

Original Research Article

Determinants of health seeking behaviours for malaria treatment in Cameroon

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ABSTRACT

Background: Household health-seeking behaviour for malaria treatment is an important policy concern in malaria-endemic African countries. This paper aims to shed light on the determinants of household's health-seeking behaviour for malaria treatment in Cameroon.

Methods: The cross-sectional study used secondary data from the fourth Cameroonian household consumption survey conducted by the National Institute of Statistics. A stratified, 2-stage sampling was implemented with a sample of 918 households which sought malaria treatment from different alternatives providers. The multinomial probit model was used to estimate the probability based on socio-demographic and economics determinants for a household to choose between different types of providers of malaria treatment.

Results: The findings of this study indicate that, the alternative providers for malaria treatment were: public health facilities (61.1%), private health facilities (8.5%), traditional healers (1.4%), pharmacies (4.6%), informal vendor (18%), other types of recourse (6.4%). The decision to choose the provider for malaria treatment depends on factors such as household head, region, level of education, religion, area of residence, socio-professional category, and gender. The level of education appears to be an important determinant of a household's seeking behaviour. Those with higher education are more likely to seek care at formal health facilities.

Conclusions: Health policy-makers need to strive to improve the socio-demographic and economic conditions and sensitize households on the appropriate alternative ways to ensure the universal access to diagnosis and effective treatment of malaria in line with the global strategies recommended by WHO to achieve malaria elimination by 2030.

Keywords: Malaria, Health-seeking behaviour, Socio-economic determinants, Treatment, Alternative providers, Cameroon

INTRODUCTION

Malaria is one of the most important parasitic diseases in sub-Saharan Africa. This parasitic disease is the leading cause of morbidity and mortality with nearly 90% of

malaria cases worldwide and 80% of associated deaths occurring in this region of the world where the disease still remains endemic.¹ The number of malaria cases worldwide was estimated at 229 million in 2019, with a 4% decline over the last two decades.² Cameroon is one

of the fifteen countries most affected by malaria, accounting for 3% of all malaria cases worldwide and 3% of malaria deaths in 2019; this makes it the third most affected country in Central Africa with 12.7% of cases.²

The health seeking behaviour for malaria treatment is a central concern of the health system in endemic countries in sub-Saharan Africa. The effectiveness of a malaria management policy depends largely on a variety of determinants, including the households' health seeking behaviour for their infected members at health facilities.³ While the health seeking behaviour for malaria treatment is a universal concern that presents almost the same problems to all health systems in endemic countries, the factors that determine this health seeking behaviour affect individuals and households to different degrees, and priorities for action may vary across countries. An analysis of the global malaria treatment database showed that treatment uptake rates differ both within and between regions.⁴ Early treatment uptake plays an important role in the effective management of malaria. For this reason, WHO recommends that malaria treatment should be provided within 24 hours of the onset of malaria symptoms to prevent the progression of infection.^{5,6}

The health seeking behaviour for malaria remains an important issue because of variations in its definition and conceptualisation.⁷ In practice, health seeking behaviour is defined as a strategy for approaching, reaching or entering a place, as well as the right or opportunity to reach, use or visit a health treatment provider.⁸ Health seeking behaviour can therefore be conceived as a match between the supply of and demand for malaria treatment, in terms of their availability and use according to an expressed need, or more broadly as a complex pathway of care based in particular on the interaction between the socio-economic conditions of individuals and communities, the characteristics of service providers, populations, organisations and health systems.^{9,10}

In Cameroon, there is limited evidence on the determinants of household's health seeking behaviour for malaria treatment. This study shed light on the socio-demographic and economic determinants of household health-seeking behaviours in Cameroon. A better understanding of the determinants of malaria seeking-behaviours could guide decision and health policy makers in designing an effective malaria control programme. To date, there is no population-based study on the determinants of household's malaria seeking behaviour for treatment in Cameroon.

METHODS

Study type

This was a cross-sectional study using retrospectively secondary data collected through the fourth Cameroonian household's consumption survey to analyse the

determinants of household's health-seeking behaviour for malaria treatment in Cameroon.

Study place and period

The study took place in the community (households) across all 10 regions of Cameroon (including Yaounde and Douala). Indeed, the fourth Cameroonian household consumption survey was conducted from 1st October to 24th December 2014, by the national institute of statistics.

