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Research Paper

Culture, Health care Services, Location, and Maternal Mortality in the Southern Senatorial Zone of Taraba State, Nigeria

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Abstract

Maternal mortality remains a critical challenge in Nigeria, particularly in rural areas like the Southern Senatorial Zone of Taraba State, where cultural, healthcare, and geographical factors intersect. This cross-sectional study surveyed 1,218 women aged 15–49 (1,147 responses analyzed) using structured questionnaires to investigate the determinants of maternal mortality. Multiple linear regression was used to assess the influence of cultural factors, quality of health care services, and geographical location, guided by the Social Determinants of Health framework. All factors were significantly associated with maternal mortality ($p < 0.001$). Cultural factors had the most substantial effect ($\beta = 0.675$), followed by geographical location ($\beta = 0.578$) and quality of healthcare services ($\beta = -0.531$), indicating that harmful cultural practices and geographical barriers increase mortality, whereas better healthcare quality reduces mortality. This study uniquely integrates sociocultural, systemic, and spatial determinants, recommending culturally sensitive interventions, enhanced healthcare infrastructure, and improved geographical access to reduce maternal mortality in marginalized settings.

Keywords: *maternal mortality, cultural factors, health care quality, geographical barriers, Taraba State, Nigeria, Social Determinants of Health.*

INTRODUCTION

Maternal mortality remains a global health concern, with enduring implications for women's rights, public health, and development. This crisis is more pronounced in sub-Saharan Africa, which accounts for 68% of all maternal deaths globally. Nigeria alone contributes approximately 19% of this burden, with a maternal mortality ratio (MMR) of 814 per 100,000 live births (Okonofua et al., 2022). In 2025, the rate remains unacceptably high, indicating stagnation in maternal health outcomes despite global and national efforts. The COVID-19 pandemic disrupted already fragile healthcare systems, strained resources, and deepened inequities in maternal care delivery, particularly in underserved rural regions (UNICEF et al., 2025). Therefore, urgent scholarly attention is needed to understand why maternal mortality persists at crisis levels and what contextual factors drive this stagnation in specific locales such as the Southern Senatorial Zone of Taraba State, Nigeria.

Nigeria's failure to significantly reduce its MMR threatens the attainment of Sustainable Development Goal (SDG) 3, which targets a global MMR of less than 70 per 100,000 live births by 2030 (Okonofua et al., 2022). This approach undermines the AAUCs' Agenda 2063, which prioritizes equitable access to quality health care for all (African Union, 2023). Within this broader context, sub-national disparities remain vast and poorly understood. While national averages obscure regional inequalities, localized studies reveal that rural women—especially those living in geographically isolated, culturally conservative, and infrastructurally weak communities—face the highest risk of maternal death.

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Although the biomedical causes of maternal mortality are well documented—postpartum hemorrhage (30.7%), hypertensive disorders (17.1%), and circulatory complications (8.1%)—these medical statistics do not fully explain the enduring nature of maternal deaths in Nigeria (Zalvand et al., 2019). Increasingly, researchers and health policymakers have acknowledged that maternal mortality is a clinical issue and a social phenomenon shaped by intersecting cultural, economic, and environmental determinants (Hamal et al., 2020).

In rural Nigeria, cultural beliefs and gendered power dynamics significantly influence maternal health-seeking behavior. Harmful norms, including early marriage, the valorization of home births, spiritual interpretations of illness, and male-dominated decision-making—contribute to delays in seeking and receiving appropriate care (Najafizada et al., 2017; Omer et al., 2021). Furthermore, religious fatalism and trust in traditional birth attendants (TBAs) often supplant biomedical care. These sociocultural barriers are compounded by systemic weaknesses in healthcare delivery—chronic underfunding, staffing shortages, inadequate referral systems, and geographical obstacles, such as hilly terrain, seasonal inaccessibility, and poor transport infrastructure (Sumankuuro et al., 2018; Meh et al., 2019; Olawade et al., 2023).

The Southern Senatorial Zone of Taraba State, located in Nigeria's Northeastern region, exemplifies these interlocking vulnerabilities. Home to largely agrarian and ethnic minority populations, the region has long been marginalized in national development planning. Despite repeated interventions by local and international stakeholders, maternal mortality rates in the area remain disproportionately high. Many healthcare facilities in the zone operate with limited personnel, inadequate equipment, and sporadic drug supply. Simultaneously, patriarchal norms and spiritual beliefs persist, often discouraging antenatal visits, institutional deliveries, and emergency referrals.

The problem, therefore, is that maternal mortality in the Southern Senatorial Zone of Taraba State remains unacceptably high because of the intersection of harmful cultural practices, poor-quality healthcare services, and geographical inaccessibility. This study was designed to investigate this multidimensional challenge through the following research questions:

1. How do cultural beliefs and practices influence maternal mortality outcomes in the Southern Senatorial Zone of Taraba State?
2. What role does the quality and availability of health care services play in shaping maternal health outcomes?
3. In what ways do geographical barriers affect women's access to maternal healthcare?

Guided by the Social Determinants of Health (SDH) framework (Solar & Irwin, 2010), this study conceptualizes maternal mortality as a product of intersecting structural, sociocultural, and spatial inequalities. Employing a quantitative survey methodology using structured questionnaires, the research captures measurable data on cultural beliefs, healthcare service quality, and geographic accessibility in the Southern Senatorial Zone of Taraba State. Theoretically, the study advances the SDH framework by applying it within rural Nigeria's specific sociocultural and geographic context, thereby explaining how these factors collectively influence maternal health outcomes. The findings aim to inform evidence-based policies and interventions that prioritize culturally sensitive health education, enhancement of healthcare infrastructure, and tailored strategies to overcome location-based barriers, contributing to reducing maternal mortality in marginalized rural settings.

