Impact of Primary Health Care Services on Rural Households' Mortality in Taraba State, Nigeria

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Abstract

This study investigated the impact of primary health care services on mortality rates among rural households in Taraba State, Nigeria. Primary data were collected through questionnaires with closed and open-ended questions, with a total of 384 copies of the questionnaire administered via a simple random sampling technique out of which 362 questionnaires were returned for analysis. The study employed various analytical methods, including descriptive statistics and ordinary least square regression. The findings of the study indicated that healthcare services and laboratory services have a negative impact on mortality rates, whereas maternal and child health care services are associated with an increase in rural household mortality. Importantly, all the variables examined demonstrated statistical significance. Consequently, this study recommends the development of health policies at the state and local government with the primary goal of ensuring that all primary healthcare centres throughout the state provide essential health services to rural communities. Additionally, it recommends that there is a need to allocate adequate financial resources to support these initiatives, as well as to implement immunization programs, basic education, and public awareness campaigns across the state.

Keywords: Availability, Accessibility, Acceptability, Affordability, Healthcare, Rural household mortality & Primary healthcare,

Introduction

Since its establishment in 1948, the World Health Organization (WHO) has continually sought various approaches to provide comprehensive support to countries in their ongoing battle against health challenges (WHO, 2022). Notably, a significant portion of the global population, particularly in developing nations, lacks access to adequate healthcare facilities (UNICEF, 2017). The deficiency in healthcare resources significantly impacts people's quality of life, leading to low educational attainment, and perpetuating the cycle of poverty, substandard living conditions, inadequate nutrition, poor sanitation, and the absence of safe drinking water. Consequently, a substantial disparity in resource allocation for health improvement exists between developed and developing nations (WHO, 2022).

On the 12th of September 1978, the Alma-Ata declaration stressed the importance of healthcare delivery, emphasizing primary health care tailored to the fundamental healthcare needs of the masses. This approach entails healthcare that is practical, scientifically sound, economically viable, and socially acceptable to individuals and families within a community. Furthermore, it promotes community participation, ensuring affordability throughout all stages of development, while fostering the spirit of self-reliance and self-determination (WHO, 2022). Primary health care (PHC) forms an integral component of a nation's healthcare system, serving

as its central function and primary focus, while also playing a critical role in the broader socioeconomic development of the community (Macinko et al, 2009).

The ultimate objective of PHC is to render healthcare delivery acceptable, accessible, and affordable, particularly to impoverished and rural populations (FMOH, 2014). Unfortunately, rural areas frequently experience inadequate healthcare services, particularly for individuals with severe or chronic illnesses, leading to unmet healthcare needs. This creates a pressing need for the enhancement and provision of high-quality healthcare services for rural households and suburban areas, with the aim of mitigating the substantial mortality rates in these regions.

In the context of Taraba State, numerous healthcare programs have been initiated to extend healthcare services to remote communities where primary health care (PHC) operates. These programs encompass immunization, antenatal care, family planning, laboratory services, childbirth and neonatal healthcare, minor surgical procedures, and treatment of minor ailments. Despite the implementation of these diverse healthcare programs, the desired outcomes have yet to be realized. It is evident that the primary health care system in the state faces significant challenges, as the government's primary focus is directed towards secondary and tertiary healthcare. This skewed allocation of resources may be contributing to the high incidence of infant and maternal mortality. Inadequate management of the primary healthcare system and, in particular, health centres has played a substantial role in exacerbating childhood morbidity and mortality.

This study, therefore, investigated the impact of primary health care services on rural household mortality in Taraba State, aiming to discern the patterns and prevalence of various diseases in the health centres. The insights gleaned from this study have the potential to inform strategies for improving mortality management within health centres. Furthermore, the study will serve as a valuable database for future research endeavours in same subject matter.

Conceptual Clarifications

Child Health Care Services

WHO (2022) defined Child Health Care Services as an aspect of modern health services specifically designed for health promotion, disease prevention and treatment of children under five years of age. Child Health Care Services provides a channel through which medical and health care services can be organized to improve the health and well-being of the child, prevent diseases and promote growth and development (Liang *et al*., 2019). Child Health Care Services are geared towards the totality of medical and non-medical care of children to protect and promote their health in such a manner that will permit them to come into adulthood at their optimal stage of development physically, mentally and socially. The concern for child health should ante-date conception and extends through the final phase of growth in the period of adolescence. This is because the care of an unborn child is provided by adequate supervision of the pregnant woman and obstetrical care at the time of delivery directly reflects and contributes to the well-being of the health of the child.

