DISEASE PREVALENCE AND INFANT MORTALITY IN THE RURAL AREAS OF AKWA IBOM STATE, NIGERIA

Victor E. Ben
Department of Sociology and Anthropology
University of Uyo
Email: vikeben4reality2007@yahoo.com

&

Udom Sunday Daniel
Department of Sociology and Anthropology
Akwa Ibom State University
Email: udomdaniel@aksu.edu.ng

Abstract

This study investigated disease prevalence and infant mortality in the rural areas of Akwa Ibom State, Nigeria. It relied on primary data obtained from 384 respondents, mainly women in the reproductive age of 15-49 years. They were randomly selected using the multistage sampling technique. The study was conducted in the six rural areas of Abak, Etim Ekpo, Obot Akara, Ibiono Ibom, Itu, Nsit Atai, Mbo and UdungUko and was guided with the assumptions of class theory and epidemiologic transition theories. Findings revealed that the six killer diseases are still on the prowl and prevailing in the study area although with a low incidence of infant mortality. Also, contrary to traditional beliefs on the impacts of natural, supernatural, and mystical forces, contravention of certain norms and or manipulation by witches, sorcerers, deities, and ancestors characterized by witchcraft (Ifot), esien-emana (fate) and ukpong (soul of the mortus), the study found that infant mortality is now determined by medically-related problems, excluding even environmental factors and hygiene. On the basis of these findings, the study recommended among other things the establishment a data pool on vital events in the state and enforcement of a compulsory reporting and documentation of such vital occurrences to provide up to date information on conditions of the new born as well as guide relevant policy and programmes concerning their plights and that of the mothers.

Keywords: Disease Prevalence, Infant Mortality and Rural Areas

Introduction

The risk of child death is still a majorissue that requires serious attention in some parts of the world despite the increasing efforts by governments and world organizations to reverse the trend. In many countries in Africa and other continents where the risk of death of new born is still high, 'the incidence has constituted a major challenge to public health amongst families (Adeyinka, Muhajarine, Petrucka and Isaac, 2020; UNICEF, 2018; Yaya, Ekholuenetale, Tudeme, Vaibhav, Bishwajit and Bernard, 2017)'. Unlike the adult, new born are susceptible to infections and diseases that put their health more at risk. Most common causes of childhood mortality include being a male child, low level of parental education, poverty, previous short birth intervals (< 2 years), teenage motherhood, inadequate access to maternal healthcare services and poor sanitation (Adeyinka, Muhajarine, Petrucka and Isaac, 2020); poverty, malaria, malnutrition, undeveloped infrastructure, and or inadequate health care; neonatal encephalopathy (problems with brain function due to lack of oxygen during birth), infections, complications of preterm birth, lower respiratory infections and diarrheal diseases (UNICEF, 2020).Many other studies quoted in Adeyinka, Muhajarine, Petrucka and Isaac (2020) have identified micro-level/compositional (that is, child and maternal household-level factors) associated with neonatal, infant and under-five mortality. For WHO (2017)the lack of access to health care before, during and after delivery contributes to high infant mortality rates in both the developing and under-developed countries. These causes both directly and indirectly account for thePolio, ARI, malaria, pneumonia, diarrhoea, measles and HIV/AIDS that still put the lives of young ones at risk.

New born mortality is an endemic issue in Nigeria, as the country (UNICEF, 2018) contributes the global second largest of the problem (that is, the under-five mortality variant). With regards to infant mortality which is the navel of this study,an estimate of 6700 children diedglobally every day while 2.4 million died in the first month of life in 2020 from causes associated with preterm birth, intrapartum-related complications (birth asphyxia or inability to breathe at birth), infections and birth defects (WHO, 2022) and neonatal causes, child pneumonia, malaria, diarrhoea, HIV/AIDS, measles and accidents (Ester, Torres, Freire, Hernández andGil, 2011). Again, nearly half (47%)of all under-5 deaths occurred in the first 28 days of life and the sub Saharan Africa which has the highest neonatal mortality rate in the

world(approximately, 27 deaths per 1000 live births), contributes 43 percent of the global new born deaths (WHO, 2022).

