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The Influence of Economic and Socio-cultural Factors on Strategic Implementation of Malaria Intervention Strategies among the Lake Basin Dwellers—Evidence from Suba South Constituency, Homabay County, Kenya

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Abstract
Malaria is one of the most serious parasitic diseases causing up to 90% of deaths annually in Sub-Saharan Africa. It is recognized that much of the morbidity and mortality associated with malaria could be reduced provided that existing strategies like ITNs, IVMs, vaccination, and ACT treatment among others are fully implemented. This study aimed at investigating the influence of economic and socio-cultural factors on the strategic implementation of malaria intervention strategies among the Lake Basin dwellers, with particular interest on the households of Suba South Constituency in Homabay County. Most of the residents of Suba South Constituency live along the Lake Victoria Basin and, due to the heavy presence of mosquitoes, are highly vulnerable to malaria attack, thus finding themselves at the very centre of the need to strategically implement every necessary measure to control the disease. Ross' quantitative theory of malaria and mosquito-borne disease transmission and the quantitative foundation of epidemiology that describe adult mosquito movement and the spatial scale of larval control required to reduce mosquito populations and eliminate malaria from an area, formed the major basis of this study. A descriptive survey research design was adopted with a sample of 392 respondents drawn from a target population of 20,609 households from the four Wards of Suba Constituency. Data was collected using questionnaire schedules and the responses were analyzed with the help of SPSS and subjected to chi-square analysis to test research hypotheses. The findings revealed that economic factors have very great influence on strategic implementation of malaria intervention strategies in Suba South Constituency, while socio-cultural factors have great influence on the same. The study recommends, among other things, that intensive awareness campaigns should be launched in Suba South Constituency to sensitize the community against the danger of malaria and the various implementation strategies available to control the spread of malaria. This would demystify the myths about malaria and disassociate it from cultural beliefs and norms like witchcraft, bad omen, and sorcery among others which impede the strategic implementation of malaria intervention strategies. It also recommends that various financial opportunities should be created in the Constituency besides, farming and that fishing activities should be made more profitable and sustainable to economically empower the community and increase their economic ability to afford some of the strategic interventions to curb the malaria menace.
Keywords: Economic Factors; Socio-cultural factors; Strategic Implementation; Malaria Intervention Strategies.

1. INTRODUCTION

1.1. Background of the Research Problem

Malaria is the most important of the parasitic diseases of humans, with 107 countries and territories having areas at risk of transmission containing close to 50 percent of the world's population (Hay and others 2004; WHO 2005). More than 3 billion people live in malarious areas and the disease causes between 1 million and 3 million deaths each year (Breman, Alilio, and Mills 2004; Snow and others 2003). Approximately, 90 % of malaria cases occur in Sub-Saharan Africa, where over one million children under the age of five die of malaria annually.

The Roll Back Malaria Partnership, which began in 1998, aimed to halve the burden of malaria by 2010 through the implementation of such control efficacious interventions such as combined anti-malarial therapies and insecticide-treated materials. Biological, environmental, political, socio-cultural, economic and behavioral factors influence the transmission of malaria, thus requiring a multidisciplinary and integrated approach to effectively control the spread of malaria. While ambitious, the initiative has made substantial progress by means of effective and efficient deployment of currently available interventions (WHO 2003, 2005). Indeed, Brazil, Eritrea, India, and Vietnam have reported successes in reducing the malaria burden (Barat 2005). Despite the enormous investment in developing a malaria vaccine administered by means of a simple schedule and recent promising results in the laboratory and in field trials in Africa, no effective, long-lasting vaccine is likely to be available for general use in the near future (Alonso and others 2004; Ballou and others 2004).

Malaria parasites have been eliminated from Europe and North America through the use of residual insecticides and manipulation of environmental and ecological characteristics; however, in many tropical and some temperate areas the incidence of disease is increasing dramatically. Much of this increase results from a breakdown of effective control methods developed and implemented in the 1960s, but it has also occurred

because of a lack of trained scientists and control specialists who live and work in the areas of endemic infection. Add to this the widespread resistance to the most effective anti-malarial drug, chloroquine, developing resistance to other first-line drugs such as sulfadoxine-pyrimethamine, and resistance of certain vector species of mosquito to some of the previously effective insecticides and we have a crisis situation (Sirima et.al., 2002)

In Vietnam and the KwaZulu-Natal province of South Africa, *P. falciparum* malaria incidence and mortality rates fell when effective treatment policies (artesunate and ACT) replaced failing mono-therapies (Hung and others 2002). The effective drug policies were implemented in conjunction with enhanced vector control; thus, effective treatment alone does not account for the fall in malaria incidence and mortality.

In response to this pressing social problem of Malaria, in April 2000, the African heads of state committed their governments that by the year 2005, 60% of malaria episodes are appropriately treated within 24 hours of onset of symptom. A strong healthcare delivery system would ideally provide early reliable diagnosis and appropriate prompt effective treatment. However, in most malaria-endemic countries access to curative and diagnostic services is limited (WHO, 2004).

In line with the global initiative to Roll Back Malaria (RBM), the Federal Ministry of Health, of the Republic of Tanzania, developed a five-year national strategic plan for the prevention and control of malaria for the period 2001 –2005. The objective was to achieve a 25% reduction in the burden of malaria by the end of 2005 by ensuring at least 60% coverage in the major malaria intervention that includes access to effective treatment, suitable vector control and detection and containment of malaria epidemics within two-weeks from onset (MOH, 2006).

