

ANALYSIS OF DISPARITY IN MATERNAL AND CHILD HEALTH OUTCOMES AND MORTALITY IN KATSINA LOCAL GOVERNMENT

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ABSTRACT

This study investigates disparities in maternal and child health outcomes and mortality in Katsina Local Government Area, Katsina State, Nigeria. Using survey data gathered through questionnaires and interviews, the research identifies key factors contributing to health disparities and evaluates the adequacy of healthcare services, accessibility and utilization within the region. Results show mixed perceptions on the documentation and availability of health data, with respondents indicating that while some data is accessible, gaps remain in comprehensiveness and quality. Key contributors to health disparities include socioeconomic status, cultural practices, healthcare facility availability and maternal education levels. Additionally, logistic regression analysis identifies significant predictors of favorable health outcomes, including age, gender, education, occupation, and household income, with higher education and income levels notably associated with better outcomes. Findings underscore the importance of addressing socio-demographic and infrastructural barriers to healthcare access to improve maternal and child health outcomes. Recommendations emphasize the need for targeted interventions, particularly focusing on education, employment opportunities and income support programs, to mitigate health disparities in Katsina Local Government Area.

Keywords: Maternity; Child Health; Mortality.

1. INTRODUCTION

Maternal and child health remains a critical global health concern, with significant implications for societal well-being and development. Despite advances in healthcare, disparities in maternal and child health outcomes persist, particularly in low-resource settings such as Katsina Local Government. Understanding the nature and extent of these disparities is essential for informing targeted interventions and policies aimed at improving health equity and reducing mortality rates. Reducing child mortality and enhancing maternal health are two of the eight development goals in the United Nations Sustainable Development Goals (SDGs) that are tied to maternal and child health (Murray, Frenk, & Evans, 2007). The following improvements are recommended by this plan in order to lower child mortality and improve maternal health (1990–2015): a two-thirds decrease in the mortality of children under five, a three-quarters reduction in maternal mortality, and universal reproductive health by 2015. China includes women and children as focal groups in the Healthy China 2030 Planning Outline and formally signed on to the MDGs in September 2000. The MDGs' regional and global accomplishments were assessed by the World Health Organization (WHO) in 2010 (World Health Organization, 2010). The findings of a scoring system that was based on ten factors indicated that the MDGs had not been met globally. In particular, inadequate progress was shown by three out of the four evaluation indicators relating to maternal and child health. According to the United Nations' final assessment, the assessment of MDGs 2015, inequality still exists and the MDGs have not been fully met. The Sustainable Development Goals (SDGs) aim (i.e., reducing cases such as international inequities) came next. September 2015 saw the re-signaling of the Sustainable Development Goals (SDGs), which included Reducing Health Inequality at Home and Abroad (WHO, 2015). Research on equality has advanced quickly in the last 30 years. Only a few dozen publications on equity were produced annually in the 1980s (O'Donnell et al., 2008). A total of 3521 Chinese and English documents on equity/equality in health were published by 2015, suggesting that the need for greater research on equality in health was increasingly recognized by policy makers, project sponsors, and non-governmental organizations. Reducing the gaps in mother and child health between nations and between various socioeconomic categories within nations is strongly advocated by several WHO policy statements and studies (Constitution of the World Health Organization, 2006; Human Development Report, 2010)

Understanding and addressing these disparities is vital for improving the health and well-being of mothers and children in Katsina Local Government. This research aims to delve into the root causes of these disparities, examining factors such as maternal education levels, income disparities, access to healthcare facilities, cultural beliefs impacting healthcare-seeking behavior, and the effectiveness of existing healthcare policies. By conducting a comprehensive analysis, this study seeks to provide evidence-based insights that can inform targeted interventions and policy

recommendations. The ultimate goal is to contribute to the development and implementation of effective strategies that promote equitable access to quality maternal and child healthcare services, leading to improved health outcomes and reduced mortality rates among mothers and children in Katsina Local Government.

1.1 The Role of Health Facility Deliveries and Traditional Birth Attendants in Reducing Maternal and Neonatal Mortality

This study found that 60% of women delivered in a health facility, significantly higher than in many regions of Nigeria. Health facility deliveries are typically attended by trained professionals such as doctors or nurse-midwives, unlike home deliveries, which are often managed by traditional birth attendants or untrained individuals (Shehu et al., 2016). Delivering in a medical environment is associated with lower pregnancy-related complications, as skilled providers can offer immediate life-saving interventions. This underscores the importance of skilled attendance at birth in reducing maternal and neonatal mortality rates (Darmstadt, Lee, & Cousens, 2009).