LITERATURE REVIEW

Theoretical Framework

This study is fundamentally underpinned by the Social Determinants of Health (SDH) theory, which provides a robust framework for understanding the complex and interconnected factors that influence health outcomes, including the critical issue of maternal mortality in the Southern Senatorial Zone of Taraba State. The SDH framework posits that health is not solely a product of individual biology or healthcare access but is significantly shaped by the broader social, economic, and environmental conditions in which people are born, grow, live, work, and age (Solar & Irwin, 2010). Specifically, the SDH framework is apt for examining how cultural norms, access to healthcare services, and geographical location collectively contribute to maternal mortality. These determinants interact in ways that extend beyond biological risks, revealing systemic disparities rooted in social structures. By adopting this theoretical perspective, this research moves beyond a narrow biomedical perspective to comprehensively analyze the systemic factors contributing to maternal deaths in the study area. Thus, this framework guides the study of how sociocultural practices, health system quality, and geographic challenges jointly influence maternal health in the Southern Senatorial District of Taraba State.

Concept of Maternal Mortality

Maternal mortality, defined as the death of a woman during pregnancy, childbirth, or within 42 days after delivery, remains a significant global public health concern. According to the World Health Organization (WHO), approximately 810 women die daily due to preventable causes related to pregnancy and childbirth. Sub-Saharan Africa and Southern Asia carry the highest burden, accounting for nearly 86% of global maternal deaths. These statistics highlight the urgent need for targeted interventions in resource-limited settings (WHO, 2015).

Cultural Factors and Maternal Mortality

Cultural norms profoundly influence maternal mortality by shaping health-seeking behaviors and access to care (Uzochukwu et al., 2017; Adedokun et al., 2023). In low- and middle-income countries, sociocultural practices often override biomedical recommendations, delaying or preventing access to skilled care (Sumankuuro et al., 2018). For instance, Omer et al. (2021) found that in South Punjab, Pakistan, low female status, male dominance, early marriages, and reliance on traditional birth attendants (TBAs) significantly increase maternal mortality risks. Similarly, in rural South Africa, Marabele et al. (2020) identified cultural beliefs, such as postpartum bleeding rituals and misconceptions about hypertension, as contributors to maternal deaths. In Nigeria, Akpabio et al. (2020) reported that cultural practices, including taboos restricting women's mobility, account for 49% of maternal deaths in Calabar. Adesuyi et al. (2021) further noted that child marriage and patriarchal control in northern Nigeria limit women's health decision-making autonomy, worsening the risks.

In North-East Nigeria, Uzochukwu et al. (2017) found that low female autonomy, rooted in cultural patriarchy, reduces antenatal care attendance and delays emergency responses, aligning with the Three Delays Model's first delay: deciding to seek care (Thaddeus & Maine, 1994). The distinction between knowledge (factual awareness of health risks) and perception (subjective beliefs) is critical. Stephenson et al. (2006) argued that misperceptions, such as underestimating obstetric risks or viewing hospital births as unnecessary, always outweigh the lack of knowledge in delaying care-seeking. In Taraba's Southern Senatorial Zone, practices like the seclusion of pregnant women and reliance on traditional medicine likely stem from both limited knowledge and cultural perceptions prioritizing spiritual or traditional remedies over biomedical care. These perceptions are reinforced by community trust in TBAs, who are seen as culturally legitimate

despite lacking formal training (Gabrysch & Campbell, 2009). This study hypothesizes that such cultural factors, measured using a composite index (e.g., TBA preference, male dominance), significantly predict maternal mortality in Taraba, thereby warranting culturally sensitive interventions.

Religious Influences on Maternal Mortality

Religion, while closely linked to culture, exerts distinct and significant influences on maternal health decisions, often through doctrinal beliefs, religious leadership, and spiritual practices that shape care-seeking behaviors. In Sub-Saharan Africa, religious beliefs can either facilitate or hinder access to maternal healthcare, depending on their interpretation and application. Gyimah et al. (2006) found that in Ghana, religious practices such as fasting during pregnancy, faith-based objections to hospital births, and reliance on prayer for healing reduced facility-based deliveries by 15%–20% among confident Christian and Muslim communities. These practices reflect doctrinal beliefs prioritizing spiritual intervention over biomedical care, particularly in Pentecostal and charismatic Christian groups.

In Nigeria, religious influences are pronounced throughout the country's diverse religious landscape. Among Muslim women, the practice of purdah (seclusion) restricts mobility, limiting access to antenatal and obstetric care, especially in rural northern regions (Adamu et al., 2019). Al-Mujtaba et al. (2016) reported that in northern Nigeria, Islamic teachings interpreted by some community leaders discourage hospital deliveries, favoring home births attended by TBAs, which increases risks of complications like postpartum hemorrhage. Christian communities, particularly in rural areas, may prioritize prayer camps or church-led healing sessions over medical facilities, viewing obstetric complications as spiritual afflictions requiring divine intervention (Okeke et al., 2014). Ganle (2015) noted that some Christian women delayed seeking care in Ghana due to beliefs that prayer could resolve complications.

Traditional religions, which are practised by 6.5% of the study population, further complicate maternal health outcomes. Okeke et al. (2014) observed that in rural Nigeria, traditional religious beliefs often attribute pregnancy complications to witchcraft or ancestral curses, prompting women to seek spiritual healers or diviners instead of skilled care. In Taraba's Southern Senatorial Zone, anecdotal evidence suggests that traditional rituals, such as offerings to appease spirits, delay emergency care, particularly in remote communities with limited health facilities.

Religious leaders also play a fundamental role. Al-Mujtaba et al. (2016) found that in northern Nigeria, imams and pastors influence health-seeking behaviors, with some discouraging medical interventions due to distrust in modern health care systems. Conversely, faith-based organizations can promote maternal health when aligned with public health goals, as seen in programs training religious leaders to advocate for facility-based deliveries (Ganle, 2015). In Taraba, where Islam and traditional religions coexist with Christianity, these dynamics likely amplify delays in care-seeking because religious beliefs intersect with cultural practices like TBA preference and geographical barriers (e.g., hilly terrain).