In order to minimize the burden of malaria, the Government of Malawi is currently implementing a number of interventions at community level. These interventions include, but are not limited to: insecticide-treated bed nets (ITNs), intermittent preventive treatment (IPT) and environmental management. These interventions prevent mosquito bites to avoid infection with, or transmission of, parasites to/from humans, or clear parasites from blood circulation to prevent disease and/or prolonged infection. Environmental management targets mosquito breeding sites in order to reduce vector densities. Under controlled settings, the current malaria interventions have been proven to effectively reduce malaria morbidity and mortality between 19% and 95% depending on the mode of prevention and control and the intensity at which these are implemented. Despite this scientifically proven effectiveness successful implementation has remained a challenge in many African countries including Malawi. These implementation challenges may have arisen, in part, due to socio-cultural beliefs and misconceptions about malaria interventions, as well as the economic-related factors including fishing careers that expose the population to mosquito bites and inadequate family incomes.

It is equally recognized that much of the morbidity and mortality associated with malaria could be reduced, provided that existing intervention strategies are made accessible and are effectively used (RBM, 2000). Preventing mortality and reducing illness through improved access to prompt diagnosis and effective treatment remain key targets of the current global malaria control strategy (WHO, 1993; WHO, 1993[a]). However, since the resurgence of malaria, compounded by the spread of drug resistance, prevention and selective vector control have become quite significant (WHO, 1993). Among these, insecticide-treated bed nets (ITNs) and curtains have emerged in recent years as the most practical (Lengeler, et al., 1996). The health impact of insecticide-treated bed nets was determined in research trials in the Gambia (Alonso et al., 1991), Ghana (Binka et al.,1996), the Kenyan Coast (Nevill et al., 1996), and Burkina Faso (Hablutetzel et al., 1997). It is estimated that 6 lives could be saved for every 1,000 children protected under bed nets—translating to approximately 336,000 malaria deaths averted if every child slept under ITNs (Lengeler, 2003). Successful malaria prevention using ITNs could also decrease demand for new drugs and slow down the spread of resistance.

The MOH, Kenya has made significant steps in alleviating the malaria menace. Kenya's Vision 2030 aims to reduce the National impact and burden of malaria through an effective implementation program of various malaria control strategies. These interventions include integrated vector management, Indoor residual spraying, the use of treated bed nets and bedclothes, the use of prophylactic drugs and other anti-malarial drugs and vaccination (NMCP, 2012). These strategies have registered varying results in various regions across Kenya, especially in the rural communities in Kenya. For instance, ITNs have been earmarked as one of the most effective methods of malaria control in Suba South Constituency.

In Suba South Constituency, malaria was found to be the leading cause of morbidity, constituting 42-48% of all illnesses clinically diagnosed across various health centres over a two-year period (MOH, 2010). The alarming malaria prevalence in Suba District has awakened various stakeholders (government and non-governmental) and they have scaled up efforts to increase the distribution and accessibility of treated mosquito nets among the households in Suba South Constituency. Insecticide spraying of breeding sites, vector management as well as IRS, have also been launched, among other strategies, in an effort to control malaria (Amos, 2011). However, these intervention strategies have not significantly reduced the rate of malaria in Suba South Constituency, prompting the researcher to look into factors that influence their strategic implementation, with particular attention to economic and socio-cultural factors.

1.2. Statement of the Research Problem

In Suba District, malaria was found to be the leading cause of morbidity, constituting 42-48% of all illnesses clinically diagnosed across various health centres in Suba District (currently Suba South Constituency) over a two-year period (MOH, 2010). various stakeholders (government and non-governmental) have scaled up efforts to implement various malaria intervention strategies including the distribution and accessibility of treated mosquito nets among the households in Suba District, IVMs, IRS, distribution of anti-malarial drugs, among others, in an effort to control malaria (Amos, 2011). However, these strategies have failed to significantly reduce the spread of malaria in the Constituency prompting the researcher to investigate the economic and socio-cultural factors influencing the strategic implementation of malaria intervention strategies in Suba South Constituency.

1.3. Purpose of the Study

The purpose of the study was to investigate the influence of economic and socio-cultural factors on the strategic implementation of malaria intervention strategies in Suba South Constituency, Homabay County.

1.4. Objectives of the Study

The research was guided by the following key objectives:

1. To examine the influence of economic factors on strategic implementation of malaria intervention strategies in Suba Constituency, Homabay County.
2. To determine the influence of socio-cultural factors on strategic implementation of malaria intervention strategies in Suba Constituency, Homabay County.

1.5. Research Hypotheses

The hypotheses of this research included:

$H_0$1. There is no significant relationship between economic factors and the strategic implementation of malaria intervention strategies in Suba South Constituency, Homabay County.

$H_0$2. There is no significant relationship between socio-cultural factors and the strategic implementation of malaria intervention strategies in Suba South Constituency, Homabay County.

1.6. Significant Terms

Economic Factors: Include monthly income, economic activities of the region, cost of intervention strategies, financial aid, among other economic considerations.

Socio-cultural factors: Include various cultural beliefs and norms like witchcraft, bad omen, sorcery, gender roles, social classes among other socio-cultural considerations.

2. LITERATURE REVIEW

2.1. Theoretical Framework

This study borrowed heavily from Ross' quantitative theory of malaria and mosquito-borne disease transmission and also the quantitative foundations of epidemiology that Ross published in 1904. This theory is a mathematical model describing adult mosquito movement and the spatial scale of larval control required to reduce mosquito populations and eliminate disease from an area.

It furthers the concept that if we reduce the number of mosquitoes in the locality by one-half, the mosquito bites will be reduced by one-half; and consequently, only half as many people will now become infected as was formerly the case. But, since the mosquitoes themselves are infected by biting previously infected persons, the percentage of infected mosquitoes, among the insects which remain, will also be reduced in its turn, because the insects will now find fewer infected persons to bite. Hence, ultimately, the number of mosquitoes will be reduced by much more than one-half. In fact, we may perhaps assume that the number of infected persons will be reduced to one-quarter—that is, in the duplicate ratio of the squared percentage of the reduction of the mosquitoes (Ross, 1904). This theory, therefore, supports the very foundations of vector control, upon which this study is based, as a key strategy to control malaria.