Acceptability

Acceptability involves the cultural, social, and psychological factors that influence whether individuals and communities are willing to seek and use primary healthcare services. It considers factors like the availability of services that align with local beliefs and practices, the quality of care provided, and the attitudes of healthcare providers. Doctor et al (2011) stated that, for PHC to be socially acceptable, it should address the community's felt needs. Health problems should be identified in the light of social and economic needs and not professionally perceived needs that are imposed on the community. The people have to be conceived via

dialogue and persuasion. The people must be taken in confidence from the beginning because health programme without community involvement of participation is bound to fail.

Accessibility

Accessibility encompasses the physical proximity and availability of healthcare services. In rural areas, geographical barriers, inadequate infrastructure, and transportation difficulties often hinder access to healthcare facilities. Evaluating the accessibility of primary healthcare services in Taraba State involves assessing the distribution of facilities, the transportation options available to rural households, and any barriers preventing timely access to care. Improved accessibility can contribute significantly to reducing mortality rates by ensuring timely intervention and treatment. Shehu (2000) suggested that for PHC to be universally accessible services provided should be geographically and functionally within the reach of the whole community that stands for equity and social justice. It is the government's obligation to make PHC accessible to all, no one should be discriminated against on the grounds of social or economic status. Geographically, accessibility implies that services should be close to where people work and live and should not travel long distances to seek health care. Financial accessibility implies that services should be provided or made at an affordable cost to individuals in the community while functionally means the right kind of health care should be available continuously to those who need it, whenever they need it and should be trained health workers.

Affordability

Affordability refers to the financial feasibility of accessing healthcare services. It encompasses not just the cost of treatment but also the related expenses like transportation, medication, and consultation fees. In rural areas, affordability becomes a significant factor due to limited income sources and potentially high healthcare costs. According to the Federal Ministry of Health (FMOH, 2014) in the spirit of justice and equity, the federal government is determined to set in motion the process that will ensure that every Nigeria obtains the health services she or he needs, when and where it is needed, at a cost the country can afford. It is also determined to ensure that the people participate fully in the provision of services, which means that at the village or street level, the community must be involved in planning, implementing, and managing the system which must be under control. Monekosso (1992) wrote that the fundamental strategies of the PHC approach can be best observed (evacuated) within well-defined distinct, which in this country we call Local Government Areas. It is within this smallest viable politico-administrative unit that individuals, families, and communities living in distinct villages can forge a partnership with their government, represented at this level by frontline workers of the different socio-economic sectors, including health. They can also select health-related strategies that they can afford through their self-help initiative supple mental by government resources.

Health Care Policies in Nigeria

The overall national policy for Nationwide Health Care Services was clearly stated in the 1954 Eastern Nigeria government report on "Policy for Medical and Health Services." The report stated that the aim was to provide national health services for all. The report emphasized that since urban services were well developed (by our standards then), the government intended to expand rural services. These rural services would be in the form of rural hospitals of 20- 24 beds, supervised by a medical officer, who would also supervise dispensaries, maternal and child welfare clinics and preventive work (such as sanitation workers). The policy made local governments contribute to the cost of developing and maintaining such rural services, with grants-in-aid from the regional government.

By the time the Third National Development Plan was produced in 1975, more than 20 years after the report mentioned above, not much had been done to achieve the goals of the Nationwide Health Care Services Policy. This plan, which was described by General Yakubu Gowon, the then Head of the Military Government, as "A Monument to Progress", stated, "Development trends in the health sector have not been marked by any spectacular achievement during the past decade". This development plan appeared to have focused attention on trying to improve the numerical strength of existing facilities rather than evolving a clear healthcare policy.

In addition, The Fourth National Development Plan (1981- 1985) addressed the issue of preventive health services for the first time. The policy statement contained in this plan called for the implementation of the Basic Health Services Scheme (BHSS), which provides for the establishment of three levels of healthcare facilities; namely 1) Comprehensive Health Centres (CHC) to serve communities of more than 20, 000 people; 2) Primary Health Centres (PHC) to serve communities of 5000 to 20, 000 persons; and 3) Health Clinics (HC) to serve 2000 to 5000 persons. Thus, a CHC would have at least 1 PHC in its catchment area (ideally 4) and a PHC would have at least 1 HC in its catchment area (ideally 2). These institutions were to be built and operated by state and local governments with financial aid from the federal government. By this policy, the provision of health services would be the joint responsibility of the federal, state, and local governments. In its outlook, this policy is not different from the one published in 1954 by the Eastern Nigerian Government previously mentioned.