Information on the rate of infant mortality reveals that 75 deaths per 1,000 live births occurred in 2008 compared to 69 deaths per 1,000 live births in 2013 (NDHS, 2013) and 67 deaths per 1,000 live births reported in 2018 (NDHS, 2018). Other types of new born mortalities include 40 neonatal deaths per 1000 live births, 35post-neonatal deaths per 1,000 live births, 157 under-five deaths per 1000 live births and 88 child deaths per 1000 live births (NDHS, 2008); 37 neonatal deaths per 1000 live births, 31post-neonatal deaths per 1,000 live births, 128 under-five deaths per 1000 live births and 64 child deaths per 1000 live births (NDHS, 2013)and 39 neonatal mortality per 1,000 live births, 28 post-neonatal deaths per 1,000 live births and 132 under-five deaths per 1000 live births(NDHS, 2018). Factors that complicate the unfortunate experiences of the young ones and by extension their parents, families and the society as indicated in the different demographic surveys include child health and nutrition practices, malaria control, vaccination and immunization programme.

Much as considerable progress has been made on lowering the rate of new born mortalities and accelerating child survival as indicated in the country's demographic surveys, yet, it is still a mirage considering the resolve of the Millennium Development Goal 4 (MDG4) to reduce under-5 mortality to 64 deaths per 1,000 live births and infant mortality to 30 deaths per 1,000 live births by 2015 (Federal Republic of Nigeria, 2010a) cited in NDHS (2013) and the Sustainable Development Goal (SDG 3) that focused on ensuring healthy lives and promoting well-being for all at all ages by 2030. Nutrition deficiency and poor ration, low birth weight, malaria and other infections, childhood diseases for example, acute respiratory infection (ARI), fever and diarrhoea, among others are still serious hurdles for most children particularly in the rural areas of the country. The scenario is without recourse to the fact that Nigeria is currently implementing several interventions such as the Expanded Programme on Immunisation, the Polio Eradication Initiative and National Emergency Action Plan, Integrated Community Case Management of Childhood Illnesses in Nigeria, and the Integrated Maternal Newborn and Child Health Strategy (National Primary Health Care Development Agency (NPHCDA, 2012) cited in NDHS (2013).

The recent submission (NDHS, 2013)that childhood mortality rates are higher in rural areas than in urban areas is quite of concern in Akwa Ibom State with only five urban areas out

of 31 administrative councils and where only an average of 25.4 percent deliveries take place in a health facility. Correspondingly, only a small proportion of deliveries are attended to by trained nurses. Others either take place in the church, attended to by a TBA or a multipurpose facility often run by a quack health practitioner. Evidently, birth weight information of the child is often gazed as (NDHS, 2018)the percentage of mothers that volunteer such information has fluctuated over the years, decreasing from 18 percent in 2008 to 16 percent in 2013 before rising again to 24 percent in 2018.Malaria which is one of the major sicknesses in the country and state is seen as a general problem that is better handled by self-treatment or medication while some families that benefit from the insecticide treated nets used it to fence waterleaf beds and cordon birds from having access to the leaf. Fever that also is a serious contributor to childhood sickness is culturally believed to cause growth and height in children or results from stretching or teething), and weather change (Abasiekong, 1997). Measles sometimes is assumed to be caused by change in weather, (Ogunjuyigbe, 2004), wicked power or bad water, or a reaction from food or drug. Similarly, diarrhoea is perceived merely as a means of getting rid of body impurities or as a sign of teething, crawling" or "stretching (Ogunjuyigbe, 2004) Most serious child sickness not associated with any known causes are blamed on intercourse at early stage after delivery, conception while breastfeeding the child, spiritual forces or witchcrafts. In most instances, medical attention to childhood sickness is considered as the second particularly by the poor and most middle-income earners after several failed unorthodox efforts to heal the sickness.

Many previous studies such as Oke, (1995) has argued that child birth, health, and survival to adulthood in traditional oriented societies are determined by forces that vary from natural, supernatural, and mystical. For some societies in Nigeria, new born are regarded as re-incarnates of certain ancestors and their ill health are believed to be due to contravention of certain norms and or manipulation by witches, sorcerers, deities, and ancestors. This gives notion as per what Offiong (1983) referred to witchcraft (Ifot) and what Umana (1996) calls esien-emana(fate) and Ukpong (soul of the mortus) among the Ibibio. Among the Yorubas, Ogunjuyigbe (2004) calls such children Abiku (children from the spirit world) while in the Igbo of southern Nigeria, such children are regarded as Ogbanje according to Achebe (1985) and Quayson, (1997) cited in Ogunjuyigbe, (2004). In most instances, infants and even children identified with these traits are referred by their parents to a diviner, soothsayer or traditional doctor, church or spiritualist and except on referral before going to the hospital. These practices

