Fitting Autoregression Pattern on Maternal Mortality Rate in Kano

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Abstract
The North Eastern Region of Nigeria has one of the highest maternal mortality ratio (MMRs) in the world, and most of these deaths are preventable. Culture, religion and customs that prevent access to care contribute immensely to these deaths. This work has sought to determine the pattern of maternal mortality in Kano state. Data used for the study was obtained from the medical department of Sir Muhd Sunusi Specialist Hospital Kano. The results have shown that maternal mortality followed a linear pattern and is on slight decline with an average of 2.225 deaths per year.

Key words: Maternal mortality, time series, Autoregressive method.

Introduction

Maternal mortality, also known as maternal death continue to be the major cause of death among woman of reproductive age in many countries and remains a serious public health Issue especially in developing countries (WHO, 2007). As explained in shah and say (2007), a maternal death is defined as the death of a woman while pregnant of within 42 days of termination of pregnancy. Irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by pregnancy or its management but not from accidental or Incidental causes. Globally, the estimated number of maternal deaths worldwide in 2005 was 536, 000 UP FROM 529,000 in 2000. According to the WHO factsheet (2008), 1500 women die from pregnancy or pregnancy –related complications every day most of these deaths occur in developing Countries, and most are avoidable of all the health Statistic compiled by the world health Organization the largest discrepancy between developed and developing countries occur in maternal mortality. Ujah et al. (2005) noted that while 25 percent of females of reproductive age lived in developed countries, they contributed only 1percent to maternal deaths worldwide.

Ujah et al. (2005), a total of 99 percent of all maternal deaths Occur in developing countries more than half of these deaths, occur in Sub – Saharan African and one third in south Asia. The maternal mortality ratio in developing countries is 450 maternal deaths per 100,000 live births Versus 9 in developed countries. Fifteen countries have maternal mortality ratios of at least 1000 per 100, 000 live births, of which all but Afghanistan and India are in Sub – Saharan African; Afghanistan, Angola, Burundi, Cameroon, Chad, the Democratic Republic of the Congo, Guinea – Bissau, India, Liberia, Malawi, Niger, Nigeria, Rwanda, Sierra Leone and Somalia (WHO 2008), Nigeria has one of the highest maternal mortality rates in the world; Second only to India whose population is eight times larger than that of Nigeria.
Mairiga et al. (2008) expressed the view that the world's maternal mortality ratio (the

number of maternal deaths per 100, 000 live births) is declining too slowly to meet millennium Development Goal (MDG) 5 target, which aimed to reduce the number of woman who die in pregnancy and childbirth by three quarters by the year 2015.Whilean annual decline of 5.5 percent in maternal mortality ratios between 1990 and 2015 is required to achieve MDG 5, figures released by WHO, UNICEF, UNFPA world bank Slow a annual decline mortality have been modest Overall while average global infant mortality and Under five mortality have been reduced by more than half in the past 40 years, and average global life expectancy at birth has increased enormously during the same period there has been no Visible progress in maternal mortality (MMR) reduction at the global level shah and say (2007) noted than the trend in developing countries is much worse, as studies from various countries of Sub – Saharan African indicate than maternal Mortality has not only continued to be high but is indeed increasing after the launch of the safe motherhood Initiative(SM I) in Kenya in 1987

The aim of this study is to investigate the pattern of maternal mortality in Kano State. By determining the trend on maternal mortality from 2009-2021 and make forecast for the next five years.

Mojekwu (2012) studied maternal mortality in Nigeria, where intervention methods are examined. Multiple regression analysis was applied to some variables for modeling maternal mortality in Nigeria. Also, stepwise regression was employed to determine the major determinant factors that affect the ratio of maternal mortality. It was found that educational attainment of delivery by skilled health professionals of women has more effort on reduction of maternal mortality in Nigeria. Hence deductions play an important role in reducing maternal mortality in Nigeria. Ibrahim (2014) determine the incidence of maternal mortality associated with non-utilization of obstetric services and how socio-demographic and medical factors influence the deaths of pregnant women. There were 2,310,727 antenatal attendance 1, 886,932 live deliveries and 3,062 maternal death during the period under review given a maternal mortality ratio (MMR) of 1625/100.000 live deliveries. It was also discovered that mean age at death for pregnant women for urban area was 28.8 years and rural 27.6 years. Both antenatal and hospital live deliveries had irregular pattern.