Sampling technique

A stratified, two-stage sampling was implemented. The sample for this survey is made of approximately 12,847 households distributed in 1024 clusters, also called survey areas, in the 12 survey regions that cover the national territory. The selected national sample household's representative of the national urban (56.2%) and rural (43.8%) population and at the regional level Yaounde (9.9%), Douala (10.0%), Adamaoua (4.8%), Centre excluding Yaoundé (6.8%), East (4.9%), Far North (13.2%), Littoral without Douala (5.8%), North (6.8%), North West (12.5%), West (10.8%), South (4.6%), South West (9.9%).

Inclusion and exclusion criteria of the study participants

In this sample, the inclusion criteria of the study participants concerned: (1) all households affected with malaria were eligible for inclusion in the study; (2) all households seeking malaria treatment from different alternative providers were included in the study; and (3) all households whose heads voluntarily gave and signed their informed consent/assent forms were included in the study. Conversely, any household non-affected with malaria was excluded; and any household affected with malaria whose head refused to voluntarily give and sign the informed consent/assent forms was excluded from the study. In line with both the inclusion and exclusion criteria, 918 households were sampled for the study.

Statistical analysis

A bi-variate analysis was used to highlight the determinants of household's health seeking behaviour for malaria treatment in Cameroon. The model of health seeking behaviour for malaria was based on the conceptual framework of health behaviour developed by Andersen and Newman, 1973 and Fosu, 1994. This proposed behavioural model shows household health seeking behaviour for a provider choice as a function of economic factors (e.g., household income) and a set of socio-demographic factors (age, level of education, household marital status, religion, distance from health centres, gender of household's head and area of residence, etc.), a health care provision characteristic (lack of trust) and a medical factor (morbidity of the individual in the household).

Our theoretical model was based on studies in developing countries on the demand for health care provider.^{11,12}

The utility of the care received from provider i is given by the following formula:

$$U_i = U(H_i, C_i)$$

Or H_i is the health status that an individual obtains by using the health care option i , and C_i is the part of income spent on non-medical goods. Thus, the quality of a medical care option is defined as the difference between the health status induced by this care and the health status induced by self-medication.

The quality of the care option i depend on the care provider and also the characteristics (education level, age, gender, etc.) of the individual using it.

If P_i is the total cost of obtaining the care option i and Y is the patient's income, then the budget constraint is expressed as follows:

$$C_i + P_i = Y$$

With $C_i > 0$ we obtain the following semi-direct utility function:

$$U_i = U(H_i, Y - P_i)$$

The above equation shows that income has an effect on utility through the consumption term. The cost of obtaining a particular type of medical care is thus represented by a reduction in the consumption of non-medical services. Assuming that the patient has medical care options $i + 1$ the utility maximisation problem will be expressed as follows:

$U^* = \text{Max}(U_0, U_1, \dots, U_i)$ where U^* is the maximum utility.

The utility function of the patient or individual who decides to use medical services is random. It is composed of a deterministic part and a stochastic term. The idea is that the deterministic part represents the average value assigned to the chosen option.

The random term is the unobservable part of the utility function.

$U_{ji} = V_{ji} + \varepsilon_{ji}$ or V_{ji} is the deterministic part of the utility function and ε_{ji} the error term.

The probability of a patient choosing care option i over option j is defined as the probability that the utility caused by the first option is higher. This is expressed as follows:

$$p_{ji} = p((V_{ji} - V_{jk}) > (\varepsilon_{ji} - \varepsilon_{jk})) \text{ for } i \text{ different from } k$$

It is assumed that the ε_{ji} are identically and independently distributed (iid) according to the logarithmic Weibull distribution. Furthermore, it is assumed that the patient does not choose a type of care for a given disease. Therefore, the probability that an individual j chooses a given type of care k is:

$$p_{jk} = \frac{e^{V_{jk}}}{1 + \sum_{i=1}^I e^{V_{ji}}}$$

The empirical model is the multinomial probit. for each choice of therapeutic care i , we define an unobservable latent variable R_i such that:

$$R_{ji}^* = \beta_i X_{ji} + u_{ji} \text{ with } R_{ji} = I(R_{ji}^* > 0)$$

β_i represents the vector of parameters to be estimated and X_{ji} the vector of explanatory variables. The term u_{ji} is distributed according to the normal distribution of zero mean.

This study examines five alternatives of providing malaria treatment: traditional practitioners, public hospitals, private hospitals, pharmacies and informal vendors. The treatment alternatives represent the dependent variable of the econometric model to be estimated. The multinomial probit model is most often used in a situation where the alternatives are similar¹⁵ and the irrelevant alternatives hypothesis (IIA) is likely to be admissible, in the sense that the absence of an alternative is likely to favour a similar solution¹⁶. The multinomial probit has been used by several authors on the determinants of health care demand in developing countries.^{13,11} Different associations were made and the results were considered statistically significant for a $p < 0.05$.