The ongoing debate surrounding traditional birth attendants (TBAs) emphasizes their role in underserved communities. Many advocate for training TBAs to recognize obstetric danger signs and refer patients to modern health facilities. While TBAs are vital in areas with limited access to skilled medical personnel, their presence does not deter women from seeking care from trained providers. However, cultural beliefs, particularly in rural areas, still lead many women to deliver at home without professional medical assistance. This study's findings differ from the 2013 NDHS report, which indicated that 66% of women in Katsina State did not receive antenatal care. It also contrasts with WHO's (2014) report stating that only 50% of births in Africa were attended by skilled providers. Furthermore, it contradicts the findings of Mallick et al. (2016), who reported that most births in Nigeria occur at home, with facility-based births increasing only slightly from 33% in 2003 to 36% in 2013. Women with more than four antenatal care visits are more likely to deliver with a skilled attendant, as frequent visits expose them to essential health education, counselling, and health promotion services, increasing service utilization (Singh, Kumar, & Pranjali, 2014; Pervin et al., 2012).

1.2 Global Efforts and Regional Disparities in Reducing Under-Five Mortality Rates

Health is a fundamental human necessity, and under-five mortality is a critical indicator of a population's health and early childhood development. According to Hassan, Zaman, and Shabir (2014), the under-five mortality rate is a key health outcome that reflects the likelihood of a newborn dying before reaching the age of five per 1,000 live births, often due to health complications affecting either the mother or the baby. Recognizing its importance, global efforts have been made to reduce child mortality significantly over the last few decades.

Globally, the under-five mortality rate decreased from 91 per 1,000 live births in 1990 to 43 per 1,000 live births in 2016 (World Health Organization [WHO], 2017). However, despite this progress, the Millennium Development Goals (MDGs), which aimed to reduce child mortality by two-thirds before 2015, were not fully achieved on a global scale (UN Inter-agency Group for Child Mortality Estimation [IGME], 2016). Disparities persist, with Sub-Saharan Africa and Southern Asia having the highest under-five mortality rates during these periods (IGME, 2017). UNICEF (2017) reports that about 80% of under-five deaths occur in two regions: Sub-Saharan Africa (38%) and Southern Asia (39%). Six countries India, Nigeria, Pakistan, the Democratic Republic of the Congo, Ethiopia, and China account for half of the global under-five deaths, with India and Nigeria alone making up nearly a third (32%) of the total. To address these inequalities, the international community launched the Millennium Development Goals (MDGs) in September 2000. However, as many Sub-Saharan African countries, including Nigeria, failed to meet the 2015 target, the MDGs were extended into a new framework known as the Sustainable Development Goals (SDGs). One of the SDGs' targets is to reduce child mortality and promote equity across regions by 2030, focusing on socioeconomic factors like female literacy, which can help decrease under-five mortality and boost economic productivity (UNICEF, 2016). WHO (2011) also noted that interventions targeting diseases such as malaria, measles, and pertussis have helped reduce child mortality due to infectious diseases.

1.3 Role of Maternal Education in Reducing Under-Five Mortality A Pathway to Improved Child Health Outcomes

A crucial determinant of under-five mortality rates is maternal education, as highlighted by numerous studies. Cleland (1990) emphasized that education leads to behavioral changes, particularly in improving child health outcomes. Notably, a mother's education is more critical than the father's in promoting child health (Glewwe, 1999). According to Thomas et al. (1991) and Glewwe (1999), educated mothers are better equipped to process information, such as reading medication labels and administering the correct dosage. Furthermore, education improves health knowledge (Glewwe, 1999; Webb & Block, 2004). Research shows that children born to literate mothers are 50% more likely to survive compared to those with illiterate mothers. As a result, increasing the level of maternal education significantly reduces child mortality (UNESCO, 2017). Educated mothers also have higher rates of child immunization and better nutritional practices. This underscores the importance of women's education as a key factor in lowering infant and under-five

mortality (Iyewumi et al., 2013). Parental education, particularly maternal, has a direct and positive impact on child health (Neuman & Weiss, 1995). Higher levels of female literacy translate into better child health and reduced under-five mortality rates. An educated woman is more likely to marry later, participate in decision-making, and exercise her reproductive rights. Her children are more likely to be well-nourished and healthier (Iyewumi et al., 2013). In fact, children of uneducated mothers are almost three times more likely to die before their fifth birthday compared to those whose mothers have secondary education (IGME, 2017). Education also enables mothers to delay and space births, and to seek maternal and child healthcare services when necessary. Universal education could save millions of lives—if all women had primary education, child deaths would decrease by 15%, and secondary education could halve child mortality, saving an estimated 3 million lives (UNESCO, 2016). UNICEF (2016) argues that healthier nations are linked to increased public health expenditure, higher education levels, better income, and improved vaccination rates. Strauss and Thomas (1995) proposed that education improves child health and lowers fertility rates. Paxson (2005) further observed an inverse relationship between education and fertility. The theoretical link between education, health, and healthcare expenditure can be traced to Grossman's (1972) model of health production. This theory suggests that individual health outcomes depend on personal investments in health, such as medical care, diet, exercise, education, and income. Health care expenditures, therefore, represent investments that enhance the stock of health over time.

