indices of Nigeria. Nigeria's unemployment figure of 23 percent for 2018 rose from 19.1 percent in 2016. A total of 7.9 million Nigerian's became unemployed in 21 months (January 2016-September 2017s (NBS, 2018). This will continue to impact on maternal and infant mortality.

Sudden Infant Death Syndrome and Infant Mortality

(SIDS) is unexplained death, usually during sleep, of a seemingly healthy baby. The direct cause of SIDS remains unknown, although doctors speculate on risk factors like babies sleeping on their stomach, exposure to cigarette smoke in the womb or after birth, sleeping in bed with parents, premature birth, being a twin or triplet, being born to a teen mother and living in poverty settings (Hoyert, 2012). SIDS occurs between 2 and 4 months and mostly in winter. SIDS was the third leading cause of infant deaths in U.S. in 2015. Rising wave of forced migration and IDP camps with reported low welfares services (Okwuwa, 2016), are SIDS risk factor.

Lack of Vitamin A and Infant Mortality

Lozano (2012) observes that approximately 250,000-500,000 children in developing countries become blind each year owing to vitamin A deficiency, with the highest prevalence in South East Asia and Africa.

Malaria and Infant Mortality

Malaria is responsible for 30 percent of child deaths in Nigeria (Federal Government, 2018). Obalum and Fiberesima (2012) state: Nigeria's health situation is very deplorable. Only 39 percent of new-born babies are being delivered by skilled health professionals. Only 23 percent of children (12-23 months) receive full course of immunization against childhood killer diseases. This can be associated with poverty. An estimated 65% of Nigerians live in poverty, a major factor in malaria prevention and treatment (US Embassy, 2011).

Diarrhea and infant mortality

Diarrhea is the second most common cause of infant deaths. The World Bank (2010) reveals that Nigeria has lost 43 healthy years of life per 1,000 from diarrhea illnesses.

Acute Respiratory Infections and Infant Mortality

ARI include upper and lower respiratory tract infections commonly manifesting cough, fever, and rapid breathing. Infant mortality rates from 2009-2017 (deaths per 1000 live births) were 83.9 (2009), 81 (2010), 78.3 (2011) and 75.7 (2017). ARI are the fourth main cause of under-five mortality. Nigeria lost 41 healthy years of life per 1,000, due to ARI (World Bank (2010).

The foregoing statistics are reversible through appropriate poverty reduction social policies and programmes. Focusing on education (formal and informal) towards improving basic literacy and skills training and scaling up PHC activities, particularly in rural areas, for routine immunization/vaccination, family planning and promotion of breastfeeding can improve their human development index, reduce poverty, improve family welfare, maternal and child survival.

Theoretical Framework

Functionalism and feminism are vital in analyzing our subject matter. Rooted in classical sociology and popularized by Parsons (1967), functionalism views society as a system of interconnected parts (social institutions) that form a functional harmony. The family, education, economic, political, and religious and health social institutions are society's pivots.

The family meets the functional prerequisite of biological reproduction. The health institution provides pattern maintenance of health needs through reduction of sicknesses and diseases with right policies and programmes. High infant mortality partially reflects systemic dysfunctions, signifying failure of the health institution to offer acceptable maternal and child health cares. It can result from lack of access, gender bias, low quality and quantity of needed resources like health facilities, education, manpower, skills, training and funding. In Nigeria, mainly the affluent afford standard health services. Thus, parental socio-economic characteristics like, income, education, opportunities, among others, determine infant mortality, life chances and national development.

Nigeria is highly gendered, with enduring cultural values, particularly patriarchy that sustains male dominance. Functionalism ignores women's marginalization, power relations and patriarchy. Feminism, as a theoretical perspective, interrogates gender inequality in social action. It views the social system as polarized in social groupings of men and women, male oppression and exploitation of females. Feminist theories emphasize patriarchy, male domination of women

in distribution of resources like political power, jobs, lands, and whatever is valuable in the socio-political and economic spaces.