Ethical approval

Ethical approval was obtained from the ethical review committee for the protection of human subjects and adult participants. In addition, all household heads provided written consent for their participation in the study.

RESULTS

Overall, the study covered 918 households in the 10 regions of Cameroon, with a greater representation in urban areas (502, 54.6%) than in rural (416, 45.4%). The alternatives for malaria treatment in Cameroon are presented in Table 1 and Figure 1 as follows-public health facilities (61.1%) including the national first class referral hospital (2.7%), regional hospital (10%), district hospital (15.3%), district medical centre (5.9%), integrated health centre/health centre (27.2%) Healers/ traditional healers/marabouts (1.4%);-informal vendor of medicines (18%);-Other alternative providers (6.4%) including self-medication (2%), advice by telephone (0.1%), home/visit of doctor or health staff (4.1%), ICG/health NGO (0.2%).

Table 2 presents the correlation between the different alternatives for seeking for malaria treatment according to the socio-demographic characteristics of households. It shows that the region and the area of residence influence the choice of a particular provider for malaria treatment. Thus, according to the region, households in North-West are the ones who mostly seek care at public hospitals (84.1%), while those who request them the least are those in Littoral (33.9%). Private hospitals are mostly used by households in Douala (19.3%), South West (15.9%) and Centre (15.3%), Pharmacies are most frequented by Douala's households (14.5%) and West region (7.8%). Traditional healers are mostly used by households in South-West (4.8%), while households in Littoral (40.7%) make greater request of informal vendors.

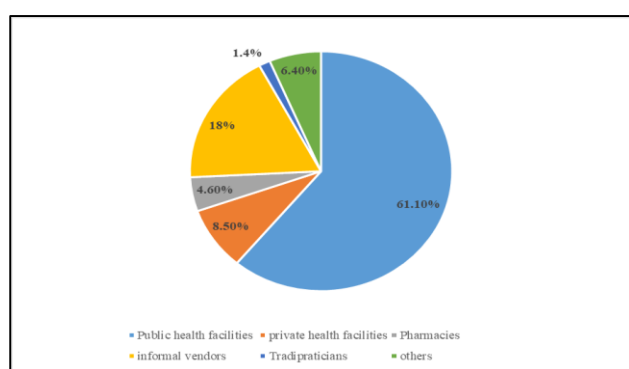


Figure 1: Different alternatives for seeking malaria care and services in Cameroon.

The results show that socio-demographic determinants significantly influence individual choices of different types of providers for malaria treatment. The majority of households (74.2%) seek care at modern health facilities (including public: 61.1%, private and pharmacies: 13.1%) and 25.8% of households seek care at other alternative.

According to place of residence, the results show that in urban areas, when facing with malaria episode, the majority of households seek care at public health facilities (59%), followed by informal vendors (14.9%) and private hospitals (11.6%). The least popular provider in urban areas is the traditional practitioner (1%). Similarly, in rural areas, the first care provider is public health facility (63.7%); the second is the informal vendor (21.6%) and the least is traditional practitioner (1.9%). On the other hand, the traditional practitioner is called upon twice as often in rural areas as compared to urban areas.

The religion of the household has a significant effect on the treatment seeking behaviour. Of the total households interviewed, most were Catholic (37.1%) and very few had no religion. Muslims represent (30.6%) of households, Protestants (20.2%), other Christians (5.6%), other religions (2.6%) and animists (2.3%). The statistics remain unchanged and for all religions except animists, the first choice for malaria treatment is the public

hospital. However, for most animist households, the main recourse for treatment is the informal vendor (50%) and the second is the public health facility (45%).

The gender of the head of the household does not seem to influence the choice of household's health seeking behaviour. The distribution nevertheless shows that, whatever the sex, the first-place households turn to for treatment is the public health facility, the second being informal vendor and followed by the private health facilities.

In addition to socio-demographic characteristics, the characteristics of the head of household influence the choice of where households seek treatment for malaria.

According to the level of education, most heads of households have secondary education 307 (33.4%) and very few have higher education 81 (8.8%). Heads of households with primary education constitute 32.4% and those with no education 25.3%. Thus, households where the head has a secondary education, mostly seek care at public hospitals (57.0%), 17.3% turn to informal vendors and 10.4% to private hospitals.