(Ben, 2010) increase the incidence of child mortality in many rural societies when the illness fails to respond to the traditional treatment. However, an assessment of Nigeria's important demographics such as very high population of 2011 (UNPF, 2019), global poverty capital (Brookings Institution, 2018), one of the eight global hungriest (UN, 2019) cited in Okwuwa and Adejo (2020) and very high maternal and infant mortality rates (UNICEF, 2017) even when the country has attracted considerable assistance and has adopted several policy interventions that should nib the phenomenon of new born mortality in the bud is quite worrisome. Thus, intimated by Ekong, (2020) recent position that Nigeria is still facing a menace of incessant childhood mortality with a call for studies to generate new scientific evidence to determine its prevalence and explore predisposing factors, it poised the interest of this study to investigate the prevalence of disease and trend in infant mortality in the rural areas of Akwa Ibom State, Nigeria.

The study Objectives

i) To identify the prevailing diseases associated with infant mortality in the rural areas of Akwa Ibom State.

ii) To identify the direct and proximate causes of the diseases.

iii) To estimate the mortality and survivorship of the infant in the study area.

iv) To make recommendations towards preventing the diseases and checking infant mortality in the rural areas of Akwa Ibom State.

Literature and Knowledge Gap

The issues related to birth conditions, life and survival of new born have ever received creditable attention in academic researches and in social, economic and health planning. This in essence is due to the importance of new born to families and the society, and also because data on the unfortunate incidence of death are prerequisites for population projection, measurement of health quality of the population, evaluation of existing health policies and application for development planning. Many academics including Nwosu (2004) has catalogue the usefulness of such data in the estimation of important demographic parameters essential for development planning, determining housing, educational, health and social needs of a population, disease control, evaluation of public health programmes, determining policy guidelines and actions needed to improve public health. The information on infant and child mortality is relevant to a

demographic assessment of a country's population and is an important indicator of the country's socioeconomic development and quality of life; can help identify children who may be at higher risk of death, and can lead to strategies to reduce this risk, such as promoting birth spacing (NDHS, 2018).

An array of factors that account for new born deaths have been identified in many studies (see for example, WHO, 2022; Adeyinka, Muhajarine, Petrucka and Isaac, 2020; Ester, Torres, Freire, Hernández andGil, 2011; Goldani, Barbieri, Bettiol, Barbieri and Tomkins, 2001; Kalter, Gray, Black and Gultiano, 1990). These factors vary from society to another but include, although not also limited to age, region, residence, education, wealth index, age at first marriage and religion of fathers and mothers are key determinants associated with childhood mortality. Sartorius and Sartorius (2014) and Mosley and Chen (1984) have labelled proximal (infectious), intermediate (e.g., water and sanitation), and distal (e.g., socio-economic status, education) as hierarchical determinants of infant mortality while Ezzati, Lopez, Rodgers, Vander and Murray (2002)classified poor sanitation and unsafe drinking water(which are pathways to diarrhoea) among the important intermediate determinants of the phenomenon. Evidence shows that morbidity and mortality of new born and adults vary depending on the socio-economic status of the family (Poerwanto, Stevenson and Klerk, 2003) while the United Nations (2001) attests that the relatively high mortality in Africa and other regions of the world is due to infectious and communicable diseases, poor living conditions, and food insecurity. The situation is worst for children than the adult members of the household.

Kalter, Gray, Black andGultiano (1990) have argued that children die of pneumonia, malaria, and AIDS; from various childhood diseases such as measles; as well as from other causes like diarrhoea, which result from lack of clean water and poor sanitation. A study on implications of family socio-economic status on child mortality: a comparative study of rural and urban areas of Akwa Ibom State, Nigeria, Ben (2010) reported that anaemia, chronic asthmatic attack, acute plasmodiasis, dysentery, cholera, measles, tetanus, diarrhoea, pneumonia, malaria, injuries, severe birth asphyxia, gross deformity at birth, severe neonatal jaundice, malnutrition, convulsion, cellulitis, sepsis, and marasmus among others are the major causes of infant and child mortality. In terms of the individual factor, infant mortality is strongly related to persistent low income and income uncertainty as well as the extent of income inequality in a population (Goldani, Barbieri, Bettiol, Barbieri and Tomkins, 2001). This aligned with studies conducted by

Udousung, Udoumoh and Effiong, (2018), on the appropriate treatment method to curb the menace of mortality caused by diseases in rural communities in Akwa Ibom State. Household income, wealth, and parental occupational/employment status are variables that directly determine a household's economic position (Ahonsi, 1992). These factors influence both quality and quantity of nutrient intake that can be afforded for children, and the quality of shelter and use of medical services; all of which affect child health and survival (Ahonsi, 1992). The factors also influence access to better medical care, clothing, shelter, food and sanitation, as well as safe drinking water (Butzetal, 1982; Neegama, 1980; Orubuloye and Caldwell, 1975; Puffer and Serrano, 1973) in Jegede (2002); acting as health determinant in urban areas of Brazil (Golddani, Barbieri, Bettiol, Barbieri and Tomkins, 2001)as well as an important indicator of infant death probabilities in Indonesia (Poerwanto, Stevenson and Klerk, (2003).