Although, feminist scholars agree on the universal challenge of gender inequality, they diverge on needed solutions. Many explore the intersections of sexism, racism, capitalism, and patriarchy. Liberal feminism, for example, acknowledges male exploitation of women, but believes it is not universally a systemic social product but rather localized practices in workplaces, educational institutions and the like which effective legislation and non-radical approaches can overcome. Radical feminists, however, pointedly locate female gender oppression in the historicity and relativity of patriarchy, specifically the family through which female exploitation is facilitated primarily in marriage, childbirth, economic dependency, and free domestic labor. Thus, Firestone (1971), one of the early second wave proponents of radical feminism, contends that capitalist family relationships must be abolished as a prerequisite to gender equality.

However, Walby (1999), has critiqued radical feminism for failing to explain changes and diversities in gender inequality. The author disaggregated patriarchy with deeper and independent forms with integral aspects of social life, including; unpaid female housework, labor market job type discrimination, male violence, state subtle acceptance of male superiority over females in alignment with entrenched cultural values and differential rules application on issues of sexual behaviors in public and private life. Walby argues that gender inequality is narrowing and offers examples such as reduced discriminated in the job market following graduation, the presence of women on the U.S. Supreme Court, and increasing female headship of governments. However, in the Gender in Nigeria Report (Oxfam International 2017), Nigeria is ranked among the 30 most unequal countries in the world. Therefore, feminist frameworks remain significant tools for analyzing and addressing persistent gender inequality.

Methodology

Study location

The research was undertaken in Bwari Area Council. Bwari is the Local Governments Headquarter of Bwari Area Council, Federal Capital Territory of Nigeria. It has a 2016 population of 581,000 (Wikipedia, 2016). Bwari is surrounded by villages such as Zuma, Gaba, Kuduru, Kubwa, Duste, Jigo, and Ushafa. The government institutions are the Nigerian Defense College, Federal Capital Development Agency staff quarters, Nigerian Law School, Joint Admission and Matriculation Board Headquarters and staff quarters, among others. Health institutions include Bwari PHC center, Bwari general hospital, PHC new Bwari, PHC Kuduru and Ushafa PHC. The dominant ethnic group in Bwari is Gbagyi with Hausa, Yoruba and Igbo as minorities.

Sample and sample frame.

Women within the child-bearing age in Bwari General Hospital, Bwari PHC center, PHC New Bwari, PHC Kuduru and Ushafa PHC form the study population. The facilities have functional equipment, pediatrics and ante-post natal resources. Clinics hold on designated days of the week though emergency cases are treated promptly. A sample of 220 nursing and pregnant mothers were sampled.

Sampling techniques

Walk-in-customers and purposive sampling techniques were used. The purposive sampling technique targeted a predetermined social group with certain characteristics which suites our purpose. It involves visually selecting pregnant and nursing mothers within the hospital who are presumed health seekers. Four research assistants from a tertiary institution, fluent in Nupe and Gbagi dialects, helped to select sample. The researcher collected samples from Bwari General Hospital, while each of the other four assistants collected samples from the Bwari, New Bwari, Kuduru and Ushafa PHCs.

This research utilized primary and secondary data from official documents, reports and journals.

Instruments of data collection

Questionnaires were employed as the instrument in collecting primary data. The questionnaire comprised two sections dealing with demographic and behavioral characteristics of respondents respectively. Most of the questions were structured. Unstructured questions allowed respondents to use their discretion to suggest possible answers to the questions. A total of 220 questionnaires were distributed in early October 2018. Only a few of the questionnaire were collected the same day while most of them were collected in late October 2018. A total of 204 questionnaires were collected but only 198 were used. Six questionnaires were rejected for inconsistencies. Questionnaires were collected on respondents' routine clinical visits. Few questionnaires were completed for respondents by the researcher and his assistants, based on need.

Reliability and validity test

Reliability and validity tests were completed with ten respondents to ensure correctness (variables measuring actual attitudes, consistent and stable outcomes) of the questionnaire contents. Thus, the design applied a reliability test, which is a measure of the extent consistent results, obtained when measures were tested. Validity was measured when the extent questions corresponded to the true test of the position of the person or object whose characteristics were being measured. Following the pretests, certain concepts were replaced or modified for clearer understanding by respondents.