2.2. Conceptual Framework

The Conceptual Framework of this study looked at economic capacity of households and the socio-cultural inclination and beliefs of the people as the key strategic factors influencing the implementation of malaria intervention strategies in Suba South Constituency. Each of these factors with varying indicators is illustrated in the table below:

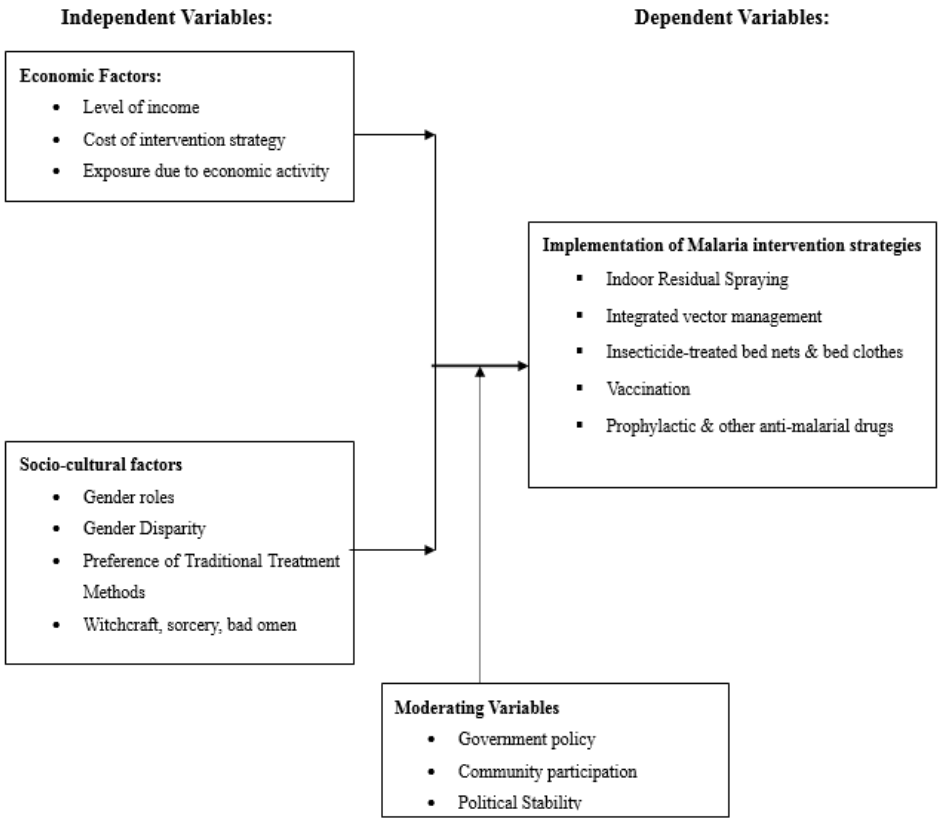

Figure 1: Conceptual Framework

2.3. Economic Factors and their Influence on Strategic Implementation of Malaria Intervention Strategies

It is now well established throughout the world that morbidity and mortality rates are directly associated with socioeconomic status. The lower the status the higher the rates. In malarious regions, the poor are disproportionately at risk for the disease, and while there is general agreement about this association, there is less agreement about the directionality of the association, like the question in the old saying, "Am I sick because I am poor, or am I poor because I am sick?" (Brown, 2000).

The use of herbal remedies in the treatment of malaria is widespread. They are often an inexpensive alternative to Western antibiotics (Ruebush et al, 1995; Silva, 1991; Tona et al, 1999). In Somalia, the aetiological connection between malaria and the mosquito has probably been recognised for a long time, and as a consequence of the long historical interaction between local culture and malaria, Somalis have developed many of their own treatment practices, including consumption of "Khat" leaves (a mild drug-like substance), fresh camel milk, purgative herbs such as "Carmo" leaves, black river fish, reciting verses of the Quaran, and massaging ill people with a mixture of sesame oil and lemon juice (Abyan & Osman, 1993).

McCombie also found that access to health facilities, severity of illness, and cost were the main impediments to health-centre use. Indeed, concern over cost of treatment is a primary reason for non-use of health clinics, as well as being a primary motivator for self-treatment, the main problem being ability, not willingness, to pay (Foster, 1991). Herbal treatment is practically free (Ahorlu et al, 1997), while certain allopathic anti-malarials can sometimes be purchased individually at shops, decreasing the cost of a single course of treatment. Visits to health centres, however, may entail additional and sometimes prohibitive costs, including travelling expenses and time lost from productive activities.

Another significant concern is the timing of malaria, which often does not overlap with the "seasonality" of available income from agricultural-based economic activities. Seeking care at health clinics requires money. In many countries malaria appears during the rainy season, when cash reserves from the previous harvest are at their lowest. Thus those seeking care at this time of year are less able to afford it due to loss of time that would be used for productive activities as well as the low cash reserves (Foster, 1991).