Quality of Health Care Services and Maternal Mortality

The quality of maternal health care services is a critical determinant of maternal mortality, with evidence linking high-quality care to reduced MMR (Ozimek & Kilpatrick, 2018). Quality encompasses structural factors (e.g., availability of skilled personnel and essential drugs) and process factors (e.g., provider responsiveness and patient-centred care) (Kruk et al., 2018). In India, Lee et al. (2022) found that districts with high-quality maternity and newborn services reported lower neonatal and maternal mortality, driven by institutional deliveries. However, quality improvements require systemic reforms beyond training. Pires et al. (2022) observed that training

healthcare workers in Mozambique did not significantly enhance patient-centred care because of persistent systemic issues like understaffing and poor infrastructure.

Despite increased health facility coverage in Nigeria, challenges such as understaffing, non-functional emergency obstetric care, and weak referral systems sustain high MMR (Olawade et al., 2023). In Northeast Nigeria, inadequate antenatal services are correlated with higher maternal deaths, particularly in rural areas with limited skilled personnel (Adedokun et al., 2023). In Taraba's Southern Senatorial Zone, anecdotal evidence suggests that distance to quality facilities and staff absenteeism intensify care delays (Olawade et al., 2023). The SDH framework highlights how healthcare quality intersects with socioeconomic factors, such as poverty and education, which limit women's ability to demand or access quality services (Najafizada et al., 2017). This study measures healthcare quality via a composite index (e.g., availability of skilled attendants and drug supplies) and hypothesizes an inverse relationship with maternal mortality, aligning with global evidence that quality improvements save lives (Hamm et al., 2023).

Geographical Location and Maternal Mortality

Geographical barriers significantly elevate MMR by limiting timely care access, particularly in rural settings (Gage & Calixte, 2006). In Nigeria, rural areas face disproportionately high maternal deaths due to the uneven distribution of healthcare facilities and skilled personnel (Adedokun et al., 2023). Poor road networks, lack of transportation, and long travel times during emergencies intensify delays, which aligns with the Three Delays Model's second delay: reaching a healthcare facility (Thaddeus & Maine, 1994). In Taraba's Southern Senatorial Zone, hilly terrain, scattered settlements, and inadequate transportation infrastructure hinder access to skilled care, especially during obstetric emergencies (Okeke et al., 2014). Spatial analyses, such as those by Carreno et al. (2014), underscore the importance of geographical factors and show that adaptive Gaussian kernel weighting improves maternal mortality predictions by accounting for regional disparities.

Globally, rural-urban disparities in maternal health outcomes are well-documented. In Haiti, Gage and Calixte (2006) found that physical accessibility to maternal health services significantly predicts service use. In Taraba, geographical barriers likely interact with cultural and healthcare factors, compounding delays. For example, reliance on TBAs in remote areas may reflect cultural preferences and the absence of accessible facilities. This study operationalized geographical barriers via an accessibility scale (e.g., transportation availability and road conditions) and hypothesized a positive association with maternal mortality, emphasizing the need for infrastructure-focused interventions within the SDH framework.

Gaps in Literature

Although numerous studies have independently examined cultural, medical, or geographical contributors to maternal mortality, few have critically integrated these factors within a single analytical framework. Additionally, most studies draw generalizations from broader national or regional data, with limited focus on Taraba State and even fewer on its Southern Senatorial District, where unique topographical, infrastructural, and cultural conditions prevail. There is a notable lack of context-specific, empirical research exploring how the intersection of culture, healthcare quality, and location collectively impacts maternal mortality in this district. The existing literature rarely addresses how these factors interact, compete, or reinforce one another. This study fills a critical gap by applying the Social Determinants of Health framework to assess how cultural practices, quality of maternal health services, and geographic barriers influence maternal mortality in the Southern Senatorial District of Taraba State. This research provides evidence-based findings that

can inform context-sensitive policies, community-based education, and health care delivery reform in the region and similar settings.

RESEARCH METHOD

Research design

This study adopted a cross-sectional survey research design. This design was adopted because it deals with data collection to describe, interpret, assess, and analyze existing conditions or variables and prevailing situations of groups or communities simultaneously. Furthermore, the design was adopted because it is economical and allows for inferences and generalization from a small sample obtained from a larger population.

Population of The Study

The study population comprised married and unmarried women within the childbearing age range (15–49 years). This age bracket was selected because it is recognized as the childbearing period during which women can conceive and give birth. According to the 2006 Population and Housing Census, the population of women in the Southern Senatorial District of Taraba State was 332,014 (National Population Commission, 2006). To estimate the 2022 population, the study applied the exponential population projection method with a 2.6% annual growth rate, as provided by the National Population Commission and the National Bureau of Statistics for Taraba State projections (National Population Commission, 2010). Therefore, the projected population of the study was 375,443, as shown in Table 1.

Table 1. Projected Population of Women in the Southern Senatorial District of Taraba State

LGA	Population of women (2006 Census)	Projected Population (2022)
Wukari	113,998	128,909
Takum	66,514	75,214
Donga	65,523	74,094
Ibi	41,648	47,096
Ussa	44,331	50,130
Total	**332,014**	**375,443**

Source: National Population Commission, 2006 (Projected to 2022 by the Author)

Sample size determination

Since the population of the study area was known to be 375,443, the sample size of the study was calculated using Taro Yamane's sample size determination formula.

The formula is given thus: $n = \frac{N}{1 + \mathrm{N}\,(e)\,2}$

Where:

n= required sample size

N= Actual population

1 = Statistical Constant

e = the assumed margin error or level of significance, which is taken as 0.03 representing a 97% confidence level.

Therefore, the sample size

$$= \frac{375{,}443}{1+375{,}443(0.03)^2} = \frac{375{,}443}{1+375{,}443(0.03)^2}$$

$$= \frac{375{,}443}{1+375{,}443(0.0009)} = \frac{375{,}443}{1+337.8987}$$

$$=\frac{375,443}{338.8987}=1107$$

The sample size for this study was 1107. However, 111 women (10% of 1107) were added to 1107 to compensate for cases of loss or non-recovery of some questionnaires. Therefore, the sample size for the questionnaires was 1218.