The major direct causes of death in urban area was eclampsia and bleeding cases while in rural areas bleeding cases followed by eclampsia and obstructed labor and then anemia were more prevalent. And data was analyzed using Microsoft excel statistical package and presented in the form of tables, frequencies, percentage, and graphs. The data was also subjected to correlation analysis to establish relationship between the variables. The study found that there was an increased trend in antenatal attendance but slight increase in hospital deliveries more pronounce in urban areas than rural areas. The numbers of hospital deliveries was far less than the number of antenatal attendance more especially in rural areas. Mamady Cham (2003) studied maternal mortality in Gambia, who died as a result of pregnancy or childbirth essentially remains invisible to the government and agencies that need to see them. This is because there is no system put in place to review maternal deaths that occurred. This makes event, or circumstances surrounding such deaths unknown. And the study was carried out in Bansang Hospital and its main catchment area Central River and upper river administrative divisions (CRD & URD).

The WHO factsheet (2008) indicates that globally about 80 percent of maternal deaths are due to four major cause's severe bleeding, infections, hypertensive disorders in pregnancy (eclampsia) and obstructed labor. Complications after Unsafe abortion cause 13% of maternal deaths. Among the indirect causes; of maternal death are diseases that complicate pregnancy

or are aggravated by pregnancy, Such as malaria, anemia, hepatitis anesthetic death, meningitis, HIV/AIDS, Sickle cell anemia, anemia and acute renal failure, which could be a complication of eclampsia. Women also die because of poor health at conception and a lack of adequate care needed for the health outcome of the pregnancy for themselves and their babies. Omoruyi (2008) estimated that in Nigeria, more than 70 percent of maternal deaths could be attributed to five major complications: hemorrhage, infection, unsafe abortion, hypertensive disease of pregnancy and obstructed labor. Also poor access to and Utilization of quality reproductive health Services contribute signification to the high maternal mortality level in the country.

Methodology

Data Used for this research work was collected from medical Records department of Sir Muhd Sunusi specialist hospital Nassarawa L.G.A Kano.

| **Coefficients**								
		Unstandardized Coefficients		Standardized Coefficients			95% C.I for B	
Model		B	Std. Error	Beta	t	Sig.	Lower	Upper
1	(Constant)	19.812	3.541		5.595	0.000	12.581	27.044
	Quarter, period 4	-2.225	1.293	-0.300	-1.721	0.042	-4.865	0.415