Ziba et al, (1994) found that in Malawi, use of malaria prevention measures (bednets, insecticides, mosquito coils, other insect repellents, burning leaves, spreading or burning dung, or burning wood fires), was income-dependent. In households where the head earned a larger than average income, use of commercial methods (mosquito coils, insecticide spray, bednets) was more common. In fact, households with moderate or greater income levels were eight times more likely to use a commercial (purchased) product. Use of inexpensive

and less effective, natural methods (burning leaves, dung, or wood) was associated with lower income.Not to be overlooked is how bednet usage relates to means of payment and income distribution. Because of seasonality of crops and income generated from them, local residents may prefer to purchase a net after the harvest, when they have more ready cash than during other times of the year, when their resources are low. However, if the mosquito density is low during these times, spending money on insecticide-impregnated bednets may not be perceived as a high priority (Binka & Adongo, 1997). But when the need is perceived as greatest, people may not have the resources to pay for protection. In Ghana, women like to make cash payment for bednets, but also favour other means of payment, such as exchanging crops from their farms or paying in installments (Binka & Adongo, 1997). Yet even if the money is present, bednets may not be a priority.

In Ghana, Aikins, Pickering, & Greenwood (1994) found a low level of bednet usage and related this to the reduced value assigned to their acquisition. Re-treating them may not have the obvious advantage of a new commodity purchase. There was also a fear among some women that if they acquired bednets, men would repossess the items. The fact that bednets were scarce in local markets may also have had some influence on their low status in the community. In contrast, in areas where bednets have historically been used for a long time, there is greater use and appreciation. In the area of The Gambia where Aikins et al (1993) conducted their study, bednets had been in use for more than 100 years; 98% of bednet users had seen their parents use them during their childhood, and perhaps due in part to these factors, 86% of the study subjects were bednet users.

Finally, in a community-based insecticide-impregnated bednet trial in Tanzania, people stated that since they did not have enough money to buy nets for the whole family, they purchased them only for adults (Makemba et al, 1995).

With the population in Suba South Constituency highly dependent on fishing as the main economic activity, and which is supplemented by subsistence farming, most of these households are poor and may not afford the strategic malaria intervention strategies. Fishing has also emerged as a dangerous activity that exposes the fishermen/women to mosquito attacks during the night, hence the spread of malaria amongst this population.

2.4. Socio-cultural Factors and their Influence of Strategic Implementation of Malaria Intervention Strategies

Although people's culture may increase malaria risk, to change such culture is not easy. MacCormack has written that "the principal reason [for why people do not accept new kinds of health behavior] is that the behavior being advocated is inconvenient, produces unwanted side-effects, or does not give visible results" (MacCormack, 1984:86). Thus, it is not usually the case that "these people don't know any better," but rather that their native logic and rationality make sense within the realities and limitations of their local circumstances.

Local perceptions of seasonality of insect population and malaria transmission are not the only factors that affect bed net use and acceptance. Perceptions of the cause of malaria and the manner of its transmission are also important: How and why does one person become infected when his neighbor does not? That is, the seemingly random nature of malaria infection may lend itself to supernatural explanations rather than to naturalistic or scientific ones. In The Gambia, Aikins et al (1993) found that people, especially those in rural areas, believed that malaria is due to possession of the ill person, particularly if it is a child, by an evil spirit or devil. This springs from witnessing the convulsions typical of severe malaria in children. If the cause of malaria is thought to be due to spirits and witchcraft, no means of biomedical prevention will suffice in stemming the tide of the infection and thus cannot play an important role in the use of malaria-prevention methods (Winch et al, 1994).

Since traditional treatment methods and healers may often be the first line of treatment for malaria, it is important to understand how, why, and what kinds of traditional methods are used. This is particularly crucial since many control programmes in the past have ignored the ways that traditional medical systems and local people deal with the disease (Lipowsky, Kroeger, & Vazquez, 1992).

Many cultures, especially in Africa, combine religion, sorcery, health, and interpersonal conflict into a unified system of belief and practice, making it necessary to consider all aspects of the social and economic environment in studying treatment-seeking behaviour for malaria (Gessler et al, 1995b). Historically, this was also the case in Italy (Brown, 2002).

Traditional healers may be consulted for a number of reasons - social, economic, therapeutic, and psychological. In a review of treatment-seeking behaviour, McCombie (1996) found that, even if most people preferred self-treatment, traditional healers were most often consulted for cases of convulsions, splenomegaly, and anaemia, even if these symptoms were not associated with malaria. Indeed, traditional healers serve a variety of important roles. In a study of the use of traditional healers in the malaria volunteer programme in Thailand, villagers preferred the traditional healers, many of whom were actually "injection doctors," specializing in administering treatment via injections. Villagers felt more comfortable having their fingers pricked by someone with previous experience in handling needles, and they felt that they were more able to complain about their symptoms and receive a sympathetic response (Okanurak, Sornmani, & Chitprarop, 1992). In a study in Ethiopia,

researchers also found that traditional birth attendants are believed to understand women's and children's problems and consequently are more likely to have a better rapport with mothers. Including indigenous and/or other traditional specialists as volunteer malaria workers may increase access to anti-malaria drugs for some hard-to-reach mothers and children (Yeneneh et al, 1993).

Who makes the decision within the household, whether it is the mother or the father, may play an important role in which kind of treatment is sought, and this can vary by region, community, and even individual household. For example, in Ethiopia researchers found that treatment-seeking determinations were usually made jointly by both parents (Yeneneh et al, 1993). In contrast, along the Kenyan Coast among the Mijikenda and Luo communities, researchers found that the male head of household generally made decisions. Socio-cultural roles played an important part in the decision-making process, especially ideas about who "owns" the child. This idea of "ownership" of children is an important consideration when studying treatment-seeking behavior in patrilineal and matrilineal societies. Since the child belongs to the patrilineage, it is the male head who makes decisions. In the Kenyan study, the male head of household (usually the husband) decided both about diagnosis as well as the type of treatment to be used. In the absence of a husband, male in-laws in the case of widowed women, and brothers or fathers in the case of unmarried women, made the determinations. A primary reason for this was to keep matters within the household and to protect the male head's position within it. In the local belief system, malaria is sometimes thought to be caused by sorcery, which can be practiced by kin against kin. Illnesses are therefore kept hidden within the household until the local healer dispels the threat from other kin or performs the necessary counteractive measures (Mwenesi, 1994).

