

Online supplementary materials

Supplementary data

KAP survey questionnaire

- 1) **Age category ?:** 1 (under 25); 2 (between 25 and 35); 3 (between 35 and 45); 4 (between 45 and 45); 5 (between 55 and 65); 6 (over 65)
- 2) **Gender ?:** 1 (Male) 2 (Female)
- 3) **Native language ?:** 1 (Afar) ; 2 (Arabe) ; 3 (Somali) ; 4 (Oromo) et 5 (autre).
- 4) **Region of origin ?:** 1 (Arta) ; 2 (Ali sabieh) ; 3 (Dikhil) ; 4 (Tadjourah) 5 (Obock) ; 6 (Djibouti) 7 (Foreign region)
- 5) **Marital status ?:** 1 (Single); 2 (Married); 3 (Divorced); 4 (Widowed)
- 6) **Educational level ?** 1 (Illiterate) 2 (Madrassa) 3 (Primary) 4 (College) 5 (Secondary) 6 (Superior)
- 7) **Mother's employment status ?:** 1 (Student) 2 (Employed) 3 (Homemaker) 4 (Retired) 5 (Other)
- 8) **Presence of children under 5 years old ?:** 1 (0 children) 2 (1 child) 3 (2 children) 4 (3 children) 5 (4 children); 5 (5 children and more)
- 9) **Presence of pregnant women ?:** 1(0) 2(1) 3(2) 4 (3) 5 (4) ;5 (5 or more)
- 10) **Main occupation of head of household ?:** 1 (Civil servant) 2 (Trader) 3 (Worker) 4 (Farmer) 5 (Livestock farmer) 6 (None) 7 (Other)
- 11) **Monthly income ?:** 1 (Less than 30,000); 2 (Between 30,000 and 50,000); 3 (Between 50,000 and 100,000) 4 (Between 100,000 and 200,000) 5 (Between 200,000 and 250,000) 6 (Above 250,000) 7 (Don't know) 8 (No answer) 9 (No fixed income) 12)
- 12) **Type of housing ?:** 1 (Permanent housing); 2 (Intermediate housing); 3 (Precarious housing)
- 13) **Type of house ?:**1 (detached house); 2 (apartment in a block of flats) 3 (other)
- 14) **Building materials ?:** 1 (Concrete blocks and concrete); 2 (Wood); 3 (Sheet metal); 4 (Recycled materials)
- 15) **Number of rooms ?:** 1 (one room); 2 (two rooms); 3 (three rooms); 4 (four rooms); 5 (five rooms or more)
- 16) **Electricity subscription ?:** 1 (Yes); 2 (No)
- 17) **Water supply system ?:** 1 (tap in the household); 2 (tap at a neighbour's house); 3

- (public tap); 4 (water tanker); 5 (mineral water); 6 (mineral water); 7 (none)
- 18) **Do you need to conserve water in your household ?:** 1 (Yes); 2 (No)
- 19) **What method do you use to store water in your household? :** 1 (Canister); 2 (Plastic bucket); 3 (Plastic barrel); 4 (Steel barrel); 5 (Other)
- 20) **Do you cover water tanks/containers in your home?:** 1 (yes); 2 (no)
- 21) **Do you remove any stagnant water around your home?:** 1 (yes); 2 (no)
- 22) **Is there a sewage disposal system?:** 1 (Yes); 2 (No)
- 23) **If so, what are the wastewater disposal systems?:** 1 (Gutter); 2 (Floor); 3 (Pit); 4 (Sewer); 5 (Other)
- 24) **Have you heard of malaria?:** 1 (Yes); 2 (No)
- 25) **If you have heard of malaria, how did you hear about it?:** 1 (Illnesses in the household); 2 (Illnesses among relatives or neighbours); 3 (Awareness campaigns); 4 (Talks); 5 (Other)
- 26) **How serious do you think malaria is?:** (0 if you think it is not serious at all, 10 if you think it is very serious)
- 27) **How is malaria transmitted ?:** 1) Mosquito bites; 2(Contact with animals); 3(Unsanitary conditions); 4(Rain); 5(Vegetation) 6(Blood transfusions); 7(Blood transfusions); 8(High temperature); 9(Consumption of expired food); 10(No answer); 11(Other)
- 28) **Through which channel did you learn about transmission methods? :**1 (Radio); 2 (Television); 3 (Healthcare personnel); 4 (Personal experience); 5 (Family); 6 (Awareness campaign); 7 (Other)
- 29) **Practices in case of malaria attack ?:** 1 (Go to a health centre); 2 (Go to a pharmacy); 3 (Home treatment before going to a centre or pharmacy); 4 (Traditional medicine); 5 (Never had a malaria attack)
- 30) **Signs related to malaria ?:** 1 (fever); 2 (vomiting); 3 (diarrhoea); 4 (headache); 4 (loss of appetite); 5 (no response); 6 (other)
- 31) **Go to a health centre as soon as signs of malaria appear ?:** 1 (immediately); 2 (after some time)
- 32) **Go to a pharmacy as soon as you notice signs of malaria?:** 1 (immediately); 2 (after a while)
- 33) **Do you take antimalarial drugs to treat yourself if you have malaria?** 1 (Yes); 2

(No)

