

## Self-treatment of Uncomplicated Malaria at Community Level in Masala Township, Ndola District, Zambia: Prevalence, Knowledge and Factors Influencing Self-treatment

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### Abstract

**Background:** Malaria is the commonest cause of fever, morbidity and mortality in the tropics. A good number of people are able to recognize the symptoms and initiate treatment. However lack of clinical evaluation of the patients by trained health professionals, may delay appropriate treatment and promote drug resistant.

**Objective:** To determine the prevalence of self-treatment of malaria among the people with regard to knowledge and factors that may influence health seeking behavior.

**Method:** Community based cross section descriptive study carried among 365 patients buying medicines from local drugstores. A structured questionnaire was used to gather data entered in Epi Data 3.1 and analysis done using SPSS version 16.0. To ascertain association between dependent and independent variables, binary logistic regression and variables with p-value of less than or equal to 0.05 were entered into multivariate regression analysis.

**Results:** Among the 365 patients interviewed 150 bought antimalarials 150/365 (41.1%).

The overall knowledge was 44.7% and significantly associated with income, education and occupation. Compared to respondents with income > K1000, respondents with income

< K500 were 94% (AOR=0.06; 95% CI [0.01, 0.21]) less likely to be knowledgeable.

Respondents with tertiary education were 2.73 (95% CI [1.50, 4.89]) times more likely to be knowledgeable compared to respondents with primary education. Compared to respondents with others' occupations, professionals were 5.97 (95% CI [2.27, 15.7]) times more likely to be knowledgeable. Sulfadoxine-pyrimethamine (fansidar) is by far the antimalaria drug that was used 51.3%. About 66.7% attributed to overcrowding and 72.7% to not being attended to in less than 2 hours upon arrival at health facility as reasons for not seeking treatment at government facilities.

**Conclusion:** Prevalence of self-medication was high 41.1% and most people lacked adequate knowledge on malaria. The individual's level of formal education, income and occupation were determinants knowledge.

**Keywords:** Malaria; Self-medication; Knowledge; Drugstore; Antimalarial

### Introduction

Malaria is a serious global problem, particularly in tropical countries where it is one of the major causes of morbidity and mortality. It is the commonest cause of fever, morbidity and a significant source of mortality, especially among infants and young children [1]. Every year, malaria causes clinical illness, often very severe in 300-500 million people and over a million people die from it. It threatens 2.2 billion people, which is about 40% of the world's population, undermining the health and welfare of the families, endangering the survival, straining both national and people's scarce resources [2,3].

In Zambia, malaria is a major public health problem. It is the leading cause of health visits and hospital deaths, accounting for 4-5% of hospital deaths. At risk of severe illness are the pregnant women and under-five children [4]. Most people are able to recognize the symptoms of malaria and usually initiate treatment. However the disadvantage of self-treatment is the lack of clinical evaluation by trained health professionals, which could result in delay of appropriate treatment. The promotion of drug resistant *Plasmodium falciparum* because of the widespread use of antimalarials in cases of under dosing and the risks associated with potentially toxic doses of these drugs are other possible disadvantages.

Many reasons have been cited for the increase in the number of people initiating self-treatment of malaria, among these being availability of antimalarial drugs and ease of access to the medicines without documentation and inadequate number of health workers has necessitated overcrowding at health centres making patients avoid long queues.

Incorrect use of anti-malaria drugs has resulted in increased disease burden and deaths from malaria (through recurrences, recrudescence and development of drug resistance). This is one of the reasons why the morbidity and mortality due to malaria is high despite anti-malaria

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drugs particularly sulfadoxine-pyrimethamine being readily available in communities [5].

A hospital-based study in Tanzania where 72.7% of patients reported having used home kept antimalaria medication for suspected malaria fever [6]. In Kilifi district of Uganda, uptake of sulfadoxine-pyrimethamine as constrained by widely held beliefs within the community that chloroquine was still effective [7]. In Bungoma district of Uganda, the community believed that sulfadoxine-pyrimethamine was too strong for children under one year and therefore opted to buy alternative, but ineffective medicines, to protect children from the perceived strong effects of the drug [8].

It is against this background that the study aimed at investigating antimalarial self-medication in the community was done. It was hoped to help determine the prevalence of self-treatment of malaria among people with regard to knowledge and practices or factors that may influence patterns of health seeking behaviour.

## Materials and Methods

### Study area

Study done in Masala Township a high densely populated urban area of Ndola district. Has a total population of 36,000 people, consisting of people of middle and low socio-economic status.

