

A Comparative Study of The Determinant of Under-Five Mortality Rate Between the Urban and Rural Areas of Mubi North Local Government of Adamawa State

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ABSTRACT

This research is aimed at identifying the major causes of under-five mortality, assessing the control measures and examining the differences of under-five mortality rate between rural and urban areas of Mubi. Data used for this research were sourced from both primary and secondary sources and data collection methods used for this study includes GPS and existing hospital records. Data analysis Techniques employed for this research was t-test analysis in order to determine the significant differences in under-five mortality rate between the urban and rural areas of Mubi. The result of the findings revealed that there is a significant difference in under-five mortality rate between the urban and rural areas of Mubi. The result clearly shows that the under-five mortality recorded in the urban areas of Mubi is higher than its rural counterpart. The research recommended that effort should be made to the greatest level towards reducing the problem of under-five mortality through the effective practice of the child survival strategies.

KEYWORDS

Comparative; mortality; child –survival

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INTRODUCTION

Mortality is defined as a state of being mortal or susceptible to death; The under-five mortality rate refers to the probability a newborn would die before reaching exactly five years of age. The world made remarkable progress in child survival in the three decades, and millions of children have better survival chances than in the 1990 – 1 in 26 children died before reaching age five in 2021, compared to 1 in 11 in 1990. (UNICEF 2021). So far, progress in reducing child mortality rates has been smoothened in the 2000s period compared with the 1990s, with the annual rate of reduction in the global under five mortality rate increasing from 1.8 percent in 1990s to 4.0 percent for 2000-2009 and 2.7 percent for 2010- 2021. (UNICEF 2023). The global under five mortality rate declined by 59 percent, from 93 deaths per 1000 live births in 1990 to 38 in 2021. Despite this progress, child survival remains a matter of urgent concern. In 2021 alone, about 13,800 under five deaths occurred every day. An intoralable high number of largely preventable child deaths. Children under five years of age died. Globally, infectious diseases including pneumonia, diarrhea, and malaria, remain a leading cause of under five deaths, along with preterm birth and intrapartum- related complications. Constant yearning and quest for effective measures for reducing under-five mortality in both the rural and urban areas of this country necessitated for this Research. Under five Mortality in this country will keep on increasing unless some control measures are applied to reduce it, (UNICEF, 2015).

