ASSESSMENT OF MALARIA INFECTION IN MBEYA CITY TANZANIA

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Abstract: This study assessed malaria infection in Mbeya City. Literature review and structured questionnaires were used to collect data from the study area, A non experimental research design was employed in which stratified simple random and purposive sampling were used to a sample size of 80 respondents. Structured questionnaires comprising of closed and open ended questions were employed in data collection. Descriptive approach was also used for data analysis by using Statistical Package for Social Science (SPSS) version 11.5. Results showed that there was a general decrease in malaria infection from 2005 to 2010. Malaria infection was more observed in people with greater than five years old. Factors influencing fight against malaria are mainly institutional, technical and planning. It is recommended that purposeful efforts should be done to invest on support of institutional, technical and planning aspects as well as intensification of efforts to make malaria treatment and control a national strategy.

I. INTRODUCTION

1.0 Background

The symptoms of malaria were described in ancient Chinese medical writings. In 2700 BCE, several characteristic symptoms were responsible for the decline of many of the city-state populations. According to http://www.malaria.com/overview/malaria-history by the age of Pericles, there were extensive references to malaria in the literature and depopulation of rural areas was recorded. In the Susruta, a Sanskrit medical treatise, the symptoms of malarial fever were described and attributed to the bites of certain insects. A number of Roman writers attributed malaria diseases to the swamps. In 340 CE, the anti-fever properties of Qinghao were first described by Ge Hong of the East Yin Dynasty. The active ingredient of Qinghao was isolated by Chinese scientists in 1971 known as artemisinin; it is today a very potent and effective ant-malaria drug, especially in combination with other medicines.

Tanzania efforts

The disease remains a major impediment to socio-economic growth and welfare. To reduce the burden of malaria, the government of Tanzania through the Malaria control programmes, National Malaria Control Programme (NMCP), and the Zanzibar Malaria Control Programme (ZMCP), have undertaken various actions supported by development partners such as the Global Fund to Fight Against HIV/AIDS, Tuberculosis and Malaria (GFATM), the US President's Malaria Initiative (PMI), The World Bank, and The United Nations International Children Fund -UNICEF (URT, 2008). In Mbeya, Malaria is among the most virulent diseases attended by Mbeya Regional Referral Hospital. According to www.wikipedia.org/wiki/malaria malaria is a life-threatening disease caused by eukaryotic protists of the genus Plasmodium that are transmitted to people through the bites of infected Anopheles mosquitoes. Protists are Bacterium or related organism belonging, in an older classification system, to the kingdom that includes Protozoa, bacteria, and single-celled algae and fungi. World Health Organization (2011) observed that Malaria is a serious problem in the world and particularly in Africa, where 20% of childhood deaths is due to the effects of the disease. An African child has an average between 1.6 and 5.4 episodes of malaria fever each year. Moreover in every 30 seconds a child dies from malaria.

Malaria can decrease gross domestic product by as much as 1.3% in countries with high disease rates (WHO, 2011). Several efforts have been done to combat malaria. However, in Mbeya region, since establishment of MRRH the extent of facilitation of treatment of malaria is missing from the context. In response to this, the current study intends to assess effectiveness of MRRH in facilitating treatment of malaria in order to comprehend its role as an institution for facilitating treatment of malaria.

Mbeya region has 18 hospitals out of which four (4) hospitals are located in Mbeya City. These are K's hospital, Uyole hospital, Mbeya Referral Hospital, and Mbeya Regional Referral Hospital. MRRH is a Public hospital located at New Forest Area in Mbeya City and is managed by the Regional Secretariat through the Regional Hospital Board and Hospital Management Team. The hospital started providing treatment to Out Patients Department (OPD) in 2002 and later to In-patients in January 2010. Since establishment medical and nursing care are two prominent facilitations provided by the hospital at a higher level of expertise. Within this scope eminent diseases attended include Malaria, Pneumonia, Diarrhoea, Anaemia and TB. The efficacy aspects of treatment of these diseases, particularly to the community of Mbeya city, need to be brought on board.

1.1. Statement of the Problem

Tanzania is one of the African countries that is at the midst of unprecedented efforts to rapidly scale-up coverage of malaria interventions, but considerable work remains. As recently as 2007-2008, prevalence of Plasmodium falciparum parasitaemia exceeded 40% in some regions of Tanzania (Bonner et.al, 2011).