### Study type, sample size, sampling procedures

Cross section descriptive study carried out between January and April 2015. A sample size of 365 people calculated using epi info. Systematic random sampling was employed to gather information from patients buying medicines from Pharmacies, drug stores and vendors within the community.

### Data collection

Qualitative and quantitative methods were used. The survey employed a structured questionnaire that was used in a face-to-face interview to gather data from the community member's accessing drugs from pharmacies, drug stores and drug vendors within the community.

### Data analysis

All the data collected was entered into a database from the time it was collected in the field. Data was entered in Epi Data 3.1 and analysed using SPSS version 16.0. Statistical tests included Chi-square test and association between measured variables was considered to be significant at P-value equal-to or less than 0.05. To ascertain association between dependent and independent variables, binary logistic regression and variables with p-value of less than or equal to 0.05 were entered into multivariate regression analysis. Knowledge was computed by adding the total score in which correct equals one and wrong zero (cut off point=2/3).

### Ethical consideration

The research was approved by the Copper belt University School of Medicine, Public health department. Verbal consent was obtained from the participants.

## Results

### Social demographics

The survey conducted included total number 365 patients visiting the drugstore outlets to buy medicines and out of these, 150 had requested to buy antimalarial drugs giving the prevalence of 150/365

(41.1%) of antimalarial self-medication.

The sex distribution of patients with malaria in the surveyed was 77/150 (51.3%) males and 73/150 (48.7%) females. The largest proportion of patients were those aged above 15 years 108/150 (72.0%) representing 53/77 (68.8%) males and 55/73 (75.3%) females. Therefore, females were more likely to be older than males (Table 1).

Among the surveyed 26.7% had primary school education, 53.3% had secondary school education and 20.0% had tertiary education.

Most of the interviewed patients were businessmen/women 50.6% while 14.0% were professionals, 15.3% housewives and 20.0% others<sup>a</sup> (Table 1).

The percentage age distribution was 6.0% in below 5 years, 22.0% between 5-15 years, 72.0% above 15 years (Table 1).

The average monthly expenditure of the surveyed was between K500 – K1000 representing 48.0% of the patients whilst those earning the least had income below K500 representing 27.3%. Among the respondents, 24.7% earned above the average monthly income and of these 29.9% represented males (Table 1).

### Factors associated with knowledge on malaria

Of the patients self-treating for malaria, only 67/150 (44.7%) had satisfactory knowledge (cause of malaria, diagnosis and recommended 1st line drug for uncomplicated malaria by ministry of health Zambia) on malaria.

The knowledge increased with the level of formal education acquired, the largest proportion was for respondents who had attained tertiary education 70.0% than those with secondary education 45.0% or primary education 25.0% (Table 2).

The respondents income level was noted to be factor that influenced knowledge with those earning income below K500 being 1/41 (2.4%) knowledgeable, those between K500-k1000 being 37/72 (51.4%), those above K1000 being 29/37 (78.4%) knowledgeable (Table 2).

Professionals were likely to be more knowledgeable on malaria representing 18/21 (85.7%) than housewives 9/23 (39.1%), business men/women 32/76 (42.1%) or the uncategorized occupations 8/30 (26.7%) (Table 2). Multivariable logistic regression showed that income, education, occupation had significant association with knowledge. Compared to respondents income > K1000, respondents with income < K500 were 94% (AOR=0.06; 95% CI [0.01, 0.21]) less likely to be knowledgeable. Respondents with tertiary education were 2.73 (95% CI [1.50, 4.89]) times more likely to be knowledgeable compared to respondents with primary education. Compared to respondents with others<sup>a</sup> (uncategorized occupations), professionals were 5.97 (95% CI [2.27, 15.7]) times more likely to be knowledgeable (Table 3).

### Anti-malaria drugs utilization

The survey has shown that sulfadoxine-pyrimethamine (fansidar) is by far the antimalarial drug that was used for self-medication by patients in the study at 51.3% of the malaria episodes, coartem 36.7%, quinine 2.0% and others<sup>b</sup> 10.0%. The main reason given by the respondents for the choice of drug bought was the cost 57/150 (38.0%), other reasons included effectiveness 52/150 (34.7%), duration of treatment 37/150 (24.7%) and others<sup>c</sup> 4/150 (2.7%) (Table 4).