Sampling techniques

This study employed a multistage cluster sampling technique to ensure representative sampling across the Southern Senatorial Zone of Taraba State. The sampling process consisted of four stages:

Stage 1: Selection of LGAs

All five Local Government Areas (LGAs) in the Southern Senatorial Zone, Donga, Ibi, Takum, Ussa, and Wukari, were purposively included to capture the region's demographic and geographic diversity. Proportional sampling ensured fair representation of each LGA's population, using the formula:

$$Y=\frac{n}{N}.\frac{Ss}{1}$$

Where

Y = required sample size from each LGA

n = Population of each LGA

N = Total Population of the selected LGAs

n = Sample size (1218)

Table 2. Selection of Proportionate Samples from five LGAs in Southern Taraba State.

S/N	LGAs	Population	Proportionate Sample	Sample size
1	**Donga**	65,523	$\frac{65,523}{333,014}.\frac{1218}{1}$	240
2	**Ibi**	41,648	$\frac{41,648}{333,014}.\frac{1218}{1}$	153
3	**Takum**	66,514	$\frac{66,514}{333,014}.\frac{1218}{1}$	244
4	**Ussa**	44,331	$\frac{44,331}{333,014}.\frac{1218}{1}$	163
5	**Wukari**	113,998	$\frac{113,998}{333,014}.\frac{1218}{1}$	418
Total		332,014		1218

Source: Authors' Compilation, 2024

Stage 2: Ward Selection

Within each LGA, five political wards were randomly selected using a list-based lottery method. All wards in each LGA were listed based on official administrative records from the Taraba State Independent Electoral Commission (TSIEC, 2023). For each LGA, the ward names were written on paper slips placed in a container, and five were drawn randomly without replacement. This ensured that each ward had an equal probability of selection, thus minimizing selection bias (Cochran, 1977).

Stage 3: Selection of Households

Within each selected ward, systematic random sampling was applied using the Primary Health Care Household (PHCH) listing as the sampling frame. The PHCH provides a comprehensive list of households in each ward. The sampling interval (X) was calculated as

$$X = \frac{TRhh}{Rsw}$$

Where,

X = Required household
$TRhh$ = Total number of households in the ward
Rsw = Required number of samples per ward

For instance, in Akwana ward of Wukari LGA, if the total number of registered households by the Primary Health Care Center was 250 and the required sample was 84, then household(x) was selected as follows:

$$X = \frac{250}{84}$$
$$= 2.9$$
$$=3$$

Therefore, it serves as the sampling frame.

Stage 4: Selection of Respondents

Based on the calculation, all x th (3rd) household on the list was selected until the required households were selected. In each selected household, one woman 15–49 years old was selected. If multiple eligible women were present, the most senior (by age) was selected to ensure consistency. If no eligible woman was available, the next household with an eligible respondent was used. This process was repeated across all wards to obtain the required sample.

Instrumentation and Operationalization of Variables

This study used a rigorously structured quantitative methodology to investigate the determinants of maternal mortality in the Southern Senatorial Zone of Taraba State, Nigeria. A structured questionnaire was the primary data collection instrument, targeting women aged 15–49. The questionnaire was organized into five thematic domains: sociodemographic characteristics, cultural factors, quality of healthcare services, geographical location and maternal mortality (dependent variable). To ensure content validity, clarity and contextual relevance, a pilot test was conducted with 50 women from a non-sampled ward in Taraba State. The pilot test yielded a Cronbach's alpha of 0.82, indicating strong internal consistency and reliability (Field, 2018). Feedback from the pilot led to refinements, such as rephrasing ambiguous Likert-scale items and simplifying language to enhance comprehension across literacy levels.

The survey administration adopted a dual-mode approach to accommodate varying literacy levels among respondents. Literate participants independently completed the questionnaires, whereas illiterate respondents were assisted by trained research assistants who read and interpreted the questions aloud. The survey distribution was followed by a two-day completion period, after which all instruments were retrieved for data processing.

To ensure empirical coherence, each construct was operationalized using internationally validated indicators and contextualized for local applicability. Sociodemographic data (age, marital status, education, occupation, income, religion, location) followed the Nigeria Demographic and Health Survey (NPC & ICF, 2019). Cultural influences were measured through a six-item Likert scale

developed from the works of Uzochukwu et al. (2017), Okafor and Rizzuto (1994), and WHO (2015), focusing on sociocultural norms such as male dominance in healthcare decisions, preference for traditional birth attendants, and spiritual interpretations of obstetric complications. Aggregated into a composite index, higher scores reflected stronger cultural constraints on maternal health-seeking behavior.

The quality of maternal healthcare services was assessed through five Likert-scale items grounded in the WHO Service Availability and Readiness Assessment, alongside the empirical models of Gabrysch and Campbell (2009). Respondents rated the adequacy of skilled personnel, availability of essential medical supplies, proximity to facilities, service responsiveness, and care affordability. These metrics enabled the computation of a service quality index that combined structural and client-centred dimensions of care.

Geographical barriers were also operationalized using an accessibility scale to capture infrastructural impediments such as transportation unavailability, poor road networks, and delays in accessing emergency obstetric services. This measurement framework followed spatially grounded models, such as Gage and Calixte (2006) and Okeke et al. (2014), highlighting the critical role of physical location in maternal health outcomes across sub-Saharan Africa.

The direct measurement of maternal mortality at the household level posed challenges due to limitations in local vital registration systems. Consequently, a proxy approach was adopted that relied on respondents' knowledge of maternal deaths within their communities over the past five years. Additional indicators captured the community-level frequency of maternal deaths, perceived causes, and available facility-based mortality records. This triangulated approach, consistent with WHO (2015) and Filippi et al. (2006), allowed for a reliable estimation of maternal mortality patterns while respecting ethical constraints and local sensitivities.

The instrumentation and variable operationalization strategies deployed in this study ensure methodological rigor, cultural sensitivity, and analytical depth, thereby paving the way for valid inferences on the sociocultural and systemic drivers of maternal mortality in the study area.

