ANALYSIS OF MORTALITY RATE DUE TO MALARIA CASE STUDY OF SPECIALIST HOSPITAL YOLA NORTH ADAMAWA STATE

BY

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GCE DDM 2014 026

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TITLE

ANALYSIS OF MORTALITY RATE DUE TO MALARIA, CASE STUDY OF SPECIALIST HOSPITAL YOLA NORTH ADAMAWA STATE.

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CCE/DDM/2014/026

BEING A PROJECT SUBMITTED TO THE COLLEGE OF CONTINUING EDUCATION DEPARTMENT OF DISASTER MANAGEMENT.

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF DIPLOMA IN DISASTER MANAGEMENT, ADAMAWA STATE POLYTECHNIC, YOLA

NOVEMBER, 2016

DECLARATION

I hereby declare That This research work has been conducted by me under the supervision of Mal Marafa Aminu .therefore all the information used are carefully and duly acknowledge by means of reference

ADAMU UMARE

CCE/DBM/2014/026

SIGN/DATE

APPROVAL PAGE

This project entitled analysis of (mortality rate due to malaria, case study of specialist hospital yola north adamaawa state.) by cce/ddm/2014/026 has been examined and approved for the award of diploma in Disaster Management, Adamawa state Polytechnic, Yola and is approved for literary presentation and contributing to knowledge.

Mal. Marafa Amina
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22/11/16
Date

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22/11/16
Date

Mr. AG John
(Project coordinator)

Date

DEDICATION

I dedicate this piece of work to Almighty Allah who grants me the ability to carry out this research and my parents, Mal. Umar Mohammed And Amina Umar.

ACKNOWLEDGEMENT

I express my profound gratitude to Almighty Allah the most high for granting me good health and strength and for sparing my life up to the moment and making it possible for me to complete this project work.

I am also grateful to my supervisor and his family Mal. Aminu Marafa for guiding me through his period despite his tight schedule who have made it possible with his constant inspiration, constructive, criticism and intellectual guidance which led to the successful completion of this project.

My profound gratitude goes to the H.O.D of Disaster Management Mr. Paul Wache Zira and other lecturers for their assistance and advice during the course of the study.

And also I want to acknowledge my friends, Mohammed Isa, Muktar Ahmed, Safiya, Maiwada, Abdulkarim, Ruth, Bashiru,

May God bless them all. Thank you.

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CHAPTER ONE

Introduction

Background of the Study

Malaria, disease caused by infections with single, called animal parasite of the genus plasmodium. Anopheles mosquitoes transmit this parasite for one person to another in through bites. Malaria is a characterized by a periodic bout of severe chills and high fever. Serious case of malaria can result in death if left untreated. More than a million people die of the disease each year, most of them in Africa (Source W.H.O 2006).

Malaria infection begins when a female mosquito of the anopheles genus, bites a human and inject infectious cells knows a porosities into the person's they multiply for one to two weeks to form cell called merozites. The merozites leave the liver to invade red blood cell, the merozites multiply rapidly until the blood cell burst as the cell Burt, they relies merozites that go on to the infection other than red blood cells and begins the cycle again. Some merozites divide to form some gametocytes, immature male and female gametes (cell involved in sexual reproduction). The gametes are involved in the transmission of disease. Malaria was once widespread in North America and other temperate regions. Today the disease occurs in tropical and sub-tropical regions, particularly in sub-Saharan Africa and Southeast Asia. The disease is also found in central a South America, Oceania, and on some Caribbean Island. Public health officials had hoped to wipe out malaria during the 20th century, however malaria parasite hand developed defense against many anti malaria drugs, this response, kwon as drug resistance, makes the drugs less effective. In addition the anopheles mosquito's that transmit the disease have become insecticides. Malaria

remains a global health problem, and public health, efforts today focus on controlling it. In addition, a worldwide effort is on the way to develop a vaccine that will protect people against the disease. In the mean time, research by W.H.O has found that sleeping under bed nets treated with insecticide can greatly reduce deaths from malaria, especially among children, the development of what is now known as formal demography is essentially the story of evolution of the life table as a means of analyzing and presenting mortality data. Before 1900 the study of fertility mortality, migration and age structure were rarely studied with any degree of mathematical sophistication, through one famous exception of Euler's remarkable invention in 1960 of the concept of the stable population. Some 150years after Euler's remarkable achievement, lotka, who is generally regarded as the father of stable population theory, published his first paper. The paper is reproduced by smith (1977) in his collection and commentary on dozens of important historical paper tracing the development of mathematical demography. Demography is "the mathematical study of populations, their general movement, and their physical, civil intellectual and moral condition". In heredity, industry forecast, mortally forecast, population forecast and the likes are based in large part on what has happened in the past in making such forecast, it must be remembered that long range projection cannot be regarded as predictions. In the light of these, there is need for one to briefly explain some types of death and models of computing the death rates, and then suggest the possible caliber of medical requirement with reference to malaria fever. (Source Achlle 1855).