a. Dependent Variable: Maternal Mortality   Rate

4.1 Analysis and Interpretation of Output

Our regression model is Y= 19.812 – 2.225(period)
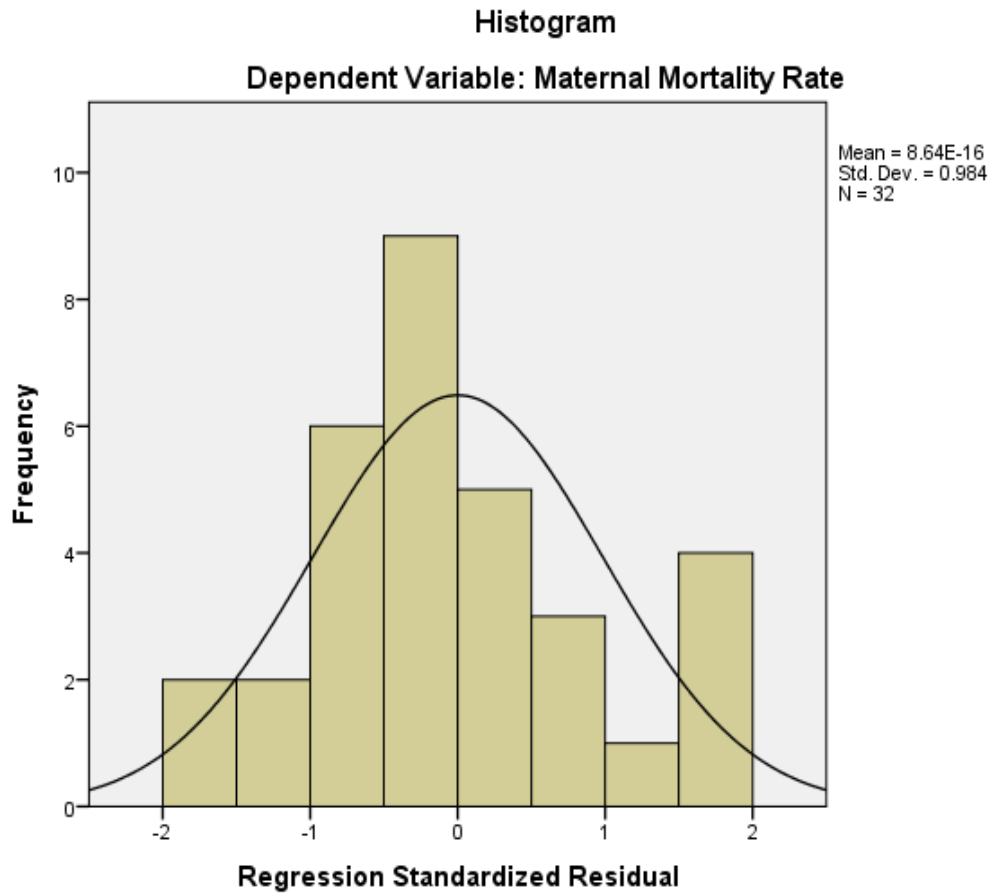
According to the histogram above, our given data is said to be normally distributed with the total number of observation N = 32 and standard Deviation = 0.984
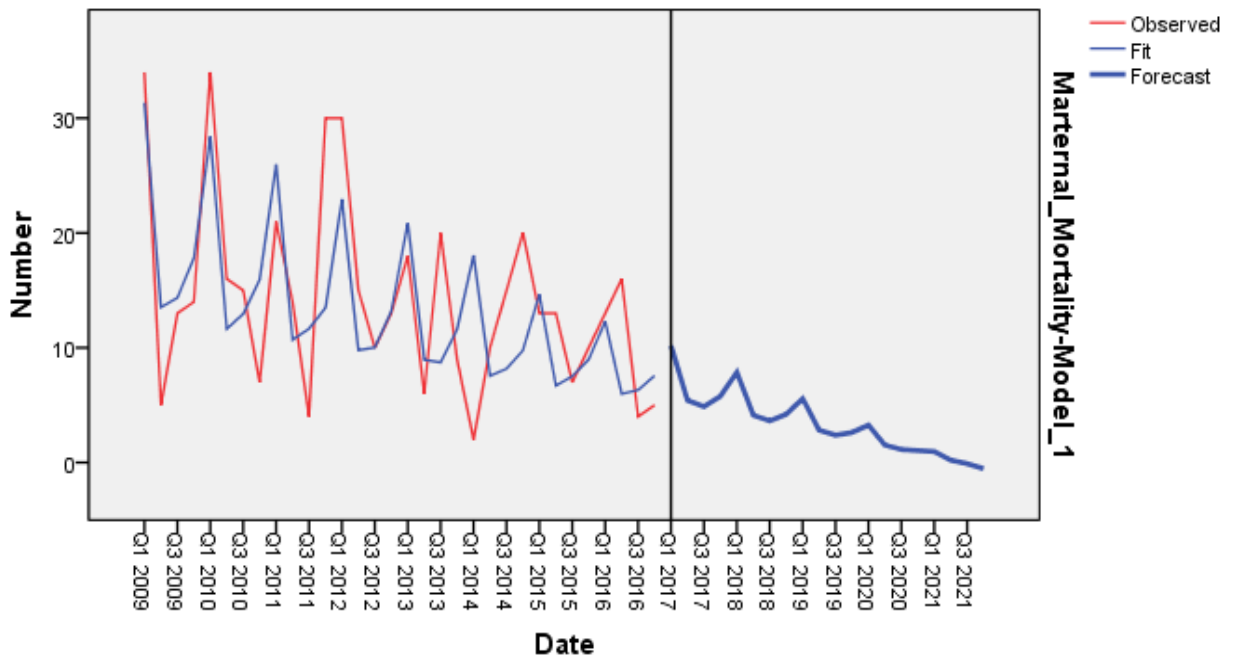
A graph showing the observed fitted and forecast.