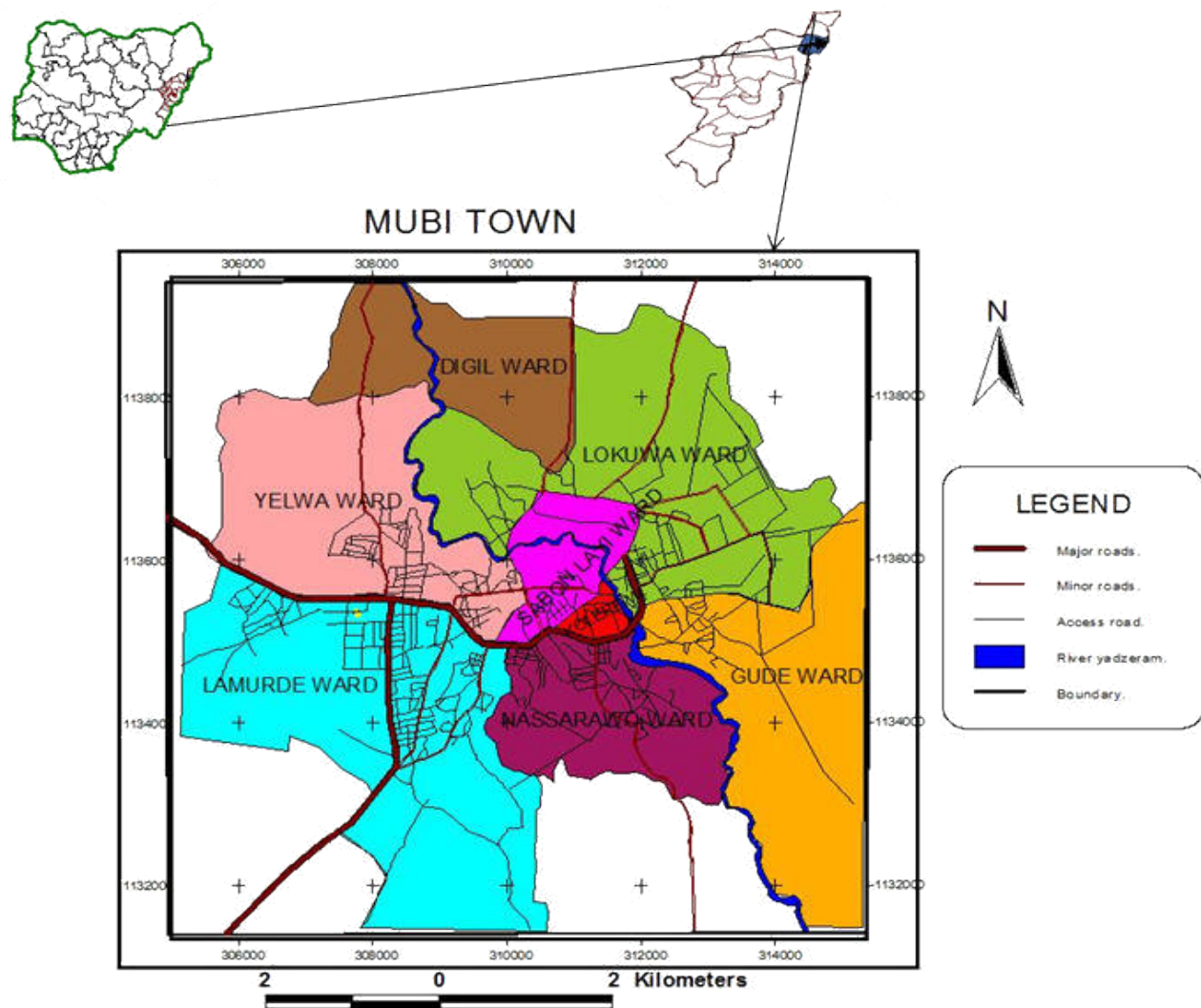
Child mortality is emotionally and physically hard on the parents. Many children in the majority of the world go unreported since poor families cannot afford to register their babies in the public registries. The same cause and preventive measures that apply to infant mortality Child Survival is a field of public health concern with reducing child mortality. Child Survival interventions are designed to address the most common causes of child death that occur, which include diarrhea, pneumonia, malaria, and neonatal conditions Curtis, et al; (2013). The death of children before their 5th birthday still remains a major public health priority UNICEF (2017). Apart from the fact that children under five contribute to an estimation of life expectancy at birth, they are also a key health indicator in any country.

A 2013 UNICEF report estimated that 6.6 million children die per year, 546,000 per month; 125,000 per week; 18000 per day; and 12 per minute UNICEF (2013). Put in more practical terms, a child dies each time one takes a breath. Currently, it is estimated that the total number of under-five deaths dropped from 12.6 million (35,000 every day) in 1990 to 5.6 million (15,000 every day) in 2016 UNICEF (2018). More than half of these deaths are preventable, and the description of the situation as a public health disaster by some researchers in the early 2000s .Bawaskar (2015). Globally, the sub-Saharan Africa region continues to remain the region with the highest child mortality rates. In 2016, the region recorded an estimated average mortality rate of 79 per 1,000 live births. This figure translates into 1 in 13 children dying before their 5th birthday. It is 15 times higher than the average of 1 in 189 in high-income countries and 20 times higher than New Zealand and Australia UNICEF (2018).

MATERIALS AND METHODS

The study area lies between latitudes 10°30' 0' and 10°15' 0' North of the equator and between longitudes 13°15' 0' E and 13°30'0'E East of the Greenwich Meridian. Mubi town is the metropolitan headquarters of Mubi North and South Local Government Areas of Adamawa State. This local government were created on the 7th February 1996; the study area shares common boundary with Hong Local Government Area to the west, Michika to the North, and with Cameroon Republic in the East. The Local Government Area has projected population of 280,009 persons and the land area of about 321.8 kilometers (Bureau of Statistics, 2006).

The study area



Source: ADSU LAB 2019.

Data for this research was collected from existing hospital records. Records on under-five mortality from the selected health centers in rural areas, and also records of under-five mortality from the selected urban health centers; in order to determine whether there is any significant difference in the under-five mortality rate between the urban and rural areas of Mubi.