Pregnant women, especially if they are primigravida, are another group at high risk because of suppressed immunity during pregnancy (Okonofua et al, 1992). For young pregnant women, however, cultural prejudices may play a role in barriers to treatment, especially if the women are unmarried. In a study among pregnant and non-pregnant adolescent girls in Nigeria, researchers found that community premarital pregnancy was resented and associated with shame. Most parents hid their unmarried, pregnant daughters at home to avoid the humiliation, and the daughters themselves stated that they did not want to be seen in public because of the negative attitude toward premarital adolescent pregnancy. Thus many of these adolescents were more likely to practice self-medication for malaria, rather than using the village health facility (Okonofua et al, 1992).

Ethnicity is another important factor that affects acceptance and use of insecticide- impregnated bed nets. Four studies in The Gambia (Thomson et al, 1996; Aikins et al, 1993.

Yet another reason for this differential use of insecticide-impregnated bednets based on ethnicity in Ghana may be that other groups believe that the Fula cause malaria, resulting in feelings of belittlement on the part of Fula group members and their consequent refusal to use insecticide-impregnated bednets (Aikins et al, 1993). This prejudice may be due to conflicts that are seen in other parts of the world as well between populations that lead a nomadic lifestyle and those that are more settled. Nomads are sometimes viewed as "backward" because of their traditional, highly-mobile lifestyles, and they are often the objects of criticism and rebuke. In a study of the Mandinka, researchers observed that bednets were preferred because of the group's living arrangements. In Mandinka households, all co-wives sleep in one room, and bednets serve as a barrier to create a small amount of privacy. In a sense, bednets are a surrogate for bedroom walls (MacCormack & Snow, 1986). In contrast, most Wolof and Fula households rarely have more than two beds per room, an arrangement that provides for a greater degree of privacy and less need for bednets to create it.

3. RESEARCH METHODOLOGY

The study employed a descriptive survey research design in carrying out the study in Suba South Constituency, with a target population of approximately 20,609 households which are spread across the four Wards of Gwassi South (6,912 households), Gwassi North (6,119 households), Kaksingri West (5,204 households) and Ruma-Kaksingri East Ward (2,374 households). Suba South, according to National Census 2009, has a population of 103,054 people, with an average number of 5 family members per household, hence the 20,609 households. The details are summarized in Table 3.1 below:

Table 3.1: Target Population of the Study

Location	Population	No. of Households
Gwassi South	34,563	6,912
Gwassi North	30,598	6,119
Kaksingri West	26,021	5,204
Ruma-Kaksingri East	11,872	2,374
Total	**103,054**	**20,609**

Source: Independent Electoral and Boundaries Commission (IEBC)

The researcher targeted to interview the heads of each sampled household in Suba South Constituency. Therefore structured interview schedules were administered to a stratified sample of 392 respondents drawn from the population of 20,609 households using the formula below:

$$n = \frac{N}{1 + (N * e^2)}$$

Where;
N= population size
e= Tolerance at desired level of confidence, at 95% confidence level = 0.05
n= sample size.
While the distribution of the sample across the various strata (Wards) was obtained using the formula:

$$\text{Stratum sample} = \frac{\text{Number of individuals in the stratum X Sample Size}}{\text{Total population}}$$

Table 3.2 below represents the overall sample size and samples across the various strata in the 4 Wards:

Table 3.2: Target Population of the Study

Location	Population	Sample
Gwassi South	6,912	132
Gwassi North	6,119	116
Kaksingri West	5,204	98
Ruma-Kaksingri East	2,374	45
Total	**20,609**	**392**

Source: Author, 2016

The responses were collated using percentages, SPSS and subjected to chi-square analysis to test the hypotheses.

4. RESEARCH FINDINGS, INTERPRETATION AND DISCUSSIONS

4.1. Response Return Rate:

The Response rate was considered very good for data analysis. Out of the 392 sampled households, 365 respondents were interviewed giving a response rate of 93.11%. Some of the household members were not present from their homes and did not return for over an hour beyond which the researcher could not wait. According to Mugenda & Mugenda (2003) a response rate of above 50% is good enough for data analysis, above 70% is very good.

4.2. Socio-demographic Attributes of the Respondents:

4.2.1. Distribution of Respondents by Gender

Gender of the respondents was recorded and the findings reveal that most of the households (54.55%) in Suba South Constituency are male-headed. However, it also reveals that a considerable number of these households (45.45%) are female-headed. These findings are shown in table 4.1.

Table 4.1 Gender of Respondents

Location	number of respondents	Percentage
Male	214	54.55
Female	178	45.45
Total	**392**	**100**

4.2.2. Distribution of Respondents by Age

The findings revealed that most of the households in Suba South Constituency are headed by relatively youthful adult members with about 54% falling within 21 – 40 years age bracket as summarized in table 4.2 below:

Table 4.2 Age of respondents in Suba South Constituency

Age (Years)	number of respondents	Percentage
10 - 20	44	11.22
21 - 30	112	28.58
31 – 40	103	26.27
41 – 50	98	25.00
Above 50	35	8.93
Total	**392**	**100**

4.2.3. Distribution of Respondents by Level of Education:

The study revealed that most of the respondents (59%) had above Secondary level of education, hence are considered educated enough to understand issues around malaria control. The findings are summarized in figure 2 below:

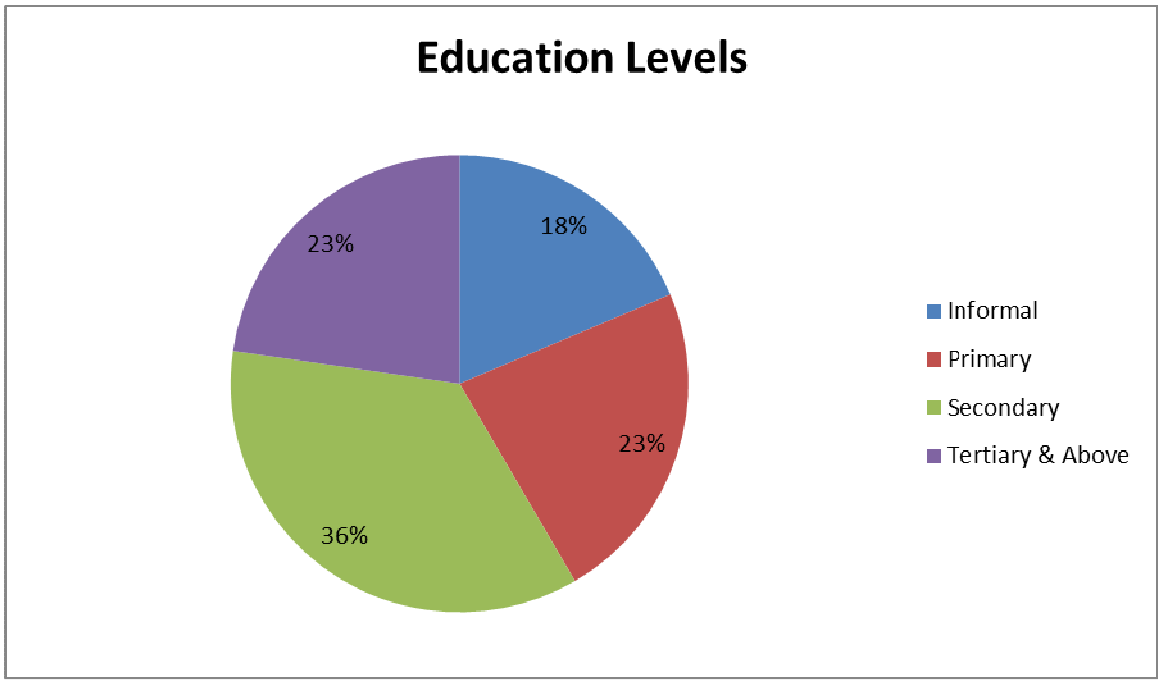

Figure 2: Education Level of Respondents

4.2.4. Distribution of Respondents by the Number of years they have lived in Suba South Constituency

The findings revealed that more than 90% of the respondents have lived in the Constituency for more than 5 years and are therefore considered to have relevant knowledge about the Constituency, which enhances the credibility of their responses. The findings are summarized in table 4.3 below:

Table 4.3: Number of Years Lived in Suba South Constituency

Years	number of respondents	Percentage
0 - 5	27	6.9
6 - 10	26	6.6
11 - 15	69	17.6
Above 15	270	68.9
Total	**392**	**100**

4.2.5. Distribution of Respondents by Occupation:

The study revealed that the major economic activities of the region are farming and fishing as confirmed by more than 60% of the respondents. However, about 32% of the respondents were engaged in some form of gainful employment like business, teaching, medical practice, banking, among others. Table 4.4 summarizes the occupation of the respondents.

Table 4.4: Occupation of Respondents

Occupation	number of respondents	Percentage
Farming	32	8.1
Fishing	56	14.3
Fishing & farming	176	44.9
Other (white collar jobs)	128	32.7
Total	**392**	**100**

4.3. Malaria Prevalence and Intervention Strategies in Suba South Constituency

4.3.1. Malaria Prevalence in Suba South Constituency

The study sought to find out whether malaria is a major problem for households in Suba South Constituency. The findings revealed that 92.6% of the respondents consider malaria a major problem, while only 6.9 % consider it a minor problem. A negligible number of respondents (0.5%), on the other hand, perceive that malaria is not a problem at all in Suba Constituency. The findings are summarized in table 4.5 below.

Table 4.5: Malaria Prevalence in Suba South Constituency

Malaria prevalence	number of respondents	Percentage
Major problem	363	92.6
Minor problem	27	6.9
Not a problem	2	0.5
Total	**362**	**100**

4.3.2. Malaria Intervention Strategies in Suba South Constituency

The findings revealed that ITNs and vector control were the two most implemented first-line strategies to control malaria in Suba South Constituency standing at about 72%. Timely intervention through IRS and administration of anti-malarial drugs were also considered key intervention strategies accounting for about 11% of the respondents. On the other hand about 14% of respondents sought traditional methods as first line treatment in case of malaria symptoms. Vaccination was however the least implemented strategic intervention at 1.8%. The findings are summarized in table 4.6 below:

Table 4.6: Malaria Intervention Strategies in Suba South Constituency

Intervention Strategy	No. of respondents	Percentage
Insecticide Treated Nets (ITNs) & Bed clothes	201	51.3
Integrated Vector Management (IVM)	82	20.9
Anti Malarial drugs	34	8.7
Indoor Residual Spraying (IRS)	12	3.0
Traditional methods (herbs)	56	14.3
Vaccination	7	1.8
Total	**392**	**100**