Marital status of head of household also has an influence on health seeking behaviour when facing malaria episode. Married heads of households represent majority of the sample (492), approximately 53.4%, single constitute 19.1%, widowers 16.2%, divorced and separated (6.2%) and those in a common-law relationship 4.6%. However, socio-professional category does not seem to have a significant impact on households' choice of provider for malaria treatment. The majority of head of household were self-employed (57.4%), 12.8% were qualified employees and only 3% employers. Similarly, for households with a primary education, the most requested care provider was the public hospital (61.1%), followed by informal vendors (18.2%) and private hospitals (8.4%).

Overall, in Cameroon, the northern regions have a higher propensity to seek malaria treatment at public hospitals than the other regions. This can be explained by the fact that in the northern regions, malaria control and prevention policies have been accentuated over the last few decades in order to contain the endemic, as the far north was a very high endemic area. The South-West and Central regions are those with a high propensity of households seeking malaria at private health facilities. This can be explained by the multiplicity of this category of health facilities in these towns, making access a little easier than in other regions. Pharmacies are more frequented in the West, Littoral and Centre regions, which can be justified by the recurrent presence of pharmacies in these regions. As for traditional practitioners, they are mostly used by households in the South-West, East and West regions, which can be justified by the cultural links between these regions, which publicises malaria treatment through natural plants

and herbs. On the other hand, informal vendors are mainly found in the Littoral. This can be explained by the location of the economic capital. The level of education significantly influence the household's health seeking behaviour ($p < 0.00$). The heads of households with no education seek care at public health facilities more than those with higher education, while private health facilities and pharmacies are more frequented by households with a higher level of education, which can be explained by the fact that households with a higher level of education assume a better quality of care in private hospitals, which motivates their choice. In contrast, traditional healers are mostly frequented by primary school households and informal vendors by those with no education. With regard to marital status, there is a statistically significant relationship between the utilisation of formal health facilities for malaria treatment and the different modalities of this variable ($p < 0.01$). The health seeking behaviour at public hospitals is more important for married households than for all other categories, while private hospitals are more utilised by households in a common-law relationship or by those who are divorced. This distribution can be justified by the fact that the cost of services in health facilities. Pharmacies and traditional practitioners are utilised mainly by households in common-law relationships and single people, while informal vendors are frequented more by widowers.

Table 2 also reveals that there is a significant relationship between religion and household's health seeking behaviour for a particular provider choice ($P < 0.01$). Muslim households utilise public health facilities more than other religions, while private hospitals are utilised more by Catholics. Protestants request pharmacies the most in case of malaria, while animists and those with no religion use informal vendors the most. Table 3 reveals that urban households are less likely to seek care at public hospitals (0.6 times less), traditional healers (0.7 times) and informal vendors (0.4 times) than

rural households. Compared to rural households, urban households are 1.4 times more likely to seek care at private hospitals than rural households and 1.6 times more likely to seek care at pharmacies.

Whether or not the head of the household is active does not appear to have a significant statistical effect ($p > 0.05$). However, it is important to note that compared to households with inactive heads, households with active heads have a higher propensity to seek treatment at informal vendors and traditional healers (2.3 and 2.07 times higher respectively).

The level of education reveals that compared to households with no education, those with higher education are 2.8 times more likely to seek care at private hospitals, 1.6 times more likely to seek care at pharmacies, 1.1 times more likely to seek care at public hospitals. Similarly, compared to out-of-school households, secondary level households are 1.06 times more likely to seek care at private health facilities, 0.53 times less likely to seek care at public hospitals, 0.46 times less likely to seek care at pharmacies, and 0.22 times less likely to seek care at informal vendors, 0.15 times less likely to seek care at traditional practitioners. The marital status, despite the statistical insignificance of the variable, compared to the category of divorced households, the married are 1.03 times more likely to seek care at public health facilities, 0.3 times less likely to seek care at private health facilities, 0.6 times less likely to seek care at informal vendors, and 0.4 times less likely to seek care at traditional healers.

Religion shows that Christian households are 0.4 times less likely to seek care at public hospitals, 1.08 times more likely to seek care at private hospitals, traditional healers, while Muslim households are more likely to seek care at public hospitals than those with no religion.

Table 1: Distribution of households according to the different alternatives for seeking malaria care and services in Cameroon.

Alternative care	Number of households	Percentage (%)
Public health training	First class national hospital	25
	Regional hospital	92
	District hospital	140
	District medical centre	54
	Integrated health centre/ health centre	250
Private health training	Clinic/medical practice	76
	Infirmery	2
Tradipratician	Healers/ traditionalists/ marabouts	13
Informal seller	At the informal drug seller's	165
Pharmacy	Pharmacy	42
Other type of appeal	Advice by telephone	1
	Other: self-medication	18
	Home/visit by doctor or health care staff	38
	ICG/NGO health	2
Total	918	100

Table 2: Descriptive statistics on the determinants of malaria care use in Cameroon, (n=918).