In this project time series analysis would be considered as the techniques of forecasting the mortality rate due to malaria fever. In view of this statistical data which are collected, observed or recorded at successive

intervals of time and generally referred to as time series data. Human malaria has been recognized since the earliest period of man's recorded history of the occurrence of mosquitoes trapped in amber; suggest its prevalence in pre-historic times.

Statement of the Problem

Malaria is one of the most serious health problems facing the world today. The world health organization estimates that over 300million new cases of malaria arise a year with approximately two to three million deaths resulting from contraction. Malaria is endemic in tropical Africa, with on estimated 90% of the malaria incidence and deaths occurring there, particularly amongst pregnant women and children. (Source W.H.O 2004).

Malaria is the only vector borne Disease To Be Placed On World Health Organization's Disability Adjusted Life Years (DALYS) list. It is important to work at health problems like malaria that grossly affect the morbidity and mortality rates, as well as the economy of a developing country, such as Nigeria. There are probably more than 100million cases of the disease in Adamawa State of which perhaps a million are fatal. The problem has grown worse in some rural areas that are still developing. In spite of the anti-malaria programs and companies within the state the result has been in infant mortality rate of 94 in every 1,000 live births and a life expectancy of 48years. Situation has shown little or no improvement within the past eighteen years and portly due to world economic and political problems.

Aim and Objectives

The main aim of the study is to examine and forecast the mortality rate due to malaria fever, in the study area specialist Hospital, Yola.

- To determine the trend movement of malaria cases and mortality due to malaria fever.
- To forecast the future occurrence of malaria and mortality rate due to malaria fever.
- To suggest out some mitigating and controlling measure of minimizing the death rate due to malaria fever.

1.4 Significance of the Study

The result of this study will be beneficial to the state government and nation at large. In knowing the mortality rate, due to malaria fever and the future occurrences of mortality rate due to malaria in the state and the country at large. Also the study will be of a benefit to the management of specialist hospital Yola in drawing intensive and pro-active conclusions towards the treatment of malaria fever cases in the hospital. This study will serve as an empirical work for future researchers that may wish to carry out a study in a related topic. This research will be beneficial to government an other related organization when recommendations offered are implemented Country at large.

Also the study will be of a benefit to the management of specialist hospital yola in drawing intensive and pro-active conclusions towards the treatment of malaria fever cases in the hospital. This study will serve as an empirical work for future researchers that may wish to carry out a study in a related topic. This research will be beneficial to government and other relevant organization which the recommendation offered are implemented.

1.5 Scope of the Study

This study covers Specialist Hospital Yola North Local Government Area of Adamawa State. Emphasis based on the rate of mortality as a result of malaria fever Specialist Hospital Yola.

1.6 Limitation of the Study

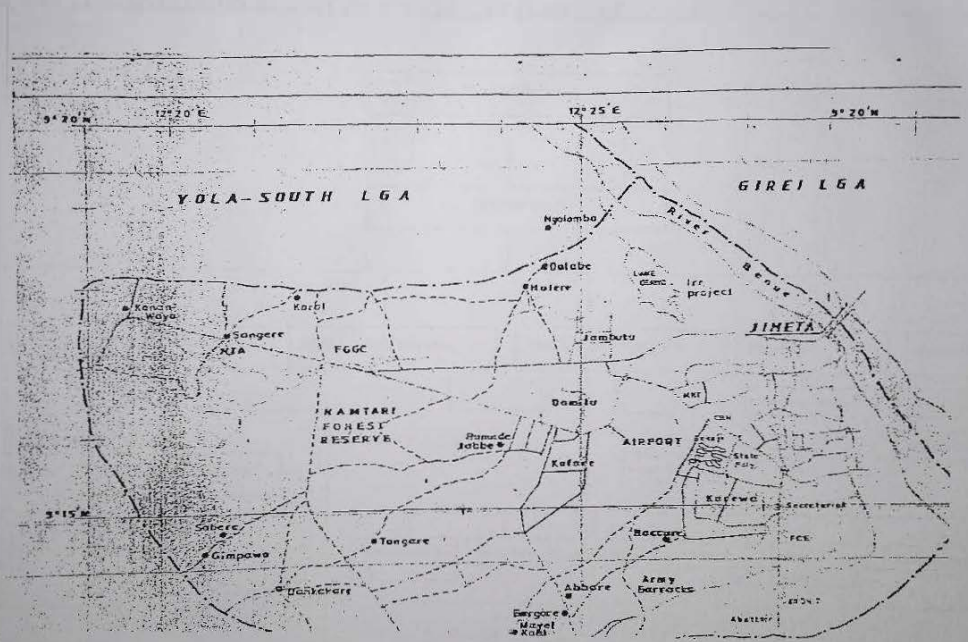
The major limitation to this work is insufficient time and finance for accurate documentation.