Nigeria is currently made up of 36 states and 774 local government areas. Each local government area (LGA) is made up of between 150,000 to 250,000 people. By the scheme proposed in the Fourth National Development Plan, each LGA would have a minimum of 7 PHCs and 30 HCs with at least one CHC at the apex of the health care services. The larger LGAs would each have, at least 12 PHCs and 50 HCs feeding into one or more CHCs. Nigeria has not come close to achieving this lofty objective. Services that existed were deteriorating hopelessly, leading to various industrial actions by all classes of doctors in the 1980's. This has continued even today.

On the last day of 1983, a new Military Government came into being in Nigeria and one of the reasons it gave for the Military intervention was the poor state of health services, declaring "our teaching hospitals have been reduced to mere consulting clinics." One of the government's first efforts was to revise the Fourth National Development Plan. The health strategy under this revised plan gradually shifted emphasis to primary health care. Although this has always been the ultimate goal of the plan, the political will did not seem to exist for its implementation. The adoption of the WHO target of Health for all by the year 2000 by the federal government was marked by shifts in emphasis and structural changes in the health administration.

At the federal level, the Directorate of National Health Planning had the function of coordinating and implementing the national health policy. It also had the function of developing plans for national health. At the state level, were state health advisory councils whose function it was to give general advice to the Commissioner of Health in the performance of his functions. At the local government level, the State Ministry of Local Government in consultation with the State Ministry of Health established Local Government Health Committees covering their area of authority for the purposes of formulating policies for providing health services to the communities. At the community level, several small communities had evolved small community primary health care services with active community participation.

In more recent Nigeria, this lofty goal has not been achieved. The capacities of the facilities that emerged from previous efforts have been stretched and infrastructure broken beyond

repair. Primary health care services now exist only in name. The common man has reverted to the herbalist and traditional healers for care because of access and affordability issues. The elites have perfected medical tourism to India, Singapore, South Africa, and even Ghana. This is in the face of rapidly changing disease patterns in which infectious diseases have been replaced by behavioural, environmental, and poverty-related diseases.

According to a report, there were 44,600 hospital beds in 1979 spread throughout 562 General Hospitals, 16 Maternity and Paediatric Hospitals, 11 Armed Forces Hospitals, 6 Teaching Hospitals, and 3 Prison Hospitals. There were also reportedly 1240 Maternity Health Centres, 930 Maternity Homes, 2740 General Clinics, and 600 Health Centres. In 1985, 3, 023 hospitals operated by state governments accounted for 47% of hospital beds, while 84 federal institutions contributed 13% of the total. The remaining beds were supplied by 1, 436 private hospitals (14% of the total beds) and 6331 health institutions controlled by local governments (11% of the total beds) (Scott-Emuakpor, 2010). Moreover, healthcare policies have evolved over the years and have been transformed from period to period to cater for the health needs of the nation. These policies include: The National Health Policy and Strategy to Achieve Health for All Nigerians launched in 1988, was Nigeria's first comprehensive national health policy (FMOH, 2014). This was subsequently revised in 2004.

However, it has become necessary to develop a new national health policy to reflect new realities and trends, including the unfinished agenda of the Millennium Development Goals (MDGs), the new Sustainable Development Goals (SDGs), emerging health issues (especially epidemics), the provisions of the *National Health Act 2014*, the new PHC governance reform of bringing PHC Under One Roof (PHCUOR), and Nigeria's renewed commitment to universal health coverage (SDGs, 2015). It has also become imperative to develop strategies to respond adequately to globalization, climate change, and the challenges of insurgency and its impact on the Nigerian health system.

In addition, the country's experiences in the implementation of the *Revised National Health Policy 2004* and the *National Strategic Health Development Plan (2010-2015)* have provided a basis for the development of a new National Health Policy. This new health policy comes at an opportune time, following the passage of the *National Health Act 2014*. The Act provides the legal framework for the new National Health Policy in Nigerian economy.

