



**BEST JOURNAL 10(2): 178 - 182**

Date received: December 13, 2012

Date accepted: March 06, 2013

Printed in Nigeria



## **THE IMPACT OF SOCIO-CULTURAL AND SOCIO-ECONOMIC ACTIVITIES ON THE EPIDEMIOLOGY OF MALARIA IN OGONILAND, NIGER DELTA, NIGERIA**

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### **ABSTRACT**

*A study on malarialiasis was conducted between 2005 and 2006 in twelve Ogoni communities (Aleto, Ogale, Ebubu, Nonwa, Sime, Kpita, Kpor, Morgbo, Bodocity, Taabaa, Nyonkuru and Bori) of River State, South-south, Nigeria. These communities were sub-divided into five study zones; Eleme, Tai, Gokana, Khana and Control, based on the number and types of suitable breeding sites for mosquito vector of the disease. The study was aimed at determining the influence of socio-cultural and socio-economic activities on the prevalence of the disease among the Ogonis in the Niger Delta, Nigeria. Out of 750 individuals examined for the disease, 381(50.8%) were positive. Of this number, 211(28.1%) were males and 170(22.7%) were females. Questionnaires were systematically administered in the five zones, and 750 responses were received. Results revealed that 372(49.6%) responded positively to aspects of the people's settlement pattern, 397(52.9%) gave theirs for the people celebrations and festivities; 437(58.3%) went for their religious activities, 444(59.2%) went for the people's different traditional methods for control of mosquito, as their main socio-cultural activities. In addition, the results included 430(57.3%) positive responses to the people's different food and drink types and their processing methods, 364(48.5%) went for their different types of occupation, while 372(49.6%) went for the people's mode of leisure hours, being their socio-economic activities. The findings further revealed that these activities impacted positively on the prevalence of the disease in the study location with significant statistical difference of  $P < 0.05$  and  $< 0.01$ . Urgent intervention measures in terms of treatment regimen, government's timely educational enlightenment campaigns to discourage such means of exposures to regular mosquito bites, use of standard control methods for the vectors etc, were further advocated in order to improve the health status of the people within the study area.*

**Keywords:** *Malarialiasis, socio-economic, socio-cultural, regimen, festivities.*

### **INTRODUCTION**

Malarialiasis in humans is caused by a protozoan parasite belonging to the genus *Plasmodium*. The disease manifests mainly by body temperature paroxysm- a rise/ fall of body temperature between 35.0°C and 40.0°C- depending on the parasite species involved. Other clinical symptoms are headache, stomach upset, chills, feverish condition, sweating, in appetite, malaise-general feeling of being unwell, nausea, acute anaemia, fatigue, emaciation among others (Udonsi, 1999). Global populations of about 300 million people are infected with the disease. Of the above figure 1 to 2.5 million, particularly children below the ages of 5yrs, die annually from it (WHO, 2000). At least 2000 of such death are reported daily in the world (WHO, 2005). In Nigeria and other developing nations of Africa, malaria is still a persistent health and developmental issue among various age groups, where up to 600 people die annually (Oparacha, 2007). The *Plasmodium* of humans include *P. malariae*, *P. ovale*, *P. vivax* and *P. falciparum*. The prevalence of the disease is on the increase daily, despite frantic attempts to keep it under check both by local and international health

bodies, using sophisticated orthodox and traditional control methods. The disease epidemiology has vastly been documented by many authors (Gillet, 1972; WHO, 1999; Colluzzi, 1994; Collins and Swan, 1995; Amadi, 2002). These authors had discussed the prevalence of the disease in relation to age, sex, occupation and educational status of the infected human population. The present study area lacks records of the disease prevalence. This study therefore aimed at providing baseline data of prevalence among indigenous human population of Ogoniland. In addition, the study also examined the influence of socio-cultural and socio-economic activities on the prevalence of malarialiasis on the population.