Factors	N	Places of care for malaria treatment (%)						P value
		Public hospitals	Private hospitals	Pharmacy	Tradi-practician	Informal seller	Other place	
Regions								
Douala	83	27.7	19.3	14.5	0.0	26.5	12.0	<0.00
Yaoundé	62	67.7	12.9	3.2	0.0	11.3	4.8	
Adamaoua	59	81.4	3.4	3.4	1.7	3.4	6.8	
Centre	59	52.5	15.3	5.1	1.7	23.7	1.7	
East	55	67.3	3.6	1.8	3.6	14.5	9.1	
Far North	204	64.2	5.4	2.5	0.0	24.0	3.9	
Coastal	59	33.9	3.4	5.1	0.0	40.7	16.9	
North	109	71.6	5.5	0.9	1.8	17.4	2.8	
Northwest	63	84.1	1.6	4.8	1.6	0.0	7.9	
West	64	56.3	9.4	7.8	3.1	20.3	3.1	
South	38	57.9	13.2	5.3	2.6	18.4	2.6	
South West	63	63.5	15.9	4.8	4.8	0.0	11.1	
Place of residence								
Urban	502	59.0	11.6	6.2	1.	14.9	7.4	<0.00
Rural	416	63.7	4.8	2.6	1.9	21.6	5.3	
Level of education								
Not in school	233	64.4	3.9	3.4	1.3	23.6	3.4	<0.00
Primary	297	61.6	8.4	2.7	2.4	18.2	6.7	
Secondary	307	57.3	10.4	5.5	0.7	17.3	8.8	
Superior	81	64.2	14.8	11.1	1.2	3.7	4.9	
Gender								
Male	592	61.5	7.9	4.7	1.	18.2	6.6	<0.73
Female	326	60.4	9.5	4.3	2.1	17.5	6.1	
Marital status								
Single	176	58.0	10.2	8.	2.3	14.2	7.4	<0.01
Monogamous married	406	64.8	6.4	3.2	1.2	17.7	6.7	
Married polygamist	86	66.3	9.3	2.3	0,0	17.4	4.7	
Widow/ widower	149	61.1	5.4	4.	0.7	22.1	6.7	
Divorced/ Separated	57	57.9	14.0	5.3	1.8	19.3	1.8	
In a common-law relationship	44	34.1	22.7	9.1	4.5	20.5	9.1	
Socio-professional category								
Frame	35	68.6	14.3	2.9	0	8.6	5.7	<0.56
Skilled employee	118	56.8	12.7	6.8	0.8	15.3	7.6	
Manoeuvre	55	60	9.1	1.8	1.8	16.4	10.9	
Pattern	34	61.8	11.8	2.9	2.9	14.7	5.9	
Working for own account	527	61.1	6.1	4.2	1.7	21.3	5.7	
Caregivers/ apprentices	21	61.9	9.5	9.5	0	19	0	
Religion								
Catholic	341	54.3	10	5.3	2.1	21.1	7.3	<0.01
Protestant	186	59.1	9.7	5.4	2.2	15.1	8.6	
Other Christian	52	59.6	7.7	7.7	0	15.4	9.6	
Muslim	281	72.2	7.1	3.2	0.7	12.8	3.9	
Animist	22	45.5	0.	4.5	0	50	0	
Other religion	24	70.8	4.2	0	0	20.8	4.2	
No religion	12	41.7	8.3	0	0	41.7	8.3	

Table 3: Multinomial probit results for household therapy use.