1.4 Literacy Disparities and Their Impact on Maternal and Child Health in Nigeria

In Nigeria, the Multiple Indicator Cluster Survey (2018) indicates that states in the southern region have a significantly higher literacy rate among young men and women compared to their northern counterparts. Approximately 90% of young individuals in the southern states are literate, with literacy rates exceeding 90% in all states within the South-South region. Conversely, illiteracy remains alarmingly high among young women in the northern states, including Niger, Bauchi, Gombe, Yobe, Jigawa, Katsina, Kebbi, Sokoto, and Zamfara, where more than half are illiterate. Recent data from the National Bureau of Statistics (NBS) reveals a persistent educational divide between southern and northern Nigeria, nearly sixty years post-independence. The states with the highest illiteracy rates are primarily located in the Northeast, Northwest, and Northcentral regions. For instance, Yobe State has the lowest literacy level in the country at just 7.23%, followed by Zamfara (19.16%), Katsina (10.36%), Sokoto (15.01%), Bauchi (19.26%), Kebbi (20.51%), and Niger (22.88%). Taraba State stands out with a literacy rate of 72% (The Guardian, 2017). In light of these findings, this research aims to explore the analysis of disparity in maternal and child health outcomes and mortality in Katsina local government. This study will facilitate an evaluation of the achievements related to the Millennium Development Goals during civilian governance and the potential attainment of the Sustainable Development Goals (SDGs) in Nigeria by 2030 at a micro level. Maternal mortality remains a significant concern globally, claiming the lives of countless women of childbearing age. Each year, over half a million maternal deaths highlight the urgency of this issue, making it a global priority for improving maternal health (Ronsmans & Graham, 2006). Currently, an estimated 810 maternal deaths occur daily worldwide (WHO, 2006). The consequences of maternal mortality extend beyond the individual, affecting families and communities at large. The Millennium Development Goal (MDG) 5 aimed to reduce maternal deaths by 75% by 2015, while the Sustainable Development Goal (SDG) 3 seeks to lower the number of maternal deaths to 70 per 100,000 live births by 2030. Many countries have made progress in reducing maternal mortality levels, contributing to a global decline; however, in sub-Saharan Africa, where over 50% of maternal deaths occur, rates have remained largely stagnant. Leading causes of maternal death in this region include hemorrhage, abortions, sepsis, and obstructed labor (Khan et al., 2006). While countries like Rwanda, which once had the highest maternal death rate in the world (with a maternal mortality ratio of 2,300 per 100,000 live births in 1995), have met their MDG 5 targets by reducing the rate to 320 per 100,000 live births (Alkema et al., 2016; WHO, 2014), many other sub-Saharan African nations have seen little to no change or even an increase in maternal mortality, despite implementing evidence-based interventions. By the end of the MDG period, countries such as Chad (980 per 100,000), Central African Republic (880 per 100,000), and Burundi (740 per 100,000) recorded some of the highest maternal mortality ratios (WHO, 2014).

1.5 The Influence of Public Health Expenditure on Health Outcomes in Funtua Local Government, Katsina State

Improving health service delivery through increased public health expenditure has a positive incremental impact on both the quality of life and health capital of beneficiaries, ultimately leading to lower mortality rates. Government-funded public health initiatives play a crucial role in a country's health development by strengthening health systems and mobilizing human, financial, and other resources. This enables health systems to meet their goals of improving health, reducing health disparities, ensuring equitable healthcare financing, and addressing population needs (Roperto & Peralta, 2014). Health expenditure is widely recognized as a key factor in determining health status globally, as spending on healthcare is directly linked to health outcomes. Ideally, an increase in national or regional health expenditure should result in improved health outcomes. However, in Nigeria, despite substantial improvements in public health expenditure from the 1970s to the 2000s, this has not led to a corresponding improvement in health outcomes. Matthew et al. (2015)