Many studies (Oluwadare, 2009; Abasiekong, 1997; Niraula, 1994;Akoto, 1990) have shown that parents with high level of religiosity and of rural background prefer spiritual healing to health care services for their children. Religious affiliation is explained as in worship or practice of Christianity, Islamic, Hinduism, Buddhism, African Traditional Religion (ATR).Mortality rate is lower for infant who are exposed to modern health care services than for those subjected to spiritual healing. There is a strong link between adequate nutrition, hygiene and sanitation, care and consumption of specialized health care services and new born health and survival (NDHS, 2013; 2018). Children's nutritional status influences their susceptibility to disease and untimely death, as well as reflects infant and child recurrent and chronic infections (Edem, 2006).For Ahonsi (1992), early mortality differentials reflect difference in prevailing levels of household poverty, provision of public utilities and social services, and in the educational levels of the population. Accordingly, most rural households on the average live in poor conditions compared to urban households, (Effiong, Ekanem, Ottong, 2023). Even in the recent times, majority of rural dwellers are still faced with problems of poor supply of safe drinking water, poor and costly health care services, poor sanitation, poor housing conditions and malnutrition. These pose serious threats on the health and survival of new born children.

It is important to note that the spurt of disease lies on varied conditions including inequality of conditions of the environment in which people. This could be associated with unsafe drinking water, poor and costly health care services, poor sanitation, poor housing conditions and malnutrition among others. A common way of understanding a disease is that it is

an abnormal condition that negatively affects the structure or function of all or part of an organism cause by factors other than external injury. According to WHO (2018) disease refers broadly to any condition that causes pain, dysfunction, distress, social problems, or death to the person affected, or similar problems for those in contact with the person. Another conceptualization of the phenomenon is that, it is a pathologic condition in which the normal functioning of an organ or the entire body of an organism is impaired or disrupted resulting in extreme pain, dysfunction, distress, or death. The prevalence of disease is thus, referred to as the rate in which the proportion of persons in a population who have a particular disease or attribute at a specified point in time or over a specified period of time. In epidemiologic study, prevalence is the proportion of a particular population found to be affected by a medical condition (typically a disease or a risk factor at a specific time.

New born mortalities both due to outbreak of disease or any other causes have raised serious global public health concern as an estimate of 144 deaths per 1000 live births continue to occur in parts of the world. Statistics published by UNICEF (2018) reveal that half of the globalunder 5 deaths in 2017 occurred in sub-Saharan Africa while 30 percent of it took place in Southern Asia. A similar report shows that about 53 percent of all under-five deaths in 2019 occurred in sub-Saharan Africa. Evidently, Africa and Asia suffer the heaviest burden as they contribute more than 80 percent of the 5.2 million global under-five deaths in 2019 as well as 52 percent of the global under-five deaths. Apart from at the continental level, statistics show that nearly half (49 percent) of all under-five deaths in 2019 occurred in just five countries that include Nigeria, India, Pakistan, the Democratic Republic of the Congo and Ethiopia. Nigeria and India alone account for almost one third of the incidence, (WHO, 2020). Just like in other regions and countries, the high infant mortality rates reflect economic and social conditions of mothers' health and the effectiveness of health systems (OECD, 2011); changes in structural factors such as economic development, general living conditions, social wellbeing, and quality of the environment (Reidpath and Allotey, 2003); lack of accessibility to health facilities and personnel, poor maternal care and primary healthcare inadequacies, poverty, illiteracy, unemployment, lack of prenatal care, alcohol consumption during pregnancy, and drug use (Okwuwa and Adejo, 2020; WHO, 2019).

