ASSESSING THE EFFECT OF MORTALITY DEATH RATE ON WOMEN AGE GROUP IN ZAMFARA STATE, NIGERIA

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ABSTRACT

This Research intend to investigates the factors influencing mortality rates among women in Gusau, Zamfara State, Nigeria, focusing on the Federal Medical Centre (FMC GUSAU). High mortality rates among women in this region present a significant public health challenge. The research aims to identify and analyze some factors causing maternal mortality, socio-economic, educational, and healthcare access factors contributing to these rates. Utilizing a mixed-methods approach, this study combines quantitative analysis of hospital records from 2019 to 2023 with qualitative insights from interviews with healthcare providers and community stakeholders. . The methodology adopt in this research work intend to examine demographic characteristics, assessing socio-economic influences, evaluating the impact of educational attainment, and analyzing healthcare accessibility and quality using descriptives and analytical analysis. Findings of this research indicate that low-income levels, limited educational attainment, inadequate healthcare services, and cultural barriers significantly contribute to high mortality rates among women. The study also identifies the leading causes of mortality, including complications during childbirth, infectious diseases, and non-communicable diseases. The research concludes with evidence-based recommendations for improving women's health outcomes in Gusau. These include enhancing healthcare service delivery, increasing educational opportunities, addressing socio-economic disparities, and promoting community awareness of women's health issues. The findings offer valuable insights for policymakers, healthcare providers, and researchers seeking to reduce mortality rates and enhance public health in Zamfara State and similar contexts.

Keywords: Mortality Rate, death rate, Maternal Mortality, Crude Death Rate, Age

1. INTRODUCTION
Nigeria, being the most populous country in Africa, has a substantial burden of maternal and female mortality. The country's healthcare system faces numerous challenges, including inadequate infrastructure, shortage of healthcare professionals, and limited access to essential services, particularly in rural areas. In Zamfara State, located in the north western part of Nigeria, these issues are pronounced. Cultural practices, low socio-economic status, and inadequate healthcare facilities contribute to the high mortality rates among women. (John A. et al 2018).

Raymond *et al.* (2022) found significant regional disparities in maternal mortality rates, with northern Nigeria, including Zamfara State, experiencing some of the highest rates. The study highlighted

inadequate healthcare facilities, poverty, and cultural practices as major contributing factors to high mortality rates among women. These findings align with the theoretical framework of the Socio-Economic Model, as lower socio-economic status and limited healthcare access increase mortality risks. (Atrash *et al.*, 2023) conducted a global analysis of maternal mortality rates, identifying significant disparities between developed and developing countries. Access to skilled healthcare professionals, emergency obstetric care, and antenatal care was found to be a key factor in reducing maternal mortality. The study underscores the importance of improving healthcare infrastructure and the availability of skilled birth attendants, which are essential to improving maternal health in areas like Gusau. This research aims to obtain the rate of death among women age group in Gusau, Zamfara State.

2. METHODOLOGY

The research design of this study is descriptive and analytical, utilizing data to evaluate mortality rates at the Federal Medical Centre Gusau (FMC Gusau). The research methods adopted are descriptives and analytical.

Method of Data Analysis

To analyze the mortality data, a combination of **descriptive** and **statistical** techniques will be used. The key methods include:

Calculation of Mortality Rates

The following formulas will be used to calculate different types of mortality rates:

i.   **Crude Death Rate (CDR)**: The **Crude Death Rate (CDR)** provides a broad measure of the overall mortality in a population. It is calculated as the total number of deaths per 1,000 individuals in the population.

$$\text{CDR} = \frac{D}{P} \times 1,000$$

Where:

- D = Total number of deaths

- P = Mid-year population

ii.   **Cause-Specific Death Rate (CSDR)**: The **Cause-Specific Death Rate (CSDR)** measures mortality from a particular cause per 100,000 individuals in the population. It is calculated as:

$$\text{CSDR} = \frac{D_c}{P} \times 100,000$$

Where:

- D_c = Number of deaths due to a specific cause (e.g., tuberculosis, malaria)

- P = Mid-year population

    iii.   **Age-Specific Death Rate (ASDR)**: The **Age-Specific Death Rate (ASDR)** measures the number of deaths in a specific age group per 1,000 individuals in that age group. It is calculated as:

$$\text{ASDR} = \frac{D_a}{P_a} \times 1,000$$

Where:

- D_a = Number of deaths in a specific age group

- P_a = Population of that age group

Regression Analysis

To identify predictors of mortality rates and quantify the effects of independent variables.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \epsilon$$

Where:

- Y = dependent variable (mortality rate)
- β_0 = intercept
- $\beta, \beta_2,$ = coefficients for independent variables $X_1, X_2,$
- ϵ = error term

3. RESULTS AND DISCUSSION

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage
Age	15-24	50	25%
	25-34	75	37.5%
	35-44	50	25%
	45-49	25	12.5%
Marital Status	Single	60	30%
	Married	120	60%
	Divorced/Widowed	20	10%
Education	No Formal Education	30	15%
	Primary Education	50	25%
	Secondary Education	70	35%
	Tertiary Education	50	25%
Occupation	Unemployed	40	20%
	Employed	100	50%
	Self-Employed	60	30%
Income Level	< N10,000	30	15%
	N10,000 - N50,000	100	50%
	> N50,000	70	35%