The data for this research was analyzed using inferential statistical tool such as the t-test and the GIS for the spatial analysis. The T-test was used to determine whether there is any significant difference in under-five mortality between the urban and rural areas of Mubi. The formula for the T-test is;

$$t = \frac{X - Y}{\sqrt{\frac{\frac{\sum x^2}{nx} - (\bar{X})^2}{n_{x-1}} + \frac{\frac{\sum y^2}{ny} - \bar{Y}^2}{n_{y-1}}}}$$

RESULTS AND DISCUSSION

The data for this research was collected from selected health center in the urban area (General Hospital Mubi) and selected health center from the rural area in Mubi (Mayo-Bani Maternity Mubi). The data was collected for five years each ranging from the year 2015-2019. The results were presented in the following tables;

TABLE 1: Analysis of 2015 under-five mortality records.

Month	S/N	General Hospital Records(X)	Mayo-Bani Maternity Records(Y)	X ²	Y ²
JANUARY	1	11	3	121	9
FEBRUARY	2	16	0	256	0
MARCH	3	30	2	900	4
APRIL	4	9	1	81	1
MAY	5	18	1	324	1
JUNE	6	19	0	361	0
JULY	7	21	2	441	4
AUGUST	8	15	4	225	16
SEPTEMBER	9	9	3	81	9
OCTOBER	10	6	2	36	4
NOVEMBER	11	19	0	361	0
DECEMBER	12	16	1	256	1

$$\frac{\sum x}{n} = \frac{189}{12} \quad \frac{\sum y}{n} = \frac{19}{12} \quad \sum x^2 = 3443 \quad \sum y^2 = 49$$

$$\bar{x} = 15.75 \quad \bar{y} = 1.58$$

Sources: Field work, 2019.

H0= There is no significant difference in under-five child mortality rate between the urban and rural areas of Mubi in the year 2015.

H1= There is a significant difference in under-five child mortality rate between urban and rural areas of Mubi in the year 2015.

Mortality Analysis between General Hospital, Mubi and Mayo Bani Maternity, 2015.

Group Statistics

Group-mortality-rate		N	Mean	Std. Deviation	Std. Error Mean
Mortality-rate	GHM	12	15.7500	6.51048	1.87941
	MBM	12	1.5833	1.31137	.37856

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Mortality rate	Equal variances assumed	9.282	.006	7.389	22	.000	14.16667	1.91716	10.19072	18.14261
	Equal variances not assumed			7.389	11.891	.000	14.16667	1.91716	9.98529	18.34805

Stage 3: determine the level of degree of freedom (df)

$$df = nx - 1 + ny - 1$$

$$df = 11 + 11$$

$$df = 22$$

$$df = 12 - 1 + 12 - 1$$

Stage 4: level of significance = 0.05

The table value at 0.05 is 2.07

Stage 6: Compare the calculated t value with the table value

Calculated t value is 7.389

Table value is 2.07

Stage 7: Interpretation /discussion:

Since the calculated t value is greater than the table value, then we reject the null hypothesis and accept the alternative hypothesis that is. to say there is a significant difference in under-five mortality rate in the year 2015 between the urban and rural areas of Mubi.

TABLE 2: Analysis of 2016 under-five mortality records.

MONTH	S/N	GENERAL HOSPITAL RECORDS(X)	MAYO-BANI MATERNITY RECORDS(Y)	X ²	Y ²
JANUARY	1	14	1	196	1
FEBRUARY	2	30	4	900	16
MARCH	3	9	3	81	9
APRIL	4	7	2	49	4
MAY	5	18	1	324	1
JUNE	6	9	4	81	16
JULY	7	15	0	225	0
AUGUST	8	6	5	36	25
SEPTEMBER	9	7	1	49	1
OCTOBER	10	14	3	196	9
NOVEMBER	11	8	2	64	4
DECEMBER	12	9	1	81	1

$$\frac{\Sigma x}{n} = \frac{146}{12} \quad \frac{\Sigma y}{n} = \frac{27}{12} \quad \Sigma x^2 = 2282 \quad \Sigma y^2 = 87$$

$$\bar{x} = 12.17 \quad \bar{y} = 2.25$$

Sources: Field work, 2019.