Following discussion of the research interests; respondents' freedom of consent on offering information; name disclosure and anonymity rules; six opinion leaders of Bwari General Hospital, who volunteered information and their real names, were interviewed in October, 2018, comprising: two nurses (Usman and John), two elderly midwives (Deborah and Asmau), Audu (pharmacist) and Musa (laboratory technologist). They are aged 29 and 45 years, working in the hospital between 7 and 15 years, hence deemed knowledgeable on the subject. The seventh choice declined participation later, claiming 'busy schedule', even with guaranteed any pseudo-name.

Method of Data Analyses

Questionnaire data (198) was codified in code sheets and presented in frequency tables and percentages. Data from the six opinion leaders were summarily incorporated into the quantitative data analyses. Three hypotheses were tested using the Chi-X statistics.

Data presentation and analysis

Table 1. Age of respondents

Age	Frequency	Percentage (%)
15 - 20 years	22	11.1
21-25 years	72	36.4
26 -30 years	62	31.3
31- 35 years	24	12.1
36-40 years	10	5.1
41 years and above	8	4.0
Total	198	100

Data from the table above, majority of the respondents (68%) are mothers within the age group of 21-30 years. Only 4% are above 40 years.

Table 2. Education, occupation and religion of respondents

Education	Freq.	Percentage	Occupation	Freq.	Percentage	Religion	Freq.	Percentage
None	16	8.1	Farming	20	10.1	Christianity	104	52.5
Primary	24	12.1	Trading	50	25.2	Islam	84	42.4
Secondary	46	23.2	Civil service.	76	38.4	ATR	10	5.1
Tertiary	112	56.6	Others	52	26.3	Others	0	0.0
Total	198	100.00	Total	198	100.0	Total	198	100.0

Legend: Freq. = frequency,

Data from table 2 reveal a highly literate set of respondents with 57% means score for tertiary education, suggesting prospects of being conversant with healthcare issues. Correspondingly, civil service has a mean score of 38.4%, trading 25.2% while 'others' recorded 26.3%. The respondents are predominantly Christians with a score of 52.5% with Muslims (42.4%).

Table 3. Monthly income of respondents

Monthly income	Frequency	Percentage (%)
Less than ₦10,000	66	33.3
₦10,000 - ₦30,000	70	35.4
₦31,000 - ₦50,000	42	21.2
₦51,000 - ₦80,000	6	3.0
₦81,000 and above	14	7.1
Total	198	100.0

The respondents have a monthly mean income (33.3%) of N10, 000-N30, 000 (less than \$100) followed by 33.3% (less than N10, 000). This implies that the respondents are extremely poor and can hardly meet Maslow's basic life needs. Nigeria's unemployment rate is 23. 1%

(Carson, 2019). Most Nigerians travel through the dangerous Sahara Desert, to Libya seeking better fortune due to poverty induced unemployment (Okwuwa, 2018).

Table 4. Respondents' husband' monthly income

Husband's monthly income	Frequency	Percentage (%)
₦10,000 - ₦30,000	32	16.2
₦31,000 - ₦50,000	40	20.2
₦51,000 - ₦70,000	24	12.1
₦71,000 - ₦80,0000	16	8.1
₦81,000 and above	22	11.1
No response	64	32.3
Total	198	100.0

From the above table, 20.2% of the respondents' husbands earn N31, 000-N50, 000 (above \$100 monthly) which translates to extreme poverty. In an empirical research on Nigeria's IDPs, Okwuwa (2016) observed: 70% of the respondents earned a monthly income of between N51, 000 and N100, 000 (less than \$300 equivalent maximum) before migrating to Gwagwalada. The situation has worsened. Nigeria is the world poverty capital (World Bank, 2018).

Table 5. Respondents' residence

Place of residence	Frequency	Percentage
Urban	120	60.6
Rural	78	39.4
Total	198	100

From the above figure, 60.6% of mothers reside in the urban areas while 39.4% reside in rural areas. This implies that majority of the mothers reside in areas where they can access PHCs.