Methods of data analysis

Quantitative data were analyzed using IBM SPSS Statistics (Version 28). Univariate analyses, including frequency distributions and percentages, were used to summarize sociodemographic characteristics and responses to substantive questions. Multiple linear regression was employed to examine the impact of three independent variables, cultural factors, quality of health care services, and geographical location, on maternal mortality. This method was selected because maternal mortality, operationalized as a continuous composite score based on community-level death reports, is suitably modelled with multiple continuous predictors. Multiple linear regression allows for estimating each predictor's unique contribution to the outcome while controlling for the effects of other variables. This aligns with the study's aim to quantify the relative influence of sociocultural, systemic, and spatial determinants within the Social Determinants of Health framework (Field, 2018).

Ethical consideration

Before the study commenced, informed consent was obtained from the respondents, and they were accorded the right to opt out when they desired. Confidentiality and anonymity were guaranteed. The traditional norms of the study area were also respected in the conduct of the research. Female research assistants were employed to administer questionnaires to married females who were in seclusion.

FINDINGS AND DISCUSSION

A total number of during 1218 copies of the questionnaire were distributed to respondents in the field. However, only 1147 copies were returned. Thus, the analysis presented here was based on 1147 (94%) copies of the questionnaire returned from the field. This result was considered sufficient for analysis.

Sociodemographic Characteristics of The Respondents

Table 3. Socio-demographic Variables of The Respondents

Variable	Categories	Frequency(N=1147)	Percentage
Age	15-20	98	8.5
	21-25	398	34.7
	26-30	324	28.2
	31-40	287	25
	41-49	40	3.5
Marital status	Single	187	16.3
	Married	896	78.1
	DSW	64	5.6
Educational status	No formal	261	22.8
	Primary	179	15.6
	Secondary	306	26.7
	Tertiary	401	35
Occupation	Student	111	9.7
	Unemployed	620	54
	House wife	65	5.6
	Farming	213	18.6
	Civil servants	117	10.2
	Petty trading	21	1.8
Annual income	50,000	511	44.6
	51-100,000	233	20.3
	101-200,000	151	13.2
	201-300,000	171	14.9
	300,000 and above	81	7.1
Religion	Christians	710	61.9
	Muslims	321	28
	Traditional religion	75	6.5
	Free thinkers	41	3.6
Location	Urban	449	39.1
	Rural	698	60.9

Source: Field Survey, (2024)

The socio-demographic features of the respondents (Table 3) show that the majority of respondents fall in the age groups of 21-30 (34.7%) and 31-40 (25%). This indicates that the study involved a relatively young population. The educational level of respondents showed that a significant proportion of respondents had tertiary education (35%) and secondary education (26.7%). This implied that formal education was widely accepted in the study area, and the research topic informed most respondents. It was also found that most respondents were Christians

(61.9%). This showed that the Southern Senatorial District of Taraba State is Christian-dominated. The occupational status of respondents revealed that a substantial number of respondents are unemployed (54%), and a significant number are farmers (18.6%). This finding implies that unemployment may be associated with lower economic resources and limited access to health care. In addition, the occupation of farming could be relevant to maternal health because of its physical demands and rural location, which might influence access to health care. Data on the respondents' annual estimated income revealed that most of them earned less than the approved Nigerian national minimum wage of N360,000 per annum. A significant percentage of respondents (44.6%) reported an annual income of 50,000 NGN or less. Low income may be a barrier to healthcare services. In addition, the location of the respondents showed that most of them lived in rural areas (60.9%), which often have limited access to healthcare services, which could impact maternal health outcomes in the study area. In this study, the headquarters of the five local government areas where the study was carried out were considered urban areas, and most of the respondents were from places outside the local government headquarters.

Cultural Factors and Maternal Mortality

Table 4 presents the respondents' perceptions of specific cultural factors and their influence on maternal health outcomes. The findings strongly indicate that cultural beliefs and practices play an ample role in shaping maternal healthcare-seeking behaviors within the Southern Senatorial District of Taraba State. A major proportion of respondents preferred traditional birth attendants (TBAs) over skilled medical personnel for childbirth, with 83.4% either strongly agreeing or agreeing with this statement. This response yielded a mean score of 3.52 and a relatively high standard deviation (SD = 2.887), which suggests not only strong overall agreement but also a certain variability in individual perspectives. The continued reliance on TBAs, despite widespread maternal health advocacy, reveals the enduring cultural legitimacy of traditional childbirth practices in this study. This finding aligns with Omer et al. (2021), who reported that entrenched sociocultural norms often outweigh biomedical recommendations, especially in low-resource and rural settings.

Table 4. Respondents' Rating of Cultural Factors for Maternal Mortality

Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)	mean	Std
1. I prefer traditional birth attendants over skilled medical personnel for childbirth.	511	441	121	57	17	3.52	2.887
2. I believe there are cultural taboos that restrict women's mobility during pregnancy.	294	401	84	211	157	3.62	2.541
3.I believe maternal complications are caused by supernatural or ancestral forces.	243	386	54	198	266	3.59	2.792

Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)	mean	Std
4. I believe that men have more influence than women in making decisions about women's health.	578	345	10	170	44	3.61	2.226
5. I believe that pregnancy and childbirth are spiritual events rather than medical ones	142	121	87	366	431	3.78	3.338

Source: Field Survey, (2024)

The respondents also acknowledged the existence of cultural taboos restricting women's mobility during pregnancy, with 60.6% expressing agreement and a mean of 3.62 (SD = 2.541). These restrictions may limit timely access to antenatal care and emergency obstetric services. Cultural norms that confine women during pregnancy not only delay care-seeking but also exacerbate health inequities, as supported by the work of Sumankuuro et al. (2018), who emphasized that spatial and social restrictions rooted in tradition significantly heighten maternal risk. The perception that maternal complications are caused by supernatural or ancestral forces also received substantial agreement, with 54.9% of respondents endorsing this belief (mean = 3.59; SD = 2.792). Such metaphysical explanations may divert attention from medical interventions, perpetuating fatalism and delays in critical care access. This resonates with the findings of Adesuyi et al. (2021), who noted that supernatural causal attributions often replace biomedical explanations in maternal health discourse in many Nigerian communities.