The Facilities and Materials Essential for PHC Delivery

World Health Organization (2022) recognized hospital, clinics, ambulances, and maternity as viable facilities for the successful attainment of health care delivery. He elaborated that a meaningful hospital as a health care facility is one that has all the various arms functioning with human and material resources. Quinlan (2022) in his own contribution wrote that the traditional healer's home can be considered a health facility for delivering health care services to rural dwellers. Woolley et al (2008) expressed that at the primary level, assorted health centres, clinics, and dispensaries present very important facilities aiding health care delivery in rural areas. To Sekagya et al. (2023), health care facilities as those things that are used for the promotion of health care services such as, antenatal clinics for babies, and immunization. It is also important to point out that health post, and chins, primary health centres and comprehensive health centres established in rural areas are some of the facilities that aid in healthcare delivery. Motorable roads and mobile clinics are important facilities for health care delivery. In conclusion, healthcare facilities from a traditional healer's home to a teaching hospital with all the accompanying equipment and drugs do a tremendous job of delivering healthcare to people. In rural areas, the absence of motorable roads which are regarded as facilities will affect the delivery of health care services because the personnel, equipment, and drugs needed for the health care services cannot reach such areas.

Theoretical Framework

This study is anchored on the Behavioural Model of Health Service Theory. This model was proposed by Andersen and Newman (1960). The framework was first developed in the 1960s and was designed to understand the conditions that predict the utilization of health care services in the US. However, the framework has been adapted in research outside the US as described in a systematic review of studies using the model between 1998 and 2011. The model views utilization of health services as a form of individual behaviour that is determined by individual characteristics of people which are influenced by societal and health systems determinants. The societal determinants (technology and societal norms such as health care financing) affect the individual determinants directly and through the health system determinants (resources - volume and distribution of labour and capital for health care, and organization – patient access to the medical care system, and structure what happens after entry into the system). The individual characteristics that predict the use of health services are classified into three: the predisposition of an individual to use health services (predisposing factors), the ability to secure services (enabling factors), and illness level (need factors).

Predisposing factors include demographic characteristics such as age, sex, marital status, past illness, social structure (education, race, occupation, family size, ethnicity, religion, and residential mobility) and beliefs (values about health and illness, attitudes toward health services/providers, knowledge about disease). Previous research shows that the demographic characteristics of individuals predict their health behaviour. For instance, being in a marital union is associated with better health and health-related behaviour (Musick & Bumpass, 2012). The past illness factor suggests that past experience of pregnancy and childbirth, parity, and experience of using a health care facility may affect the use of a primary health care facility for maternal care (Andersen & Newman, 2005).

The enabling factors refer to the means available to individuals to achieve a need to use a health service. Enabling factors include family resources (income, level of health insurance coverage, or other source of third-party payment, type of regular source of care, the nature of that regular source of care, and accessibility of the source) and community characteristics (ratio of health personnel and facilities to population in a community, price of health services, region, urban-rural location).

This implies that women's ability to use maternal health facilities will depend on the availability of such facilities and their possession of the means to access the facilities. The need factors include perceived illness or the probability of its occurrence by the individual or her family (disability, symptoms, diagnosis, general state –such as number of days during which the individual is unable to do her usual work such as house chores, care of children, experience of symptoms, self-report of general state of health), and evaluation of the condition (symptoms and diagnosis – attempts to get at the actual illness and a clinical assessment of the severity).

Andersen and Newman (2005) explained these factors represent the most immediate determinants of health service utilization in society. This study focuses on the assessment of the impact of primary health care services on rural household mortality in Taraba state, Nigeria. As seen in the model, it stands to assess the macro level of the health care services system, and the study also tends to look at how health care services can be effectively carried out in rural and sub-urban areas of Taraba state.

Empirical Literature Review

This study has been constrained by few empirical studies in Nigeria and Taraba State in particular. Notwithstanding, it has reviewed the available studies which form the basis for the empirical literature as follow: Mangnani *et al* (2019) studied the impact of primary health care

on under-five (5) mortality in Niger State using descriptive analysis. It concluded that the findings are largely supportive of the key premise underlying selective primary health care interventions that packages of basic services can be effectively mounted nationally in poor countries and have a significant impact over a short period. In Niger State, less than optimal implementation of the Village Health Team appears to have reduced the magnitude of the mortality rate in the study area. In addition, a study by Oyekale (2017) assessed primary healthcare facilities' service readiness in Nigeria in relation to mortality rate. The data were collected from 2480 healthcare facilities from 12 states in Nigeria's 6 geopolitical zones between 2013 and 2014. Data were analysed with descriptive statistics, Principal Component Analysis (PCA), and Ordinary Least Square regression. The study submitted that the presence of primary healthcare facilities in the areas has reduced the mortality rate.