4.4. Influence of Economic Factors on Implementation of Malaria Intervention Strategies in Suba South Constituency

4.4.1. Monthly Income of Households in Suba South Constituency

The study revealed that most of the respondents (more than 60% as presented earlier) were involved in fishing and farming as their major economic activities. Therefore about 86% of the respondents were found to earn an average monthly income of less than Kenya Shillings 20,000, with only 14% of the respondents earning above Ksh. 20,000. This indicates that the households have little disposable incomes to spend on the family basic needs, including malaria control and other healthcare interventions. Figure 3 below summarizes the findings:

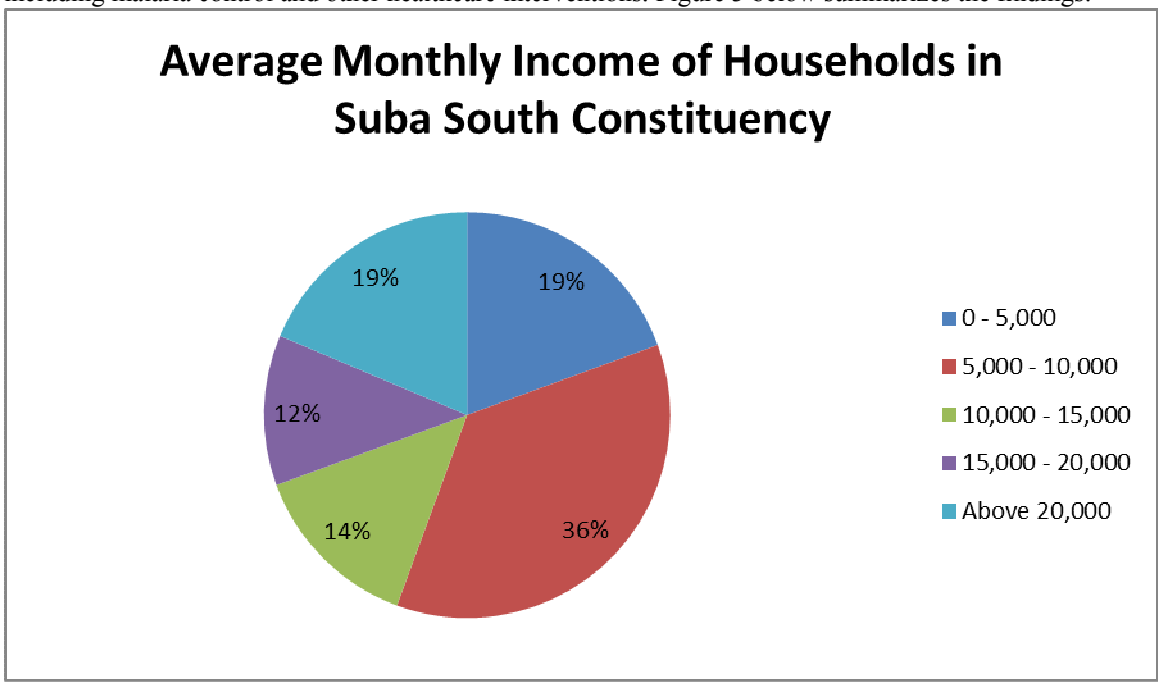

Figure 3: Average Monthly Income of Households in Suba South Constituency.

4.4.2. Analysis of the Extent of Influence of Economic Factors on Implementation of Malaria Intervention Strategies in Suba South Constituency

The study sought to find out the extent to which various economic factors (including household level of income, cost of malaria intervention strategy and exposure due to economic activity) influence the household's ability to strategically implement malaria intervention strategies. A five point Likert scale was provided against which

respondents rated these factors. The chi square value was calculated from the tabulated results of the Likert. The calculated value for χ^2 at 5% level of significance was 393.0. Since the calculated value is greater than the table value of 5.991, the researcher rejected the null hypothesis and concluded that there is indeed a significant relationship between the listed economic factors and the implementation of malaria intervention strategies in Suba South Constituency.

Table 4.7: The Extent of Influence of Economic Factors on the Implementation of Malaria Intervention Strategies in Suba South Constituency.

Economic Factors	Total Frequency		Very great		Great		Neutral		Little		Very little	
	f	%	f	%	f	%	f	%	f	%	f	%
Level of Income	392	100%	247	63%	113	29%	8	2%	15	4%	9	2%
Cost of Intervention	392	100%	250	64%	121	31%	3	1%	13	3%	5	1%
Susceptibility due to Economic Activity	392	100%	98	25%	238	61%	27	7%	16	4%	13	3%

The findings in the table above indicate that majority of the respondents considered households' level of income and cost of malaria intervention strategies (63% and 64% respectively) to have very great influence on the household's ability to strategically implement malaria intervention strategy. On the other hand, most of the respondents (61%) considered susceptibility due to economic activity to have great influence on implementing malaria intervention strategy. The findings are presented in table 4.7 above, and they indicate, generally, that economic factors have very great influence on the strategic implementation of malaria intervention strategies among households in Suba South Constituency.

4.5. Influence of Socio-cultural Factors on Implementation of Malaria Intervention Strategies in Suba South Constituency

4.5.1. Analysis of Causes of Malaria and Socio-cultural Factors Affecting the Implementation of Malaria Intervention Strategies in Suba South Constituency.