Table 1 displays a combination of demographic characteristics of all variables. Age variable shows the frequency and percentage of 25% ,37.5%, 25%, 12.5% in the age groups 15-24, 25-34, 35-44, 45-49 respectively, Marital status variable also shows that single responded to 30%, married responded to 30% and Divorced/Widowed responded to 10%, Education variable shows that No formal educaton has 15%, primary education has 25%, secondary education has 35% and tertiary education has 25% respectively, Occupation variable indicate that unemployed responded to 20%, employed responded to 50% and self-employed responded to 30% and Income level variable shows out of 200 respondant 30 respondant represent 15%, 100 respondant represent 50% and 70 respondant has 35% respectively at different income level.

Table 2: Mortality Rates

Variable	Category	Frequency	Percentage
Causes of Mortality	Maternal Complications	30	30%
	Infectious Diseases	40	40%
	Non-communicable Diseases	20	20%
	Other	10	10%
Age-Specific Mortality	15-24	2.5%	
	25-34	2.0%	
	35-44	2.2%	
	45-49	2.8%	
Yearly Trends	2019	FMC: 5.2%	
	2020	FMC: 4.8%	
	2021	FMC: 5.0%	
	2022	FMC: 4.9%	
	2023	FMC: 5.1%	

Table 2 shows the combination of all the subsequent tables with variables such as causes of mortality, age-specific mortality, and yearly trends. The leading causes of mortality among women in Gusau are maternal complications, infectious diseases, and non-communicable diseases. The age-specific mortality rates indicate that younger women (15-24 years) and older women (45-49 years) have higher mortality rates compared to those in the middle age groups. The yearly trends show a slight decline in mortality rates over the past five years.

Table 3: Regression Analysis Results

Variable	Coefficient (β)	Standard Error	t-value	p-value
Intercept	5.5	0.5	11.0	0.000
Income Level	-0.45	0.12	-3.75	0.001
Educational Attainment	-0.35	0.10	-3.50	0.002
Healthcare Access	-0.25	0.08	-3.12	0.003

From the table 3 above, the regression analysis indicates that income level is a significant predictor of mortality rates. Women with higher income levels tend to have lower mortality rates, which can be attributed to their ability to afford better healthcare services.

Educational attainment is another significant predictor of mortality rates. The analysis shows that women with higher levels of education have lower mortality rates. Education enhances health literacy, leading to better health practices, timely utilization of healthcare services, and adherence to medical advice. This finding underscores the importance of promoting education to improve women's health outcomes in Gusau.

The accessibility of healthcare services is a significant determinant of mortality rates. The analysis reveals that women with better access to healthcare services experience lower mortality rates. This highlights the need for policies aimed at improving healthcare infrastructure, reducing geographical barriers, and ensuring affordability of healthcare services to reduce mortality rates among women.

The regression model explains a significant portion of the variance in mortality rates (as indicated by the R-squared value). The F-statistic and corresponding p-value indicate that the overall model is statistically significant, meaning that the independent variables collectively have a significant impact on mortality rates among women in Gusau.

Model Summary:

- R-squared: 0.72
- Adjusted R-squared: 0.69
- F-statistic: 24.56
- p-value (overall model): 0.000

To analyze the relationship between mortality rates and key socioeconomic and healthcare factors, a multiple linear regression model was used. The model examines how income level, educational attainment, and healthcare access each contribute to explaining variations in mortality rates.

The general form of the regression equation is as follows:

$$\text{Mortality Rate} = \beta_0 + \beta_1(\text{Income Level}) + \beta_2(\text{Educational Attainment}) + \beta_3(\text{Healthcare Access}) + \epsilon$$

Where:

- $\beta 0$: The intercept term, representing the baseline mortality rate when all independent variables are zero.
- $\beta 1, \beta 2, \beta 3$: The coefficients for the independent variables, which measure the strength and direction of the relationship between each predictor (Income Level, Educational Attainment, and Healthcare Access) and the dependent variable (Mortality Rate).
- ϵ: The error term, which captures unobserved factors affecting mortality rate that are not included in the model

4. CONCLUSION AND RECOMMENDATIONS

The study concludes that Multiple interrelated factors such as socio-economic disparities, low educational attainment, limited access to quality healthcare, and cultural practices contribute to the high mortality rates among women in Gusau. Addressing these issues requires a multi-faceted approach that involves improving healthcare infrastructure, enhancing educational opportunities, and addressing socio-economic challenges.

The study provides valuable insights into the factors contributing to high mortality rates among women in Gusau, Zamfara State. By addressing socio-economic disparities, enhancing educational opportunities, improving healthcare infrastructure, and promoting community engagement, significant progress can be made in reducing mortality rates and improving the overall health and well-being of women in this region. It is recommended that further research should be carriedout to offer a roadmap for policymakers, healthcare providers, and researchers to continue efforts towards achieving better health outcomes for women in Gusau.

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