Stage 1: stating the hypothesis

H₀= There is no significant difference in under-five mortality rate between the urban and rural areas of Mubi in the year 2016.

H₁= There is a significant difference in under-five mortality rate between urban and rural areas of Mubi in the year 2016.

Mortality Analysis between General Hospital, Mubi and Mayo Bani Maternity, 2016.

Group Statistics					
Group-mortality		N	Mean	Std. Deviation	Std. Error Mean
Mortality-rate	GHM	12	12.1667	6.78010	1.95725
	MBM	12	2.2500	1.54479	.44594

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Mortality rate	Equal variances assumed	8.835	.007	4.940	22	.000	9.91667	2.00740	5.75357	14.07977	
	Equal variances not assumed			4.940	12.139	.000	9.91667	2.00740	5.54846	14.28488	

Stage 3: determine the level of degree of freedom(df)

df=nx-1+ny-1 df=12-1+12-1

df=11+11 df =22

Stage 4: level of significance is 0.0

The table value at 0.05 is 2.0

Calculated t value is 4.940

Table value is 2.07

Stage 7: Interpretation /discussion:

Since the calculated t value is greater than the table value, then we reject the null hypothesis and accept the alternative hypothesis that is to say there is a significant difference in under-five mortality rate in the year 2016 between the urban and rural areas of Mubi.

TABLE 3: Analysis of 2017 under-five mortality records.

MONTH	S/N	GENERAL HOSPITAL RECORDS(X)	MAYO-BANI MATERNITY RECORDS(Y)	X ²	Y ²
JANUARY	1	12	3	144	9
FEBRUARY	2	14	4	196	16
MARCH	3	16	2	256	4
APRIL	4	5	1	25	1
MAY	5	10	0	100	0
JUNE	6	4	4	16	16
JULY	7	27	2	729	4
AUGUST	8	9	0	81	0

MONTH	S/N	GENERAL HOSPITAL RECORDS(X)	MAYO-BANI MATERNITY RECORDS(Y)	X ²	Y ²
SEPTEMBER	9	26	1	676	1
OCTOBER	10	25	3	625	9
NOVEMBER	11	21	5	441	25
DECEMBER	12	8	2	64	4

$$\frac{\sum x}{n} = \frac{177}{12} \quad \frac{\sum y}{n} = \frac{27}{12} \quad \sum x^2 = 2953 \quad \sum y^2 = 89$$

$$\bar{x}=14.75 \quad \bar{y}=2.25$$

Sources: Field work. 2019.

The Hypothesis

H₀= There is no significant difference in under-five mortality rate between the urban and rural areas of Mubi in the year 2017.

H₁= There is a significant difference in under-five mortality rate between urban and rural areas of Mubi in the year 2017.

Mortality Analysis between General Hospital, Mubi and Mayo Bani Maternity, 2017

Group Statistics

Group 'mortality-rate	N	Mean	Std. Deviation	Std. Error Mean
Mortality-rate				
General hospital mubi	12	14.7500	8.21446	2.37131
MayoBani Maternity	12	2.2500	1.60255	.46262

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower		Upper
Mortality-rate	Equal variances assumed	22.450	.000	5.174	22	.000	12.50000	2.41601	7.48949	17.51051
	Equal variances not assumed			5.174	11.836	.000	12.50000	2.41601	7.22786	17.77214

Since the calculated t value is greater than the table value, then we reject the null hypothesis and accept the alternative hypothesis that is to say there is a significant difference in under-five mortality rate in the year 2017 between the urban and rural areas of Mubi.

TABLE 4: Analysis of 2018 under-five mortality records.

MONTH	S/N	GENERAL HOSPITAL RECORDS(X)	MAYO-BANI MATERNITY RECORDS(Y)	X ²	Y ²
JANUARY	1	12	1	144	1
FEBRUARY	2	15	2	225	4
MARCH	3	23	0	529	0
APRIL	4	18	1	324	1