The above graph shows both the observed value and the Auto Regression fitted value as well as our forecast for the period of five consecutive years. It is also observed that there is a downward slope which signifies that there is a decline in the maternal mortality rate.

4.4 Test Statistic
ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	198.025	1	198.025	2.962	0.042[b]
	Residual	2005.975	30	66.866		
	Total	2204.000	31			

a. Dependent Variable: Maternal Mortality Rate
b. Predictors: (Constant), QUARTER, period 4

Conclusion

There exists enough evidence to conclude that the slope of the population regression line is zero and, hence, the year is was found to be a good predictor of Maternal Mortality Rate were the present of other variables will help to visualize the result.

'Analysis of Maternal Mortality' had looked at the pattern of maternal mortality and forecast of the pattern using the Autoregressive Method. The African Union conference in Kampala which started on July 19 and will end July 27, has been discussing strategies to reduce maternal mortality. As a mother who has experienced the consequences of poor maternal health systems in Uganda, I thought it was time to tackle this crucial yet often neglected area of maternal health. It is now two decades since the launch of the Global Safe Motherhood Initiative in 1987, but women are still dying in childbirth, and their deaths seem to be invisible. Fortunately, we can prevent these deaths if we invest in a few key safe and affordable health services. Dela, 2004 Outlined four (4) ways of reducing maternal mortality rate are Health Education to parent, Provision of good roads to ensure accessibility to health facilities, Provision of adequate health Centers and increasing the manpower strength as well as welfare of health practitioners. Implementing the above strategies is not only the right thing to do; it is the economically smart thing to do. Women and girls are a driving force in our economies, and when women are healthy, they play a crucial role in the development of countries. Young women especially, have lifetimes of potential economic returns to give to their communities.

Reference

Mojekwu (2012) "Maternal Mortality in Nigeria: Examination of Intervention Methods" Journal International Journal of Humanities &Social Science. 2(20) 135 – 149.

Mamady Cham (2003) Maternal Mortality In Gambia Department Of General Practice And Community Medicine, Faculty Of Medicine, University Of OSLO NORWAY. (1 – 136).

Shah, I.H., Say L,. (2007) Maternal Mortality and Maternity Care from 1990-2005: Uneven but Important Gains Reproductive Health Matters, Vol.15, No.30 Maternal Mortality and Morbidity: Is Pregnancy Getting Safer for Women?, pp.17-27

World Health Organization (2008), Factsheet, Maternal Mortality, Department of Making Pregnancy Safer.

World Health Organization (2006) Regional Committee for Afri ca Resolution, Health Financing: A Strategy for the African Region, AFR/RC56/R5, para. 2(c) (2006), available at

http://www.who.int/health_financing/documents/afrrc56-r5-
healthfinancingstrategy.pdf.

YAR'ZEVER S. Ibrahim, (2014) "Temporal Analysis of Maternal Mortality in Kano state,
Northern Nigeria: A Six Year Review." American Journal of Public Health Research,
Vol. 2, No, 2 (2014): 62 – 67.