### **MATERIALS AND METHODS**

#### *Study area and Population*

The study area was divided into five zones, namely Eleme, Tai, Gokana, Khana, and Control with limited breeding sites, which included the following twelve communities: Aleto, Ogale, Ebubu, Sime, Nonwa, Kpita, Kpor, Morgbo, Bodo city, Taabaa, NyoKuru and Bori.



The zones were selected based on the availability of suitable breeding sites for mosquito vector of the disease. The zones are located between latitudes 50°N and 70°E, with a population of over 500,000 indigenous people (National Population Commission, 1991). The study area exhibits longer duration of rainy season (April-November) and shorter dry season (December-March) (Nwibari, 2008). These climatic conditions influence positively the availability of breeding sites for the mosquito vector of the disease. The location lacks adequate health facilities, and has poor drainage system. Greater proportions of Ogonis are literates and mostly career civil servants, but most illiterate indigenes are subsistent farmers and fishermen. Few boreholes serve as source of drinking water, but basically streams and well water are the main sources of domestic water across the location. The area completely lacks pipe-borne water.

#### **Blood sample collection and investigation of suitable breeding sites, (Udonsi, 1999)**

Prior to the collection of blood samples in 2005, reconnaissance visits were initiated to ascertain, by physical observation, the types and number of existing suitable breeding sites for mosquito vectors, which served as the basis for the study in terms of the division of the study location into five zones. It also serves as an integral aspect of the study following the types and number of such investigated suitable breeding sites for mosquito vector of the disease being properly recorded and tabulated for the different zones. The reconnaissance visits also served the purpose of seeking the compromise of selected community heads to help mobilize voluntary blood donors, who were gathered at the various community halls or village squares for the blood collection exercise. Explanations were made to the village heads and volunteers about the research procedures and benefits. Individual's consent was obtained to facilitate and encourage smooth and harmonious exercise during blood collection. 2 to 4mls of blood samples were then collected intravenously from cubical veins of arms of every donor, using sterile syringes on agreed dates across the zones. The collection was carried out by health workers employed from the various communities. Visits to primary health institutions and collated data on the prevalence of the disease were done. This complimented blood sample collection, and also as an integral aspect of the study. Incentives were given to the blood donors which

include cash, beverages and bathing soaps. They were also promised a re-visitation for the purpose of treating those infected with the disease. Collected blood samples were preserved in sterile bottles containing anti-coagulants and taken to the laboratory for microscopy. Blood samples were further examined same day of collection, while unexamined blood samples were preserved at -40°C refrigeration, and later examined to avoid parasite disintegration (Amadi, 2000, Udonsi, 1999, Adams and Maegraith, 1984).

#### **Statistical Analysis**

All data collated were analysed using the two-way analysis of variance (ANOVA) to serve for comparative grounds for the variously investigated parameters, and especially to ascertain the significant differences statistically obtained against results for examined parameters, among the different human characteristic groups; sex, age, educational status and occupational groups. The collated data obtained from various analyses were further expressed in percentage as it affects the numbers so obtained for every investigated parameter throughout the study (Adams and Maegraith, 1984).

#### **Administration of questionnaires**

Questionnaires were administered simultaneously on 750 individuals who were examined for the disease. The same numbers distributed were retrieved from respondents during the blood sample collection. The parameters for socio-cultural and socio-economic activities included the people settlement pattern, celebration or festivities, religious activities and traditional mosquito control methods. Others included the people's occupation, leisure hours, food/drink types and processing methods for the food and drink etc (Nwibari and Udonsi, 2006).

#### **RESULTS**

The results of the study show that of the 750 persons examined for the disease, prevalence of malarial was recorded in 381 (50.8%) cases with 211 (28.1%) as males while 170 (22.7%) were females. Age group of 31-40 yrs had the highest prevalence rate 151(20%), while 71yrs and above had the least prevalence rate 0(0.0)(Table:1). It was also observed that socio-cultural activities of human population had effect on the disease prevalence as well as the socio-economic activities of study population (Tables 2-3).