In Mbeya region the first five most commonly reported causes of morbidity for in-patients were Malaria, Pneumonia, Diarrhoea, Anaemia and TB. Out of these, malaria was the dominant cause for morbidity followed by Pneumonia, Diarrhoea and Anaemia respectively. In Mbeya city the single most important cause of morbidity among in-patients was Malaria (URT, 2011). There are continuous various actions taken by the Government to fight against malaria transmission. Hospital research

programmes like Mbeya Medical Research Programme (MMRP), and other health facilities have contributed to facilitating treatment of Malaria. MRRH is one of the important public hospitals which facilitate treatment of malaria. The hospital started to operate as a regional hospital in 2002 delivering OPD services only and later in January 2010 started providing inpatient services. Despite the fact that MRRH has been operational for about a decade there is a knowledge gap on effectiveness of the hospital in facilitating treatment of malaria. The current study aimed to contribute to filling these gaps, by examining the status of malaria infections in Mbeya city and comparing this with development of MRRH. This included analysis of two scenarios: before and after establishment of MRRH as well as development of options for promoting performance of the hospital in facilitating treatment of malaria.

1.2. Objectives of the Study
The major objective of the researcher was to assess malaria infection in Mbeya city

1.2.2. Specific objectives

The specific objectives of the study were;
   i.)   To examine status of malaria infection.
   ii.)   To assess trend of malaria infection
   .

II. RESEARCH METHODOLOGY

3.0 Introduction
This chapter presents how research was designed, area of study, target population, sampling procedures, sampling frame, sampling units, data collection methods, and data analysis.

3.1 Research design
Kothari (2006) gives the meaning of research design as the management of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. The conducted study used a non experimental design in which the sampling procedure was cross sectional because it saves time, saves cost and is flexible in respect to data collection methods. It is a fairly exhaustive method which enables the researcher to study deeply and thoroughly different aspects of the phenomenon (Kothari, 1990). In addition, both qualitative and quantitative data was used. The study extensively used key informant interviews, and secondary data. People's perceptions and attendance to MRRH was investigated.

3.2 Area of study
The study was conducted in Mbeya region specifically in Mbeya city. The city comprises of 36 Wards out of which five (5) wards were purposively sampled for social survey which are Mwakibete, Nzovwe, and Iyela wards from Iyunga division as well as Majengo and Forest ward from Sisimba division. Geographically,
Mbeya City is located between Latitudes 8050' and 8057' South of the equator and between longitudes 33030' and 35035' East of Greenwich Meridian. It has a total land area of 214 square kilometers and borders Mbeya District. Mbeya City was purposefully selected so as to provide a case study because:
   i.)   MRRH is located in New Forest area in Mbeya City.
   ii.)   The city harbours large numbers of people not only from Tanzania but as well from neighbouring countries of Malawi and Zambia.

3.2 Sampling design

3.2.1 Sampling procedure
The study employed a multistage sampling procedure set on two divisions Iyunga and Sisimba, in which 100 household leaders from five (5) aforementioned Wards were interviewed. Each ward provided 20 respondents who were stratified basing on the following.
a). Ordinary/average households: In each of the selected wards, 6 ordinary households were purposefully selected.
b). Poor households: Six poor households from each of the 5 wards were selected. The list of poor households in each village was drawn from compiled ward registers. These households help to show challenges that the vulnerable and the marginalized face in obtaining health services, as a public hospital, in facilitating treatment of malaria to marginalized groups.
c). Rich households: Eight rich households from each of the 5 wards were selected. The list of rich households in each village was drawn purposively from the compiled ward registers. These households help to show how the rich influence, factors facilitating treatment of malaria in Mbeya City.

3.2.2   Sampling frame
The sampling frame comprised a list of wards, list of MRRH staff and patients. A random sampling procedure was used to sample five wards out of the existing 36 wards of Mbeya City. The five wards; Mwakibete, Nzovwe, and Iyela wards from Iyunga division as well as Majengo and Forest ward from Sisimba division were selected because of limited time and resources.

3.2.3   Sampling unit
The sampling units included:
   i.)   Key Informant Interviews
      a)   Ward Officers: Five (5) ward officers were interviewed from five wards in two divisions.
      b)   MRRH staff: Five (5) staff members were purposefully selected.
   ii.)   Household leaders: (20) house hold leaders from each of the five wards.

3.3 Data collection methods

Kothari (2006) defines data collection methods as the means through which data can be obtained. It is important to know the means of how the researcher obtained data.

3.3.1 Primary Data

This stage of data collection involved the use of questionnaires to both household leaders and key informants through interviews that were adopted in Mbeya City. The data collected by this approach are basically primary spatial, temporal and socio-economic. Spatial data are information on location and differential relationship of resources activities, problems and opportunities. Temporal data are information on what local, national and international events the community consider being important in their history and how they influence determination of effectiveness of MRRH in facilitating treatment of malaria in Mbeya City. Socio-economic data include information about other resources such as resources and commodities owned by respondents, which influence household capability to pay for health services.

