Mortality And Fertility In Sub-Sahara Africa: Investigating The Precautionary Measures In Nigeria, 1960s – C.1990s

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Abstract

In the early 1960s, many countries in sub-Saharan Africa (SSA) became independent nations. At the time, the healthcare system was fragile and the region recorded an increase in child mortality rates (CMRs). Techniques were therefore designed in an attempt to cope with the situation- the replacement and hoarding techniques, also referred to as "precautionary measures". With replacement method, couples tend to replace an actual child death by having another one. On the other hand, families who have not experienced child loss have excess births in order to safeguard against future possibility (hoarding). Apart from low chances of child survival particularly in the 60s and 70s, the cultural value placed on children and the practice of large family size also justified this approach. These strategies have been seen to enhance fertility by influencing reproductive decisions. Causation however runs in other direction as reduction in childbirth leads to falls in fatality. The 1990s witnessed a drop in CMRs owing to health care plans and population policies. This decline did not transcend to lower fertility due to an increase in child morbidity, a situation which further stimulated fertility. With a focus on Nigeria, the paper aims at exploring these measures as a form of community innovation and

response to child mortality. In addition, the cultural factors underlying its adoption and its nexus with fertility are investigated. The research employs a qualitative method of analysis, using oral sources as primary material and other sources for secondary collections.

Keywords: Child mortality | fertility| sub-Sahara Africa | Nigeria.

Introduction

Mortality rates in (SSA) have been on the rise since the 1960s, and have only shown moderate decline in recent years. Studies revealed that in 1960, Africa accounted for over 14% of child mortality burden worldwide.[1]In some parts of the region in the mid -60s, there was a fall in mortality rates, albeit, the drop was unevenly distributed across countries in the region.As posited by Anna-Maria Aksan, there is a significant difference in child and neonatal mortality between Eastern and Southern African countries when compared to West Africa.[2] Between 1960 and 1985, child mortality risks in countries like Kenya and South Africa fell drastically. In the same periods, Nigeria recorded only moderate figures.[3]

According to the World Health Organization (WHO, 1990), the probability of a child dying before age one is highest in Africa- (51 per 1000 live births), a figure six times higher than that of Europe (8 per 1000 live births).[4] In the early 1990s, sub-Saharan Africa recorded about half of all child mortality in the world.[5] UNICEF's recent report (2012) also indicated that the region is responsible for 38% of global child deaths.[6] Alison and Finkle added, "the highest rates of child

[1] Mark, Montgomery and Barney Cohen. *From Death to Birth: Mortality Decline and Reproductive Change.* (Washington (DC): National Academies Press (US) 1998: 98-100

[2]Aksan, Anna-Maria. "Effects of Childhood Mortality and Morbidity on the Fertility Transition in sub-Saharan Africa." *Population and Development Review* 40, no. 2 (2014): 326.http://www.jstor.org/stable/24027925.

[3] Ibid

[4] World Health Organization (WHO), 1990. *Factsheet:Child Mortality in sub-Saharan Africa*

[5] World Bank (WB). 1997. *World Development Report: The State in a Changing World.* https://openknowledge.worldbank.org/handle/10986/5980

[6] United Nations International Children's Emergency Fund (UNICEF) 2012. Committing to child survival: A promise renewed. Progress report, 2012. https://www.who.int/pmnch/media/news/2012/unicef_progress_report_2012.pdf?ua=1

mortality are still in Sub-Saharan Africa where 1 in 9 children dies before age five, more than 16 times the average for developed regions (1 in 152)".[7]Discourses on the phenomenon have identified several elements perpetuating the trend.

The reasons for child mortality (CM) in SSA can be investigated from two dimensions- proximate and remote causes. Preterm birth, neonatal sepsis, neonatal tetanus and congenital defects are the most common proximate causes in newborns. In the post neonatal stage, diarrhea, pneumonia, malaria, measles, malnutrition and under nutrition, have been highlighted. HossainBazle et al posited that these factors are occasionally linked to specific environments. - "The relative importance of these main causes will vary across populations because of differences in ecology (malaria), behavior (neonatal tetanus), and vaccination patterns (measles)".[8]It is pertinent to note that CM can be as a result of multiple ailments.[9] This is particularly the situation in SSA where a malnourished child may suffer ALRI-pneumonia and subsequently dies from diarrhea. Moreover, proper diagnoses are difficult to obtain because a large proportion of deaths occurs outside medical facilities. Diagnoses are often complex even in hospitals due to "lack of complete and accurate case histories, a low rate of autopsy, and shortage of diagnostic facilities".[10]This is common in diagnosing diseases like pertussis and meningitis.Furthermore, studies conducted in the 90s have linked child mortality to acquired immune deficiency syndrome (AIDS). Although, this factor is not evidence-based as there are no reliable data on the incidence of AIDS- related deaths among children in the region, it is apparent that the epidemic has a direct and indirect impact on child survival. The health of a child can be hampered through mother to child transmission, which occurs