**Table 1: Age and sex related prevalence of Malaria in the study area (Figures in brackets are percentages)**

Age/Sex Group (years)	Total number. Examined	Male Prevalence	Female Prevalence	Total No Infected
11-20	12(1.6)	03(0.2)	04(0.5)	07(0.8)
21-30	251(33.8)	43(5.7)	82(10.9)	124(16.6)
31-40	282(37.6)	92(12.3)	56(7.9)	151(20.6)
41-50	127(16.9)	49(6.5)	41(1.9)	63(8.4)
51-60	56(7.5)	20(2.7)	9(1.2)	29(3.9)
61-70	16(2.1)	5(0.7)	2(0.2)	7(0.9)
≥71	3(0.4)	0(0.0)	0(0.0)	0(0)
<b>Total</b>	<b>750 (100)</b>	<b>211(28.1)</b>	<b>170(22.7)</b>	<b>381(50.8)</b>

**Table 2: Respondents for various socio-cultural activities on malaria in the study area (Figures in brackets are percentages).**

Investigated Zones	Total number of respondents	Positive responses for SP(%)	negative responses for FC(%)	positive Responses for RA(%)	Responses for MCM
Zone 1 Eleme	300	130(17.3)	150(20.0)	175(23.3)	120(13.6)
Zone 2 Tai	150	75(10.0)	80(10.7)	90(13.3)	65(8.7)
Zone 3 Gokana	108	99(13.2)	107(14.3)	110(14.7)	60(8.0)
Zone 4 Khana	95	55(7.3)	46(6.1)	50(8.7)	26(3.4)
Zone 5 Control	25	13(1.7)	14(1.8)	12(1.5)	6(1.1)
TOTAL	750	372(49.6)	397(52.9)	437(58.3)	444(59.2)

Key: SP=Settlement Pattern; RA=Religious Activities, FC=Festivities/Celebrations; MCM=Mosquito Control Methods.

**Table 3: Respondents on the socio-economic activities on malaria in the study area investigated (Figures in bracket are percentages and all positive responses).**

Zones of study	Number of Respondents	Responses for FT/PM(%)	Responses for Occ(%)	Responses for LH(%)
Zone 1 Eleme	300	180(25.0)	120(16.0)	165(22.0)
Zone 2 Tai	150	68(9.1)	58(7.7)	70(15.3)
Zone 3 Gokana	95	120(16.0)	113(15.3)	115(15.3)
Zone 4 Khana	95	50(6.6)	61(8.1)	65(8.7)
Zone 5 Control	25	21(1.6)	10(1.3)	13(1.7)
TOTAL	750	430(57.3)	364(48.5)	372(49.6)

Key: FT/PMs=Food Types/Processing Methods, Occ.= Occupation, LH=Leisure Hours

## DISCUSSION

A prevalence of 50.8% obtained between 2005 and 2006 in this study for malaria represents a higher status for the disease among the examined population in the study location. This result is supported by previous researches on relative subject, Udonsi (1981) and Amadi *et al* (2002) who reported separately a higher prevalence 53% of malaria in their findings on parasitic infections and health care delivery in rural areas of Imo State, and 60% in studies on the pattern of *Plasmodium falciparum* infection in two communities of Yenagoa, Bayelsa State, Nigeria. It was observed that the prevailing status of the disease

in the area was gender-specific and age-dependant, following the result of age and sex-related prevalence obtained, whereby age group 31-40yrs with the highest number( 283) of examined persons as volunteers whose blood samples were screened revealed a chronological highest prevalence of 151 (20.6% ). Age group ≥71 with least number of persons (03) screened, was without any positive case. This further showed that there was a linear age-related prevalence whereby the higher number of persons screened for the disease, the higher the percentage prevalence and vice versa.



It further revealed that males 92(12.3%) showed more susceptibility and positivity among the number of positive cases observed in the study compared to females 56(7.9%), which is also in corresponding numbers of the different sexes screened for the disease. More males submitted to screening than females as fully represented in the data obtained above. This is further observed to be consistent with Amadi *et al* (2000) where the number of female (80) present to be screened for *Plasmodium falciparum* revealed a corresponding prevalence rate, higher than males (35) who were less in number screened in the area. They further attributed this to more females involving in related fishing activities than males in the study. In the present study, more males involved in related occupation like farming, fishing, palm wine tapping, and consequently, higher prevalence of males than females.