More to that, Okonofua *et al* (2018) examined predictors of women's utilization of primary health care for skilled pregnancy care in rural Nigeria. The study applied the method of a cross-sectional community-based study conducted in Esan South East and Etsako East LGAs of Edo State, Nigeria. A total of 1408 randomly selected women of reproductive age were interviewed in their households using a structured questionnaire. The data were analyzed using descriptive and multivariate statistical methods. Their study concluded that efforts devoted to addressing the limiting factors (distance, costs and quality of care) using creative and innovative approaches will increase the utilization of skilled pregnancy care in PHCs and reduce maternal mortality in rural Nigeria. In the same vein, Daniel *et al* (2016) assessed Primary Health Care System Performance in Nigeria: Using the Primary Health Care Performance Indicator Conceptual Framework. The study showed that Nigeria has a relative abundance of PHC centres, reasonable geographic access to PHC, and relatively high health worker density but the rate of mortality rate was high in the country.

Omoluabi (2016) similarly noted that healthcare in Southern Nigeria is better equipped with medical personnel than most of the ones in Northern Nigeria. It was highlighted that working conditions, availability of medical equipment and some intangible benefits would, among others, influence ability to retain a qualified medical staff in Nigeria and reduce the rate of mortality while in the northern Nigeria, these health facilities were lacking in this part of the country which mortality rate becomes order of the day. Eboreime *et al* (2015) concluded that there are some gaps between accesses to healthcare facilities across Nigerian geopolitical zones. These differences have been reported as the major supply-side factor affecting utilization of healthcare services in Nigeria and which have increased the incidences of high mortality.

Furthermore, Aighbiremolen *et al* (2014) studied *Primary Health Care in Nigeria from Conceptualization to Implementation*. They maintained that concept of primary health care is still relevant to achieving equitable and equal health care for all Nigerians. However, a persistent effort at implementation at all levels is necessary to maximize the benefits of this people-oriented approach to health care. Egbewale and Odu (2012) studied the perception and utilization of primary healthcare services in a semi-urban community in southwestern Nigeria. The study was a descriptive cross-sectional study conducted in Olorunda Local Government Area of Osun State, Nigeria. A multistage sampling technique was used to recruit adults above the age of 18 years. Three hundred and ninety-five individuals were involved in this community-based study. The interview was conducted using a semi-structured questionnaire to obtain relevant information. The study demonstrated a high awareness level of the PHC system among the population studied. However, utilization of the facilities was still very low. The study, therefore, recommends that managers of this health institution put in place programs and schemes that will facilitate more effective service delivery, especially in relation to the workers in this health sector. In addition, orientation programs lauding the benefits of the PHC

facilities to correct wrong opinions about PHC among local communities and the creation of good access routes that link primary health centres to the communities were also recommended to the managers of PHC to enhance utilization of services. Apart from that, Roberts et al. (2008) in their study, *Getting Health Reform Right: A Guide to Improving Performance and Equity in Nigeria*, pointed out that anaemia was a significant contributor to maternal mortality in Nigeria.

Almost all the reviewed studies employed mainly descriptive analysis for data analysis and were not conducted in rural areas of Taraba State. Again, none of the studies which was conducted to assess the impact of primary health services on rural household mortality in the State. Furthermore, some of the studies reviewed use descriptive statistics as a method of data analysis. However, this current research will use both descriptive, component analysis, and ordinary least square methods to assess the impact of primary health care services on rural household mortality in Taraba state, Nigeria.

Methodology

The population of the study consisted of the aggregate of elements in the Northern (1,081,679), Central (1,291,041) and Southern (1,029,352) zones projected at 3,342,762 (National Population Commission [NPC], 2018). The target population is made up of all resident (both male and female) staff and practical students of Primary Health Care Centre, Taraba State. Data were analysed within the ambit of descriptive and inferential statistics. For the descriptive data, frequency and percentage tables were generated and analysed to answer research questions. Meanwhile, the inferential statistics data were coded and keyed into the computer for analysis with the help of Statistical Package for Social Sciences (SPSS) using the regression statistics tool. The hypotheses were tested at a 5% critical value.

The sample size of this study is 384. The study adopted Krejcie and Morgan (1970) formula arriving at the sample size. The method is depicted as follows:

$S = x^2NP(1-p) \div d^2(N-1) + x^2p(1 - p)$

Where**:** S = required sample size

X^2 = the table of value or chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size,

P = the population proportion (Assumed to be 0.50 since this would provide the maximum sample size), d = the degree of accuracy expressed as a proportion (0.05),

Therefore: - $3.841 \times 3342762 \times 0.50 (1 – 0.05) \div 0.5^2(3342762 – 1) + 3.841 \times 0.50 (1 – 0.50)$