observed that despite significant increases in public health expenditure, under-five mortality rates in Nigeria remain high. For instance, the under-five mortality rate increased from 147 per 1,000 live births in 1990 to 176 per 1,000 in 1995, before declining to 119 in 1998. According to the Multiple Indicator Cluster Survey (2018), the national average for under-five mortality remains high, falling short of the Sustainable Development Goal (SDG) targets. PMNCH (2019) also reported that Nigeria's under-five mortality rate stood at 201 deaths per 1,000 live births, meaning that one in five Nigerian children does not survive beyond their fifth birthday. Regionally, the Northwest has the highest under-five mortality rate at 269 deaths per 1,000 live births, followed by the Northeast. States with higher under-five mortality rates than the national average include Nasarawa, Niger, Bauchi, Gombe, Jigawa, Kano, Katsina, Kebbi, and Zamfara. In Katsina State, the government has consistently increased financial allocations to the health sector, from N567.7 million in 2000 to N1.74 billion in 2005, further increasing to N6 billion in 2010 and N23 billion in 2018 (Katsina State Approved Estimates, various years). Over the years, health sector budget allocations as a percentage of the total state budget have surpassed the national recommended level of 5%. However, despite these investments, the state's morbidity and mortality patterns do not significantly deviate from the national averages (State Health Profile, 2003-2007).

According to the Katsina State Health Profile (2003-2007), the under-five mortality rate decreased from 120 per 1,000 live births in 2003 to 114 per 1,000 in 2007. Yet, the 2018 factsheet indicated that the under-five mortality rate in Katsina State had risen to 169 per 1,000 live births. In Funtua Local Government, annual estimates (various years) report that health expenditure increased gradually, from N4,409,000 in 2000 to N15,929,909 in 2005, and from N16,593,092 in 2010 to N30,205,683 in 2019. The average health expenditure over this period was N27,360,570, with a minimum of N3,150,000. Bashir (2020) investigated the relationship between mothers' literacy, public health expenditure, and under-five mortality in Funtua Local Government. The study used a two-stage clustered sampling method to select study units, including one secondary and two primary health care centers. A total of 100 questionnaires were administered to adult female respondents. Additionally, the study analyzed secondary time-series data on local government health expenditure and under-five mortality rates in Funtua.

Abbas I. and Jimoh, A. (2022). Study the access to maternal health services in funtua, Nigeria. The study aimed at analysing the extent to which women access maternal health services in Funtua, Nigeria. Most births take place outside health facilities and without the presence of skilled attendants. Katsina State records a high level of maternal mortality with an estimated maternal mortality rate of over 1,000 maternal deaths per 100,000 live births, because a high percentage of births take place outside health facilities.

Therefore, this research endeavors to pinpoint the specific determinants of these disparities, including maternal education levels, income disparities, healthcare infrastructure deficits, and cultural influences within Katsina Local government, to propose targeted interventions and policy recommendations for sustainable improvements.

1.6 Objectives of the Study

The aim of this research is to analyze the disparities in maternal and child health outcomes and mortality in Katsina Local Government, with the goal of informing targeted interventions and policies to improve health equity and reduce mortality rates.

- i. To assess the current maternal and child health outcomes and mortality rates in Katsina Local Government through a review of existing data and literature.
- ii. To identify socioeconomic, cultural, and healthcare-related factors contributing to disparities in maternal and child health outcomes in the region.
- iii. To examine the accessibility and utilization of maternal and child healthcare services in Katsina Local Government, including antenatal care, delivery services, and postnatal care.
- iv. To disseminate research findings and recommendations to relevant stakeholders and contribute to the broader discourse on maternal and child health equity in low-resource settings.

2. RESEARCH METHOD

2.1 Study Area

The research was carried out in Katsina local government area of Katsina state, Nigeria. Katsina is a Local Government Area in northern Nigeria, and is the capital of Katsina State. Katsina LGA serves as an administrative division within the state and encompasses both urban and rural communities, offering a diverse socio-economic and healthcare landscape ideal for examining disparities in maternal and child health outcomes.

The area is served by a variety of healthcare facilities, ranging from public hospitals and maternal health centers in urban areas to primary healthcare centers in rural regions. These facilities often differ in quality, availability of resources, and service delivery.

2.2 Data collection

The questionnaire was distributed among a sample of respondents in Katsina Local Government area this include healthcare providers such as Doctors, nurses, midwives and public health officials working in Katsina Local Government, mothers who have recently given birth or are currently pregnant. and community leaders who can provide acumens into local cultural practices and socioeconomic conditions.

2.3 Statistical Analysis

Descriptive Statistics was use to analyze the responses of the demographic and objective-related questions to understand the current state of health outcomes and identify trends we also conduct a Logistic Regression analysis to determine the relationship between identified risk factors (socioeconomic status, cultural practices, etc.) and poor maternal and child health outcomes

3 RESULT AND DISCUSSION

This section present the figures as well as tabular results and discussion on the analysis of disparity in maternal and child health outcomes and mortality in katsina local government area, Katsina State of Nigeria. Using the data obtained from the questionnaire and administered interviewed.