MONTH	S/N	GENERAL HOSPITAL RECORDS(X)	MAYO-BANI MATERNITY RECORDS(Y)	X ²	Y ²
MAY	5	7	1	49	1
JUNE	6	22	2	484	4
JULY	7	16	4	256	16
AUGUST	8	31	3	961	9
SEPTEMBER	9	8	3	64	9
OCTOBER	10	2	4	4	16
NOVEMBER	11	0	0	0	0
DECEMBER	12	0	0	0	0

$$\frac{\Sigma x}{n} = \frac{154}{12} = 12.83$$

$$\frac{\Sigma y}{n} = \frac{21}{12} = 1.75$$

$$\Sigma x^2 = 3040$$

$$\Sigma y^2 = 61$$

$$\bar{x} = 12.83 \quad \bar{y} = 1.75$$

Source: Field work, 2019.

$$t = \frac{\bar{X} - \bar{Y}}{\sqrt{\frac{\frac{\Sigma x^2}{nx} - (\bar{X})^2}{n_{x-1}} + \frac{\frac{\Sigma y^2}{ny} - \bar{Y}^2}{n_{y-1}}}}$$

Mortality rate analysis between General Hospital, Mubi and Mayo Bani maternity, 2018

Group Statistics

Group mortality rate	N	Mean	Std. Deviation	Std. Error Mean	
Mortality rate	General Hospital Mubi	12	12.8333	9.83346	2.83868
	Mayo Bani maternity	12	1.7500	1.48477	.42862

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper	
Mortality Rate	Equal variances assumed	19.970	.000	3.861	22	.001	11.08333	2.87085	5.12955	17.03712
	Equal variances not assumed			3.861	11.501	.002	11.08333	2.87085	4.79807	17.36860

Since the calculated t value is greater than the table value, then we reject the null hypothesis and accept the alternative hypothesis i.e. to say there is a significant difference in under-five mortality rate in the year 2018 between the urban and rural areas of Mubi.

TABLE 5: Analysis of 2019 under-mortality records.

MONTH	S/N	GENERAL HOSPITAL RECORDS(X)	MAYO-BANI MATERNITY RECORDS(Y)	X ²	Y ²
JANUARY	1	9	1	81	1
FEBRUARY	2	11	4	121	16
MARCH	3	13	1	169	1
APRIL	4	7	0	49	0
MAY	5	6	0	36	0
JUNE	6	11	1	121	1
JULY	7	18	3	324	9
AUGUST	8	7	2	49	4
SEPTEMBER	9	16	4	256	16
OCTOBER	10	14	0	196	0
NOVEMBER	11	11	3	121	9
DECEMBER	12	15	3	225	9
		$\frac{\Sigma x}{n} = \frac{138}{12}$	$\frac{\Sigma y}{n} = \frac{22}{12}$	$\Sigma x^2 = 1748$	$\Sigma y^2 = 66$
		$\bar{x}=11.5$	$\bar{y}=1.83$		

Source: Field work, 2019.

Mortality rate analysis between General Hospital Mubi and Mayo Bani Maternity, 2019

Group Statistics

Group mortality rate		N	Mean	Std. Deviation	Std. Error Mean
Mortality-rate	General Hospital Mubi	12	11.5000	3.82575	1.10440
	Mayo Bani Maternity	12	1.8333	1.52753	.44096

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
Mortality-rate	Equal variances assumed	7.888	.010	8.129	22	.000	9.66667	1.18918	7.20046	12.13287	
	Equal variances not assumed			8.129	14.420	.000	9.66667	1.18918	7.12309	12.21024	

Since the calculated t-value is greater than the table value, then we reject the null hypothesis and accept the alternative hypothesis i.e. to say there is a significant difference in under-five mortality rate in the year 2019 between the urban and rural areas of Mubi.