3.3.2 Secondary data

Collection of secondary data was carried out continuously for 10 weeks during the study tenure as an on-going process. The Mbeya Regional Commissioners Office, Mbeya City Directors Office and MRRH databases were frequently visited so as to solicit relevant information. An attempt was made to revisit grey literature, unpublished literature and reports in projects and NGOs offices that had relevance to the subject matter and the study area. Resourceful libraries were visited at the University of Mzumbe and as well as online databases. At the grassroots level, ward office files and wall information were observed. The National Census (2002) data was used to estimate populations in the study area.

3.4 Data analysis

3.4.1 Descriptive statistics

Under descriptive statistics, means, percentages and frequency distribution of different variables were calculated. Results from descriptive statistics were used to construct frequency distribution tables important to simplify interpretation of the results. Both qualitative and quantitative techniques in data and information analysis were used. Data from Semi-structured interviews with key informants and households leaders were reduced, summarized, coded and analyzed statistically using SPSS for windows. The analyses were complementary to each other and not mutually exclusive, with each method bringing slightly extra information, which helped to deepen the breadth of understanding of the effectiveness of MRRH in facilitating treatment of malaria in Mbeya City.

3.4.2 Developing scales

The respondents were asked questions to ascertain their perceptions towards facilitation of MRRH on treatment of malaria. The responses were recorded in a Likert-scale format (Trochim, 2006) as follows: Respondents were asked questions on statements relative to the study that required the following responses, of which each was coded the scale in parenthesis; strongly agree (1); agree(2); undecided(3); disagree(4) or strongly disagree(5). Adding up the scores for the same statements combined the total scores for each statement. Statements with the highest and lowest scores were taken as statements that are accepted or rejected outright by respondents, to compose the scale that was actually used for determination of the perceptions. . Responses were grouped into 3 categories namely: Positive, neutral and negative, where by the strongly agree and agree responses were considered positive, undecided as neutral and disagree and strongly disagree responses as negative.

IV. RESULTS AND DISCUSSION

4.1 Malaria cases in Mbeya city

When compared to other endemic diseases malaria was observed to be the dominant disease. In addition, comparison between five years period shows that malaria cases were found to be relatively high for all the years except in 2010. However the mean malaria cases for the past five years was less than the highest number of malaria cases that was observed in 2009.

According to the results in table 1 the mean number of malaria cases from 2005 to 2010 was 62,816. This implies that in 2009 there were 67,457 malaria cases which is 17.9% of the cases observed in a period of six years. The lowest cases were 51.3 (13.6%) which was observed in the year 2010.

Table 1: Malaria cases in Mbeya City for the past five years

Years	Frequency	Percent
2005	65,234	17.3
2006	63,675	16.9
2007	65,177	17.3
2008	64,015	17.0
2009	67,457	17.9
2010	51,335	13.6
TOTAL	376,893	100.0
MEAN	62,815.5	16.67

Source: Mbeya city council reports, 2011

4.2 Trend of malaria infection in different age groups

Malaria infection has increased with time. Investigation of two different age groups ($\pm$ 5yrs of age) has increased. Result in Figure 1 show that the rate of increase in malaria infections was higher in ages more than 5 than under 5years of age for all the years except in the years 2003-2004. However the population of Mbeya city has increased by 18.9% as explained in table 9 above.
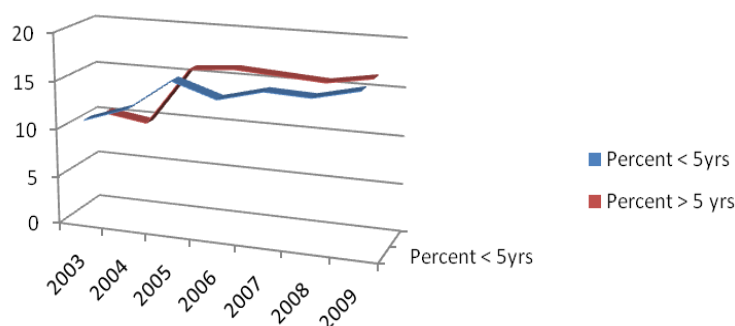
Figure 1. Malaria infection for different age groups

Furthermore investigation on the number of OPD patients who attended MRRH revealed that the number of patients who were found to be malaria positive, after diagnosis, increased from year 2002 to 2003 and later decreased from year 2003 to 2010 for both age groups as indicated in table 2. The increase in number of OPD malaria infection cases from 2002 to 2003 was probably due to increased awareness on availability of health services, which started providing health services in year 2002. Dialogue with key informants revealed that in 2003 publicity works were done to create awareness on availability of health services. Basing on the aforementioned trend there are chances that this has contributed positively to decrease in malaria infections in Mbeya city.