On obtained results from investigated socio-cultural and socio-economical activities, it was also observed that the various parameters showed greater positive responses in support of the high prevalence of the disease in the study, within the five zones as fully represented in Tables 2 and 3. Respondents for various socio-cultural activities in the five zones gave their positive responses to questions corresponding with the higher prevalence status for the investigated individuals on the sparse settlement pattern of the people in the study location. They also gave similar positive responses to aspect of increased religious activities, celebrations / festivities, as well as very poor traditional mosquito control methods adopted by the people exposing them to more mosquito bites consequently, the higher prevalence status obtained for the disease. Similarly, higher positive responses were also obtained for the investigated socio-economic parameters following result collated and shown above in the five zones. The people's occupation, food types/processing method and their leisure hours showed greater positive responses in support of the higher prevalence status obtained for the disease in the study. It was also observed that malarial endemic localities within previously investigated zones for same parameters similar to those of the present study, showed corresponding positive responses by Respondents to similar questionnaires, buttressing the high impact of activities on prevalence status obtained in those investigated socio-cultural and socio-economic parameters within these localities, such activities as these, are regarded as main sources of easy exposure to persistent mosquito bites, and relatively high transmission rate for the disease in this location. Oparaocha, (2007) in agreement with the present study, reported that use of traditional control methods for malaria which include burning of traditional herbs believe to have insect- repellent potentials, were commonly patronized because they were easily collected around houses. He further reported that correct knowledge of the etiology of the disease was highly dependent on occupation and

educational level of people endemic areas. Thereby supporting the present study, whereby majority of infected individuals were illiterates who were fully involved in miniature jobs and main occupation as farming, fishing, palm wine tapping, as well as other socio-cultural activities as masquerading, late night visit to neighbour's houses as well as body exposure during leisure hours outdoors, during night hours as also supported by Martha *et al* (2002) who emphasized such outdoor activities.

Similarly Emerton (1992) also agreed with the present study in the different reports on the high prevalence status as well as the seasonal differences, finding the people's celebrations/festivities during which abundance of mosquito vectors breed and transmit easily the Plasmodium parasite through persistent bites on the people so exposed by such activities within the raining seasons, which tally with those festive seasons, as New Yam festivals, with masquerading into late-night hours through water-logged communities, routes from house to house, begging for alms and chasing youths, thereby become easily attacked by female biting mosquito.

Nwoke (2004) confirmed impact of changing human environment and climate on emerging and re-emerging of parasitic diseases lecture in support of the sparse settlement pattern influencing high malarial prevalence status in the present study. He further stressed the impact of such environmental factors that expose individuals to constant mosquito bites due to uncompleted living houses, sparse within fishing pots and amidst vegetations as well as bushes surrounding such living houses, where very high mosquito breeding capacity is predominant, consequently predisposing the people to persistent mosquito bites and malarial parasites transmission.

## CONCLUSION

In conclusion, the high prevalence status obtained in this study also requires an equal measure of urgent and drastic attention by health bodies both at the local and international support levels to access the study location, following the success of the findings here- in, as it provides for baseline data both for further researchers and intervention regimen. This will certainly better the health of the dwellers in the area. Precautionary measures through extensive educational enlightenments campaign against such activities exposing the people to the infection will also help minimize prevalence and attacks of malarial in this location.

## Recommendation

- Similar researches to ascertain and improve on the results and findings are required in the study location.
- Since this study serves as base line data for other studies on malarial in area, it is expected to be treated so in the future.



- The people need urgent attention of both government, well meaning individuals, committed medical personnel and health organizations etc, to remediate their health situation.
- Adequate supply or distribution of well treated mosquito bed nets in the location.
- Intensive open health educational enlightenment campaign is also needed in the location.
- The people require certain levels of self-empowerment programs, to check-mate their poverty rate especially among indigenes and other dwellers within the location.

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