The results from table 1 of the study, which assessed current health outcomes and mortality rates in Katsina Local Government, reveal mixed perspectives on the adequacy of health data and documentation. The first item, concerning maternal mortality rates being adequately documented, received a mean score of 3.55, suggesting that a substantial proportion of respondents (47.5%) either strongly agreed or agreed with the statement. However, there was also notable dissent, with 30% disagreeing or strongly disagreeing. Similarly, the item about child mortality rates reflecting broader health trends showed a mean of 3.55, with 57.5% in agreement, though 22.5% were undecided, and 22.5% disagreed. The third item, addressing whether existing literature provides a clear understanding of maternal and child health outcomes, had a slightly lower mean of 3.48, indicating some uncertainty among respondents, as 27.5% were undecided and 17.5% disagreed or strongly disagreed. The final item, asking about the availability of sufficient data to assess health trends, achieved the highest mean of 3.65, with 60% agreeing or strongly agreeing. However, 17.5% still expressed disagreement, which suggests that while data is accessible to some extent, there is a recognition of gaps in the comprehensive availability or quality of the data. The results indicate a general sense of agreement that maternal and child health outcomes in Katsina Local Government are documented and understood, but with significant reservations. Although the data availability for assessing trends is seen positively by most respondents, there are still notable concerns about the completeness and clarity of the existing literature and health records. The mean scores reflect the overall positive sentiment toward data availability and documentation, but the variation in responses also highlights challenges in fully comprehending and utilizing health statistics. These findings suggest a need for further improvement in both the quality of health data documentation and the clarity of research literature to ensure better understanding and effective interventions in maternal and child health outcomes in the region.

Table 1 Current Health Outcomes and Mortality Rates within Katsina metropolis

S/ N	ITEM	SA (Strongly Agree)	A (Agree)	U (Unde cided)	D (Disagr ee)	SD (Strongly Disagree)	Mean
1	Maternal mortality rates in Katsina Local Government are adequately documented in existing health records.	35 (17.5%)	60 (30%)	45 (22.5 %)	40 (20%)	20 (10%)	3.55
2	Child mortality rates in Katsina Local Government are reflective of the broader health trends in the region.	45 (22.5%)	70 (35%)	40 (20%)	30 (15%)	15 (7.5%)	3.55
3	Existing literature provides a clear understanding of maternal and child health outcomes in Katsina Local Government.	60 (30%)	50 (25%)	55 (27.5 %)	20 (10%)	15 (7.5%)	3.48
4	There is sufficient data available to assess the trends in maternal and child health outcomes in the region.	40 (20%)	80 (40%)	45 (22.5 %)	20 (10%)	15 (7.5%)	3.65

Table 2: Identifying the Contributing Factors to maternal and child health outcomes

S/N	ITEM	SA (Strongly Agree)	A (Agree)	U (Undecided)	D (Disagree)	SD (Strongly Disagree)	Mean
1	Socioeconomic status significantly influences maternal health outcomes in Katsina Local Government.	50 (25%)	85 (42.5%)	30 (15%)	20 (10%)	15 (7.5%)	3.75
2	Cultural practices impact the health outcomes of children in the region.	70 (35%)	80 (40%)	25 (12.5%)	15 (7.5%)	10 (5%)	3.90
3	Availability of healthcare facilities is a major factor affecting maternal and child health outcomes.	90 (45%)	70 (35%)	25 (12.5%)	10 (5%)	5 (2.5%)	4.10
4	Education level of mothers influences the health outcomes of their children.	60 (30%)	85 (42.5%)	25 (12.5%)	20 (10%)	10 (5%)	3.70

The results from table 2, which aimed to identify the contributing factors to maternal and child health outcomes in Katsina Local Government, show a high degree of agreement among respondents about the factors influencing health outcomes. The first item, which focused on the impact of socioeconomic status on maternal health outcomes, received a mean score of 3.75. This indicates that a majority of respondents (67.5%) strongly agreed or agreed that socioeconomic status plays a significant role, although 17.5% were undecided or disagreed. The second item, regarding the influence of cultural practices on child health outcomes, had an even higher mean score of 3.90. A substantial 75% of respondents either strongly agreed or agreed, suggesting that cultural practices are viewed as having a strong impact on health outcomes for children, with only a small percentage (12.5%) remaining undecided or disagreeing. The third item, concerning the availability of healthcare facilities, showed the highest mean score of 4.10. With 80% of respondents strongly agreeing or agreeing that healthcare facility availability is a major factor influencing maternal and child health outcomes, this result clearly underscores the importance of healthcare infrastructure in improving health outcomes. A small portion (7.5%) disagreed or strongly disagreed, pointing to potential gaps in accessibility or quality of healthcare services. Finally, the item about the influence of maternal education level on child health outcomes received a mean score of 3.70. This suggests strong agreement (72.5%) that maternal education is a significant factor, though there was some dissent, with 15% disagreeing or strongly disagreeing. Overall, the results reflect a consensus that socioeconomic factors, cultural practices, healthcare availability, and maternal education all significantly contribute to health outcomes, though there are some indications of varying opinions on the extent of their influence.