Factors	Relative risk ratio	Std Err.	Z	P>z	95% Conf.	Interval
Public hospitals						
Urban	0.68	0.21	-1.29	0.20	0.37	1.23
Asset	1.25	0.48	0.58	0.56	0.59	2.64
Secondary	0.54	0.26	-1.27	0.21	0.21	1.40
Superior	1.12	0.78	0.16	0.87	0.29	4.38
Primary	0.63	0.29	-0.99	0.32	0.25	1.57
Female	1.36	0.50	0.84	0.40	0.66	2.82
Christian	0.48	0.36	-0.98	0.33	0.11	2.09
Muslim	1.13	0.92	0.15	0.88	0.23	5.53
Single	0.85	0.48	-0.29	0.77	0.28	2.56
Married	1.04	0.54	0.07	0.95	0.37	2.90
Widower	0.68	0.42	-0.61	0.54	0.20	2.29
Private hospitals						
Urban	1.42	0.57	0.88	0.38	0.65	3.12
Asset	0.89	0.42	-0.26	0.80	0.35	2.22
Secondary	1.07	0.68	0.10	0.92	0.31	3.73
Superior	2.83	2.37	1.24	0.21	0.55	14.59
Primary	1.23	0.75	0.33	0.74	0.37	4.06
Female	1.42	0.64	0.78	0.44	0.59	3.41
Christian	1.09	1.12	0.08	0.94	0.14	8.18
Muslim	1.81	1.97	0.54	0.59	0.21	15.37
Single	0.34	0.21	-1.71	0.09	0.10	1.17
Married	0.33	0.19	-1.90	0.06	0.10	1.03
Widower	0.21	0.16	-2.10	0.04	0.05	0.90
Pharmacy						
Urban	1.61	0.77	1.00	0.32	0.63	4.09
Asset	1.17	0.66	0.28	0.78	0.39	3.54
Secondary	0.47	0.33	-1.08	0.28	0.12	1.86
Superior	1.62	1.44	0.54	0.59	0.28	9.31
Primary	0.35	0.25	-1.49	0.14	0.09	1.40
Female	0.72	0.39	-0.60	0.55	0.25	2.06
Christian	1.25	1.58	0.18	0.86	0.11	14.74
Muslim	1.32	1.76	0.21	0.84	0.10	18.03
Single	0.68	0.49	-0.54	0.59	0.17	2.76
Married	0.32	0.22	-1.67	0.10	0.08	1.23
Widower	0.51	0.43	-0.79	0.43	0.10	2.68
Tradipratician						
Urban	0.42	0.28	-1.28	0.20	0.11	1.58
Asset	2.08	2.35	0.65	0.52	0.23	19.02
Secondary	0.16	0.18	-1.63	0.10	0.02	1.46
Superior	0.54	0.78	-0.43	0.67	0.03	8.98
Primary	0.80	0.71	-0.25	0.80	0.14	4.55
Female	3.01	2.22	1.49	0.14	0.71	12.79
Christian	73793.08	27600000.00	0.03	0.98	0.00	.
Muslim	48896.34	18300000.00	0.03	0.98	0.00	.
Single	0.79	0.76	-0.25	0.80	0.12	5.19
Married	0.42	0.40	-0.91	0.36	0.07	2.69
Widower	0.07	0.10	-1.98	0.05	0.01	0.98
Informal vendor						
Urban	0.72	0.24	-0.97	0.33	0.37	1.40
Asset	2.30	1.07	1.80	0.07	0.93	5.71
Secondary	0.29	0.15	-2.37	0.02	0.10	0.81
Superior	0.12	0.11	-2.35	0.02	0.02	0.70
Primary	0.37	0.18	-2.02	0.04	0.14	0.97
Female	0.89	0.37	-0.28	0.78	0.39	2.01

Continued.

Factors	Relative risk ratio	Std Err.	Z	P>z	95% Conf. Interval
Christian	0.25	0.19	-1.80	0.07	0.05 1.13
Muslim	0.24	0.20	-1.71	0.09	0.05 1.24
Single	0.60	0.37	-0.84	0.40	0.18 2.00
Married	0.65	0.37	-0.77	0.44	0.21 1.96
Widower	0.58	0.39	-0.80	0.42	0.16 2.16

DISCUSSIONS

The results of this study address a gap in the evidence base for understanding the determinants of malaria seeking behaviour for alternative providers in Cameroon. The main finding of this study shows that the key determinants associated with the malaria seeking behaviour in the different alternative sources of treatment were region, area of residence, level of education, religion, marital status, socio-professional category, and gender. These findings contrast with the results of the study in Southeast Asia Region on malaria seeking behaviour for malaria treatment, with a rate of 27.6% (95% CI: 26.3-29.1) for community malaria treatment uptake in government health facilities that provide a comprehensive malaria case management and the rate of community access to all sources of malaria treatment was 78.8% (95% CI: 77.4-80.2), which was the highest proportion among all countries reported in 2016.¹⁴

The study reveals that the health seeking behaviour at other specific sources is 18% for informal vendors in kiosks, 2% for self-medication, 1.4% for traditional healers, 4.4% for other sources of treatment. These results again contrast with the results of a recent study in Indonesia showing that 84.3% of communities seek care at modern health facilities (of which public: 82.4% and private: 1.9%), 7.9% at traditional healers, 4.3% at self-medication and 3.4% at informal vendors in kiosks.⁴ Thus, the study shows that a high proportion of households sought treatment for malaria outside health facilities. This result is in contradiction with studies conducted in India, Ghana, but they are consistent with findings from Saudi Arabia and Zambia, which indicate that a high proportion of the community seeks treatment at health facilities.¹⁵⁻¹⁸ Household awareness of the need to seek treatment at health facilities is crucial to ensure that all clinical cases of malaria can be accurately examined by RDT or microscope to enable health professionals to identify types of malaria and provide treatment accordingly.¹⁹