### Information on malaria

All the patients interviewed reported having received some form

Characteristic	Total n= 150 (100%)	Male 77(100%)	Female 73 (100%)
<b>Age group</b>			
< 5 year	9 (6.0)	4 (5.2)	5 (6.8)
5 - 15 years	33 (22.0)	20 (26.0)	13 (17.8)
>15 years	108 (72.0)	53 (68.8)	55 (75.3)
<b>Income</b>			
< K500	41 (27.3)	11 (14.3)	30 (41.1)
K500 – K1000	72 (48.0)	43 (55.8)	29 (39.7)
>K1000	37 (24.7)	23 (29.9)	14 (19.2)
<b>Educational level</b>			
Tertiary	30 (20.0)	21 (27.3)	9 (12.3)
Secondary	80 (53.3)	44 (57.1)	36 (49.3)
Primary	40 (26.7)	12 (15.6)	28 (38.4)
<b>Occupation</b>			
Professional	21 (14.0)	15 (19.5)	6 (8.2)
Housewife	23 (15.3)	0 (0.0)	23 (31.5)
businessman/woman	76 (50.6)	42 (54.5)	34 (46.6)
Others <sup>a</sup>	30 (20.0)	20 (26.0)	10 (13.7)

**Table 1:** Demographic characteristics of patients self-treating for malaria n= 150

Characteristic	Interviewed n= 150 (100%)	Knowledgeable (100%)	P Value
<b>Sex</b>			
Male	77 (51.3)	34 (44.2)	= 0.897
Female	73 (48.7)	33 (45.2)	
<b>Age group</b>			
< 5 year	9 (6.0)	5 (55.6)	= 0.296
5 - 15 years	33 (22.0)	11 (33.3)	
>15 years	108 (72.0)	51 (47.2)	
<b>Income</b>			
< K500	41 (27.3)	1 (2.4)	< 0.001
K500 – K1000	72 (48.0)	37 (51.4)	
>K1000	37 (24.7)	29 (78.4)	
<b>Educational level</b>			
Tertiary	30 (20.0)	21 (70.0)	< 0.001
Secondary	80 (53.3)	36 (45.0)	
Primary	40 (26.7)	10 (25.0)	
<b>Occupation</b>			
Professional	21 (14.0)	18 (85.7)	< 0.001
Housewife	23 (15.3)	9 (39.1)	
businessman/ woman	76 (50.6)	32 (42.1)	
Others <sup>a</sup>	30 (20.0)	8 (26.7)	

**Table 2:** Association between social demographic factors and knowledge of malaria management n=150.

of information on malaria. The major single source of information on malaria reported was the health facility 34.7%, radio/television 22.7%, others<sup>d</sup> 4.0% whilst information from family and friends was 38.6% constituting a very big percentage. The information represented different drugs used in malaria 46.0%, use of protective measures such as insecticide treated nets 28.0%, signs and symptoms 15.3%, dangers of the disease 8.0% and others<sup>e</sup> 2.7% (Table 4).

### Factors influencing self-treatment

Table 5 describes the reasons why patients did not seek treatment at government health facilities, 10.0% mentioned long distance from the

Factors	AOR (95% CI)
Income	0.06 (0.01, 0.21)*
< K500	
K500 – K1000	
> K1000	1
Educational level	2.71 (1.50, 4.89)*
Tertiary	
Secondary	
Primary	1
Occupation	5.97 (2.27, 15.7)*
Professional	
Housewife	
Businessman/woman	0.72 (0.42, 1.25)*
Others <sup>a</sup>	1

**Table 3:** Factors associated with knowledge of malaria management in a multivariate logistic regression in Masala, Ndola, Zambia. NB: \*statistically significant association at P-value of < 0.05.

Question	Frequency 150 (100%)
<b>Anti-malaria drugs bought</b>	
Coartem( atermether- lumefantrin)	55 (36.7)
Sulfadoxine-pyrimethamine (Fansidar)	77 (51.3)
Quinine	3 (2.0)
Others <sup>b</sup>	15 (10.0)
<b>Reasons given for choice of particular anti-malaria</b>	
Cost	52 (34.7)
Effectiveness	37 (24.7)
Duration of the treatment	
Others <sup>c</sup>	4 (2.7)
<b>Sources of information on malaria</b>	
Television/Radio	34 (22.7)
Health facility	52 (34.7)
Relatives	26 (17.3)
Friends	32 (21.3)
Others <sup>d</sup>	6 (4.0)
<b>Type of information received</b>	
Drugs used	69 (46.0)
Dangers	12 (8.0)
Signs and symptoms	23 (15.3)
Use of protective measures	42 (28.0)
Others <sup>e</sup>	4 (2.7)

**Table 4:** Antimalarial drug utilization and sources of information n=150.

health centre, 66.7% mentioned overcrowding at the facilities, 22.0% mentioned lack of proper treatment at the government health facilities and 1.3% said they could not afford treatment.