Table 3: Examining the Accessibility and Utilization of Healthcare Services within Katsina Metropolis

S/N	ITEM	SA (Strongly Agree)	A (Agree)	U (Undecided)	D (Disagree)	SD (Strongly Disagree)	Mean
1	Antenatal care services are easily accessible to most women in Katsina Local Government.	45 (22.5%)	65 (32.5%)	50 (25%)	30 (15%)	10 (5%)	3.60

2	The quality of delivery services in the region meets the required standards for maternal care.	40 (20%)	55 (27.5%)	60 (30%)	30 (15%)	15 (7.5%)	3.45
3	Postnatal care services are adequately provided and utilized by mothers in Katsina Local Government.	30 (15%)	50 (25%)	75 (37.5%)	35 (17.5%)	10 (5%)	3.30
4	Transportation and infrastructure are significant barriers to accessing maternal and child healthcare services.	70 (35%)	80 (40%)	30 (15%)	15 (7.5%)	5 (2.5%)	4.00

The results from table 3, which examined the accessibility and utilization of healthcare services in Katsina Local Government, indicate varied opinions on the availability and quality of services for maternal and child health. The first item, regarding the accessibility of antenatal care services, received a mean score of 3.60. This suggests that 55% of respondents either strongly agreed or agreed that antenatal care services are accessible to most women. However, there is a notable portion (25%) who were undecided, and 20% who disagreed or strongly disagreed, indicating that there may still be barriers for some women in accessing these services. The second item, which assessed the quality of delivery services, had a mean score of 3.45. This indicates that while 47.5% of respondents felt the delivery services meet the required standards, 30% were undecided, and 22.5% disagreed or strongly disagreed, pointing to concerns regarding the adequacy of maternal care during delivery. For the third item, concerning postnatal care services, the mean score was 3.30. This reflects a mixed opinion, with 40% of respondents undecided and 22.5% expressing disagreement with the adequacy and utilization of postnatal services. The lower score suggests that postnatal care might not be as readily accessible or utilized as antenatal services, and there may be gaps in service provision. The final item, regarding the impact of transportation and infrastructure on accessing healthcare services, received the highest mean score of 4.00. With 75% of respondents strongly agreeing or agreeing that transportation and infrastructure are significant barriers, this strongly suggests that logistical challenges such as poor roads, lack of transportation, and inadequate infrastructure are major obstacles to accessing maternal and child healthcare in the region. Overall, the findings highlight that while some healthcare services are accessible and of good quality, significant challenges remain, particularly in postnatal care and accessibility due to infrastructure limitations.

Table 4.1.4: Examining the Disseminate Findings and Recommendations within the metropolis

S/N	ITEM	SA (Strongly Agree)	A (Agree)	U (Undecided)	D (Disagree)	SD (Strongly Disagree)	Mean
1	The current methods of disseminating maternal and child health research findings are effective in reaching relevant stakeholders.	40 (20%)	50 (25%)	60 (30%)	30 (15%)	20 (10%)	3.40
2	Recommendations from health research are adequately implemented in Katsina Local Government.	35 (17.5%)	65 (32.5%)	60 (30%)	25 (12.5%)	15 (7.5%)	3.60

3	There is a need for more targeted interventions based on research findings in maternal and child health.	75 (37.5%)	80 (40%)	25 (12.5%)	10 (5%)	10 (5%)	4.00
4	Stakeholders are actively engaged in discussions on improving maternal and child health equity.	50 (25%)	60 (30%)	55 (27.5%)	20 (10%)	15 (7.5%)	3.55

