

A survey on malaria treatment seeking behavior in Ethiopia (2020)

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Abstract

Background: Malaria is endemic in Ethiopia, with different transmission intensities. The disease is endemic in areas with an elevation of less than 2000m above sea level in which an estimated population of 56.6 million people of the total Ethiopian population (about 110 million) is at risk. Hence, the country has employed malaria diagnosis, treatment and prevention therapies as one of the major intervention programs in addition to the use of long-lasting insecticidal nets (LLINs). The present survey is aimed at investigating the treatment-seeking behavior of the population in malaria endemic areas.

Objective: To measure key indicators of malaria treatment-seeking behavior across the different regions of Ethiopia.

Methods: A cross-sectional study was conducted between February-April, 2020 and June-July, 2020 by using a standardized questionnaire and quantitative data collection approaches. The target population included malaria endemic areas (Enumeration areas with altitude $\leq 2,000$ m above sea level). The total sample size $n = 7650$ Households, and enumeration areas = 306 were determined by using the appropriate formula for sample size calculation ignoring the finite population correction.

Result: In this 2020 survey, a total of 6,773 sampled households participated with a response rate of 98.9%. More than 67% of study participants' ages were under 30 and there were nearly an equal proportion of men (51%) and women (49%). The proportion of households and children under five years who seek advice or treatment for the fever was 66.5% and 64.2 %, respectively. Among individuals with fever for whom advice or treatment was sought, 81.8% of them sought advice or treatment from public sector sources. The result shows that out of those who sought malaria treatment, about 90.2% of households were tested for malaria parasites. According to their response, 95.2% of households were communicated by the health care provider and the diagnostic test shows 38% of them were positive for malaria.

Conclusion: The proportions of households and under five years' children who sought advice or treatment have increased over the years. It should however be improved further to attain the ultimate target of elimination. The need for awareness through health care facilities should also be enhanced to encourage treatment seeking behavior.

Keywords: Malaria, treatment seeking behavior, Ethiopia.

Introduction

Malaria is one of the world's major public health concerns causing yearly up to 243 million clinical cases and almost a million deaths worldwide. In Ethiopia, malaria remains one of the endemic vector-borne diseases particularly in areas with an elevation of below 2000m above sea level where above half of the total population resides (Adhanom et al. 2006; Ministry of health. Ethiopia 2008). The intensity of transmission varies due to the diverse topographic features and climatic factors (Tulu 1993). Mindful of the toll malaria has been causing, the Ethiopian government has deployed key antimalarial interventions using the approach scale-up for impact (SUFi) since the mid-2000s (Hiwot et al. 2018). Subsequently, the Ethiopian National Malaria Control Program has registered a

remarkable reduction in malaria cases and deaths as witnessed in some of the evidences (Otten 2009; Steketee and Campbell 2009; Hiwot et al. 2018).

The disease can be prevented and cured. Targets of preventive measures are the vector mosquito, human hosts and the causative agent (*Plasmodium*). Some of the WHO recommended prevention strategies are the use of long lasting insecticidal-treated nets, environmental modification and indoor residual spraying (IRS) that prevent the replication of mosquitoes, as well as malaria diagnosis and treatment (WHO 2011). Over a decade, the country employed malaria diagnosis, treatment and prevention therapies as one of the major intervention programs parallel to

the universal distribution of LLINs (Ministry of health. Ethiopia 2011; Batisso et al. 2012). Currently, the country in collaboration with its partners is developing a new national strategic plan (NSP) for 2021-2025 focusing on malaria elimination and to sustain the gains that were made. This survey is, therefore, designed to investigate malaria treatment seeking behavior by households in malarious areas of the country to provide data for the NSP.

Materials and Methods

Study design: This survey was conducted between February-April, 2020 and June-July, 2020 in malaria endemic areas sampled from nine regional states and a city administration. A cross-sectional survey was undertaken in systematically sampled households. The study implemented the quantitative data collections approaches by using a standardized questionnaire.

Study area: The study covers malaria endemic areas or enumeration areas (EAs) with altitudes $\leq 2,000\text{m}$ above sea level and individuals at risk for malaria. A revised 2019 EA of the Central Statistics Agency (CSA) was considered as a sampling unit for this survey.