Section B: Mothers' PHC access behaviors

Table 6. Respondents' place of delivery

Place of Delivery	Frequency	Percentage (%)
At homes	60	30.3
PHC	118	59.6
Spiritual home	12	6.1
Others	8	4.0
Total	198	100

From the above table, 30.3% of the respondents deliver their last babies at home, 59.6% of respondents did so at PMCs which is expected, based on their high literacy and residence scores.

Table 7. Frequency of children's immunization

Option (months)	Frequency	Percentage (%)
1-2	52	26.3
3-4	50	25.2
5-6	40	20.2
7-8	16	8.1
Others	40	20.2
Total	198	100

From the data, a majority of the mothers (52%) take their babies for immunization from 1-4 months. This low score could be due to transportation cost factor, based on their low incomes. We advise mothers to immunize children as when due. Majority do so but some mothers do not follow prescribed schedule (Debora).

Table 8. Children's daily feeding

Option	Frequency	Percentage (%)
2 Times	14	7.1
4 Times	84	42.8
6 Times	64	32.3
Others	36	18.2
Total	198	100

From the above table, the mean score (43%) is 4 times daily which is minimal. Mothers should breastfeed their newborn babies between 4 and 8 times daily, depending on age, using the Age-by-Age Feeding Guide (Mackenzie, 2019).

Table 9. Children's food diet balance

Food Balance	Frequency	Percentage %
Balanced diet	180	90.9
Unbalanced diet	18	9.1
Total	198	100

Balanced diet was explained to respondents in the questionnaire, additional to clinic health tips they receive from the PHCs. From data, 90.9% of mothers believe that they feed their babies balanced diet. Olomola and Nwafor (2018), based on a recent research on Nigeria agriculture opine: Food quality has decreased as data indicate that undernourishment increased from 6.1% in 2010 representing 9.7 million people to 7% in 2016, representing 12.9 million.

Table 10. Respondents' by place of treatment for self and babies

Option	Frequency	Percentage (%)
PHCs	164	81.8
Traditional homes	24	12.1
Spiritual homes	8	4.0
Others	4	2.1
Total	198	100.0

From the above table, 81.8% of the respondents receive PHCs treatment. In an interview with Usman, a staff member of the medical personnel at General Hospital, Bwari, he stated that most of the women treat their babies here because government provides free medical treatment and drugs.

Table 11. Reasons for choice of PHCs

Option	Frequency	Percentage
No money	32	16.2
Husband prefers	142	71.7
Others	24	12.1
Total	198	100.0

From the above table, 71.7% of respondents take their babies to the PHCs because their husbands prefer them for safety and economic reasons. We don't have all the drugs, sometimes the women buy our prescribed drugs. Supplies come intermittently from government and four NGOs. Some private philanthropists supply free drugs from Abuja, states Pharmacist Audu.

Table 12. Means of accessing PHC

Means of access	Frequency	Percentage
Motorcycle	88	44.4
Motor car	102	51.5
Bicycle	6	3.0
Donkey/horse	2	1.0
Total	198	100

From the above data, 44.4% of the respondents use motorcycles while 51.5% use motor cars. This implies that majority of mothers' use motor cars in accessing the PHC.

Test of the Hypotheses

Hypothesis one

Table 13. Relationship between mother's educational level and access to PHC services.

Mother's educational attainment	Place of care				
	At home	PHC	Spiritual home	Others	Total
Primary	10	6	4	4	24
Secondary	20	20	2	4	46
Tertiary	46	46	10	10	112
None	6	6	2	2	16
Total	82	78	18	20	198

Level of significance = 0.05. D.F = (r-1) (c-1), D.F = (4-1) (4-1), D.F = (3) (3), D.F = 9, Critical value= 16.92 and Calculated value =6.44.

Through cross-tabulation of the variables and applying the Chi X test, the calculated value (6.44) <critical value (16.92) at 0.05 level of significance. Consequently, the alternative hypothesis is rejected. The finding does not support a relationship between mother's educational level and accessing PHC services. The finding does not support Tenuola and Shaibu (2013) that the higher the women's level of education, the higher the immunization coverage.