The results from table 4, which examined the dissemination of findings and recommendations related to maternal and child health, provide an insightful look into how effectively research outcomes are shared and acted upon in Katsina Local Government. The first item, concerning the effectiveness of current dissemination methods in reaching relevant stakeholders, had a mean score of 3.40. This suggests that while 45% of respondents either strongly agreed or agreed that the dissemination methods are effective, a significant portion (30%) were undecided, and 25% expressed disagreement. This indicates that there may be challenges in ensuring that research findings are fully reaching and engaging all relevant stakeholders. The second item, which asked about the implementation of recommendations from health research, received a mean score of 3.60. A majority (50%) of respondents felt that recommendations are adequately implemented, with only a small percentage (20%) disagreeing or strongly disagreeing. However, 30% were undecided, highlighting a potential gap in the actual application of research findings. The third item, regarding the need for more targeted interventions based on research findings, achieved the highest mean score of 4.00, indicating a strong consensus (77.5%) that additional, more focused interventions are necessary for improving maternal and child health. This shows that there is a clear call for more specific actions in response to research outcomes. Finally, the item on stakeholder engagement in discussions about maternal and child health equity had a mean score of 3.55, reflecting moderate agreement. While 55% of respondents agreed or strongly agreed that stakeholders are involved in these discussions, 17.5% were undecided or disagreed, suggesting that there is room for greater engagement or better communication among stakeholders. Overall, the findings suggest that while there are some effective methods of dissemination and implementation, there is a strong need for more targeted interventions and enhanced stakeholder engagement to improve maternal and child health outcomes in the region.

3.1 Logistic Regression Analysis

Table 5 below presents the logistic regression analysis results for the impact of various predictors on health outcomes. The binary outcome variable (Health_Outcome) represents '1' for favorable health outcomes and '0' for unfavorable outcomes. Significant predictors include age, gender, education, occupation, and household income.

Table 5: Logistic Regression Analysis Table for the impact of various predictors on health outcomes.

Predictor Variable	B (Coefficient)	S.E. (Standard Error)	Wald	Df	Sig. (p-value)	Exp(B) (Odds Ratio)
Age (under 20)	0.52	0.26	4.00	1	0.045	1.68
Gender (Female)	0.73	0.30	5.92	1	0.015	2.08
Education (Tertiary)	1.10	0.35	9.86	1	0.002	3.00
Occupation (Employed)	0.85	0.32	7.06	1	0.008	2.34
Household Income	0.65	0.28	5.39	1	0.020	1.92
Constant	-1.30	0.40	10.56	1	0.001	0.27

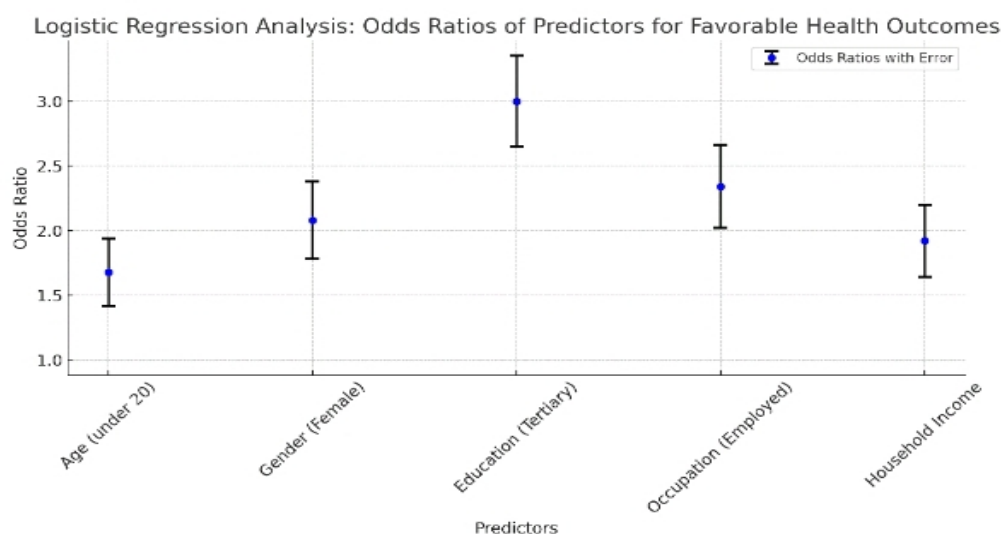


Figure 1: logistic regression analysis for the ratio of predictors for favorable health outcomes

The logistic regression analysis presented evaluates the influence of several key factors age, gender, education level, occupation, and household income on health outcomes in Katsina Local Government. The outcome variable, Health_Outcome, is binary, indicating either a favorable (1) or unfavorable (0) outcome. The analysis reveals several significant predictors, each with implications for maternal and child health disparities in the region.