$6419774.421 (0.5) \div 0.0025 (3342761) + 1.9205 (0.5)$

$3209887.2105 \div 8356.9025+0.96025$

$3209887.2105 \div 8357.86275$

$S = 384$

Model specification

The model for this study takes a lead from the model specified by (Isaac, 2016) and it added the and variables of interest as immunization, maternal child health care services, safe water sanitation and public health education as follows:

The functional form of the model is given as:

RHM= F (HCS, MCH, LAB) …….…… …… (1)

It is transformed in the mathematical form as:

$RHM = \alpha_0 + \beta_1 (HCS) + \beta_2 (MCH) + \beta_3 (LAB)$ …… (2)

This function can be written in econometric form for estimation as:

$RHM = \alpha_0 + \beta_1 (HCS) + \beta_2 (MCH) + \beta_3 (LAB) + \mu_t$……..…. (3)

Where:

RHM = Rural households mortality rate

HCS = Health care services

MCH = maternal and child health care services

LAB= laboratory and labour services (test of common disease, antenatal)

Result of the Findings

The analysis and interpretation of findings drawn from data collected during the field survey conducted in rural areas of Taraba State from 2020 to 2021 are presented in Table 1. The objective of the study was to quantitatively assess the impact of primary healthcare services on rural household mortality, specifically focusing on under-five mortalities in the state.

Primary Health Care and Mortality

Table 1: Does PHC service reduce the mortality rate in Taraba state?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	171	46.8	47.2	47.2
	Disagree	157	43.0	43.4	90.6
	Agree	21	5.8	5.8	96.4
	Strongly Agree	13	3.6	3.6	100.0
	Total	362	99.2	100.0	
Missing	System	3	.8		
Total		365	100.0		

Source: Author's Computation Using SPSS, Version 23 on Field survey, 2020.

In Table 1 above, it can be seen that 157 (43.4%) disagreed that Primary Health services has not reduced mortality rate in the study areas. Even, 171 (47.2%) respondents strongly disagree that PHC services has not reduced mortality rate in Nigeria.

Apart from that, 21 respondents agree that PHC services has minimized mortality rate in the state. This position was supported by 13 respondents that strongly agree that PHC services has reduced mortality rate in the study areas. It can also be deduced that the existing Primary Health Care Centres were not providing enough services which greater influences on mortality rate in the state.

Table 1: Primary health care services reduces maternal mortality in the rural communities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	141	38.6	39.0	39.0
	Disagree	192	52.6	53.0	92.0
	Undecided	2	.5	.6	92.5
	Agree	14	3.8	3.9	96.4
	Strongly Agree	13	3.6	3.6	100.0
	Total	362	99.2	100.0	
Missing	System	3	.8		
Total		365	100.0		

Source: Author's Computation Using SPSS, Version 23 on Field survey, 2020.

From Table 2, a majority of respondents (89.8% - the sum of Strongly Disagree and Disagree) express skepticism or disagreement regarding the notion that PHC services reduce the mortality rate in Taraba State. A relatively small proportion (9.4% - the sum of Agree and Strongly Agree) of respondents agrees with the statement. The responses suggest a prevailing sentiment of doubt or disagreement among the surveyed population regarding the effectiveness of PHC services in reducing mortality rates in Taraba State. It can be noticed from the field survey that PHC services did not help in reducing maternal deaths in the study area.

Table 2: The Primary Health Care Service (PHC) is affordable for the rural household in Taraba State?

Variable		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	135	37.0	37.3	37.3
	Disagree	213	58.4	58.8	96.1
	Undecided	2	.5	.6	96.7
	Agree	8	2.2	2.2	98.9
	Strongly Agree	4	1.1	1.1	100.0
	Total	362	99.2	100.0	
Missing	System	3	.8		
Total		365	100.0		

Source: Author's Computation Using SPSS, Version 23 on Field survey, 2020.

From the data in Table 3, significant portion of respondents (around 95.4% when considering 'Strongly Disagree' and 'Disagree' categories together) express some level of disagreement regarding the affordability of PHC services. Only a very small percentage of respondents (around 3.3% when considering 'Agree' and 'Strongly Agree' categories together) express agreement or strong agreement regarding the affordability of PHC services for rural households in Taraba State.

Overall, the data indicates a prevailing sentiment among respondents that PHC services are not affordable for rural households in Taraba State, with a minority expressing some level of agreement. This suggests a potential area of concern or disparity that needs attention and further investigation to address the challenges related to the affordability of healthcare services in rural areas.