17.0 Study Area

1.7.1 Location

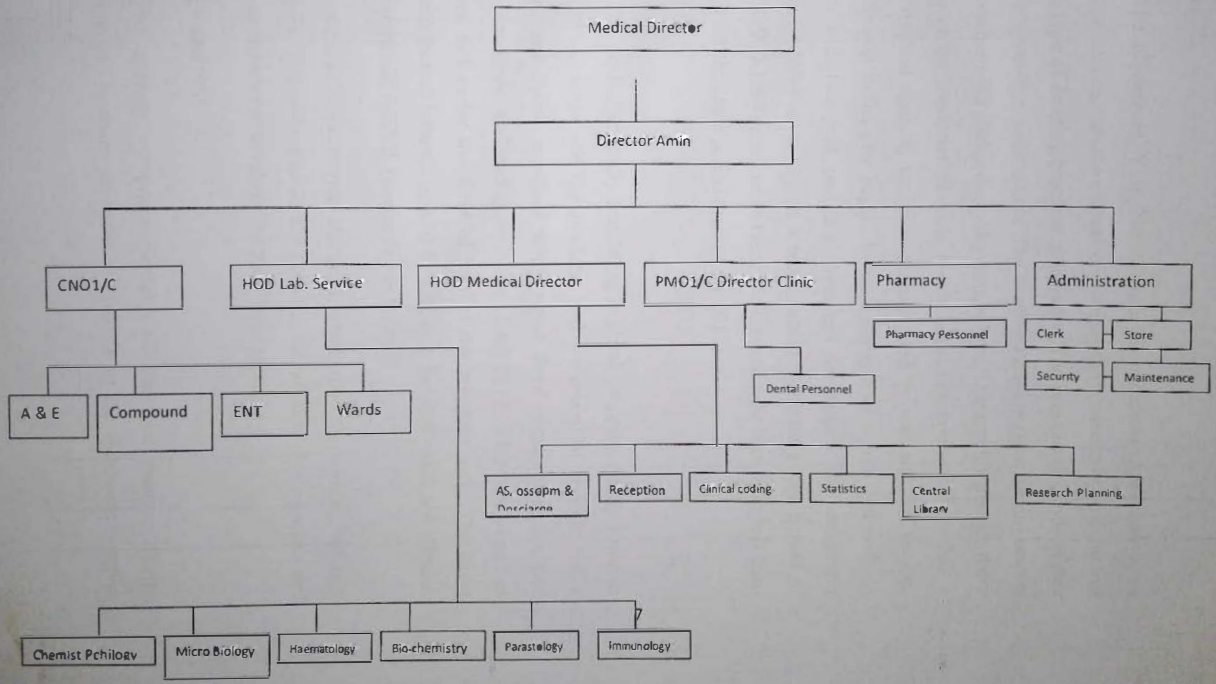
Specialist Hospital is in Yola north which lies at latitudes $9^0$14"N and longitude 12^0 28^0E. It has land area of about 8.06859km with an altitude of 185.9meters above sea level source (Claudio 2006). The town is located near the river Benue. The river itself is a wide sandy flood. Plain that serves as sources of water for irrigation in dry season farming and fishing. (Source Claudio 2006).

1.7.2 Map of the Study Area



1.7.3 Organisational Chart

Fig: 2.1: THE ORGANISATION CHART OF SPECIALIST HOSPITAL, YOLA



1.7.4 Climate

The climate of Yola North Local Government Area has a an important influence on the natural vegetation, the characteristic of the soil and the type of farming practice in the area. The prevailing winds in this area are North-East trade winds. The North-East wind (Hamarttan) occurs in November with sticky dusty dry atmosphere. During this period, there is little or no precipitation Yola North Local Government Area has a humid tropical climate, which is characterized by wet and dry season. Rainy season in the city begins towards the end of march and ends to October with two peak period in June and September. The maximum record of rainfall is in August it record about 3800mm in the period of 24year (1970-1994) and march being the minimum or least with less than 76.0mm for the same period (source ray 2013)

1.7.5 Soil

The land is generally undulating lowland, slopping gently towards the North direction and the available soil are mixed of chronic pellic vertisols and cultric cambisol which could form segement shales and stones, limestone, and sand stone (source Gary 2013). This type of soil in this area fall under the limit of 242 of the mapping unit. The most important factors influencing soil formation in the study area are climate, temperature and rainfall. (source James R 2008)

High temperature accelerate chemical weathering of minerals through hydrolysis. The soil are generally richer in the weather able minerals and have a strong clay minerals of the three layer type.