The study has shown that 72.7% of the patients admitted to not being attended to in less than 2 hours upon arrival at the health facility by health centre staff and 42.7% of the patients were not able to reach the nearest health centre within 1 hour of walking (Table 5).

### Discussion

The survey conducted showed prevalence of 150/365 (41.1%) antimalarial self-medication among the community members. A similar study done in Tanzania by Kigochi Neg Kigochi(MD) in titled “Malaria and anti-malaria drug utilization among adults in rural coastal community in Tanzania, knowledge, attitudes and practices - 2005”,

Question	Frequency 150 (100%)
<b>Why patients do not seek treatment at the health facility</b>	15 (10.0)
Long distance	
Overcrowding	100 (66.7)
do not receive proper treatment	33 (22.0)
cannot afford	2 (1.3)
<b>Ability to be attended to at the health facility within 2 hours upon arrival</b>	41 (27.3)
Yes	
No	109 (72.7)
<b>Patients ability to reach closest health facility within 1 hour of walking</b>	86 (57.3)
Yes	
No	64 (42.7)

**Table 5:** Factors influencing self-treatment of malaria n= 150.

Others<sup>a</sup>= Famers, House help or servant, Shop keepers

Others<sup>b</sup>= Coarinate, Amodiaquine

Others<sup>c</sup>= Recommended by a relative, Drugs given at health centre before

Others<sup>d</sup>= Newspapers, Roadside poster

Others<sup>e</sup>= Laviciding, Spraying in houses, Mosquito repellents

showed a prevalence of 44.2% of self-medication with antimalarials which is in correlation with this study [9].

The sex distribution of patients self-medicating with antimalarials in the surveyed was almost an even score representing 51.3% males and 48.7% females. This showed that the incidence of malaria episodes in the area of study to be independent of sex.

The percentage age distribution was higher in those above 15years representing 72.0%, the observation showed significant variation across age groups and may be attributed to the fact that parents or guardians would prefer to take younger children to the government health centre as opposed to self-treating them. The lower incidence in those below 5 years could also be due to the increase in the contact time between children and health workers through

programs that are available for children at the health centres such under five immunization programs, child health week, protection accorded by maternal antibodies or maximum parental care (sleeping in insecticide treated mosquito nets).

The majority of the interviewed were patients whose occupation was trading (businessman/woman) 50.6%, the association between self-medication and respondent's occupation probably signifies that certain occupations may be more predisposed to self-medication than others. This would reflect on the responses in that people involved in trading are usually busy with their business and that they would look for quicker ways of attending to their illness such as self-treatment. The overall knowledge was 44.7% and increased with increasing level of education, income and occupation, as these subjects were likely to be more exposed to information about malaria and be better informed on the appropriate medication than those with low level of education or income. The knowledge was satisfactory among professionals representing 85.7% compared to housewives, businesspersons and others<sup>a</sup>. Professionals could be more educated and have more exposure to information on malaria and understanding of the disease, this means that improving factors such as the level of formal education in the

community would reduce the rate of morbidity and mortality.

The patient's interviewed used clinical methods to diagnose malaria, the failure to confirm malaria with laboratory methods may lead to other illnesses that present with similar symptoms being treated as malaria which could result in missed diagnosis and delay appropriate treatment which can be fatal. The symptoms of malaria are rather non-specific and occur with most other common infections such as influenza, typhoid, viral hepatitis, dengue or fever of unknown origin e.g. tuberculosis.

The survey showed that sulfadoxine-pyrimethamine (fansidar) was by far the anti-malaria drug used by most patients in self-medication as it was used by most of the respondents in the malaria episodes representing 51.3% compared to coartem 36.7% which is the 1st line recommended drug for treatment of uncomplicated malaria by ministry of health Zambia and the main reason for the choice of drugs bought was the cost 38.0%. All the patients interviewed reported having received some form of information on malaria.

The single major source of information on malaria reported was the health facility 34.7% whilst information from family and friends represented 38.6% which constituted a very big percentage and the worry being that the information may be inaccurate and distorted. Inquiry on why the patients would at times not seek treatment at government health facilities .revealed the majority 66.7% mentioned overcrowding at the facilities. The issue of overcrowding making patients not going to seek treatment at government health facilities was also reflected when we looked at the number of patients 72.7 % not being attended to by health centre staff in less than 2hours upon arrival at the health facility.