This curious finding could be explained by some factors in Bwari. Firstly, the effects of concentration of such tertiary institutions as the Joint Admissions and Matriculation Board (only body which conducts examinations annually for millions of Nigeria's tertiary education admission seekers), The Nigerian Law School, VERITAS University, and a polytechnic, among others. Secondly, health personnel offer expectant and nursing mothers health tips during clinic sessions and advise them to encourage others in their neighborhoods to avail themselves of the free PHC services. Thirdly, some faith-based organizations' and philanthropists were observed offering financial and non-financial reliefs to impoverished nursing mothers around on Tuesdays. Being a constituent of the Federal Capital Territory, Bwari enjoys the benefits of its affluence. Usman observes: We broadcast health messages to the people through the local radio station, in Nupe and Gbagi dialects. These factors might have enlightened and attracted some illiterate and poverty mothers to avail themselves of the free PHC services:

Bwari is a big family. The women maintain good hygiene and take good care of their infants. We take maternal and child health seriously... You can see our illustrated health posters within the hospital, PHCs and the market (Usman and John).

*Hypothesis two***Table 14. Relationship between mother's socio-economic status and access to PHCs**

Mother's Occupation	Where did you deliver your last baby				
	At home	PHC	Spiritual home	Other	Total
Farming	10	6	2	2	20
Trading	18	30	2	0	50
Civil servant	18	56	2	0	76
Others	16	28	2	6	52
Total	60	120	8	8	198

Level of significance = 0.05. D.F = (r-1) (c-1), D.F = (4-1) (4-1), D.F = (3) (3), D.F = 9, Critical values= 16.92 and Calculated value =24.37.

At 0.05 level of significance, the test statistics $24.37 >$ critical value (16.92). This supports the alternative hypothesis that the higher the socio-economic status of parents, the more likely they access Primary Health Care services.

*Hypothesis three***Table 15. Relationship between mother's residence and access to PHC services.**

Residents	Where did you deliver your last baby				
	At home	PHC	Spiritual home	Other	Total
Urban area	32	78	4	6	120
Rural area	28	40	8	2	78
Total	60	118	12	8	198

Level of significance = 0.05 D. F = (r-1) (c-1), D.F = (4-1) (2-1), D.F = (3) (1), D.F = 3, critical values= 7.82 and Calculated value (C.V) = 10.36.

At 0.05 level of significance, the test statistics $24.37 >$ critical value (16.92). This supports the alternative hypothesis that there is a relationship between parents' residence and accessing PHC.

Discussions of Findings

The discussion is based on the research questions and three tested hypotheses that focus on Nigeria's high infant mortality that impairs infancy and childhood with possible early death, compromised life chances and stagnated national development. With survey method, the empirical research aims at investigating the relationships between environmentally determined attributes of expectant and nursing mothers and child survival, and hence, socio-economic development.

Data reveals that most respondents of reproductive age acquired tertiary education, work as civil servants and reside in urban areas. These qualities predispose them to accessing PHC

services. Data reveal that the rate of infant mortality in Bwari area council is low. No respondent has lost a child, as opposed to the negative national infant health indicators.

Maintaining good health and lowering infant mortality are easy for enlighten mothers. They must maintain good hygiene, clean environment with houses ventilated. They are always advised to keep the children warm during cold season and wash their hands and baby feeding bottles well. We advise mothers to eat local food hygienically prepared with lots of vegetables and any fruit in season. (Deborah and Asmau, midwives).

Based on respondents' non-inferential statistical data analyses of relatively high education, urban residency and civil service jobs as qualitative attributes, considered along health tips and free medical treatment provisions and finally, zero infant mortality outcome, we can conclude that environment, human capital quality and health, have relationships. This supports Tenuola and Shaibu (2013): The higher the women's level of education, the higher the immunization coverage.