[7] McIntosh, Alison. C. and Jason Finkle L. "The Cairo conference on population and development: A new paradigm?" *Population and Development Review*, 21, no. 2 (1995): 256 https://doi.org/10.2307/2137493

[8] Hossain, MianBazle, James F. Phillips, and Thomas K. Legrand. "The Impact of Childhood Mortality on Fertility in Six Rural Thanas of Bangladesh." *Demography* 44, no. 4 (2007): 756-57. http://www.jstor.org/stable/30053117.

[9] Warwick Anderson and Randall M. Packard. "A History of Global Health: Interventions into the Lives of Other Peoples"*Journal of the History of Medicine and Allied Sciences*, 73, no. 1(2018): 113, https://doi.org/10.1093/jhmas/jrx014

[10] Ibid

primarily during birth or through breast milk.[11]Baylies and Bujra estimated in their survey that at least 80 percent of children with HIV/AIDS die before their fifth birthday.[12] With the advancement in health technologies, this finding has been debated in contemporary works. As put forward by Akombi and Renzaho, the effect of AIDS among infants and children is minimal, and death is uncertain. The authors added that the transmission of AIDS from mother to infant probably increases infant and child mortality by fewer than 5 deaths per 1,000.[13]

In developing countries, apart from diseases, other factors have been identified as key causes of rising CMRs in the region. In SSA where health infrastructure is largely underdeveloped, quality health care services are private and involve out-of-pocket expenditure (OOP),[14] which may limit healthcare access especially for suburb populations. Ewbank and Gribble attributes weak public healthcare to lack of funding and political commitment.[15]Furthermore, different socioeconomic forces fuel the trend. These factors revolve around cultural norms, early marriages and the practice of large family size.

[11] Carolyn Baylies and Janet Bujra *AIDS, Sexuality and Gender in Africa* (London: Routledge, 2000): 113. The indirect effect of HIV/AIDS arises from orphan-hood faced by an uninfected child whose mother is ill or dies of AIDS.
[12] Ibid, 119
[13] Blessing JakaAkombi and Andre MasumbukoRenzaho. "Perinatal Mortality in sub-Saharan Africa: A Meta-Analysis of Demographic and Health Surveys". *Annals of Global Health*, 85, no. 1 (2019)*:* 59. DOI: 10.5334/aogh.2348In SSA, in the year of study, Lesotho (Southern Africa), reported the highest rate of perinatal mortality resulting from AIDS. Lesotho has one of the highest rates for HIV globally and the second highest in SSA. The interaction of HIV with other maternal infections during pregnancy results in poor birth outcomes as pregnancy accelerates the progression of infections due to its immunosuppressive effect. Studies have shown that maternal HIV status leads to an increased risk of stillbirth and death in the neonatal period. More so, HIV-positive mothers are more likely to have low birth weight neonates than HIV-negative mothers, with low birth weight being an established risk factor for neonatal deaths.Namibia and Swaziland also have high HIV prevalence but have maintained a lower perinatal mortality rate due to access to antiretroviral treatment and prevention of mother to child transmission (PMTCT) services.
[14]MenizibeyaOsain Welcome. "The Nigerian Health care system: Need for integrating adequate medical intelligence and surveillance systems". *Journal of Pharmacy and BioAllied Sciences*, 3, no. 4(2011): 67. DOI: 10.4103/0975-7406.90100
[15] Ewbank Douglas C., Gribble James N. *Working Group on the Effects of Child Survival and General Health Programs on Mortality.* Washington (DC): National Academies Press (US); 1993.

To sustain these practices,strategies were designed in form of coping mechanisms amidst child mortality ravaging the region.

Research Methodology

For this study, a qualitative research model with a phenomenological case study approach was employed. Phenomenology is a form of qualitative research that focuses on the study of an individual's lived experiences within the world. This technique usually entails using inductive qualitative methods like interviews and dialogues to acquire "deep" information and perceptions of specific respondent subgroups.[16]

The interviews were conducted with women who were no longer of reproductive age.As a historical investigation, this category of women were considered suitable for the study, giving credence to Gabraith Hunter's assertion "an individual with long experience in life is an important source material or valuable document itself….[17]"

The women spoke about their experiences in relation to reproduction, child mortality and contraception. Although an interview guide was utilized with predetermined questions and potential follow-up questions, the interviews were generally unstructured and participants were given the opportunity to freely discuss. This strategy was employed as studies have shown that interviewees become disillusioned when an interviewer sticks rigidly to the questionnaires. Thus, as posited by Belinda Bozzoli in her work on Women of Phokeng, the interviewees at some point should be allowed to direct the interviews.[18]

For secondary materials, books and journals articles were obtained from institutional and organization catalogues and repositories.