## Conclusion

The prevalence of self-medication was high among the residents of Masala Township representing 41.1%. The knowledge on the disease was low, in particular those with low levels of income, education and occupation. The larger proportion of patients who were self-treating was that of those above 15years which may signify reduced access to government health facilities in the older age group.

The study has shown that there would likely be over-use of anti-malaria drugs due to lack of laboratory confirmation of the malarial episodes as the treatment was based mainly on symptoms without laboratory confirmation. Malaria symptoms are non-specific and it is therefore possible some febrile illnesses that were treated as malaria were actually not malaria cases.

Fansidar was the anti-malaria drug used by most of the patients and appears to be the most widely used drug for malaria for those who self-prescribe due cheaper cost of the drug compared to other antimalarial drugs such as coartem which is Zambia ministry of health recommended 1st line drug for uncomplicated malaria.

There was a lot of information flow on malaria in these communities through friends and relatives, such sources of information may be inaccurate and lead to distortion of facts and misconceptions on the disease. Overcrowding and delay in attending to patients at government health facilities has increased self-medication among the community members, who lack adequate knowledge on the disease. Self-medication is often associated with emergence of drug resistance, it would be a worst of resources to continue changing drugs without understanding the causes of treatment failures or resistant of some drugs. Therefore providing people with formal education, better income and better



health services may help in counteracting self-medication.

### Limitation

The knowledge captured on patients younger than 15 years, could not be generalized as the information was obtained from their parents or guardians. The owners of some drug stores were not comfortable with such information be collected from their patients as most them are not legally allowed to sell prescription drugs to the public and in that regard they did not allow much time with their patients.

### Recommendations

1. Only registered drug outlets should be allowed to sell anti-malaria drugs, as most unregistered outlets offer antimalarial drugs to patients without a prescription.
2. Increase emphasis on the recommended 1st line anti-malaria drug.
3. Knowledge on the need for laboratory diagnosis of malaria need to be addressed among the community members to avoid the emergence of drug resistance.
4. Most of the respondents attributed their lack of seeking treatment at the health facilities to overcrowding and delays hence the need to improve on the number of health workers.

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### Patient Questionnaire

District: .....

Township: .....

Questionnaire#.....

Date: .../.../.....

1. Sex

- A. Male
- B. Female

2. Age

- A. < 5years
- B. 5- 15 years
- C. >15 years

3. What is your occupation?

- A. Professional
- B. Housewife
- C. Businessman/woman
- D. Others

4. What is your level of education?

- B. Tertiary
- C. Secondary
- D. Primary

5. What is your monthly income?

- A. Below k500

B. k500 - k1000

C. Above k1000

6. Do you have Malaria?

- A. Yes
- B. No

7. If answer to question 6 is A, then proceed to ask. How can one know it is malaria?

.....  
.....  
.....

8. Can I ask you some questions about malaria?

- A. YES
- B. NO

9. What causes malaria?

.....  
.....  
.....

10. What anti-malarial drug(s) is/are currently recommended by the Ministry of Health for treatment of simple (uncomplicated) malaria?

.....

11. Which antimalarial drug do you buy the most?

- A. Coartem
- B. Fansidar
- D. Quinine
- E. Others (Specify).....

12. What are the reasons for the choice of the antimalarial that you buy?

- A. Cost
- B. Effectiveness
- C. Duration of treatment
- D. Others (specify)

13. Have you ever received any information on malaria?

- A. YES
- B. NO

14. What are the sources of information on malaria in this community?

- A. Friends
- B. Community Health Worker
- C. Radio
- D. Health Centre
- E. Other (specify) .....

15. What type of information have you received on malaria?

- A. Signs and symptoms of malaria
- B. Dangers
- C. Drugs used
- D. Use of protective measures
- E. Other (specify) .....

16. Why do you sometimes not seek treatment at the Health Centre when you have malaria?

- A. Distance is too far

- B. Overcrowding at the health facility
  - C. Do not receive proper treatment
  - D. Not able to afford cost of treatment
17. Are you able to reach the nearest health facility within 1 hour walking?
- A. YES
  - B. NO
18. Are you able to be attended to at the health facility in less than 2 hours after arrival at the health facility?
- A. YES
  - B. NO

#### END OF INTERVIEW

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