4.5.1.1. Household's Perception on what Causes Malaria

The study sought to investigate the perception of the respondents on what actually causes malaria and the findings showed that a majority of respondents (64%) understand that malaria is caused by mosquito bites. A further 36% attributed the causes of malaria to cultural/societal factors like bad omen, disobeying community norms and witchcraft. This reveals that there are still some misconceptions and myths surrounding the cause of malaria in Suba South Constituency that need to be demystified. The findings are as presented in table 4.8 below:

Table 4.8: Causes of Malaria

Cause of Malaria	Number of respondents	Percentage
Mosquito bites	251	64
Witchcraft/sorcery	66	17
Disobeying community norms	32	8
Bad omen	43	11
Total	**392**	**100**

4.5.1.2. Socio-cultural factors affecting the Implementation of Malaria Intervention Strategies:

The findings revealed that 58% of respondents perceive gender roles exposing women and men to mosquito bites, i.e. herding animals, cooking in open places late in the evening/night to influence the strategic implementation of malaria intervention strategies in Suba South Constituency. A further 23% consider preference of traditional healers and treatment methods over qualified medical personnel to also influence the implementation of malaria intervention strategies. This is justified by their cultural beliefs that malaria is caused by bad omen, witchcraft or sorcery or as punishment for disobeying community norms and values. Another 19% of the respondents affirm that gender disparity; preference of male household members in accessing treatment opportunities; also influence the strategic implementation of malaria intervention strategies in Suba South Constituency. Figure 4 below summarizes the socio-cultural factors influencing the implementation of malaria intervention strategies in Suba Constituency.

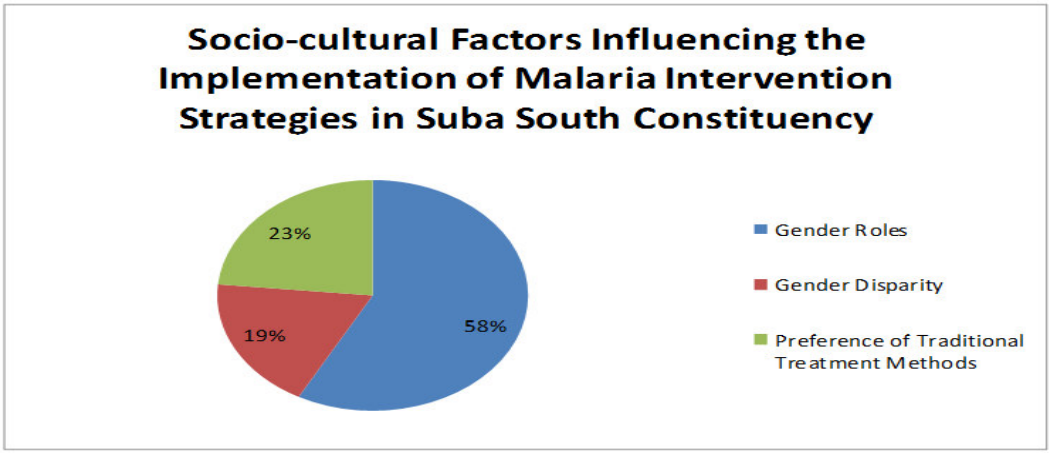

Figure 4: Socio-cultural Factors Influencing the Implementation of Malaria Intervention Strategies in Suba South Constituency.

4.5.2. Analysis of the Extent of Influence of Socio-cultural Factors on Implementation of Malaria Intervention Strategies in Suba South Constituency

The study sought to find out how various socio-cultural factors (including gender roles, gender disparity and preference of traditional treatment methods) influence the household's ability to strategically implement malaria intervention strategies. A five point Likert scale was provided against which respondents rated these factors. The chi square value was calculated from the tabulated results of the likert. The calculated value for χ^2 at 5% level of significance was 310.16. Since the calculated value is greater than the table value of 5.991, the researcher rejected the null hypothesis and concluded that there is a significant relationship between the listed socio-cultural factors and the implementation of malaria intervention strategies in Suba South Constituency.

Table 4.9: The Extent of Influence of Socio-cultural Factors on the Implementation of Malaria Intervention Strategies in Suba South Constituency.

Socio-economic Factors	Total Frequency		Very great		Great		Neutral		Little		Very little	
	f	%	f	%	f	%	f	%	f	%	f	%
Gender Roles	392	100%	133	34%	234	60%	4	1%	12	3%	9	2%
Gender Disparity	392	100%	120	31%	149	38%	67	17%	34	9%	22	5%
Preference of Traditional Treatment Method	392	100%	46	12%	207	53%	37	9%	48	12%	54	14%

The findings in the table above indicate that majority of the respondents considered gender roles and preference of traditional treatment methods (60% and 53%) respectively to have great influence on the household's ability to strategically implement malaria intervention strategy. The findings are presented in table 4.9 above, and they indicate, generally, that socio-cultural factors have great influence on the strategic implementation of malaria intervention strategies among households in Suba South Constituency.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The purpose of this study was to investigate the factors influencing the strategic implementation of malaria intervention strategies in Suba South Constituency. The study established that economic factors, including household income levels, cost of intervention strategies and susceptibility due to economic activities, having chi-square value of 393.00, and socio-cultural factors, including gender roles, gender disparity and preference of traditional treatment methods, having a chi-square value of 310.16 (with calculated chi-square values, χ^2 at 5% level of significance, greater than the table value of 5.991) are considered to have a very great and great influence, respectively, on the implementation of malaria intervention strategies in Suba South Constituency, Homabay County.

5.2. Recommendations

In view of the study findings and the conclusion drawn above, this study recommends that intensive awareness campaigns should be launched in Suba South Constituency to sensitize the communities against the danger of malaria and the various implementation strategies available to control the spread of malaria. The study also recommends that these awareness campaigns should also aim to demystify the myths about malaria and disassociate it from cultural beliefs and norms like witchcraft, bad omen, sorcery among others that impede the strategic implementation of malaria intervention strategies among households in Suba South Constituency.

The study also recommends to policy makers that various financial opportunities should be up-scaled in

Suba South Constituency through additional and alternative businesses and lucrative careers. Besides, farming and fishing activities should be made more profitable and sustainable through an improved product-value-chain to economically empower the community and increase their monthly income, hence their ability to afford and strategically implement the various malaria intervention strategies.

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