1.7.6 Geology and Soil

The geology comprises partially of fractured granite, diorite, migmatite and gneisses generally referred to as the Basement complex

rocks.These rocks belong to Precambrian to corly paleozic age (source Gary 2013)

The soil are mainly clay loams that graduate into the sandy loam and gravelly soil towards the hill slope. Recent alluvial soils are found around the padama and on the floodplains. Generally, the soils are immature, dark and rich in humus in the "Ahorizon" and laterites occur in the "B horigon" (source Gary 2013)

1.7.7 Vegetation/ Hydrology

The vegetation is the Guinea Savannah type, with shady trees and shrubs showing fresh leaves and 2m tall grasses abound in the rainy season. During the dry season, the environment gets to conserve water (source Molden 2007). And developed resistance against dry weather. Major tress are locus bean, Ashiwali Tararind and host of herbs and shrubs (source Larson 2014).

Temperature in the study area are relatively high with mean annual of 32^0C (CA0 1997) (Fig2 and Table 2). Diurnal temperature range lies between 8-100 celsius. Influence by katabatic and the Jos Plateau during the night and morning hours (source Godfray, 2010).

The study area is drained by two small streams, which run Bagale hills (oldewage 2006) and also the river adjacent area such as lake Gerio is a functional investment by the upper Benue River Development Authorities of Adamawa State Agriculture programme (ADAP) where all cultivation and light fishing practical.

1.7.8 Economic Activities.

There are various human activities practical in the study area. The commercial, industrial, recreational activities. About 90% of the population engage in rain fed Agriculture, irrigational and mix-farming

(source Garret 1999). Crops grown mostly for domestic use and commercial purposes are maize, groundnuts and rice. Fattening cattle. Sheep and goats for sale areas practiced. The population is a mixture of farmers, traders, ortisions hunters, and civil servant (source Robert 2004)

1.7.9 Population

Jimeta is a political headquarter of Yola North local Government Area and one of the twins' town is Yola town (Yola South Local Government Area) that constituted Adamawa Capital it is located seven (7) kilometers away to north of Yola town with population of over 325, 925 with population growth rate of 2.83 (2006 census) covering an estimated area of 305km^2. It is geographically located between latitude 9^{0}14 " N and 9^0 18" ½ longitude 12^0 25E (Source Adepohu 2010)

1.8 Operational Definition of Terms

Malaria: Malaria is a fever-producing illness that is caused by the bites of Anophcles mosquito (malaria insect) that is characterized by fever.

Mortality rate: Mortality rate is the number of death in proportion to total population

CHAPTER TWO

2.0 Review of Related Literature

2.1 The Concept "Malaria"

Malaria as a vector bone infections disease that is wide spread in tropical and sub-tropical regions. It infects between four to six million people every year and causes death between one to three million annually with most cases among young children in sub-Saharan Africa. Malaria is not just a disease commonly associated with poverty but also a cause of poverty and a major hindrance to economic development Source (Andelmon 2002).

According to Lal (1989) malaria is once of the common infections disease and an eminent public health terrorist. The disease is caused by protozoan parasites of the germs plasmodium. The most serious forms of the disease are caused by plasmodium falcrparum and plasmodium vivals but either related species (plasmodium, ovale, plasmodium malaria and sometimes plasmodium Knowles) can also infect human. This group of human pathogenic plasmodium species is usually referred to as parasite.

Malaria parasite is transmitted by female anopheles mosquitoes. The red blood cells causing symptoms that include anemia (light headache shortness of breath, tachycardia e.t.c) as well as other general symptoms such as fever chills and death. Malaria transmission can be reduced by preventing mosquito's bites with insect repellents and mosquito's nets or by spreading insecticides inside houses and drainage where mosquitoes lay their eggs. Unfortunately, no vaccine is currently available for malaria instead prevention drugs must be taken continuously to reduce the risk of infection. Malaria infections are treated through the

use of anti-malaria drugs such as chlloroguine although drug resistance is increasing source (Trung 2004).

2.2 Causes of Malaria

Protozoan is a single-called animal-like organism that lives in moist environments, perhaps the most infamous pathogenic protozoan is specie of the genus plasmodium. which causes malaria an infectious disease responsible for over a million deaths worldwide each year. In 1880 a French army doctor working in Algeria by name Charles Louise observed parasite inside the red blood cells of people suffering from malaria. He therefore proposed that malaria was caused by this protozoan; the first time protozoa was named plasmodium by an Italian scientist by name Ettore Marchiafara in 1907.