Clarification of Terms

Child mortality (CM) is the death of children under the age of five.[19] Child mortality rates (CMRs) or under-five mortality (U5), according to

[16]Punch, Keith. *Introduction to Social Research: Quantitative and Qualitative Approaches.* (London: Sage Publishers) 2005: 9.
[17]Gabraith Hunter. V. *An Introduction to the Study of History* (London: Sage Publishers) 1964: 11
[18]Belinda Bozzoli and MmanthoNkotsoe. *Women of Phokeng-Consciousness, Life Strategy, and Migrancy in South Africa, 1900-1983.* (United Kingdom: Heinemann publishers) 1991: 18.
[19] Last, John M. *A Dictionary of Epidemiology*, 3rd edition. (New York: Oxford University Press), 1995: 110. See also: José Leopoldo Ferreira

UNICEF, refers to the probability of dying between birth and exactly five years of age expressed per 1,000 live births.[20] In exploring the concept, more specific terms are used and child mortality is broadened to include perinatal mortality, neonatal mortality and infant mortality.

MacDorman and Gregory defined perinatal mortality as the number of fetal deaths past 22 (or 28) completed weeks of pregnancy plus the number of deaths among live-born children up to 7 completed days of life, per 1000 total births (live births and stillbirths).[21] Neonatal mortality refers to death of a live-born baby within the first 28 days of life. Early neonatal mortality is the death of a live-born baby within the first seven days of life, while late neonatal mortality occurs after 7 days and before 28 days.[22]Neonatal mortality and postneonatal mortality (covering the remaining 11 months of the first year of life) are reflected in the infant mortality rate.Infant mortality is used to describe the death of a child between the time it is born and one year of age.[23]The mortality rates of these births are measured by the number of deaths per 1,000 live births. Overall, child mortality is used as a veritable tool in determining mortality rates since it is encompassing and involves the death of a child from the neonatal stage, to infanthood and childhood.

Child Mortality Trends in Nigeria

The level of socioeconomic development and quality of life in a country are reflected in its mortality rates. According to National Bureau of statistics, "Nigeria has a population of 150 million people with women of child bearing age constituting about 41 million and children less than five years of age constituting 38 million".[24] It therefore means that women in this category and under-five children make up a considerable portion of the population. The high rate of death among this group is worrisome and has been a focus of scholarship in recent time. According to Jacob Adetunji"Nigeria has

Antunes. "A Dictionary of Epidemiology" *Journal of Epidemiology and Community Health* 63, no. 5 (2009):334. DOI: 10.1136/jech.2008.082511

[20] Ibid

[21] Montgomery and Cohen. *From Death to Birth: Mortality Decline and Reproductive Change*

[22] United Nations International Children's Emergency Fund (UNICEF) 2012. *Committing to child survival*

[23] Ibid

[24] Ibid

the second highest number of under-five deaths (733,000) after India (1.1 million)".[25] The estimates developed by the United Nations Inter-agency group on child mortality 1964-2019, showed that the 1960s, (1964-323.3) and 1970s (1970-281.4) had the highest CMRs. There was a steep drop in the 1980s, (1987-208.7), followed by a flattening of the curve in the 1990s.[26] However, anomalies do emerge in statistics when rates are underreported. For example, mortality rates are higher in home deliveries than hospital deliveries, and these deliveries are often not recorded in medical registers.