Theoretical Discussion

The empirical background of this study was derived from the assumptions of theories: class theory and epidemiologic transition theory. Apparently, social explanation of health emphasizes the fact that illness varies with class, gender, ethnic group and less obvious on factors such as proximity and support from family members. This idea colludes the postulation by Aaron Anthonovsky, (1967) that one's social class determines the chances of staying alive in a particular population as well as the inequality of impacts; a fact that prompted the World Health Organization's argument that mortality relations systematically differin urban and rural areas of countries of the world(WHO, 2002).Apart from spatial differentiation in mortality level which as argued, lies in the social class structure, the theory holds that the observed differences in mortality levels are related to the differences in the socio-economic characteristics of the people; in the relationship, the socio-economic characteristics operate as independent variable while mortality risks are dependent variables; and, the directions of the relationship between mortality incidence and socio-economic characteristics is inverse.

Although the theory seemed too generalized and can be criticized for holding only a descriptive view of the death and life conditions of people as well as not providing explanation on the effects of technology, industrial development, poverty reduction, improvement in education, agriculture, and health care service, among others on individual or family class status, it illustrates the experiences in disease prevalence and trend in infant mortality among the lower and middle class individuals and families in the rural areas compared with those in the urban areas. Also, the theory has generated an approach for explaining the conditions of life of people belonging to different class statuses in many societies. It has provided useful insight into the effects of culture, economic, and increase in population on the status of people, including that of children. For instance, the disadvantage conditions and spatial inequalities experienced by parents and guardians in lower- and middle-classes, are sometimes proximate factors to disease spread and death of infants. Some of the factors include unhygienic environment that often cause measles, diarrhoea; none nutritious food which associate stunted growth, under-weight, among others.

In the second phase of the theoretical discussion, two ideas were borrowed from the epidemiologic transition theory. These include the idea that personal behavior and lifestyle influence the patterns and levels of disease and injury and that the epidemiologic transition like

the demographic transition reflects the varying forces of socio-economic development (immunization, water purification and use of insecticides, etc.), sanitation, and public health, and, to a much lesser extent, advances in clinical medicine, that define human state of health and survival. Just as the factors steered the wheel of transition in the western societies, they remained impactful on diseases vis-à-vis the lives and survival of infants but for certain spatial conditions that vary from location of residence, income, level of education, belief, etc. these and many other factors are social class-related. They limit time, exposure, knowledge about availability, accessibility, affordability and use of services meant to exterminate infant diseases in the study area.

Methodology

The absent of documented evidence on infant diseases even in the Nigeria demographic survey reports was a big challenge to this study; it jeopardized empirical interest in the study. In the alternative, the study relied only on primary data elicited from 384 respondents (only women, aged 15-49 years), each selected from a separate family unit or household. The data were based on birth histories of children ever born alive, sex, disease infection, duration and outcome of the infection. Emphasis was placed on infants (new born aged 0-12 months).The data were used to estimate the prevalent rate of each of the diseases as well explain the trend of infant mortality in the study population. All the data were collected from the respondents in a face to face interview basically in six (6) local government areas of Abak, Etim Ekpo, Obot Akara, Ibiono Ibom, Itu,Nsit Atai, Mbo and Udung Uko. In each of these areas, eight (8) communities were selected while six (6) households selected from every community. This process involved multistage random sampling method.

The 384 sample size was determined using Cochrane formula that is given as

$$n = \frac{z^2 \cdot pq}{e^2}$$

Where,
n = required sample size
z = confidence level (95%), equivalent of 1.96 value under the normal curve
e = tolerable error margin of 5% (0.05)
p = proportion estimate of 50 (0.5)
This implies, n = 1.96^2 x 0.5 x 1- 0.5

$$n = \frac{3.8416 \times 0.25}{\frac{0.05^2}{0.0025}}$$

$$n = \frac{0.9604}{0.0025}$$

$$n = 384$$

Data Presentation

Table 1: Personal Characteristics of the Respondents

Variable (of women)	Description	No. of Respondents	%
Age	15-19	Nil	-
	20-24	17	4.4
	25-29	57	14.8
	30-34	91	23.7
	35-39	126	32.8
	40-44	69	18.0
	45-49	24	6.3
Highest education	Primary	13	4.4
	Post Primary	212	55.2
	Higher Education	136	35.4
	Tertiary	23	6.0
Employment Status	Unemployed	97	25.3
	Self-Employed	171	44.5
	Paid Employment (Private)	49	12.8
	Paid Employment (Public)	67	17.4
Monthly Income (‘000)	< 20	39	13.6
	21-50	82	28.6
	51-80	28	9.8
	81-110	43	15.0
	>111	95	33.0
Marital Status	Single	4	1.0
	Married	356	92.7
	Divorced	Nil	-
	Widow	13	3.4
	Separated	3	0.8
	Co-habited	8	2.1
	Total	384	1000