2.3 Symptoms of Malaria

Symptoms of malaria generally begin from 7 to 15 days after a bite prom an infectious mosquito about the time when the release wastes and toxins (poisonous substances) along with merozoites. Fever develops as the immune system responds to the toxins in the blood.

The fever that characterizes malaria usually occurs in periodic attacks every 72 hours prom infection with plasmodium-malaria and every 48hour from infection with other plasmodium that causes malaria. An attack begins with chills and shivering soon followed by a high fever. Sweating then brings the temperature down. These attacks usually leave an individual exhausted. Headaches, nausea and vomiting may also accompany the fever and chills. Anemia may occur as a result of the bursting and destruction of red blood cells. Server cases of malaria caused by plasmodium falciparum can affect the brain and other organs, as blood cells infected with the parasite stick to the walls of tiny blood vessels and

block the flow of blood and oxygen into cerebral malaria and lead to coma and, if not treated, to death. If the kidneys are affected, kidney failure may follow. (Source Claudio 2006).

2.4 Distribution of Malaria

According to W.H.O (2005) malaria causes about 350 to 500million infections in human and approximately one to three million deaths annually. This represents at least one death every 30seconds. When a female mosquito bites a human who has malaria, it takes in blood containing plasmodium gametes inside the mosquito stomach, the gametes quickly mature. The male and female gametes unite to produce a zygote which multiplies to create thousands of sporozoites. The sporozites migrate to the mosquito's salivary glands. When the mosquito bites another human, the life cycle of the malaria parasite begins in the human body.

Ann (1999) in her study on malaria among Bwatiye people in Adamawa State report that the vast majority of the cases occur in children under the age of five (5) year, pregnant women are also vulnerable, despite much dexterity to curtail vulnerable. Despite much dexterity to curtail transmission and increase treatment, there has been a little or no change in areas that has been en-twined by this disease since 1992.

Indeed, if the prevalence malaria stays on its present upward court, the death rates could be double in the next twenty-five years. Precisely, statistics are unknown because do not have access to hospital or the means to afford death care consequently the majority of cases are undocumented. Malaria is presently endemic in abroad and around the equator. in areas of South America, South and South East Asia, parts of middle East and oceanic, and Africa. However, it is in sub-Sabaran Africa where 85 to 90% of malaria mortalities occur. The geographical

distribution of malaria with special region is complex and malaria free areas are found close to each other. In dry areas outbreak of malaria can be predicted with reasonable occurancy by mapping rainfall.

From observation it is seen that malaria is more common in rural area than urban areas. In Africa malaria is present in both rural and urban areas, though the risk is low in large cities.

2.5 Diagnosis and Treatment of Malaria

According to Salom (2005) malaria is difficult to diagnose based on symptoms alone. The intermittent fever and other symptomms can vary in their duration and severity and could be caused by other illness. A diagnosis of malaria is usually made by examining a sample of the patient's blood under the microscope for presence of malaria parasite in the red blood cells. The different species of plasmodium can be distinguished by their appearance under the microscope. More advanced and expensive tests can detect proteins or genetic material of plasmodium parasites in a patient's blood. Since the 1600s malaria has been treated with quinine, a chemical derived from the bark of the south American cinchona tree. This drug interferes with the parasite's development in the 1930s and 1940s, is more effective, safer and cheaper than quinine. Unfortunately, malaria parasites have developed resistance to chlloroquine, rendering it useless in many parts of the world. Other anty-malaria drugs include atovaquone, meflo uine, pyrimethamine, toxocycline, and artemisinin derivative. Resistance has also developed against these drugs, necessitating a search for new drugs and for new combination of existing drugs. Physicians increasingly prescribe a combination of drugs in treating malaria to improve the effectiveness of the drugs.

Active malaria infection with falcrparum is a medical emergency requiring hospitalization of infection with plasmodium-vivax and plasmodium malaria. Basic treatment of malaria involves supportive measures as well as specified anti-malaria drugs. When properly treated, someone with the disease can expect a complete cure.

2.6 Prevention and Control of Malaria

After repeated infections, people who live in regions where malaria is prevalent develop a limited immunity to the disease. This partial protection does not prevent them from developing malaria again, but does protect them against the most serious effects of the infection. They generally develop a mild form of the disease that does not last long and is unlikely, to be fatal infants and children are especially vulnerable to malaria because they have not yet built up immunity to the parasite some people have genetic traits that help them resist malaria. Sickle-cell anemia and thalassemia, for example, are inherited blood disorders linked to malaria resistance.