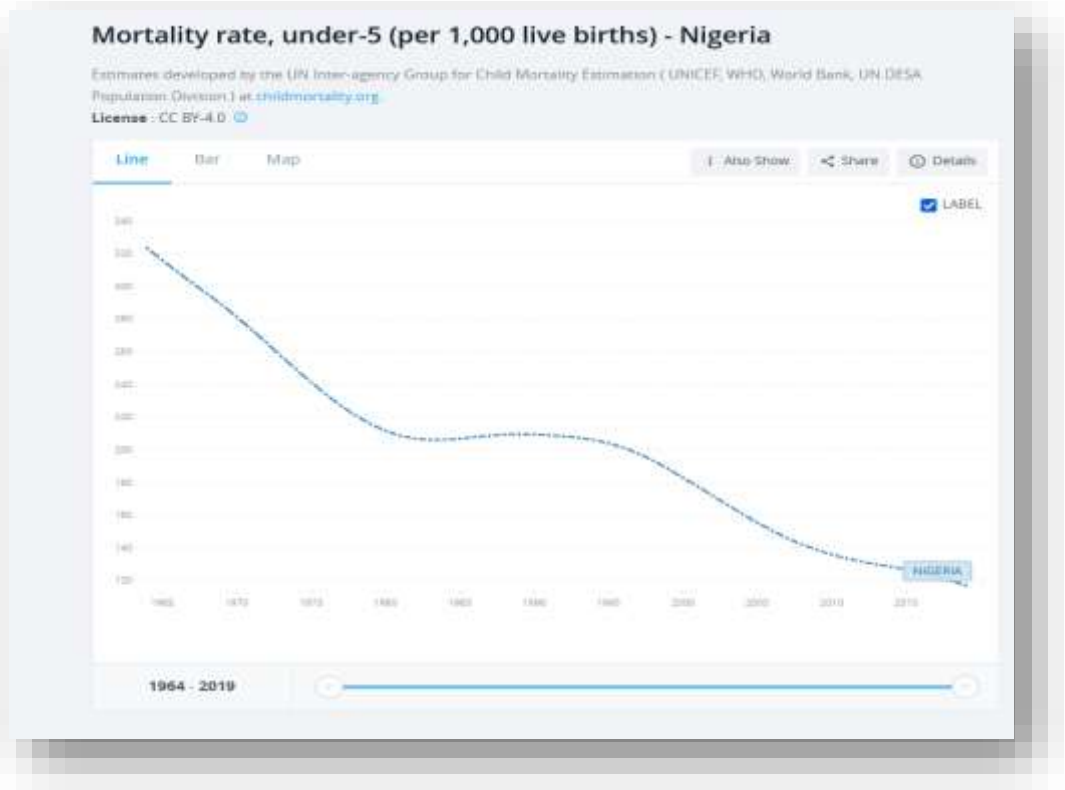

Figure 1: Mortality rate, under-5 (per 1,000 live births). Estimates developed by the UN Inter-agency Group for Child Mortality Estimation[27]

[25]Jacob Ayo Adetunji. "Infant mortality in Nigeria: Effects of place of birth, mother's education and region of residence". *Journal of Biosocial Science*, 26, no. 4 (1994): 469-477. DOI: https://doi.org/10.1017/S002193200002160X

[26] The United Nations Inter-agency Group for Child Mortality Estimation- UN IGME (UNICEF, WHO, World Bank, UN DESA Population Division) at childmortality.org.

[27] Ibid

The events in Nigeria at the time influenced the figures above. The country's health sector was slowly developing and underfunded when it became a sovereign nation in 1960. Shortly after independence, Nigeria was confronted with political crisis- the military coup (January 15, 1966), counter-coup (July 28, 1966) and the fratricidal war lasting for thirty months (civil war July 6, 1967- January 15-1970). The impact of conflicts on health has been highlighted in research. Studies have shown that conflict serves as a barrier to facility-based deliveries and often results in the destruction of health infrastructure and a lack of skilled health personnel, leading to an increase in the risk of perinatal mortality due to unassisted births and a lack of timely provision of life saving emergency perinatal services.[28]In contrast, in the 1980s, with national initiatives to repair war-damaged infrastructure, mortality rates was controlled to a significant degree.In August 1987, the federal government launched a "Primary Health Care Plan (PHC)".[29] With this scheme, health received enormous funding, medical personnel were adequately remunerated, hospitals were renovated, preventive and curative medicines were in abundant supply, and life expectancy increased.This effort was responsible for the low CMRs recorded in the period.

In broad terms, poverty has been blamed for the incident of CM in Nigeria. One of the main indicators of poverty besides low income, as observed by RowntreeSeebohm, is lack of access to social services such as education and adequate healthcare.[30]"With 68% of the population living on less than $1.25 per day and 86.9 million of its 180 million inhabitants living in extreme poverty",[31] the high level of mortality in the region can be associated with impoverishment. Poverty is related with poor birth outcomes, an important determinant of child survival. The resultant effect of poverty in children is malnutrition. Also, in a tropical area like Nigeria where the weather allows for the breeding of anopheline mosquitoes (carriers of

[28]Menizibeya Osain Welcome. *The Nigerian Health care system*

[29]Aigbiremolen, A.O et al. "Primary Health Care in Nigeria: From Conceptualization to Implementation. *Journal of Medical and Applied Biosciences* 6, no. 2(2014): 36.