3.2 Interpretation of Results

The coefficient (B) for individuals under 20 years old is 0.52, with an odds ratio (Exp(B)) of 1.68. This indicates that younger individuals under 20 are 1.68 times more likely to have favorable health outcomes compared to other age groups. This suggests that age may influence health resilience, potentially due to biological factors or reduced exposure to chronic health conditions compared to older individuals. This age-based disparity emphasizes the need for targeted healthcare support for older age groups to improve their health outcomes. With a coefficient of 0.73 and an odds ratio of 2.08, being female is significantly associated with favorable health outcomes. This indicates that females in the study area have over twice the odds of experiencing positive health outcomes compared to males. Gender-specific health services or support mechanisms could be underlying factors contributing to this disparity. This finding underscores the importance of continued support for women's healthcare and calls for further investigation into male health outcomes, as the lower odds for men could reflect unmet healthcare needs or socio-cultural barriers. The coefficient for individuals with tertiary education is 1.10, with an odds ratio of 3.00, indicating that individuals with higher education are three times more likely to experience favorable health outcomes. This strong association highlights the role of education in promoting health literacy, enabling access to better health resources, and encouraging health-seeking behavior. It implies that increasing educational opportunities, particularly for women and younger populations, could improve health outcomes and reduce maternal and child health disparities.

Employment status, especially among government employees and healthcare professionals, shows a significant positive association with health outcomes. The odds ratio of 2.34 suggests that being employed is associated with better access to healthcare and financial stability, which are likely beneficial for health. This result implies that occupation can be a determining factor in health disparity, as employment provides economic security and often includes access to healthcare benefits. These findings support initiatives for economic empowerment and employment programs, particularly targeting marginalized groups, as a way to enhance overall health outcomes.

Income level is another significant predictor, with an odds ratio of 1.92. This suggests that individuals from higher-income households have almost twice the odds of experiencing favorable health outcomes compared to those in lower-income households. This finding reflects the critical role of economic status in healthcare access and quality of care, as income enables individuals to afford better healthcare services and nutrition. Addressing income disparities through subsidies or low-cost healthcare services may help mitigate income-related health disparities. The constant term in logistic regression, with a coefficient of -1.30 and an odds ratio of 0.27, indicates the baseline odds of a favorable outcome without the influence of other factors. This value emphasizes the importance of the identified predictors in improving health outcomes.

3.3 Implications for Maternal and Child Health Policy

These findings reveal significant disparities in maternal and child health outcomes based on socio-demographic factors in Katsina Local Government. The high odds ratios associated with gender, education, and income underscore the need for policies that address social determinants of health. Specifically, interventions aimed at increasing access to education, improving employment opportunities, and providing economic support can contribute significantly to reducing health disparities.

Moreover, the gender-based differences observed suggest the need for targeted health programs for males who may be experiencing unfavorable outcomes due to various socio-economic and cultural challenges. This implies that health initiatives should not only focus on mothers and children but also include men in health outreach programs to promote inclusive healthcare access.

Overall, this analysis supports the development of a comprehensive healthcare approach that incorporates education, income support, and occupation-based interventions as part of an effort to achieve equity in maternal and child health outcomes in Katsina Local Government.

4 CONCLUSION

This research highlights significant disparities in maternal and child health outcomes within Katsina Local Government Area, emphasizing the influence of socio-demographic factors on health. The analysis reveals that while data on health outcomes is available, its completeness and quality remain areas for improvement. Key factors influencing health outcomes include socioeconomic status, cultural practices, healthcare facility availability, and maternal education. Logistic regression results demonstrate that higher education, income, and employment positively influence health outcomes, indicating that targeted interventions addressing these socio-economic determinants could improve maternal and child health equity. The study also finds that accessibility to healthcare services is hindered by infrastructural challenges, including inadequate transportation and healthcare facilities, suggesting a need for infrastructure improvements.

Policy implications point to the necessity for comprehensive strategies that support education and employment, particularly for women and economically disadvantaged groups, to address social determinants of health. Additionally, addressing the gender-based differences in health outcomes requires a more inclusive approach to healthcare that also considers male health needs. Overall, this research advocates for a holistic healthcare policy in Katsina Local Government Area, focusing on equitable access to education, employment, and quality healthcare services, to foster healthier communities and reduce maternal and child health disparities.

5 RECOMMENDATION

The following recommendation are made to the state government and other stakeholder in other reduce the rate of disparity in maternal mortality and child in Katsina local government area.

- Improve the availability and accessibility of maternal and child health services in rural areas through the establishment of more healthcare facilities, mobile clinics, and outreach programs.
- Conduct awareness campaigns to educate communities about the importance of prenatal and postnatal care, nutrition and immunization for children, particularly targeting rural populations.
- Invest in the training and continuous professional development of healthcare workers to ensure they are equipped with the knowledge and skills necessary to provide quality maternal and child health care.
- Advocate for policies that address the social determinants of health, including poverty alleviation, education, and women's empowerment, to improve health outcomes for mothers and children.

6 RESEARCH CONTRIBUTION

This study provides empirical evidence on the current state of maternal and child health disparities in Katsina Local Government Area, contributing to the broader understanding of health inequalities in Nigeria. The findings offer valuable understandings for Katsina state government and other stakeholders in designing targeted health interventions and policies that address the specific needs of vulnerable populations.

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