In the absence of an effect vaccine and the rise of drug resistance, malaria prevention has had to rely on basic anti-mosquito measures. Such measure include draining sites where mosquitoes lay their eggs. Covering water cannels, and introducing into ponds fish that feed on mosquito larvae. Travelers who lack immunity to malaria should take precautionary measures when visiting areas where the disease is prevalent. Such measures include using insect repellents, wearing protective clothing that cover the skin, and sleeping under mosquito nets. Currently, no effective vaccine against malaria exist, although researchers around the world are working to develop one. Such a vaccine would either stop the infection from developing a malaria vaccine has been difficult because strategies for evading the human immune system. Many of these strategies are not

well understood. And it is difficult to develop a vaccine that will block all of the parasite's way of getting past the immune system. A successful vaccine will need target several stages of the parasite's life cycle. Progress towards a vaccine has also been slow because the parasite is difficult to produce and study in the laboratory, as it must live inside the cells of another organism. In the year 2001 Glad well news paper writes that malaria can bes prevented and controlled b prophylactic drugs, mosquito bites.

There is currently no vaccine for the prevention of malaria, but is an active field of research.

2.7 Socio-Economic Effects

W.H.O (2006) report that malaria is not a disease commonly entwined with poverty but is also a propeller of poverty and major hindrance to economic development. The disease has been associated with major negative economic effect on regions here it is wide spread. A comparison of average per capital GDP in 1995, adjusted to give parity of purchasing power, between malicious and non-malicious countries demonstrating a field folds disparities (us & 1,526 versus us & 8,268) moreover in countries where malaria is rampant, average per capital GDP has risen to of 0.4% annually compared to 44% per annum in other countries. However its economic negative impact of malaria has been estimated to cost us & 12billion every year. Economic negative impact of malaria includes decrease in the rate of productivity due to mental dysfunction caused by cerebral malaria which metamorphosed into physiological and psychological imbalances prompting in loss of investment and tourism.

CHAPTER THREE

Methodology

3.0 Introduction

In any research work there is need for methodology as it is often said that, blood is the life wire of any living organism. So is methodology to a research work. This chapter will therefore identify research method to be used in data collection and analysis.

3.1 Research Design

The design for this study is survey. Survey research studies both large and small populations by selecting and studying sample chosen form the population to discover the relative incidence, distribution, and interrelations of sociological and psychological variable, source (Osuala: 2013).

The major advantage of the survey design is that information obtained may be accurate which will enables the researcher to arrive at a valid conclusion and generalizations.

3.2 Area of the Study

The study area will cover Specialist Hospital Yola-North, Adamawa State.

3.3 Population of the Study

The medical records department of Specialist Hospital, Yola constitutes the population of this study. The research focused on the records of malaria cases and deaths due to malaria for the past period of ten years from 2005 to 2011. Population is a political headquarters of Yola North Local Government Area and one of the twins' towns is Yola

Town (Yola South Local Government Area) that constituted Adamawa Capital. It is located seven(7) Kilometres away north of Yola town with population of over 325, 925 with population growth rate of 2.83 (2006 census) covering an estimated area of 305km^2. It is geographically located between latitude $9^0$14'' N and $9^0$18'' ½ longitude $12^0$25E (Adepohu A 2010)

3.4 Method of Data Collection

Documentary method of data collection will be used in collecting data for this study which entails Specialist Hospital, Yola.

3.5 Method of Data Analysis

The data that shall be collected for this study will be analysis using time series consists of description of the components movement, which assume that the time series variable x is a product of the variable T, C, S and I which are the product of the produced respectively. In symbol X=T,C,S,I=TCSI. The decomposition which consists of an investigation of factor such as T. C, S and I are referred to as time series analysis.

Decomposition of time Series

In decomposition we assume that;

- Data is made up of pattern and error.
- Data consist of pattern of trend, cyclical,

Irregular and seasonal plus errors. This composites series is symbolized by the following terms;

$X_t = T_t+S_t+C_t+I_t$ this addition model is used when true absolute of S_t, C_t and I_t are known.

If in order way round, they are given in percentages, the model takes the multiplicative form.

$X_t = T_t \times S_t \times C_t \times I_t$

$^{yt}/_{T_t} = S_t C_t I_t$

Taking logarithm of $(T_t S_t I_t)$ we obtain

$\text{Log } Y_t = \text{Log } T_t + \text{Log} S_t + \text{Log } I_t$

The principles of the two techniques are synonymous. Although in the second case logarithm is added. This statistical method of analyzing data may gives a clear interpretation of the data that will be obtained from the documented source which is aimed at determining malaria pattern, forecasting malaria case and malaria mortality rate.