[30] Rowntree, Seebohm. B. *Poverty: A Study of Town Life* (Macmillan: London), 1901: 208. World Bank, 1990, *Poverty: World development report*, Oxford University Press, New York

[31] Anyanwu, John. C., 1997, 'Poverty in Nigeria; concepts, measurement and determinants', in Selected Papers for the Annual Conference on Poverty Alleviation in Nigeria, Nigerian Economic Society, Ibadan, 22–24 August 1997.

malaria parasites), the inability to afford medical and protective care contributes to the high prevalence of malaria in children.[32] UNICEF's report noted malaria as one of the leading causes of morbidity and mortality among under-five (U5) children in Nigeria.[33]Emanating from this, copious works have identified malnourishment and malaria as one of the major causes of CM in the country.

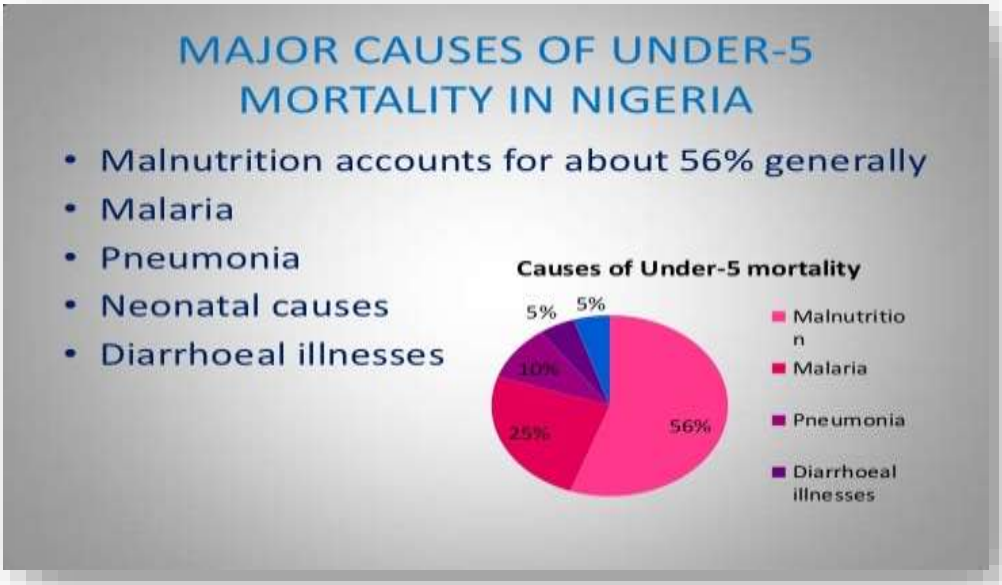

Figure 2: Ahmadu, M.T. Millennium Development Goal in Nigeria. https://www.slideshare.net/Maimunat/millennium-development-goal-4-in-nigeria1[34]

The fact that a sizeable number of Nigerian rural populations predominantly engage in farming or fishing, live in unhygienic conditions and isolated settlements, meant that the average population is spread over horizontally vast land and water spaces and thus, demand a corresponding spread of health.[35] The absence of basic amenities to cater for this sub-group makes malaria disease and

[32] Paul Emeka C. "The Impact of Malaria on the People of Anambra State Nigeria and their Response to the Disease". *Journal of Infectious Diseases & Therapy* 5, no. 5(2017): 308. DOI: 10.4172/2332-0877.1000324
[33] UNICEF, World Malaria Report, 2015.
[34] Ahmadu, Memunat .T. Millennium Development Goal in Nigeria. https://www.slideshare.net/Maimunat/millennium-development-goal-4-in-nigeria1
[35] Sunday New Nigerian, "New Perspectives in Health Policy for Nigeria" 1984- 2000. January 12, 1986: 14.

infections a common experience in the area. This challenge dominated most media publications in the twentieth century;

"The majority of children born in Nigeria die before the age of five. During the period 1975-1980, an average of 140.5 children out of every 1,000 children born alive in Nigeria died before their fifth birthday. This high level of death of children is at once a measure of diseases and malnutrition…"

(Sunday New Nigerian, 1986, p. 14)[36]

However, since 1990, programs and policies have been broadened with specific focus on deaths and the need to curb the trend. The period also witnessed an improvement in health technologies and the distribution of health materials (mosquito nets) to the northern parts and rural communities. Adetunji argued that the Northern states are recognized as "hot spots" of child mortality.[37] Likewise, as demonstrated in the study of Yamada Tadashi, the majority of children who die before age five are born in rural environments.[38]

The Nexus between Fertility and Mortality: Understanding the Hoarding and Replacement Techniques.

Over the past few decades, the causal relationships between child mortality and fertility have been a controversial issue. The connection is explored using the hoarding and replacement techniques. The explanation of these strategies answers questions raised about the irony of deaths and births. The hoarding effect, sometimes referred to as "insurance model" arises from the tendency of couples in high-mortality settings to anticipate mortality risks, thereby having excess births in order to safeguard against the possibility of future losses.[39]

[36] Ibid

[37] Jacob Ayo Adetunji. *Infant mortality in Nigeria: "Effects of place of birth*

[38] Yamada, Tadashi. "Causal Relationships between Infant Mortality and Fertility in Developed and Less Developed Countries." *Southern Economic Journal* 52 no. 2(1985): 364–68. DOI: https://doi.org/10.2307/1059622.