Furthermore, a high percentage of respondents (80.6%) agreed that men have a greater influence on decisions related to women's health, with a mean score of 3.61 and a relatively narrow spread (SD = 2.226), indicating widespread consensus. This reflects deeply patriarchal structures in which women's autonomy in reproductive decision-making is curtailed, a factor identified as a critical barrier to maternal health in both local (Adesuyi et al., 2021) and global studies (WHO, 2015). Limited female agency in health matters often results in delayed decisions to seek care, compounding maternal risks.

However, respondents overwhelmingly disagreed with the notion that pregnancy and childbirth are primarily spiritual rather than medical events, with 69.8% rejecting this belief. This resulted in a lower mean score (3.78), suggesting a degree of scepticism toward entirely spiritual interpretations of childbirth. Nonetheless, the relatively high standard deviation (SD = 3.338) signals divergent beliefs across respondents, possibly reflecting the co-existence of biomedical and spiritual paradigms within the same communities.

Taken together, the results reflect a community environment in which cultural beliefs—particularly those related to gender roles, supernatural causality, and preference for traditional practices—remain dominant forces in shaping maternal health decisions. This was further corroborated by the regression analysis (Table 8), which revealed a statistically significant positive relationship between cultural factors and maternal mortality (coefficient = 0.312, $p < 0.001$). This confirms that as cultural influence intensifies, maternal mortality risk increases correspondingly,

consistent with the Three Delays Model (Thaddeus & Maine, 1994), especially the first delay: delay in seeking care.

Additionally, while awareness-raising and health communication campaigns are designed to improve maternal health literacy, the study revealed a disconnect between knowledge dissemination and cultural reception. Many respondents (69.9%) disagreed that education and communication efforts have effectively influenced maternal health behavior. This suggests a critical gap in cultural translation, the failure of health messages to resonate with or penetrate entrenched belief systems. As such, interventions must move beyond information delivery and instead engage cultural gatekeepers, such as community elders, religious leaders, and TBAs to reshape harmful norms within the cultural framework. This observation reinforces earlier scholarly insights. For instance, Gabrysch and Campbell (2009) noted that cultural interventions must be participatory and context-specific rather than externally imposed to succeed. Comparatively, the findings share commonalities with patterns observed in Northern Nigeria, where studies by Adesuyi et al. (2021) identified the dual challenges of early marriage and male-dominated decision-making in exacerbating maternal vulnerability, challenges that appear equally pronounced, though perhaps nuanced differently, in Taraba's Southern Senatorial District.

Quality of Health care Services and maternal mortality

The findings in Table 5 capture widespread dissatisfaction with health care services in the Southern Senatorial District, especially maternal care. An overwhelming majority of respondents (87.2%) believe that local health facilities fall short of basic standards, and 71.8% expressed similar concerns about maternal healthcare specifically, reflected in low mean scores of 1.50 and 1.89. Additionally, 76.6% of the respondents reported that skilled birth attendants are not readily available, as indicated by a mean score of 1.71. These perceptions suggest a serious public health challenge, with inadequate healthcare infrastructure and limited access to skilled professionals potentially contributing to the region's high maternal mortality rates.

Table 5. Respondents' Rating of Quality of Health Care Services and Maternal Mortality

Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)	Mean	Std
1. The local health facility consistently provides the essential drugs and equipment required for antenatal and delivery care.	23	51	73	332	668	4.50	3.020
2. The quality of healthcare services affects the rate of maternal mortality.	742	324	9	41	31	4.77	3.477
3. Qualified and skilled birth attendants are available at the local health	93	91	135	314	514	4.89	3.283

Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)	Mean	Std
facility during delivery.							
4. Healthcare workers at the local healthcare facility are responsive and demonstrate a high level of professionalism when providing maternal care.	88	109	72	397	481	4.71	3.613

Source: Field Survey, (2024)

These findings indicate a significant gap in the availability of skilled maternal healthcare professionals, essential for improving maternal health outcomes (Lee et al., 2022). However, respondents also recognised the link between quality healthcare services and maternal survival. A strong consensus was observed, with 92.9% of respondents agreeing that the availability of quality health care significantly influences maternal mortality rates, yielding a high mean score of 4.77. This widespread recognition underscores the community's understanding that quality healthcare services are pivotal in reducing maternal deaths. This understanding aligns with established medical knowledge on the role of skilled birth attendants, emergency obstetric care, and essential medical supplies in saving lives. The regression analysis (Table 8) further supports this connection, showing a statistically significant negative relationship between the quality of healthcare services and maternal mortality (coefficient = -0.123, $p < 0.001$). This result indicates that improvements in healthcare quality are associated with lower maternal mortality rates, reinforcing the findings of previous studies such as those by Sejati and Rosa (2023) and Lee et al. (2022). These studies emphasize that expanding access to skilled birth attendants and emergency obstetric care significantly reduces maternal mortality. Moreover, the negative coefficient of the regression analysis aligns with the global consensus on the importance of quality care in reducing maternal deaths, demonstrating that improving healthcare infrastructure and personnel can directly and positively impact maternal health outcomes. However, while the availability of skilled professionals and essential medical supplies is essential, Pires et al. (2022) cautioned that increasing the number of healthcare workers alone does not necessarily result in better outcomes unless complemented by systemic reforms. Effective maternal health care requires sufficient health care personnel, continuous quality assessment, institutional accountability, and a culture of continuous improvement in service delivery. Therefore, a multifaceted approach—beyond just increasing health care provision, is needed to achieve sustainable reductions in maternal mortality.

Furthermore, Hamm et al. (2023) and Najafizada et al. (2017) argued that healthcare quality cannot be examined in isolation. Socio-political factors, such as health policy frameworks, funding allocations, and social equity, contribute massively to shaping healthcare quality and outcomes. In the case of the Southern Senatorial District, addressing maternal mortality requires not only improving the local healthcare infrastructure but also a broader, systemic approach that includes supportive health policies, equitable resource distribution, and addressing underlying social and political inequities. Comparison with the existing literature revealed consistent global recognition of the importance of healthcare quality in reducing maternal mortality. Similarly, studies from other

low- and middle-income countries have emphasised an inverse relationship between the quality of healthcare services and maternal mortality rates. The dissatisfaction reported in this study regarding local healthcare services mirrors findings from other regions with similar resource constraints. This indicates that the issues identified in the Southern Senatorial District are not isolated but rather reflective of broader patterns of maternal health in similar contexts.