CHAPTER FOUR

Data Analysis, Result and Discussion

4.1 Data Analysis

Table1: Malaria pattern (seasonal distribution)

Year Month	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Jan.	64	92	88	60	-	45	50	37	40	41
Feb.	55	45	105	92	-	77	54	84	52	71
Mar.	71	63	58	94	74	59	129	94	106	84
April.	109	75	37	42	59	53	197	71	70	91
May.	50	100	79	72	44	64	185	89	48	34
June.	108	49	67	112	62	103	70	109	58	90
July.	83	92	78	35	814	83	76	135	32	153
Aug.	49	36	11	68	43	75	89	59	49	73
Sept.	72	91	52	49	74	85	103	146	45	61
Oct.	59	38	81	62	73	119	99	154	37	58
Nov.	62	31	72	98	124	126	157	103	47	105
Dec.	96	35	38	84	61	87	33	58	46	92
Total	880	757	864	868	695	975	1142	1139	630	951

Source: record department specialist hospital Yola.

Table2: Malaria Death Pattern (Seasonal Distribution)

Year Month	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Jan.	8	5	9	4	-	4	10	6	3	5
Feb.	3	6	15	12	-	10	6	17	2	11
Mar.	12	4	2	9	4	9	14	22	9	6
April.	16	9	0	2	13	9	46	9	12	10
May.	4	12	8	4	4	14	37	18	4	4
June.	13	3	9	13	4	17	6	13	6	8
July.	7	11	6	3	8	15	11	16	1	11
Aug.	5	3	10	5	6	9	7	7	6	4
Sept.	8	6	4	5	7	14	6	17	4	7
Oct.	9	4	7	8	6	9	14	14	5	8
Nov.	7	8	4	6	13	7	20	14	1	9
Dec.	13	6	2	7	2	4	2	9	2	4
TOTAL	105	77	76	68	67	121	179	162	55	87

Source: record department specialist hospital Yola.

The computations were based on the data on malaria pattern and malaria death pattern in table 1 and 2. It should be noted that the deseasonalized forecast figure are approximated to the nearest whole number , since the data for this project deals with human beings and there is no fractional human being

Table 3: computational data of malaria cases

Year	Total (y)	X	X^2	XY
2005	880	-5	25	-4400
2006	757	-4	4	-3028
2007	864	-3	1	-2592
2008	868	-2	1	-1736
2009	695	-1	4	-695
2010	975	1	1	975
2011	1243	2	4	2486
2012	1139	3	9	3417
2013	630	4	16	2520
2014	951	5	25	4755
TOTAL	9001	0	110	1702

The parameter estimated for the data constant □ and β can be obtained by:

□ $=\sum y=9001/10=900.1$

$\beta=\sum xy/\sum x^2=1702/110=15.47$

The fitted linear trend will be

T_t=900.1+15.47x

The forecast of malaria occurrence

The year 2015 coded value of x=6

=900.1+15.47x

=900.1+15.47x6

=993

The year 2016 coded value of x=7

=900.1+15.47x

=900.1+15.47x7

=1008

The year 2017 coded value of x=8

=900.1+15.47x

=900.1+15.47x8

=1023

The year 2018 coded value of x=9

=900.1+15.47x

=900.1+15.47x9

=1038

Year	Total (y)	x	X^2	Xy
2005	105	-5	25	-525
2006	77	-4	16	-308
2007	76	-3	9	-228
2008	78	-2	4	-157
2009	67	-1	1	-67
2010	121	1	1	-121

2011	179	2	4	358
2012	162	3	9	486
2013	55	4	16	220
2014	87	5	25	435
TOTAL	1007		110	335

Table 4: Computational Data based on mortality due to malaria

The estimate for the parameter □ and β can be obtained using;

□=∑y/N=1007/10=100.7

β=∑xy/∑x^2=336/110=3.05

The linear trend

T_t=100.7+3.05x

The forecast of Death due to malaria 2015 coded value of x=6

=100.7+3.05x

=100.7+3.05x6

=119

2016 coded value of x=7

=100.7x3.05x

=100.7+3.05x7

=122

2017 coded value of x=8

=100.7+3.05x

=100.7+05x8

=125

2018 coded value of x=9

=100.7+3.05x

=100.7+3.05x9

=128

Table 5: Deceasonalized and Deasonal Index of Mortality Due to Malaria

MONTH	TOTAL	INDEX%	INDEX
Jan.	658.63	65.863	0.65863
Feb.	1010.17	101.077	1.01007
Mar.	1097.2	109.72	1..0972
April.	1450.9	145.09	1.4509
May.	1154.71	115.09	1.15471
June.	821.23	82.123	0.8212
July.	1000.26	100.026	1.003
Aug.	995.06	99.506	0.9951
Sept.	908.21	90.821	0.9082
Oct.	1012.64	101.246	1.0126
Nov.	984.44	98.444	0.9844
Dec.	648.44	64.844	0.6485