The study indicates that the fact of being in employment is a determinant of the choice of therapeutic recourse in Cameroon. Working households tend to self-medicate (informal vendors, traditional practitioners), which can be explained by the failure of the public health care system, which makes self-medication indispensable rather than resorting to modern medicine.^{20,21} This result corroborates those of Senegal²² who found that the health seeking behaviour of modern medicine in case of malaria in children under five years old is higher among mothers

who are managers/employees (52.5%) and shopkeepers (42%) compared to those who are inactive (36.4%).

Similarly, there is a significant relationship between the level of education and the choice of alternative providers of malaria treatment in Cameroonian households.²³ The study shows that households with no education were more likely to seek malaria treatment outside health facilities than those with a high level of education. It is more likely that the uneducated were associated with low health literacy, so they are not aware of appropriate settings to treat their illness, which leads to the low utilisation of modern professional health facilities, as highlighted in other studies.^{24,25} In addition, households with a higher level of education have a greater tendency to seek malaria treatment at private health facilities. However, this result should be analysed with caution as there are other social determinants of health, such as unemployment and low education, which also have an impact on an indigenous person's ability to access health care services.^{26,27} This suggests a continued focus on education to ensure increased and appropriate malaria seeking behaviour.

The marital status of the parents has little statistical influence on therapeutic health seeking behaviour ($p>0.05$). The type of union modifies the propensity to consult modern medicine as well as the location of outpatient consultations: married households are less likely to consult traditional therapists than health facilities.^{21,29} Because the presence of a spouse, who is moreover educated, favours and more easily orients the choice of the household towards modern medicine to the detriment of self-medication (informal vendors).

Another determinant of therapeutic choice seems to be the religion of the household's head. Muslim households have a higher propensity to use private health facilities and pharmacies than Christian households, compared to those of no religion. This can be explained by the practices of these religions, which sometimes encourage modern or non-modern use.²⁸

The malaria seeking behaviour for modern health facilities (public and private hospitals, pharmacies) is more important in urban areas than in rural areas. Thus, in urban areas, the predominant choice for modern outpatient care may be justified by the fact that households are mostly better educated than in rural areas and therefore better equipped to make decisions in favour of modern medicine.¹⁷ The study highlighted the understanding of the determinants of therapeutic seeking of malaria treatment by Cameroonian households.

However, the study has a number of limitations. Not all determinants of treatment uptake were taken into account in the analysis, e.g., household economic well-being quintile, cost of treatment, number of malaria cases in the household, distance between households and selected treatment sites.

CONCLUSION

The study identified the determinants of malaria health-seeking behaviours in Cameroon. The findings revealed that the choice of malaria providers depends on factors such as region, level of education, religion, area of residence, socio-professional category and gender. Policy-makers need to strive to improve the socio-demographic and economic conditions and sensitize households on the appropriate alternative ways to ensure the universal access to diagnosis and effective treatment of malaria in line with the global strategies recommended by WHO to achieve malaria elimination by 2030.

