UNIVERSITY FOR DEVELOPMENT STUDIES (UDS)

FACULTY OF MATHEMATICAL SCIENCES

DEPARTMENT OF STATISTICS

PROJECT PROPOSAL

PROPOSED TOPIC:

COMPARISON OF MILD MALARIA IN LAWRA (INTERVENTION) AND BONGO (CONTROL) WITH SEASONAL INTERVENTION

BY

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FMS/1100/12

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1. **INTRODUCTION**

**1.1 Background**

Malaria is a serious and sometimes fatal disease caused by a parasite that commonly infects a certain type of mosquito (Female Anopheles Mosquito) which feeds on humans. Four kinds of malaria parasites have long been known to infect humans: Plasmodium falciparum, P. vivax, P. ovale, and P. malariae. Recently, it has been recognized that P. knowlesi, a type of malaria that naturally infects mosquito in Southeast Asia, also infects humans, causing malaria that is transmitted from animal to human ("zoonotic" malaria). P. falciparum is the type of malaria that is most likely to result in severe infections and if not promptly treated, may lead to death. Although malaria can be a deadly disease, illness and death from malaria can usually be prevented. Centers for Disease Control and Prevention, Malaria Report, 10th December, 2012.

Commonly, the disease is transmitted by a bite from an infected female Anopheles mosquito, which introduces the organisms from its saliva into a person's circulatory system. In the blood, the parasites travel to the liver to mature and reproduce. Malaria presents symptoms that typically include fever and headache, which in severe cases can progress to coma or death. Centers for Disease Control and Prevention, 10th December, 2012.

Malaria is one of the most severe public health problems worldwide. It is a leading cause of [death and disease](http://www.cdc.gov/malaria/about/disease.html) in many developing countries, where young children and pregnant women are the groups most affected. Centers for Disease Control and Prevention, 10th December, 2012.

Malaria remains a major public health problem, with an estimated burden of 216 million clinical episodes and 655 000 deaths worldwide attributable to malaria in 2010. A significant proportion (91%) of reported deaths from malaria occurs in sub Saharan Africa, where children under 5 years of age bear most of the burden. In 2010, it was estimated that 86% of all malaria deaths occurs in this age group. www.mmv.org/sites/default/files/uploads/docs/publications/seasonal%20malaria%20chemoprevention%20field%20guid.pdf

According to the world malaria report 2013, In South Africa, for every 700 patients admitted for malaria there were 90 deaths in 2012, in South Sudan the report revealed that for every 9000 malaria case admitted there was about 1,350 deaths, The pattern was not different in the republic of Côte d’Ivoire where the report revealed that for every 100,000 patients admitted, there existed about 800 patients admitted because of malaria, out of this figure 100 deaths were recorded. WHO COUNTRY PROFILE, 2013

In Ghana the report admitted that for every 1760 patients admitted with malaria, there were 30 deaths which is about 1.7%.

According to the Northern Regional Health Directorate, death toll records for 2012 indicate that 815 deaths caused by malaria were recorded at the various health facilities across the region.  
A total of 183,351 regional trend of malaria cases were admitted with Chereponi having 3,025, Bimbila 2,799, Gushiegu 4,083, Karaga 2,245, Savelugu 2,984 and the Tamale Teaching Hospital 3,137.

In the Upper East Region of Ghana, malaria accounts for 53.3% of all out patient cases, 41.4% of all admission, and 41.7% of all deaths among children less than five years in the region (Upper East Regional Health Directorate, Half Year Report, 2011).

Malaria remains the number one cause of morbidity and mortality especially in children under five in the Upper West Region. In 2009 the Region recorded a total of 232,866 cases and 247,704 in 2010. Dr Alexis Nang-beifubah, Regional Director of the Ghana Health Service (GHS) made this known at the 2010 Annual Health Performance Review Meeting in Wa.

**1.2 PROBLEM STATEMENT**

According to the latest estimates, released in December 2013, there were about 207 million cases of malaria in 2012 (with an uncertainty range of 135 million to 287 million) and an estimated 627 000 deaths (with an uncertainty range of 473 000 to 789 000) (WHO,2013).

Between 1957 and 2011, in the United States, 63 outbreaks of locally transmitted mosquito-borne malaria have occurred; in such outbreaks, local mosquitoes become infected by biting persons carrying malaria parasites (acquired in endemic areas) and then transmit malaria to local residents.

In areas with lower transmission (such as Latin America and Asia), residents are less frequently infected. Many persons may reach adult age without having built protective immunity and are thus susceptible to the disease, including severe and fatal illness. www.cdc.gov/malaria worldwide/reduction/itn.html

The most vulnerable are persons with no or little immunity against the disease. In areas with high transmission (such as Africa south of the Sahara), the most vulnerable groups are Young children, who have not yet developed partial immunity to malaria, pregnant women whose immunity is decreased by pregnancy, especially during the first and second pregnancies and travelers or migrants coming from areas with little or no malaria transmission, who lack immunity.

Most deaths occur among children living in Africa where a child dies every minute from malaria. Available statistics indicate that about ninety percent of deaths due to malaria in the world occur in Africa, according to WHO. Ghana had an estimated 7.2 million cases of malaria in 2006, out of which 3.9 million occurred among children less than five years (the largest cause of under five deaths, at 26%) (WHO Report, 2000).