Sampling size determination: To select a representative sample from this population, first, the initial sample size was determined by using the following formula:

$$n = \text{deft}^2 \frac{(1/p - 1)}{\alpha^2}$$

Where the *deft* is the design effect defined as the ratio between the standard error using the given sample design and the standard error that would result if a simple random sample had been used. A nationally representative sample of $n = 7650$ households (HHs) and enumeration areas (EAs) = 306 were determined where all women age 15-49 and children under the age of 5 years who spent the night before the survey in the selected households were eligible to be interviewed in the survey (This is a design set where the expected number of this high risk target groups are included in the survey). The sample survey was stratified and selected in two stages. In the first stage, 306 EAs were selected with probability proportional to the EA size and with independent selection in each sampling stratum. In the second stage of selection, a fixed number of 25 households per cluster were selected with an equal probability of systematic selection from the newly created household listing. Each region was stratified into urban and rural areas yielding 25 sampling strata. (The detailed process of sample selection processes are mentioned elsewhere in another paper).

Data collection and analysis: Data were collected through interviews of household heads or their representatives. The MIS 2015 survey questionnaire was adapted for designing the section of the malaria treatment seeking behavior questionnaire. A standardized household questionnaire was completed using touch-screen phones and the ODK electronic data collection tool. After collection, the data were sent to a securely maintained central server at EPHI. The data were transferred via the internet into EPHI local server every day. No personal identifiers were asked during data collection. Statistical analyses were conducted using Stata and other statistical package software to generate descriptive statistics of categorical and continuous variables.

Ethical clearance

This study obtained ethical approval from the Institutional Review Board (IRB) of the Ethiopian Public Health Institute. The purpose and objectives of the study were explained to health authorities and local leaders at all levels before initiating data collection. Study participants also gave informed consent and confidentiality of data was ensured by the principal investigator. Data analysis was performed using coded data. Accordingly, the designated supervisors during data collection were talking to the health facility authorities, different administrative units, community representatives and households on the objective of the survey then submit those letters for permission in order to proceed with data collection.

Results

Household response rates: In this survey, a household was defined as a person or group of persons, related or not, living together in the same dwelling unit, under one household head and sharing a common cooking arrangement. Demographic and socioeconomic characteristics of each household member who spent the night preceding the survey in the sampled household were collected including usual residents and history of travelling, information on their household characteristics. As depicted in Table 1, a total of 7,560 households were selected for the sample, of which 6,847 were occupied.

Table 1: Results of household response rate

Result	Residence		Total
	Urban	Rural	
Households selected	2,625	5,025	7,650
Households occupied	2,435	4,412	6,847
Households interviewed	2,384	4,389	6,773
Household response rate ¹	97.91%	99.48%	98.92%

¹Households interviewed/households occupied

Of the occupied households, 6,773 were successfully interviewed, yielding a response rate of 98.92%. The response rate among rural area was slightly higher (99.48%) than in urban areas (97.91%).

Characteristics of the study participants: More than 67% of study participants' ages were under age 30, reflecting the young age structure of the Ethiopian

population. The household member questionnaire provided information on the composition of households' gender in which 51% and 49% were found to have male and female sexes, respectively. Most of the study participants (78%) live in rural areas. By region, the highest number of study participants reside in Oromia (36%), followed by SNNPRs (23%), and Amhara (18%) regional states. More details are indicated in Table 2.

Table 2: Background characteristics of the selected household members in percent distribution