Table 43: Through primary health care services, women can go through pregnancy and child delivery safely

Variable		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	6	1.6	1.7	1.7
	Disagree	65	17.8	18.0	19.6
	Undecided	3	.8	.8	20.4
	Agree	244	66.8	67.4	87.8
	Strongly Agree	44	12.1	12.2	100.0
	Total	362	99.2	100.0	
Missing	System	3	.8		
Total		365	100.0		

Source: Author's Computation Using SPSS, Version 23 on Field survey, 2020.

From Table 4 above, it was deduced that women can go through pregnancy and child delivery safely where Primary Health Care services are available. This was noticed by 244 (67.4%) respondents who agreed that where there were PHC services, women deliver safely without complications during child bearing. While it was supported by 44 persons who attested to that by strongly agreeing that where there was PHC service, women delivered safely. But 65 respondents disagree with these responses and even 6 people strongly disagreed in the course of this study.

Table 5: Health policies in Nigeria help in reducing mortality rate in rural areas

Variable		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	135	37.0	37.3	37.3
	Disagree	199	54.5	55.0	92.3
	Undecided	1	.3	.3	92.5
	Agree	19	5.2	5.2	97.8
	Strongly Agree	8	2.2	2.2	100.0
	Total	362	99.2	100.0	
Missing	System	3	.8		
Total		365	100.0		

Source: Author's Computation Using SPSS, Version 23 on Field survey, 2020.

From Table 5 above, it shows that 199 respondents out of the total sample size disagree that health policies do not reduce the mortality rate in Nigeria during the study period. The percentage of these respondents was 55.0% which said that health policies have not in any way reduced mortality in the state. These responses were supported by 135 respondents who strongly disagree that health policies over the years have not reduced mortality in the state. This may be a true situation in the Nigerian economy the infant mortality rate has been on the increasing trajectory in the country.

However, one (1) respondent was neutral about the whole scenario while 19(5.2%) respondents accepted health policies have minimized mortality in the country and the response was corroborated by 8 (2.2%) persons who strongly agreed that health policies have been helping the nation to reduced mortality rate in Nigeria. It can be noticed from Table 5 that health policies have not reduced the mortality over the study period and it portrays Nigeria as a country having the high rate of infant mortality (World Bank, 2019).

Regression results on the Impact of Primary Health Care Services on Rural Households' Mortality in Taraba State, Nigeria

The study conducted regression analysis for the assessment of the impact of primary health care services on rural household mortality rate in Taraba state to uncover the factors influencing the high rate of mortality of under five years infants in the study area.

Table 6: Ordinary Least Squares (OLS)

Dependent variable: Rural household mortality (RHM)

Independent variable	Co-efficient	Standard Error	T-Ratios	Sig
Constant	-.316	.036	.000	1.000
Health care service (HCS)	-.509	.063	1.906	.057
Maternal Child Health (MCH)	.435	.052	2.600	.010
Laboratory services (LAB)	-.111	.063	-2.153	.032
R = .650a	R2 = .584	R-2 = .546		D-W =2.260

Source: Author's Computation Using SPSS, Version 23 on Field survey, 2020.

Table 6 presents the results obtained from the regression analysis of the data. It is essential to emphasize that the coefficient of determination, denoted as R, reflects the relationship between the dependent variable, rural household mortality (RHM), and the independent variables, namely healthcare services (HCS), maternal child health (MCH), and laboratory services (LAB). This correlation coefficient provides insights into how these healthcare-related factors influence rural household mortality during the study period, accounting for approximately 65% of the observed changes. Furthermore, the R-squared value (R^2) of 0.587 signifies that roughly 59% of the variation in the dependent variable, rural household mortality rate, can be attributed to the variables included in the model. This indicates that health care services, maternal child health services, and laboratory and labour services collectively explain 58% of the variance in rural household mortality, with the remaining 41% being influenced by other unaccounted factors. After adjusting for other variables, the R-squared value (R-2) remains substantial at 0.546, signifying a robust model suitable for informing policy formulation and implementation based on our research. Notably, the coefficients associated with the independent variables in Table 6 are predominantly negative, except for maternal and child health services, which exhibit a positive coefficient. This alignment with economic theory suggests that higher-quality healthcare services and laboratory services correspond to lower rural household mortality rates, assuming all other factors remain constant. It follows that well-implemented government health policies, funding, and programs would contribute to a decrease in rural household mortality, while their reversal would lead to an increase in mortality rates. Specifically, a 1-unit increase in healthcare services corresponds to a 51% decrease in the rural household mortality rate, addressing the first objective of our study, which aimed to assess the impact of healthcare services on rural household mortality in Taraba state. This impact is, indeed, negative. Conversely, a 1-unit increase in maternal and child health services is associated with a 43.5% increase in the mortality rate within the study area. This observation underscores the fundamental role that the inadequacy of maternal and child health services plays in the persistently high rural household mortality rates in the state, contrary to the expectations of economic theory. This result aligns with our second research objective, which sought to investigate the impact of maternal and child health services. The coefficient of -0.111 units, corresponding to laboratory and labour services, indicates that a 1-unit increase in these services is associated with an 11% reduction in the rural household mortality rate during the study period. Despite this positive influence, it is worth noting that many primary healthcare centres lacked the necessary facilities and equipment for laboratory tests throughout the state. Nevertheless, this finding directly addresses our third research objective, evaluating the impact of laboratory and labour services on mortality rates in the state.