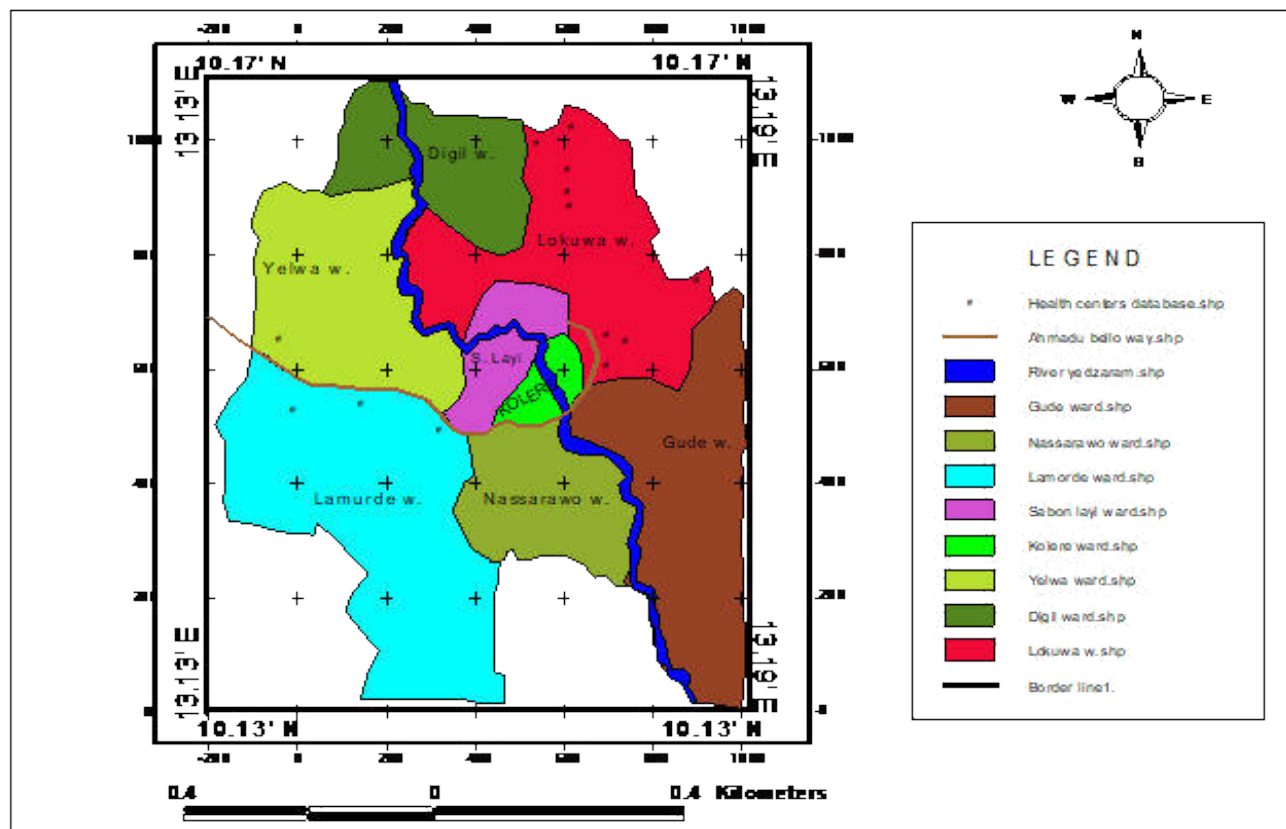


FIGURE 2: Locations of the Health centers.

SUMMARY

This research work among other things includes a critical look at the major causes of under-five mortality in general. More so, this research work offers or gives effective control measures to reducing under-five mortality rate for achieving good standard of living. Under-five mortality as a broad concept is caused mainly by pneumonia, malaria, malnutrition, diarrhea and preterm birth conditions among others. In reducing under-five mortality, a set of activities have to be put into practice which include immunization interventions, oral rehydration therapy, micronutrient supplementation, sleeping under treated insecticide mosquito or bed nets, practice of hand washing with soap, improved sanitation, using clean drinking water etc.

CONCLUSION

In conclusion, the research focuses broadly on the comparative study of under-five mortality rate between urban and rural areas of Mubi. The results whether of the under-five mortality rate in urban and rural areas of Mubi based on the analysis of these five years period shows that there is a significant difference in under-five mortality rate in urban and rural areas of Mubi.

RECOMMENDATIONS

- The government should provide up-to-date health centers with adequate facilities and well-trained medical practitioners.
- Attention should be given by making effort towards reducing the problem of children death within the study area through effective practice of the child survival strategies.
- The government should regulate the equitable distribution of immunization interventions exercise effectively in both the urban and rural areas of Mubi which can help to a greater extent in reducing children's deaths.
- Women should be educated on the issue of effective care of children.
- Access to clean drinking water should be the focal aim of the government within the urban and rural areas of Mubi.
- Government should help by removing the financial and social barriers to accessing basic services.
- Government should help through equal distribution of health centers within the study area.

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