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REFERENCES

- Aubry P, Gauzere BA. Paludisme. Document pédagogique, Centre René Labusquière, Institut de Médecine Tropicale, Université de Bordeaux. 2018;30.
- World Health Organization. World Malaria Report 2020: 20 years of global progress and challenges. Geneva: World Health Organization. 2020. Available at: <https://www.who.int/publications-detail-redirect/9789240015791>. Accessed on 2 June 2022.
- Littrell M, Miller J, Ndhlovu M, Hamainza B, Hawela M, Kamuliwo M, et al. Documenting malaria health coverage in Zambia: A systems effectiveness approach. *Malar J*. 2013;12(371).
- Guntur R, Kingsley J, Amirul I. Malaria treatment-seeking behaviour and its associated factors: A cross-sectional study in rural East Nusa Tenggara Province, Indonesia. *J Preventive Med Public Health*. 2021;21(367).
- Gulliford M, Figueroa J, Myfanwy M, Hughes D, Gibson B, Beech R, et al. What does access to health care mean? *J Health Services Res Policy*. 2002;7(3):186-8.
- Challenger J, Gonçalves B, Bruxvoort K, Tiono A, Drakeley C. How delayed and non-adherent treatment contribute to onward transmission of malaria: a modelling study. *BMJ Glob Health*. 2019;4(6).
- Levesque J, Harris M, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. *Int J Equity Health*. 2013;12(18).
- Ridde V, Kafando Y. A community Based targeting approach to exempt the worst -off from user fees in Burkina Faso. *J Epidemiol Community Health*. 2010;64:10-15.
- Haddad S, Nougara A, Ridde. Inequalities in access to services and their determinants in Burkina Faso. *Santé, Société et solidarité*. 2004;2:199-210.
- Haggerty J, Roberge D, Levesque JF, Loignon C. An exploration of Rural- urban differences in health care-seeking trajectories: implications for measures of accessibility. *Health Place*. 2014;28(92).
- Audibert M, Mathonnat J, Henry MC, Nzeyimana I. Rôle du paludisme dans l'efficience technique des producteurs de coton du Nord de la Côte d'Ivoire. *Revue d'économie et de développement*. 1999;7(4).
- Tiehi TN. Antenatal care in cote d'Ivoire: an empirical investigation. *semantic scholar*. 2013.
- Hausman J, Wise D. A conditional Probit model for qualitative choice: Discrete decisions recognizing interdependence and heterogeneous preferences. *Econometrica*. 1978;46(2).
- Dieng M, Audibert M, Le Hesran JY, Dial A. Déterminants de la demande de soins en milieu péri urbain dans un contexte de subvention à Pikine, Sénégal. *HAL*. 2015.
- Battle K, Bisanzio D, Gibson S, Bhatt S, Cameron E, Weiss DJ, et al. Treatment seeking rates in endemic malaria countries. *Malar J*. 2016;15(20).
- Singh MP, Saha KB, Chand SK, Anvikar A. Factors associated with treatment seeking for malaria in Madhya Pradesh, India. *Trop Med Int Health*. 2017;22(11):1377-84.
- Auwah RB, Asante PY, Sakyi L, Biney AA, Kushitor MK, Agyei F, et al. Factors associated with treatment-seeking for malaria in urban poor communities in Accra, Ghana. *Malar J*. 2018;17(1):168.
- Khairy S, Al-Surimi K, Ali A, Shubily HM, Al Walaan N, Househ M, et al. Knowledge, attitude and practice about malaria in south-western Saudi Arabia: A household-based cross-sectional survey. *J Infect Public Health*. 2017;10(5):499-506.
- Nzooa SM, Tembo-Mwase E, Gebreslasie M, Samson M. Knowledge, attitudes and practices in the control and prevention of malaria in four endemic provinces of Zambia. *Afr J Infect Dis*. 2017;32(1).
- Mbanefo A, Kumar N. Evaluation of Malaria Diagnostic Methods as a Key for Successful Control and Elimination Programs. *PubMed PMID*. 2020;5(2):102.
- Williams DR, Harold WN, James JS. Racial/Ethnic discrimination. *Am J Public Health*. 2003;93(2).
- Franckel. Les comportements de recours aux soins en milieu rural au Sénégal. Le cas des enfants fébriles à Niakhar. PhD thesis. Paris Nanterre: Université Paris

- Nanterre. 2007.
23. Sougoudou. Recours thérapeutique des mères en cas de paludisme chez les enfants de moins de cinq ans selon le milieu de résidence au Cameroun. Master's thesis. Yaoundé: IFORD. 2010.
24. Caldwell J, Caldwell P. Women's position and child mortality and morbidity in less developed countries. *Science Open*. 1993;122-39.
25. Van der Heide I, Wang J, Droomers M, Spreeuwenberg J. The relationship between health, education, and health literacy: results from Dutch adult literacy and life skills survey. *J Health Communication*. 2013;18(1).
26. Berkman N, Sheridan S, Donahue K, Halpern D, Crotty K. Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med*. 2011;155(2).
27. Davy C, Harfield S, McArthur A, Munn Z. Access to primary health care services for Indigenous peoples: A framework synthesis. *Int J Equity Health*. 2016;15(163).
28. World Health Organization. Bridging the "Know-Do" Gap Meeting on Knowledge Translation in Global Health. Geneva Report. Switzerland: World Health Organization. 2006. Available at: <https://www.measureevaluation.org/resources/training/capacity-building-resources/high-impact-research-training-curricula/bridging-the-know-do-gap.pdf>. Accessed on 2 June 2022.
29. Ntamabyaliro Y, Burri C, Lula Y, Ishoso EA. Knowledge of Antimalarials and Health Seeking Behaviour of Households in Case of Suspected Malaria in Democratic Republic of the Congo. *Trop Med Infect Dis*. 2021;6(157).

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