Background characteristics	Weighted Percent	Weighted Number	Unweighted Number
Age in Group			
under 5	15.6	3,224,263	3,482
6-9	10.9	2,251,579	2,416
10-14	14.2	2,946,004	3,180
15-19	9.2	1,898,523	2,215
20-24	9.6	1,981,621	2,415
25-29	8.2	1,695,631	2,220
30-34	8.0	1,657,623	2,325
35-39	5.4	1,110,453	1,544
40-44	5.9	1,213,698	1,465
45-49	3.1	649,828	778
Above 50	10.0	2,079,846	2,262
Total	100	20,709,069	24,302
Gender			
Male	51.0	10,566,372	12,287
Female	49.0	10,142,515	12,012
Total	100.0	20,708,887	24,299
Place of Residence			
Rural	77.9	16,127,104	16,196
Urban	22.1	4,581,965	8,106
Total	100.0	20,709,069	24,302
Region			
Tigray	10.9	2,256,185	3,020
Afar	1.2	237,729	1,738
Amhara	18.3	3,793,363	2,444
Oromiya	36.3	7,515,003	3,041
Ethiopia Somali	3.5	733,896	2,146
Beni Gumuz	3.5	716,965	2,806
SNNPR	23.6	4,884,385	3,469
Gambela	1.3	259,707	1,770
Hareri	0.4	91,405	1,559
Dire Dawa	1.1	220,431	2,309
Total	100	20,709,069	24,302

Malaria treatment seeking behavior: According to the survey results shown in Table 3, out of the total 20,709,069 surveyed households, only 687,414 (3.3%) responded as one of their family members has been ill with a fever at any time in the last two weeks preceding the survey. Out of the households that responded as one of their family members has been ill with fever in the last two weeks, 67% of them sought advice or treatment for the fever from any source. Similarly, out of the total 123,161 surveyed children

under five years, 64.2% of them sought advice or treatment for the fever from any source. From the total of those who got advice or treatment, the majority (82%) of them sought advice or treatment from public health facilities and 16.5% sought advice or treatment from private health facilities while about 2% of the population from other sources. Out of the total household members who have been ill with fever at any time in the last two weeks preceding the survey, 27.6% still had fever at the time of the survey.

Table 3: Malaria treatment seeking behavior in the general population and under five year's children

Malaria treatment seeking behavior fever in children and or on adults indicators	Categorical response	Weighted Cases		Unweighted Cases
		Proportion	Count	
Proportion of household population has been ill with a fever at any time in the last two weeks	Yes	3.32%	687,414	1,281
	No	96.48%	19,980,353	22,904
	Don't Know	0.20%	41,302	117
	Total	100.00%	20,709,069	24,302
Proportion of population who seek advice or treatment for the fever from any source	Yes	66.50%	457,135	1,044
	No	33.50%	230,279	237
	Total	100.00%	687,414	1,281
Proportion of under five years children who seek advice or treatment for the fever from any source	Yes	64.22%	79,095	100
	No	35.78%	44,066	35
	Total	100.00%	123,161	135
Where did you seek advice or treatment?	Public sector	81.79%	392,435	972
	Private medical	16.50%	79,158	93
	Other source	1.72%	8,235	3
	Total	100.00%	479,828	1,068
Is (NAME) still sick with a fever?	Yes	27.59%	189,384	555
	No	72.16%	495,343	720
	Don't know	0.25%	1,736	5
	Total	100.00%	686,463	1,280

Diagnostic blood test results for malaria: For diagnostic blood test results for malaria, if the health care provider communicated the result of the test, species identification, and medication status during the illness and the types of the drug taken are summarized in Table 4. The result shows that out of those who sought malaria treatment about 90.2% of households were tested for malaria parasite, 5.3% were not tested and 4.5% didn't know whether they were tested or not. According to their response, 95.2% of households were communicated by the health care providers, 4.4% were not communicated and 0.6% don't know whether they were communicated or not. Regarding the result of the diagnostic test, 38% of them were found positive for malaria, 28% negative and 9% don't know. Out of the total confirmed cases 37.8%, 17.2%, and 8% were pf, pv and mixed infected type respectively. During the development of fever, 39% of households know the name of the antimalarial drug they took and 23.5% responded that they did not know. Regarding the name

of antimalarial drugs they took for the fever at any time during the illness, 62.4% of households knew the name of the drug and 37.5% did not know the name of the drug they took.

Source of drug and time of use: The majority (62%) of the study participants took the medication (Coartem) on the same day that the fever started while 15.6% of the population responded that they took Coartem the next day after the fever started. The rest study participants; 8.9%, 9.9% and 3.5% responded as they have taken malaria medication two days, three days and four and above days after the fever started respectively. As shown in Table 5, the source of medication for malaria treatment, the majority (49%) of the patients were given malaria drugs from Public HC/Hospital followed by 38% of the patients from Health Extension Workers/HPs, 7% of the patients from Pharmacy and 6% of the patients from Private Health Facility.