Table 6: Deseasonalized and Seasonal Index of Mortality Due to Malaria

Year Month	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Jan.	12	8	14	6	-		15	9	5	8
Feb.	3	6	15	15	-	6	6	17	2	11
Mar.	11	4	2	8	4	10	13	20	8	6
April.	11	6	0	1	9	6	32	6	8	7
May.	4	10	7	4	4	12	32	16	4	4
June.	16	4	11	16	5	21	7	16	7	10
July.	7	11	6	3	8	15	11	16	1	11
Aug.	5	3	10	5	6	9	7	7	6	4
Sept.	9	7	4	6	8	15	7	19	4	8
Oct.	9	4	7	8	6	9	14	14	5	8

Nov.	7	8	4	6	13	7	20	14	1	9
Dec.	20	9	3	11	3	6	3	14	3	2
Total	114	80	83	68	66	124	167	168	54	92

Table 7: Computations Based on Deseasonalized Data of Mortality

Year	Total (Y)	X	xy	X^2
2005	114	5	723	25
2006	80	4	320	16
2007	83	3	249	9
2008	86	2	172	4
2009	66	1	66	1
2010	124	-1	-124	1
2011	167	-2	-334	4
2012	168	-3	-504	9
2013	54	-4	-216	16
2014	92	-5	-460	25
TOTAL	1034	0	-108	110

Due to Malaria

4.2 Result

It is observed from the analysis that the pattern of malaria cases in 2015, 2016, 2017 and 2018 would be 993, 1008, 1023 and 1038 respectively having an upward trend.

And the number of deaths that would occur due to malaria in 2015, 2016, 2017 and 2018 are 119, 122, 125 and 128 respectively with an upward trend.

4.3 Discussion

The result obtained from the analysis indicates an upward movement of trend values which forest of malaria cases and mortality rate due to malaria. The result shows that the rate of malaria cases that would occur in future years is at higher increase likewise the mortality rate due to malaria.

If preventive measures are taken to eradicate malaria in the state, the mortality rate would also reduce in the future years.

CHAPTER FIVE

Summary, Conclusion and Recommendation

5.0 Introduction

This Chapter presents the summary of the research it summarises what the study is all about such as findings, conclusion and at the same time recommendations. Lapses or problems observed and possible area for further research in connection with the topic will also be highlighted.

5.1 Summary

Table 8 below shows the summary of analysis carried out in view of this study.

YEAR	MALARIA CASES	MORTALITY DUE TO MALARIA
2015	5493	119
2016	6408	122
2017	1023	125
2018	1039	164
TOTAL	13963	530

Table 8: Summary of Analysis

5.2 Conclusion

From the analysis carried out it is clearly indicated that mortality due to malaria is directly proportional to the number of malaria cases. But it effective measures are adopted to combat malaria then there is every indication that mortality due to malaria would drastically drop.

Conclusively, regular environmental sanitization and use of insecticides would also help reduce the rate of malaria cases and mortality due to malaria.

5.3 Recommendations

Based on the findings of this study, the following recommendations were made:

1. Mortality rate due to malaria is at a tremendous increase; therefore government should put much effort towards prevention of malaria than cure.
2. Non Governmental organizations (N.G. Os) should support in the area of public enlightenment and campaign for prevention of malaria.
3. With recent discoveries which review that rural inhabitants are prone to be casualties of malaria infections propelling in the increase of mortality rates, on such areas in order to control the spread and bring the rising mortality rate down.

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QUESTIONNAIRE

Department of Disaster Management
P. M. B. 2146,
Yola,
Adamawa State.

Dear Respondent,

RESEARCH QUESTIONNAIRE

I am a final year student of the above department undertaking research work on a topic: ***Statistical Analysis of Mortality Rate Due to Malaria*** (Case of study of Specialist Hospital, Yola). In partial fulfilment of the award of Diploma in Disaster Management. This questionnaire is designed to request you to provide necessary information that will help me carry out this research successfully.

I assure you that the response will be treated with confidentiality.

Yours faithfully,

YUSUF CHANUWA

CCE/DDM/2013/089

5. In the year 2009, from January to December how many people were affected by malaria..... and how many dead.....?
6. In the year 2010, from January to December how many people were affected by malaria..... and how many dead.....?
7. In the year 2011, from January to December how many people were affected by malaria..... and how many dead.....?
8. In the year 2012, from January to December how many people were affected by mal ria..... and how many dead.....?
9. In the year 2013, from January to December how many people were affected by malaria..... and how many dead.....?
10. In the year 2014, from January to December how many people were affected by malaria..... and how many dead.....?