[39] Alfred Yankauer. "Does Mortality Affect Fertility" *American Journal of Public Health* 69 (6): 1979: 338. Since the emergence of the demographic transition theory in 1986, questions about the relationship between child survival and reproductive decision-making have been the subject ofdiscussion and debate. Original proponents of the theory cited historical evidence that mortality decline was followed by fertility decline, suggesting a causal relationship between mortality and fertility. Conversely, declining childhood mortality increases the number of surviving children, leading couples to compensate with fertility control. See: _____ Infant and Child Mortality and the Demand for Children." *Population Review* Jan-Dec, 1983: 14.

This is considered a desperate measure in Nigeria where child survival is unpredictable. The replacement model comes into play following the event of an actual child loss.[40] Parents tend to replace a child death by consciously having or planning another one. Palloni and Rafalimananadescribed both strategies as "precautionary measures".[41]

In interviews with women in Nigeria, it was discovered that the replacement technique is relatively common in the sub-region. Hoarding is mostly practiced by rural dwellers and among the poor. Child replacement is however tied to the sex of the child lost.The responses of participants showed that their reproductive decisions on the need to replace rested largely on their preference for the lost child's sex and the sex of surviving children. For instance, in the process of answering the question on the number of children, MrsNgoziOlejeme delved into the demise of her lost child and the urgent need for replacement. She said:

"In the Nigerian society, especially among the Igbos, we value male children a lot. There must be atleast one male child in the household for the family to be complete. In the absence of that, a woman's marriage is sitting on the fence; she can be replaced at any time. When I lost my son at the age of four, I had to quickly conceive the following year with the hope that I will have another son because he was my only son. Thankfully, I had a boy".[42]

In a bid to replace a favourite sex, some women keep having children until their goal is achieved. This was the case of MrsChiomaEgbuobi:

"When I lost my only son, I kept having children until I was able to replace him in my third birth."[43]

[40] Ibid

[41] Alberto Palloni and HantamalaRafalimanana. "The Effects of Infant Mortality on Fertility Revisited: New Evidence from Latin America". *Demography*, 36 no. 1(1999): 45 DOI: https://doi.org/10.2307/2648133.

[42] Interview with MrsNgoziOlejeme. Conducted and transcribed by Cinderella Temitope Ochu, June 28, 2021. In Bazle's study on Bangladesh, there was a similar response. Replacement is dependent on the sex of the dead child, sexes of the surviving children as well as the perceived monetary and psychic costs of birth control.

[43] Interview with Mrs Chioma Egbuobi. Conducted and transcribed by Cinderella Temitope Ochu, June 23, 2021.

In the course of research, it was also observed that some women hoard children in order to have a large number of living sons. This was evidence in the narration of Mrs Felicia Iregbu:

"My initial births were four girls; the fifth was a boy. I was not satisfied with just one boy, what if anything happens to him? So I find myself having more until I had the third boy. I currently have five girls and three boys"[44]

Causation however runs in other direction as reduction in childbearing leads to falls in infant and child mortality. The chances of a child surviving in the event of repeated childbirth are slim. Ronald Ridker illuminated the incessant death of children in Nigeria's remote villages due to short interval between births.[45]Inadequate birth spacing often occurs in early marriages, a practice common in Northern Nigeria where girls are given out in marriage at a young age (sometimes while still children), and expected to procreate virtually throughout their reproductive lives.[46] The most dominant religion in this region also resists western education as a form of infidel learning.[47] In this instance, girls stay at home to reproduce, nurture their babies and attend to domestic chores. In an interview with a Muslim woman, she recounted her experience as a young girl and mother (anonymous);

"I was given out in marriage at the age of thirteen, and I was getting pregnant on a regular basis, I did not know how to control it. I

[44] Interview with Mrs Felicia Iregbu. Conducted and transcribed by Cinderella Temitope Ochu, July 16, 2021.

[45]Ronald G. Ridker. *Interrelationships between Mortality and Fertility*(Baltimore: Johns Hopkins University Press) 1976: 240-54. The positive association between the length of post-partum amenorrhea and the duration of breast feeding are the biological andphysiological causal effects of a decline in infant mortality that reduces fertility. The prolonged lactation due to the reduction in infant mortality has an important fertilityreducing effect. See: Ruzicka LT, Kane P. "Infant and child mortality: the implications for fertility behavior". *Popul Res Leads.* 16, (1988): 9 PMID: 12342137.