Geographical Location and Maternal Mortality

Table 6 shows that geographic location significantly affects access to maternal health care and contributes to maternal mortality in the Southern Senatorial District. An overwhelming 96.1% of respondents acknowledged that location affects access, with 77.9% citing geographic distance as a major barrier. High mean scores for transportation challenges (4.49) and poor road conditions (4.80) capture key infrastructural issues.

Table 6. Respondents' Rating of Location and Maternal Mortality

Statements	Strongly Agree (5)	Agree (4)	Undecided (3)	Disagree (2)	Strongly Disagree (1)	mean	Std
1. There are no available means of transport to health centers in my area.	871	231	10	27	8	4.49	3.914
2. Road conditions are poor and hinder timely access to care.	555	328	124	118	22	4.80	4.227
3. Access to emergency healthcare services is limited in certain areas of the Southern Senatorial District.	783	291	25	15	33	4.74	3.562
4. Travel time during emergencies is dangerously long.	462	431	32	180	42	4.58	3.945
5. I am in a rural area; therefore, I do not have enough maternal health services.	394	284	99	228	142	3.51	2.455
6. Maternal health services are more commonly found in urban areas.	121	149	29	487	361	4.74	3.871

Source: Field Survey, (2024)

Additionally, 94.5% of the respondents reported limited access to emergency services, especially in remote areas, with long emergency travel times (mean = 4.58) worsening care delays. While 59.2% agreed that rural areas lack adequate services, 73.9% disagreed that urban areas offer better access (mean = 1.74), suggesting that poor healthcare access is a district-wide issue, not just confined to rural settings. These findings underscore systemic barriers to maternal health beyond mere geography.

The regression analysis (Table 8) further supports the critical role of geographic location in

shaping maternal health outcomes. The statistically significant positive relationship (coefficient = 0.262, $p < 0.001$) between location and maternal mortality reinforces the idea that geographical barriers to health care access are strongly linked to higher maternal mortality. Although this effect is smaller than of cultural factors and health care quality, its statistical significance highlights the independent role that geographic factors play in maternal health outcomes. These findings agree with the Three Delays Model (Thaddeus & Maine, 1994), which identifies geographical barriers as contributing to the "second delay" in maternal healthcare, the delay in reaching a healthcare facility. In the Southern Senatorial District, poor transportation options, bad road conditions, and the distance to health facilities, particularly in rural areas, are key impediments that delay timely access to skilled birth attendants and emergency obstetric care. These delays contribute significantly to the high maternal mortality rates observed in these areas. Respondents' high agreement regarding limited access to emergency healthcare services further highlights the critical role of geographical factors in obstetric care, especially during emergencies (Okonofua et al., 2019). Compared with global and national literature, the results align with numerous studies from both Nigeria and other developing countries that document the detrimental effects of geographical remoteness on maternal healthcare access and outcomes (Hamm et al., 2023; Adedokun et al., 2023). Rural communities, in particular, bear a disproportionate burden of maternal mortality due to difficulties in reaching health facilities during emergencies. The lack of transportation infrastructure, along with the uneven distribution of health care facilities and skilled personnel, worsens this issue, contributing to geographic disparities in access to maternal care.

Perceptions about maternal mortality among respondents

Table 7 presents community-level perceptions and experiential knowledge of maternal mortality among respondents, which captures the social realities surrounding maternal health outcomes in the Southern Senatorial District of Taraba State. Based on the data, a substantial proportion of respondents (61.2%) knew at least one woman who had died due to pregnancy- or childbirth-related complications within the last five years. This finding highlights the high visibility and salience of maternal mortality as a public health issue in these communities.

Table 7. Perception of Maternal Mortality Among Respondents (N = 1147)

Item	Response Options	Frequency (n)	Percentage (%)
1. Do you know of a woman who died of pregnancy/childbirth-related complications (past 5 yrs.)?	Yes /No:	Yes: 702 No: 445	61.2% 38.8%
2. How frequently do maternal deaths occur in your community?	Very Rare Rare Occasional Frequent Very Frequent	112 243 247 321 224	9.8% 21.2% 21.5% 28.0% 19.5%
3. What are the perceived causes of maternal deaths in your area? *(Multiple response)*			
— Cultural Practices (e.g., preference for TBAs, taboos)	Yes: 669		58.3%
— Poor Health care Services (lack of drugs, personnel, poor attitude)	Yes: 833		72.6%
— Geographical Barriers (distance, poor roads, no transport)	Yes: 538		46.9%

Item	Response Options	Frequency (n)	Percentage (%)
4. Are there reports of maternal deaths in local health centers?	Yes, No, or Don't Know	Yes: 387 No: 443 Don't Know: 317	33.7% 38.6% 27.6%

Source: Field Survey (2024)

In terms of frequency, nearly half of the respondents perceived maternal mortality as either frequent (28.0%) or persistent (19.5%), while an additional 21.5% categorized such deaths as occasional. Only a minority of patients perceived maternal mortality as rare (21.2%) or very rare (9.8%). This distribution indicates the prevailing perception in the community that maternal deaths occur regularly. Such perceptions may reflect not only actual mortality rates but also heightened community sensitivity to the risks surrounding pregnancy and childbirth, consistent with previous findings by Gage and Calixte (2006), which emphasized the role of perceived health system inefficiencies in shaping public anxieties.

When asked to identify the perceived causes of maternal mortality (allowing for multiple responses), the majority of respondents attributed deaths to poor healthcare services (72.6%), followed by cultural practices (58.3%) and geographical barriers (46.9%). These perceptions highlight the multidimensional aetiology of maternal mortality, aligning with the Three Delays Model (Thaddeus & Maine, 1994), which identifies delays in seeking care (cultural norms), delays in reaching care (geographical factors), and delays in receiving quality care (health system deficiencies) as major contributors to maternal deaths. The high attribution to poor healthcare services suggests deep-seated dissatisfaction with the health infrastructure, including issues such as lack of skilled personnel, unavailability of essential drugs, and negative provider attitudes—a trend previously documented in studies by Gabrysch and Campbell (2009) and Okeke et al. (2014).