Data in table 1 provide information on personal characteristics of the respondents. For age, the respondents were grouped in cohorts of five and as shown in the table, 126 (32.8%) respondents were 35-39 years, 91 (23.7%) respondents reported their ages in the cohort of 30-34

while 69 (18.0%) and 57 (14.8%) others were 40-44 years old and 25-29 years old, respectively. No respondent was found in the age group of 15-19 years but 17 (4.4%) of the respondents said they were between 20-24 years while another 24 (6.3%) respondents said their ages fall in the 45-49 cohort or group. Information on literacy level of the respondents revealed that 212 (55.2%) have completed post primary education while 136 (35.4%) have finished a higher education. As indicated in the table, 23 (6.0%) have graduated from a tertiary institution whereas 13 (4.4%) respondents only said they could complete a primary education.

In terms of employment status of the respondents, data in the table show that 97 (25.3%) who had full-time engagement as house wives were unemployed; 171 (44.5%) were self-employed while another 49 (12.8%) respondents were in paid employment but in establishments or organizations. Only 67 (17.4%) of the respondents said they were in the employment of the state or federal government. Given the employment status of the respondents, data in the table indicate that 95 (33.0%) respondents reported a monthly income of ₦111,000 or more. For 82 (28.6%) of the respondents, their monthly income varied between ₦21,000-₦50,000 whereas for 43 (15.0%) respondents, their monthly income was in the range of₦81,000-₦110,000. The table also shows that 28 (9.8%) respondents reported a monthly income varying between ₦51,000-₦80,000 compared to 39 (13.6%) respondents that reported a monthly income of ₦20,000 or less. Based on data n the table, 356 (92.7%) respondents were married, and while 13 (3.4%) of them were widowed, eight (2.1%) were cohabiting a partner, three (0.8%) were separated and only four (1.0%) reported being single. No respondent throughout the study reported divorced as a married status.

Table 2: Life Table showing Survivorship of the Infants

Age x	nx	lx	Dx	qx	Lx	Tx	ex	Graph
0	428	1000	12	0.012	994	7060	7.06	3
1	423	988	30	0.0303644	973	6066	6.1396761	2.99
2	410	958	16	0.0167015	950	5093	5.3162839	2.98
3	403	942	17	0.0180467	934	4143	4.3980892	2.97
4	396	925	9	0.0097297	921	3209	3.4691892	2.97
5	392	916	0	0	916	2288	2.4978166	2.96
6	392	916	2	0.0021834	915	1372	1.4978166	2.96
7	391	914	0 (914*)	0 (1*)	457	457	.0.5	2.96

Data in table 2 shows both the survival and death probabilities of infants in the study area. The data seemed defective although obtained directly from the respondents (mothers); this is of course, as the data could have been under or over reported by the respondents. However, the data were used in the absent of documented (data) alternative that give could reliable information on infant death in the area. As shown in the table, the age of the infants (x) were coded 0, 1, 2, 3, 4, 5, 6 and 7 to represent birth, 6 weeks, 10 weeks, 14 weeks, 6 months, 9 months, 12 months and 15 months before exceeding infant age. Since the infants did not all die at that end of the fifteen months, 0 instead of 914 was entered for dx at age 7 and 0 instead of 1 for qx at the same age 7. The figures for plotting graph almost appear uniform as evident of the defectiveness of the data presented in this table, although the significant improvement in primary healthcare services, expertise and dedication of the health personnel in the health infrastructure across the state as well as the commitment of the state government, donor agencies and NGOs, and high acceptability by parents and caregivers, have had a levelling impact on causes of infant mortality. This is possible due to Nigeria's government proactive stance on polio eradication through routine immunisation, intensified action on vaccination against diseases outbreak for example polio, cerebrospinal meningitis, measles, yellow fever and efforts toward elimination of tetanus. The data show a high survival rate of infants in the study area (see column nx, number alive at every age: 1-7), in view of the number dying and related mortality index (qx) indicated in the table.