[46] Henry, Victor D., et al. "Awareness, Use and Unmet Need for Family Planning in Rural Northern Nigeria" *African Journal of Reproductive Health*, 17, no. 4(2013): 114.Survey showed that firstborn children die almost twice the rate of later-born children (7.9% v. 4.6%). Both situations apply to women in Africa. They marry early and they keep having children even in their 40s-a later age with likelihood of complications during pregnancy. See also: Ezeh et al. "Under- 5 Mortality and Its Associated Factors in Northern Nigeria: Evidence from 22, 455 Singleton Live Births (2013-2018)" *International Journal of Environmental Research and Public Health.* Monjok, Emmanuel, John, Ekabua and Andrea, Smesny. "Contraceptive Practice in Nigeria: Literature Review and Recommendation for Future Policy Decisions", *Journal of Contraception*1 no. 1 (2010): 9-10. DOI: 10.2147/OAJC.S9281

[47] Ibid

conceived most of the time while breastfeeding. It affected my health, the health of the baby outside and the one inside. I lost three children as a result……"[48]

The age of first birth as posited by RamaiyaAstha, has a significant effect on mortality rates. "Reducing mortality risk can be achieved when reproduction is delayed by adolescents".[49]Fundamentally, early marriages, large family size and sons' preference practices in Nigeria and across other sub-regions are rooted in sex roles and expectations. As opined by Marshall and Polgar, nearly all parents have social and economic gains which increase with the number of children in the family. Children add two types of value to their parents and households; economic and noneconomic in nature. They may be economically valuable as participants in the productive and servicing activities of the household, and as well serve as potential sources of security to the parents or other close relatives at old age.[50] In agricultural settings, children served not only to replenish labour but also to extend cultivation. The economic value of children in an agricultural environment is usually expressed in terms of their participation in farming activities and their contribution to the household income through wage earning.[51]

Christine Oppong elucidated the link between parental expectations, sex roles and gender preferences. Apart from assisting in farm work as earlier indicated, male children were valued for several other reasons which include; ritual sacrifices expected to be performed by first sons during the funeral rites of their fathers, continuity of the family name and perpetuation of the lineage.[52] Although parents depend on their female children for old age support, they often invest more on the male offspring than females. As a result, records on mortality rates show a higher percentage for girls than boys.

[48] Interview in Lagos (anonymous). Conducted and transcribed by Cinderella Temitope Ochu. July 9, 2021.
[49] Ramaiya, Asthma et al. "A systematic review of risk factors for neonatal mortality in Adolescent Mother's in Sub Saharan Africa". *BMC Res Notes*7**,** no.750 (2014): 12 . DOI: https://doi.org/10.1186/1756-0500-7-750
[50] John Marshall and Steven Polgar. *Culture, Natality and Family Planning.* (North Carolina: Carolina Population Centre) 1976: 88-90
[51] Ayokunle Omobowale. O. "The Context of children in Yoruba popular culture", *Global Studies of Childhood*, 9, no. 1 (2018): 20-22.
[52] Christine Oppong. *Sex Roles, Population and Development in West Africa: Policy-Related Studies on Work and Demographic Issues*. (Portsmouth: Heinemann) 1987:120.

Investments (education), care (medical) and attention (nutrition) are often concentrated on the male child.[53]

In sub-Saharan as a whole, priority is given to a large family size as children are desired for other reasons such as marital stability and property rights. Also, offspring are said to bring prestige, confer social status, satisfy emotional needs and ensure spiritual safekeeping by complying with the injunction of the gods/ancestors.[54] Given the crucial importance, women were expected to produce children; failure to do so is often met with ostracism or divorce. Indeed, in African societies, life without children was perceived as not worth living.

[53]Lopez AD, Ruzicka LT, Waldron I. *Sex differentials in mortality*. (Canberra: Australian National University) 1983:78.Child mortality is not prominent among breastfeeding children but common in the post-weaning stage. It arises from the selective neglect of girls in the allocation of household resources. Gender bias also reflects in reproductive behavior. For example, contraceptive adoption and continuation rates are higher if the last-born child is male than if it is female. See: May, David A., and David M. Heer. "Son Survivorship Motivation and Family Size in India: A Computer Simulation." *Population Studies* 22, no. 2 (1968): 199–200. https://doi.org/10.2307/2173019.The girl child is valued for the purpose of bride wealth.

[54] Susan, Cochrane H. and Samir Farid M. *Fertility in Sub-Saharan Africa: Analysis and Explanation*. (Washington, D.C World Bank Discussion Papers), 1989: 89.