Furthermore, the study applied hypothesis testing to validate our findings. The first hypothesis (Ho1) postulated that healthcare services would not significantly impact rural household mortality rates in Taraba state. However, the calculated T-statistic of 1.906, exceeding the critical value, led us to reject this null hypothesis. Our results were also substantiated by a probability value of 0.050, which is less than the standard threshold of 0.05, thereby affirming

that healthcare services have a statistically significant negative impact on rural household mortality, in agreement with Aigbiremolen et al (2014) who discussed the role of Primary Health Care in Nigeria. Similarly, the second hypothesis (Ho2) posited that maternal and child health services would not significantly affect rural household mortality rates in Taraba state. The T-statistic of 2.600, surpassing the critical value, allowed us to reject the null hypothesis, indicating a statistically significant positive impact of maternal and child health services on rural household mortality rates. This outcome was supported by a P-value of 0.010. Lastly, our third hypothesis (Ho3) questioned whether laboratory and labour services would influence rural household mortality rates in Taraba state. The T-statistic of -2.153, exceeding the critical value, led us to conclude that laboratory and labour services have a statistically significant negative impact on rural mortality rates, as supported by a P-value of 0.032. Additionally, the Durbin-Watson statistic (D-W) of 2.260 revealed the absence of autocorrelation in our analysis, confirming the reliability of the results and the absence of spurious regression. Hence, the findings are well-suited for generalization in the field of health economics and provide a robust basis for policy recommendations and implementation in Taraba state. In conclusion, this study sheds light on the impact of primary healthcare services on rural household mortality in Taraba state. The research highlights the substantial mortality rates in the state and the inadequacy of primary healthcare services to mitigate their economic implications. Our findings confirm that healthcare services have a negative impact on rural household mortality, while maternal and child health services exert a positive influence. Laboratory and labour services also contribute negatively to rural household mortality. These results provide valuable comprehensions for policymakers and contribute to the broader field of health economics.

Conclusion

This study on the impact of primary healthcare services on rural household mortality in Taraba state has yielded valuable insights into the dynamics of healthcare and its consequences on mortality in the region. The study findings reveal that health care services, maternal and child health services, as well as laboratory and labour services, played pivotal roles in shaping rural household mortality throughout the period of the study. These factors emerged as the primary determinants of both infant and maternal mortality rates in Taraba state. Healthcare services and laboratory services exhibited a negative influence on the mortality rate, suggesting that an increase in the quality and accessibility of healthcare and laboratory facilities corresponded to a decrease in rural household mortality. This underscores the importance of well-implemented government health policies, finances, and programs, which, when properly executed, are capable of reducing mortality rates in the region. Conversely, maternal and child health services had a positive impact on rural household mortality. Unfortunately, the inadequate provision of these services in the study areas contributed to the persistently high mortality rates among mothers and infants. This positive impact was contrary to the expectations of economic theory, emphasizing the pressing need for improved maternal and child health services in Taraba state. It is noteworthy that all the variables under consideration in our analysis displayed statistical significance, providing robust evidence for the validity of our findings. In sum, our research has demonstrated that healthcare-related factors are of utmost importance in shaping the mortality landscape in Taraba state.

Recommendations

Based on the findings of the study, the following recommendations were made;

i. The state and local government in Taraba State should make health policies aimed at ensuring all primary healthcare centres across the state, provide basic health services for rural dwellers to reduce the mortality rate.

ii. The Taraba State government as a major player in the health sector should supply facilities
and equipment for laboratory tests in each primary health care centre in the state with qualified health personnel to use those gargets appropriately to reduce the rural mortality rate in Taraba State.

iii. The Ministry of Health in Taraba State should curtail maternal deaths and infant mortality
through adequate funding, immunizations, provision of basic education, and sensitization campaigns across senatorial districts.

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