According to Madam Matilda Atugiyiri, from the Catholic Relief Services (CRS) at a day’s capacity enhancement in malaria programming, organized in Tamale revealed that, the three Northern regions continue to record the highest malaria cases in the country.  
Sourcing her information from the multiple survey indicators, the Upper West region is championing with 51% while the Northern region is rated 48% with the Upper East region pegged at 44%.thechronicle.com.gh/northern-ghana-records-high-malaria-casas.  
In Tamale, despite many years of prevention and control measures, malaria still remains a public health problem in low lying and water logged areas. In some areas across the metropolis, the transmission persistently occurs throughout the year (A.R. Abdul-Aziz et al, 2012).

It is as a result of the above concerns that the Ghana malaria control program has introduced another tool SMC, which is approved by WHO, to help reduce if not to eradicate malaria in the country, therefore making is necessary to conduct this study. The study however is “Comparison of Mild Malaria In Laura (intervention) and Bongo (control) Districts with Seasonal Intervention”. This study will help inform policy makers about the effectiveness of SMC (Seasonal Malaria Chemoprevention) in prevention of malaria in children and this can also be extended to other age groups in the country.

**1.3 RESEARCH OBJECTIVES**

**1.3.1 SPECIFIC OBJECTIVES**

1. To measure the effectiveness of SMC by comparing the reduction in the incidence of confirmed uncomplicated cases in the intervention and control districts
2. To measure the effectiveness of SMC in reducing deaths due to malaria.
3. To assess acceptability of the intervention among parent and guardians.

**1.4 SIGNIFICANCE OF THE STUDY**

The study is aimed at providing information to the Ghana Health Service, District Health Management Team (DHMT), Municipal Assembly, Health facilities, the traditional authorities and the entire country about the effectiveness of Seasonal Malaria Chemoprevention in the treatment/prevention of malaria. This would help curb the problem of Malaria by helping policy makers to accept SMC as another tool in the control/treatment of malaria in the country, undertake health education programmes for Districts and other community members to understand the need to accept SMC. This would go a long way to help the nation in controlling the complications and deaths associated with Malaria. It would also be used as baseline information for other related researches.

**METHODOLOGY**

**3.1 Study population**

To measure the impact of the SMC implementation, one district from the intervention site Upper West Region(Lawra district) and one district from the control site region Upper East Region(Bongo ) have been selected randomly for the study.

**3.1.1 Lawra District**

The Lawra District is one of the Eleven (11) Districts that make up the Upper West Region. It lies in the North Western corner of the Upper West Region in Ghana between Latitudes 20 25W and 2°45"W and Longitudes 10°20" N and 11°00"N. The District has its Administrative capital at Lawra .The District shares boundaries with Nandom District to the North, to the south with Jirapa District, to the west with Ivory Coast and to the East with lambussie-karni.

The 2010 National Population and Housing census results put the District’s population at 100,929. This is about 15.2% of the Region’s total population of 576,583.

The district has five health centres, 10 CHPS compounds, three pharmacy shops, one clinic and one hospital which provide health care to the peoples.

**3.1.2 Bongo District**

The Bongo district lies within the Guinea Savannah woodlands. The district falls approximately between latitude 11°10’ and 10°3’ North and longitude 10°1’ West. It shares boundaries with Burkina Faso to the North, Kassena-Nankana East District to the West, Bolgatanga Municipal to the South West and Nabdam District to the South East.

The population of Bongo is about 84, 545 people living in dispersed compounds. According to the projected population for 2010, Bongo Township and its environs has a population of about 17,008 which accounts for about 18% of the entire population of the district.

More than 95% of the district is rural and the main occupation of the people is subsistence farming, predominantly millet and livestock.

On the area of health, there is only one hospital in the district and five health centers as well as 17 fixed point CHPS compounds, 18 mobile clinics (CHPS), one clinic and five pharmacy shops strategically located within the district to provide health care to the populaces.

**3.2 Research Design**

This is a comparative evaluation to assess the impact of SMC on malaria using a cluster randomized control design.

**3.3 Sample size**

I will be relying heavily on the data at the Navrongo Health Research center on the Seasonal Malaria Chemoprevention.

Sample size calculation will be based on one of the primary outcome measure- impact of SMC on severe malaria.

To demonstrate a 75% reduction in proportion of severe malaria cases in the intervention districts a minimum number of 14 clusters per arm are required. Effectiveness assumption is based on studies in the Gambia and Senegal which showed a reduction in severe malaria by 75%.

**3.4 Data Analysis**

I will be using Minitab and Excel to analysis all my data, chats will be produced using Excel, figures and tables will be produce using Minitab.

**3.5 Budget**

Since I will be relying on data from the research center which is free of charge, I hope to only spend about Gh₵ 100.00.

This will be due to transportation cost and printing of my chapter work for my supervisor to read since He will not accept soft copy.

The breakdown is as follows:

BUDGET

|  |  |
| --- | --- |
| **ITEM** | **AMOUNT (GH₵)** |
| PRINTING | 50.00 |
| PHOTOCOPY | 20.00 |
| TRANSPORT | 20.00 |
| MISCALLENOUS | 10.00 |
| **TOTAL** | **100.00** |

**3.5 Scheme of work**

**3.5.1 Nov/Dec:** I hope to finish my proposal if it is accepted then I will start chapter one and end it by the end of December.

**3.5.2 January:** within this period I will start my chapter two and if it is accepted, then I will start with the chapter three.

**3.5.3 February:** If only the entire plan above is achieved, then I will contact Dr. Ansah for the data, for analysis which is suppose to help me write the chapter four.

**3.5.4 March:** In this month all corrections should be done, and the final chapter writing should be completed.

**3.5.5 April:** Final work should be ready by the end of this month.