Primarily, the study tested three hypotheses relating mother's educational level, parental socio-economic status and residential location (urban or rural) to accessing PHCs services. Curiously, the first chi X test does not support a relationship between mothers' education and accessing PHCs, a finding that was rationalized with such pull factor effects as concentration of tertiary institutions in Bwari, health personnel health care tips to expectant and nursing mothers (who are encouraged to invite illiterate and needy mothers, to the health facilities) during clinic sessions, health awareness campaigns and public invitations to free health care offers communicated in local media and dialects, among others. These factors, combining faith-based and NGOs' philanthropy, might have enlightened and attracted the illiterate and poor mothers to appropriate the free PHC services. Musa, the laboratory technologist opines: We offer free laboratory tests to all pregnant woman, literate or poor. It offers them relief.

The second Chi X test supports the alternative hypothesis that the higher the socio-economic status of parents (mother, specifically), the more likely they access Primary Health Care services and maintain better mother and child health, and society generally. Thus, they need empowerment, socially, politically and economically, not exclusion. The third Chi X test supports the alternative hypothesis that there is a relationship between parents' residence and accessing Primary Health Care services. The implication of the foregoing is that inclusiveness in resource allocation within a polity yields the greatest results, in this case, better health outcomes.

Summary and recommendations

Nigeria's infant mortality, one of the global highest, is worrisome even for the international community, notably the World Bank, UNICEF and WHO. The respondents' non-inferential statistical data analyses of relatively high education, urban residency and civil service jobs as qualitative attributes, considered along health tips and free medical treatment provisions and finally, zero infant mortality outcome, suggest that environment, human capital quality and health outcomes have relationships.

Mother's education, place of residence, birth interval, weight at birth, skill of birth attendants, unimproved water and unimproved toilet significantly influenced neonatal, infant and under-five mortalities. Though these factors have been pointed out in literature, not much progress has been recorded in the reduction of burden of childhood deaths (Morakinyo, 2017).

The above and our finding implicates exclusiveness and poor health outcomes in resource allocation within a polity. Inclusiveness yields the greatest results of in this case, better health outcomes. Acemoglu and Robinson (2013) contend that: Extractive institutions based on such concepts as elite rule, impunity, narrow-mindedness and autocracy among others, are the main causes of underdevelopment. Inclusive institutions manifesting transparency, openness and egalitarianism s are the sources of development and wealth.

The Executive Director of UNESCO, Lake (2016), notes: Denying hundreds of millions of children a fair chance in life does more than threaten their future. This reflects Nigeria's official attitude to health issues. Low progress reflects leadership insensitivity to the health burden, usually borne by women and the poor. Of N61.481 trillion in 10 years, the Federal Government allocated only N2, 775 trillion to health. The 2019 record is the worst vote in 9 years, with 3.57% (Ndujihe, 2019).

Nigeria can reduce infant mortality and other health challenges by a double-digit budget, public-private partnerships for health sector development, revamping rural social infrastructure, gender balance in resource allocation, and reducing governance costs. The present low health sector budget and urban focused allocation will continually vitiate the precarious human development index particularly women and children, induce low intelligence quotient pool, national education standard and development. Reflecting Nigeria's poverty profile, the laboratory technologist, Musa opines: Many mothers cannot transport themselves for medical tests due to poverty. Government should create jobs. Those who come here get free tests. Six opinion leaders expressed this summarized view:

There is poverty in rural areas where the women are not as lucky as the urban counterparts. We are lucky being part of Abuja. Rural areas lack PHCs. Many are non-functional, lacking equipment and trained personnel. Government should improve health budget, financially induce rural health personnel to retain them, otherwise, brain drain, maternal and infant mortality will continue to rise. Women need empowerment too.

The above opinion summarizes our research findings and recommendations. Governance should be inclusive. Maternal and infant health contribute significantly to Nigeria's wealth. Aggressive rural transformation, main female habitat, improved health budgets, better infrastructures, effective monitoring and evaluation can reverse the negative health trend. Government should include women in decision-making and development agenda, for equity.

Conclusion

In pursuing standard health situation and national development, Nigeria should summon the political will and eliminate the extant exclusive governance model imbued with high infant mortality and under-five deaths, stunting, wasting and low intelligent quotient, among others. They constitute human rights denials. Nigeria should engage an inclusive model towards social justice, opportunities for female empowerment in decision-making and business startup facilitation for gender balanced development. Empowered women transform children and society.

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