Table 4: Blood test and drug results

Variables	Category	Weighted Percent	Weighted Count	Unweighted Count
Was a diagnostic blood test for malaria performed?	Yes	90.2	326,536	904
	No	5.3	19,163	30
	Don't Know	4.5	16,143	13
	Total	100	361,842	947
Did the health provider communicate the result of the blood test?	Yes	95.0	310,277	870
	No	4.4	14,331	30
	Don't Know	0.6	1,928	4
	Total	100	326,536	904
What was the result of the blood test?	Pf positive	37.9	117,218	234
	Pv, pm or po positive	17.2	53,439	233
	Pf, Pv or mixed infe	7.9	24,648	168
	Negative	28.	86,806	192
	Don't know	9.1	28,166	43
	Total	100	310,277	870
At any time during the illness, did (NAME) take any drugs for the fever?	Yes	62.4	428361	992
	No	37.0	253834	282
	Don't Know	0.6	4268	6
	Total	100	686463	1280
Do you know the name of the drug you took?	Yes	38.9	266973	864
	No	12.5	85642	78
	Don't Know	11.0	75746	50
	Total	100	428361	992

Table 5: Source of drug and the time to take the drug

Variables	Categorical response	Weighted Percent	Weighted Count	Unweighted Count
How long after the fever started did you first take COARTEM?	Same day	61.8	101,076	362
	Next day	15.8	25,767	81
	Two days after the fever	8.9	14,590	66
	Three days after the fever	9.9	16,234	56
	Four or more days after the fever	3.5	5,644	23
	Don't know	0.1	215	1
	Total	100	163,526	589
Where did you get Artemether-Lumefantrine (AL) (COARTEM)?	Health extension worker	38.1	62,262	243
	Public HC/Hospital	48.8	79,824	301
	Private health facility/worker	5.7	9,387	28
	Pharmacy	7.4	12,053	17
	Total	100	163,526	589

Discussion

The key findings of this survey can be best discussed by comparing them with the results of previous similar surveys. Out of the households that responded as one of their family members has been ill with fever in the last two weeks, 67% of them sought advice or treatment for the fever from any source. Similarly, out of the total 123,161 surveyed children under five years, 64.2% of them sought advice or treatment for the fever from any source. This is a significant achievement for the program compared to the 2015 EMIS where only 38%

of the children sought advice or treatment for their fever in the two weeks preceding the survey. Of the total of those who got advice or treatment, 82% of them sought advice or treatment from the public and 16.5% from private health facilities. The result also shows that of those who sought malaria treatment, 90.2% of households were tested for malaria parasite and 38% of them were positive for malaria. This shows that health facilities play a great role in increasing awareness about the disease as well as encouraging their treatment seeking behavior.

Prompting treatment of all malaria cases with appropriate and effective antimalarial drugs is one of the key interventions for malaria control in Ethiopia. Fever is a major manifestation of malaria and other acute infections. Most malarial fevers occur at home, and effective treatment is critical to prevent morbidity and mortality. During the development of fever and at any time during the illness 39% and 62.4% of households knew the name of the antimalarial drug they took respectively.

The majority (62%) of the study participants took the medication Coartem on the same day that the fever started while 15.6% it the next day after the fever started. The numbers indicate that although more than half of the participants were well informed, more work needs to be done to reach the rest of the communities. Almost half (49%) of the patients were given malaria drugs from Public HC/Hospital followed by 38% of the patients from Health Extension Workers/HPs, 7% of the patients from Pharmacy and 6% of the patients from Private Health Facility. This implies the participants were able to get the drugs from legally approved sources which increases the success rate of their recovery.

Conclusion and Recommendation

The proportion of households (67%) and children under the age of five years (64.2%) who sought advice for treatment has shown an increase over the years yet more work is needed to encourage the people in the malarious areas to seek treatment. Since public and private health facilities were the places most of the participants sought advice and treatment from, the Social and Behavioral Change Communication (SBCC) packages of the malaria control program should consider this information to increase awareness.

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