Survival Rate of Infants

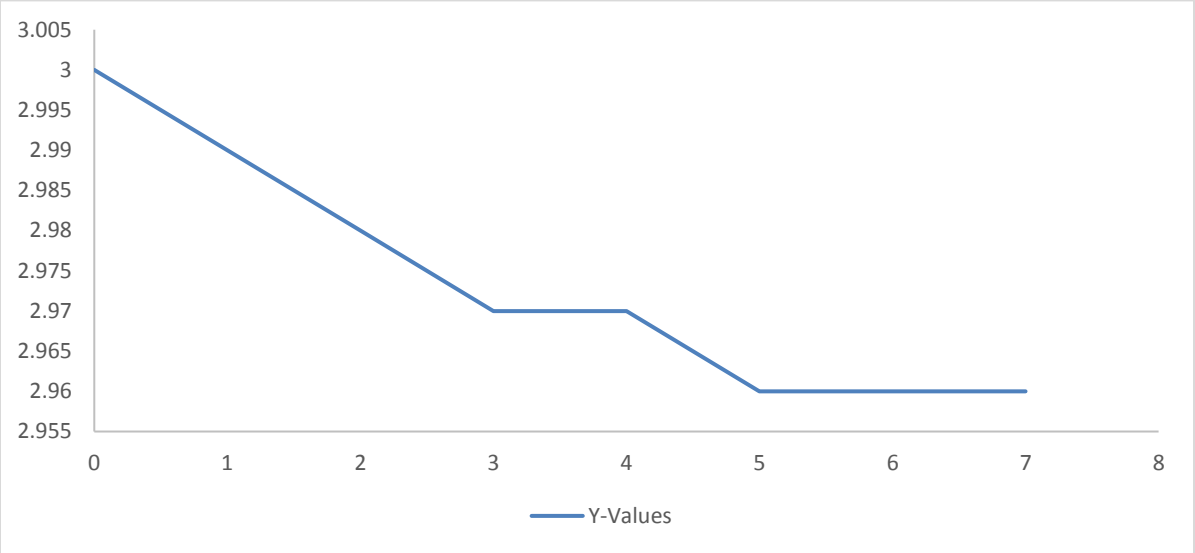

Figure showing the survival rate of infants in the study areas
Field work: 2023

Discussion of Findings

Evidence from the study revealed an absent of a reliable local and state level data on vital events of birth and death. Data contained in national document such as the NDHS reflect only national and regional characteristics of most vital occurrences or incidences. In parts of the state and specifically the study area, the six killer diseases are still on the prowl and prevailing; although the incidence of death is low. Contrary to traditional beliefs on the impacts of natural, supernatural, and mystical forces (Oke, 1995); contravention of certain norms and or manipulation by witches, sorcerers, deities, and ancestors described by Offiong (1983) and Effiong, (2019**)** as witchcraft (Ifot) and Umana (1996) asesien-emana (fate) and ukpong (soul of the mortus), the study found that infant mortality is now determined by medically-related problems, excluding even environmental factors and hygiene. This study found that the risk of under-5 death depends greatly on a number of socio-economic, bio-demographic and health-related variables, such as mother educational level, wealth index, marital status, place of residence, gender, geopolitical region, mother's age at birth, preceding birth interval, number of children ever born, and the size of child at birth. The finding of this agrees with Ester, Torres,

Freire, Hernández and Gil (2011) argument that children in underdeveloped countries are not decimated by exotic diseases but rather by common and frequent problems. For instance, during COVID 19 pandemic disease no infant of child life was loss despite the relax nature and passive attitude of rural dwellers to the safety protocols and lockdown rules. On the contrary, the study found a deviation from the position of Black, Morris and Bryce (2003) who attributed children death to drinking unsafe water or the lack of access to water for personal hygiene and poor access to basic sanitation. Evidently, most communities in the rural areas of Akwa Ibom State are still drinking from stream, rain water, borehole and snatched water that are locally and surreptitious produced. These confirmed similar studies by Effiong and Ekpenyong, (2017), that most people in rural communities in Akwa Ibom State do not have access to social amenities to enhance their livelihood, and thus, are further exposed to other killer diseases.

There is also a collaboration of our study findings with Hall (2008) who reported a link between poor sanitation, poor water quality, malnourishment of the mother and infant, inadequate prenatal and medical care, and the use of infant formula as a breast milk substitute and the incidence of infant mortality. Similar collaboration was equally noticed in the case of women's status and disparities of wealth on infant mortality rates. In areas where women have few rights and where there is a large income difference between the poor and the wealthy (Reidpath and Allotey, 2003). Another major determinant of the rates of infant mortality is level of education. The reason is that educated mothers have better socio-economic status, better knowledge on family health and childcare, preventive care, effective use of modern health services and good management of child illness. It changes the customary and social familial relationships as regards decision making and engages the mothers in several issues like childcare which plays a role in reducing child mortality. Low or poor education and limited access to birth control contributes to higher births per mother and short intervals between births. Correspondingly, high frequency of births limits time for other activities that range from social, economic and domestics particularly in poor family settings. This may in turn limits resources and capacity to provide for the needs and services of young in the quality and standard required. The study found that for families in the study area, there is nothing like standard and quality of services to the young ones, only what the parents or care giver can afford.