Many scholars such as John Caldwell,[55]Odimegwu Clifford,[56] and Cain Mead[57]have linked the slow adoption of contraception in Nigeria (15% CPR) to these socio-cultural elements and the increase in mortality. A change in reproductive behavior and child expectation is central to a reduction in CM, Caldwell argued. Clifford added that the acceptance of a family system in which large numbers of children are no longer culturally expected to provide wealth and social status has to precede the acceptance of modern contraception. To Mead, family limitation is unrealistic in a community where children's survival is not assured.

In agreement with Mead's assertion, Olsen Randall pointed out that although mortality has been receding since the 90s as indicated in fig 1, fertility is still high in Nigeria.[58]The nature of Nigeria's mortality transition differs from that of the rest of the world. As the country began to experience a fall in CMRs, morbidity appeared to be another battle to contend with. In the words of Aksan; "fertility will remain on the rise until morbidity is lowered along with mortality".[59] John Cleland added, "If mortality falls decisively, the fertility response remains weak unless the larger surviving cohorts of children are

[55] Caldwell, John. "The Control of Family Size in Tropical Africa" *Demography* 5, 2 (1968): 609. DOI: http://www.jstor.org/stable/2060250 Accessed 10 May 2018Ron Lesthaeghe. "On the Social Control of Human Reproduction", *Population and Development Review* 6, No. 4 (1980): 527-548. https://doi.org/10.2307/1972925

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[58]Olsen, Randall J., "Estimating the Effect of Child Mortality on the Number of Births." *Demography*, 1980: 435.

[59]Aksan, Anna-Maria and ShankhaChakraborty. "Childhood disease and the precautionary demand for children," *Journal of Population Economics* 26, no. 3 (2013): 853-54.

healthy".[60] If child mortality is alleviated because curative methods enhanced survival, the occurrence of diseases will make surviving "short-lived" and further increase anxiety among parents who will be concerned about their children's potential health status. Parents anticipate lower returns to investment and continue to choose large families. The investigation of David Barker buttressed this fact. Childhood infections and diseases, as posited by Barker, have adverse effects on cognitive and physical development, contributing to malnutrition and stunting, impeding educational attainment, development in adulthood and return on investment.[61] In a society where children are expected to provide for their parents at old age, physically impaired children cannot be relied on. It therefore becomes imperative to have another child, preferable a healthy one to secure the future.

Conclusion

This study has explored the relationship between child mortality and fertility in Nigeria in relation to the hoarding and replacement strategies. From the analysis given, fatality shapes reproductive behavior and family building. While it may be plausible to think that the innovation served its purpose by reducing the impact of child loss in a family, it simultaneously enhanced fertility and induced mortality. The consequence of frequent conception and inadequate spacing has been illustrated to support this notion. Given this fact, it will be assumed that a lowered mortality will translate to fertility decline but this was not the case. In Nigeria, the prevalence of malaria, cholera, diarrhea, pneumonia and other childhood ailments especially in

[60]John Cleland. "The Effects of Improved Survival on Fertility: A Reassessment." *Population and Development Review* 27 (2001): 69. https://www.jstor.org/stable/3115250

[61]David Barker J. P *Mothers, Babies, and Disease in Later Life*. (London: British Medical JournalPublishing Group) 1994: 98.Childhood infections have adverse effects on cognitive and physical development. School-age children may have difficulty learning because of cognitivedamage caused by early childhood illness, which is then exacerbated if newillnesses affect their school attendance and concentration while at school. Less effective schooling combined with physiological scarring from childhood
illness and increased susceptibility to adult illness may then dampen labor productivity. By depleting population health, the morbidity burden in sub-Saharan
Africa dampens expected returns to human capital investment. Bastian Monkediek and Hilde Bras. "Family Systems and Fertility Intentions: Exploring the Pathways of Influence*". Eur J Popul*2017 Feb; 34(1): 33–57. DOI: 10.1007/s10680-017-9418-4

villages without quality healthcare, meant that a child's health is unstable and eventual death is envisioned. In a situation where a child is alive but with a compromised health, parents' approach to coping with the situation is not dissimilar from response to actual mortality. Improvements in child survival without a corresponding improvement in the epidemiological environment may therefore result in reversed gains. Although, vaccination coverage for some childhood diseases such as measles, pertussis, diphtheria and tetanus has increased tremendously in the 90s and beyond, treatments for malaria (a common disease in Nigeria), and vaccines for a number of other life threatening diseases are minimal and in some cases out of reach due to poverty and substandard health care. Therefore, children survive one disease to face another. Apart from vaccines, the use of curative drugs like antibiotics and oral rehydration systems has been effective in treating diarrhea infections. Exposure to unclean water and poor sanitation however facilitate reinfection.