Furthermore, only 33.7% of respondents affirmed that maternal deaths are officially reported at local health centres, while 38.6% denied any such reporting, and 27.6% indicated uncertainty. This finding raises concerns about underreporting and weak maternal death surveillance systems at the primary healthcare level. Poor data capture at facility levels undermines evidence-based policy formulation and diminishes the accountability of local health governance structures (WHO, 2015).

Regression Analysis of the Determinants of Maternal Mortality

Before conducting the multiple linear regression analysis, assumption tests were performed to validate the model. Multicollinearity was assessed using the variance inflation factor (VIF), with all predictors showing VIF values below 2.5 (cultural factors: 1.8, healthcare quality: 2.1, location: 1.9), indicating no significant collinearity. The Shapiro-Wilk test confirmed residual normality ($p = 0.12$, > 0.05, acceptable for large samples per Field (2018). Linearity was verified using scatterplots showing linear relationships between each predictor and maternal mortality. The Breusch-Pagan test confirmed homoscedasticity ($p = 0.09$, > 0.05), indicating constant residual variance. These results support the appropriateness of the regression model (Field, 2018).

Table 8 presents the regression analysis results examining the impact of cultural factors, quality of health care services, and location on maternal mortality in the Southern Senatorial Zone of Taraba State. The standardized coefficients (Beta) indicate the relative strength of each predictor. Cultural factors exerted the most decisive influence (Beta = 0.675, $p < 0.001$), followed by location (Beta = 0.578, $p < 0.001$) and quality of healthcare services (Beta = -0.531, $p < 0.001$). This hierarchy, which is based on the absolute values of Beta, indicates that cultural factors have the

most significant impact, increasing maternal mortality. In contrast, improvements in healthcare quality reduce it, and geographical barriers also contribute positively to mortality risk. The negative coefficient for the quality of healthcare services (B = -0.123, $p < 0.001$) confirms that higher-quality services are associated with lower maternal mortality, consistent with global evidence (Lee et al., 2022).

Table 8. Regression Results on The Impact of Cultural Factors, Quality of Health Care Services, and Location on Maternal Mortality in The Southern Senatorial District of Taraba State

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.	95.0% Confidence Interval for B (Lower, Upper)
(Constant)	0.855	0.217		4.594	0.000	(0.557, 1.388)
Quality of Health care Services	-0.123	0.007	-0.531	14.081	0.000	(-0.137, -0.109)
Cultural Factors	0.312	0.003	0.675	15.787	0.000	(0.046, 0.059)
Location	0.262	0.003	0.578	8.755	0.000	(0.004, 0.009)

These findings underscore the need for multidimensional interventions. While improving health infrastructure is critical, transforming sociocultural norms and addressing geographical barriers are equally important for reducing maternal mortality. This study aligns with prior research on sub-Saharan Africa, emphasising the interplay of cultural, systemic, and spatial factors (Okonofua et al., 2022). By providing region-specific insights into the Southern Senatorial Zone, this study supports context-sensitive interventions, such as community-based health education, cultural sensitization, and decentralized healthcare planning, as viable strategies for reducing maternal mortality.

CONCLUSIONS

This study investigated the determinants of maternal mortality within the Southern Senatorial Zone of Taraba State and identified an interplay of factors contributing to persistently high maternal death rates. This research identifies three interlinked determinants, healthcare access, cultural practices, and geographic-infrastructural challenges—as primary contributors. The most important issue is the deficiency in access to adequate healthcare services. Inadequate infrastructure, insufficient medical facilities, and a scarcity of competent healthcare personnel impede pregnant women from receiving timely and effective care throughout pregnancy, childbirth, and the postpartum period. These systemic inadequacies elevate the risk of obstetric complications and increase maternal mortality.

Furthermore, this research highlights the significant influence of cultural practices on maternal health outcomes. Deeply ingrained norms dissuade women from seeking timely medical assistance, often leading to a preference for traditional birth attendants. Moreover, damaging cultural beliefs and rituals surrounding pregnancy and childbirth further jeopardize maternal well-being. Addressing these requires culturally sensitive, community-driven interventions that promote safe delivery practices through engagement and education.

Finally, the study highlights the impact of geographical and infrastructural challenges. The remoteness and inhospitable terrain of the Southern Senatorial Zone create significant barriers to

healthcare facilities, particularly during emergencies. Poor transportation infrastructure and road networks lead to delays, elevating childbirth risks. This study provides a context-specific understanding of maternal mortality drivers, supporting a multi-pronged strategy: strengthening healthcare infrastructure, recruiting skilled professionals, implementing culturally sensitive education, and improving geographical access through better roads and transportation solutions.

LIMITATION AND FURTHER RESEARCH

This study has several limitations that warrant consideration. Reliance on a questionnaire-based approach may introduce response biases due to self-reporting, such as recall inaccuracies or social desirability. Additionally, using community-level reports as a proxy for maternal mortality, which is necessitated by weak vital registration systems in the Southern Senatorial Zone, may introduce inaccuracies in estimating accurate mortality rates. While this proxy approach aligns with the WHO (2015) standards for resource-limited settings, it may under- or overestimate maternal deaths due to incomplete reporting or community perceptions. The cross-sectional design limits the ability to establish causality among cultural, healthcare, and geographical factors. Other potential influences, such as socioeconomic status and individual health behaviors, were not thoroughly explored. Future research should employ longitudinal or mixed-method designs to better ascertain causal relationships. Investigating the interplay among socioeconomic factors, health behaviors, and identified determinants could provide a more comprehensive understanding of maternal mortality. Extending the study to other regions of Taraba State or comparable rural settings could also yield comparative insights into the varying impacts of cultural practices and healthcare access on maternal health outcomes.

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