Important other indicators that determined the consistency of this study with those of others particularly NDHS (2018) include household wealth, mother's education, age of mother,

number of previous births and births intervals. The NDHS (2018) report show that under-5 mortality rate lower for mothers in the cohort of 40-49 years (120-124 deaths per 1000 live births) and higher for mothers aged 20 years or less (160-168 deaths per 1000). Mothers who have had birth for seven or more times risk higher new born mortality (190 deaths per 1000 live births) while those mothers with birth interval of two years of less experienced higher new born mortality (183 deaths per 1000 live births) compared to the mothers who skipped four or more years before the next child birth and experience lower new born mortality (83 deaths per 1000 live births). For the mother who has higher education, their new born mortality experienced dropped to 56 deaths per 1000 live births and increased for the mothers with low education (170 deaths per 1000 live birth). The area of disagreement with the NDHS (2018) is the argument that boys are more likely than girls to die in childhood within the region of (137 male deaths per 1,000 live births versus 127 female deaths per 1,000 live deaths.

This study found a significant impact of household wealth on new born mortality and other drivers of the phenomenon. It correlated the report of NDHS (2018) that new born mortality decreased with an increase in household wealth (53 deaths per 1000 live births) and increased with a decrease in household wealth (173 deaths per 1000 live births). On the contrary, there is a disagreement with the argument that in the least-developed countries (LDC), the primary cause of infant mortality is poor quality of water as such is often contaminated by faecal material or other infectious organisms can cause life-threatening diarrhoea and vomiting in infants. The idea of hygienic water, food and environment in parts of the study area is a far except in African context. There is an eyesore in the waterside area where dwellers bath, defecate and cook with and drink from the same water source.

Although low birth weight has been reported consistently in the various demographic surveys and supported by Okwuwa and Adejo, (2020) as s single most significant characteristic associated with higher infant mortality, no evident was captured in the findings of this study. Also, the study could not verify due to inadequate data, the use of breast milk substitutes in poor families which Verzemnieks, (2003) argues accounts for increased risk of infant death. Other indices that sufficient data were not accessed due to conservativeness of the respondents include issues of parental care, preterm delivery, sudden infant death syndrome (SIDS) and injuries arising from suffocation, pregnancy-related complications such as abortion or forced delivery. The study confirmed the effect of accessibility (of modern health services) as a strong factor that

determines level of new born mortality as earlier reported by Etukudo and Ben (2016) and Ben and Lawrence (2023) although only skeletal evidence subsists that new born mortality has ever been caused by such factor. Also, the study correlated Etukudo and Ben (2014) study findings on the effect of waiting time, distance to the nearest health facility, transport cost, among others as possible factors that determine the level of use of health care services and mortality of child and the mother.

Recommendations

It is important in view of the findings of this study to make the following recommendations to help contend the ugly incidence of infant mortality in parts of Akwa Ibom State.

i) To establish a data pool on vital events in the state and enforce a compulsory reporting and documentation of such vital occurrences that would not give up to date information about the new born but also would guide relevant policy and programmes.

ii) To articulate specific programmes and actions that could facilitate complete control perhaps eradication of the direct and proximate causes of infant diseases, for example, compulsory pre-natal and post-natal services consumption by all mothers and the introduction of mobile-health policy in every part of the State.

iii) To adopt adequate and enforceable laws that would help to strengthen the policies and programmes meant to protect the lives of infants and relief parents and families of unexpected loss.

Conclusion

Life and death are inevitable natural phenomena. The incidence of death cannot be exterminated in human life and the human society no matter how remote or developed such a society is, since it is, like birth a natural phenomenon that is exclusively divine. However, what is disgusted is it occurrence from factors that could be put under control if not totally eliminated. It is sad that despite the huge resources and efforts committed to check infant deaths from causes such as diseases, the incidence still occurring untimely particularly in the rural areas, thus, the

significance of this study which was to investigate disease prevalence and infant mortality in the rural areas of Akwa Ibom State, Nigeria. It is hope that the recommendations made in this paper, would serve in a great extent as panacea to the incidence of infant mortality in the study area.

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