Table 2: Malaria in OPD patients, Mbeya city

Years	Age groups				Total	
	< 5 Years		5+ Years			
	Frequency	Percent	Frequency	Percent	Frequency	Percent
2002	6,450	16.9	2,932	13.4	9,382	15.6
2003	6,855	17.9	3,566	16.3	10,421	17.3
2004	6,174	16.1	2,382	10.9	8,556	14.2
2005	4,521	11.8	2,314	10.6	6,835	11.4
2006	4,317	11.3	2,326	10.7	6,643	11.1
2007	3,362	8.8	2,635	12.1	5,997	10.0
2008	2,394	6.3	1,714	8.0	4,108	6.8
2009	2,196	5.7	1,886	8.6	4,082	6.8
2010	1,998	5.2	2,058	9.4	4,056	6.8
TOTAL	38,267	100.0	21,813	100.0	60,080	100.0
Mean	4,252		2,424		6,676	

Source: MRRH reports

4.3 Factors influencing fight against malaria

4.3.1 Institutional development

Institutional aspects brought on board by most key informants were policy monitoring and programme management. Table 3 shows that 59.2% of the respondents identified improvement of institutional capacity could constrain efforts to combat malaria.The Government of the United Republic of Tanzania adopted a National Health Policy in 2003. However not enough is being done to track the implementation of the policy and plan. According to staff meetings held at MRRH with the Regional Commissioner this was due to among others, incompetence of some of the administrators. However recent efforts have led to changes in the organization structure provided by Prime Minister Office-Region Authority and Local Government which has upgraded the RMO to an Assistant Administrative Secretary. More over changes have been done to the title "*Medical Administrator*" which has been linked to stronger policy and programme management for effective performance of MRRH. Thus for improved performance it is suggested that institutional development should be obligatory for enhancing performance of MRRH.

4.3.2 Technical

Key informant surveys suggested three options aimed at improved sustainable performance approaches of MRRH. These were provision of technical knowledge on control of malaria vectors, improvement of hospital infrastructures and improvement of health service system respectively. Table 15 shows 62% of the respondents were positive to the opinion that MRRH should intensify provision of knowledge on control of malaria vectors.

4.3.3 Planning

In this context planning encompasses both budgeting and development planning processes. Results in table 3 show that 46.9% of the respondents considered promotion of planning was a good alternative for improvement of MRRH in facilitating treatment of malaria. It is suggested that budgeting and development planning processes should be made more meaningful and effective without delaying actions.

Table 3: Constraints to fight against malaria

Practice	Frequency	Percent
Institutional		
Not constraint	10	10.2
Slightly constraint	30	30.6
Constraint	58	59.2
Total	**98**	100.0
Infrastructure (Buildings, water and electrical systems)		
Not constraint	34	34.7
Slightly constraint	52	53.1
Constraint	12	12.2
Total	**98**	100.0
Technical (Sustainable services)		
Not constraint	26	26.5
Slightly constraint	32	32.7
Constraint	40	40.8
Total	**98**	100.0
Education		
Not constraint	25	25.5
Slightly constraint	35	35.7
Constraint	38	38.8
Total	**98**	100.0
Finance		
Not constraint	29	29.6
Slightly constraint	32	32.7
Constraint	37	37.8
Total	**98**	100.0
Planning (Budgeting and Development forecast)		
Not constraint	32	32.7
Slightly constraint	20	20.4
Constraint	46	46.9
Total	**98**	100.0
Environment		
Not constraint	46	46.9
Slightly constraint	30	30.6
Constraint	22	22.4
Total	**98**	100.0

Source: Study findings

V. CONCLUSION AND RECOMMENDATION

It is evident from the current study the approach used in this study can be a basis for valuing the status of occurrence of a disease in a community. However, it is recommended that a good look should be taken for improvement of institutional, technical and planning aspects as a strong move towards facilitating treatment of malaria. In doing so, emphasis should be on organizational and management practices.

Therefore the current study recommends improvement of institutional, technical and planning aspects as core issues for promoting the fight against malaria

Since, it is not possible to mention every one, I express my sincere thanks to my colleagues and all friends who helped me in one-way or another. I also thank all my respondents and anyone else who in one way or another made the study successful. However, the shortcomings of this study are my own weaknesses and should not be directed to anyone acknowledged in this study.

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