- 34) **If you are taking antimalarial drugs for curative purposes, how many days do you use them for?:** 1 (For the duration prescribed by your doctor); 2 (Until symptoms disappear); 3 (No answer)
- 35) **Do you think that antimalarial drugs are effective in treating malaria?:** 1 (Yes); 2 (No)
- 36) **Where did you buy the medicines?:** 1 (Health centre); 2 (Pharmacy); 3 (Other)
- 37) **Do you usually spend your holidays in your region of origin?:** 1 (Yes); 2 (No) ; 3 = (not originally from the region)
- 38) **If you usually spend your holidays in your region of origin, do you take preventive measures against malaria?:** 1 (Yes); 2 (No); 3 (not from the regions)
- 39) **Ownership of impregnated mosquito nets?:** 1 (Yes); 2 (No)
- 40) **If you have impregnated mosquito nets, how many?:** 1 (1); 2 (2); 3 (3); 4 (4); 5 (5 or more)
- 41) **If you do not have mosquito nets, why not? :** 1 (Not necessary); 2 (Lack of funds); 3 (Not eligible for free distribution); 4 (Owns at least one mosquito net)
- 42) **Use of mosquito nets? :** 1 (Every day); 2 (Sometimes); 3 (Never); 4 (Does not own a mosquito net)
- 43) **Use of mosquito nets for?:** 1 (the whole family); 2 (children under 5); 3 (pregnant women); 5 (does not use); 6 (does not own a mosquito net)
- 44) **Condition of mosquito nets?:** 1 (Good); 2 (Fair); 3 (Poor)
- 45) **Benefits of using impregnated mosquito nets?:** 1 (Kills mosquitoes); 2 (Good sleep); 3 (Protects against mosquito bites); 4 (Other)
- 46) **Do you think that impregnated mosquito nets are effective in preventing malaria?:** 1 (Yes); 2 (No)
- 47) **How did you acquire the impregnated mosquito nets?:** 1(Purchase) 2(Donation) 3(Other)
- 48) **Use of impregnated mosquito nets is essential during?:** 1(The rainy season) 2(The cool season) 2(The hot season) 3(No answer)
- 49) **Have you heard of indoor residual spraying (IRS)?:** 1(Yes) 2(No)
- 50) **How did you learn about indoor residual spraying (IRS)?:** 1 (Radio) 2 (Television) 3 (Healthcare personnel) 4 (Personal experience) 5 (Family) 6 (Awareness campaign) 7

(Other)

- 51) **Have you benefited from indoor spraying with residual insecticide?:** 1 (Yes) 2 (No)
- 52) **In which year did you benefit from indoor residual insecticide spraying ?:** 1 (2019)
2 (2020) 3 (2021) 4 (2022)
- 53) **Benefits of using indoor residual insecticide spraying ?:** 1 (Kills mosquitoes); 2 (Sleeps well); 3 (Protects against mosquito bites); 4 (Other)
- 54) **Are you bitten by mosquitoes?:** 1 (yes); 2 (no)
- 55) **Can all mosquito bites transmit malaria?:** 1 (yes); 2 (no)
- 56) **When are you bitten by mosquitoes?:** 1 (dusk); 2 (at night)
- 57) **During the cool season, do mosquitoes bite you ?:** 1 (every night);
2 (often); 3 (never)
- 58) **During the hot season, do mosquitoes bite you?:** 1 (every night);
2 (often); 3 (never)
- 59) **Other means of protection?:** 1 (Ensure good hygiene); 2 (Window screens); 3 (Door curtains); 4 (Use of sprays); 5 (Use of insecticides); 6 (Door and window screens); 7 (Smoke); 8 (Other)
- 60) **Proposed solutions for improving access to insecticide-treated mosquito nets and indoor residual spraying?:** 1) (Increase awareness); 2) (Widespread distribution of insecticide-treated mosquito nets); 3) (Involve the community in the distribution of mosquito nets); 4) (Other)

Supplementary Table 1

Questions	weighted average
Knowleges Questions	
Can all mosquito bites transmit malaria?	4.6
Have you heard about malaria ?	2.0
Have you heard of indoor residual spraying?	6.2
Through which means is malaria transmitted?	3.2
What are the symptoms of malaria?	2.3
What is the benefit of using impregnated mosquito ?	5.2
Attitudes Questions	
Do you think malaria is a serious disease ?	2.9
Do you think anti-malarial drugs are effective in treating malaria?	4.0
In your opinion, during which season is the use of impregnated mosquito nets essential?	4,4
Do you think that impregnated mosquito nets are effective in preventing contact with malaria	3.2
Practices Questions	
Do you go to a healthcare facility as soon as you notice symptoms related to malaria?	6.4
Do you go to a pharmacy as soon as you notice symptoms related to malaria?	5.2
Do you have an impregnated mosquito net	2.4
Do you use the impregneted mosquito ?	3.3
Do you use the impregnated mosquito net for the whole family?	3.3
If so, do you take preventive measures against malaria before travelling?	3.2
Do you take anti-malarial drugs to treat malaria?	5.1
If you are taking antimalarial drugs for treatment, how long are you using them for?	4.7

What is the condition of the mosquito ?	5.7
What other means of protection do you use besides the impregnated mosquito ?	9.5
Questions	Score
	Score index

The weighting assigned to each knowledge, attitude and practice question

Supplementary Table 2

Knowledge

Familiarity with malaria	None of the three answers is correct = 0	0 = No knowledge
Knowledge about how malaria is contracted	Only one of the three answers is correct = 1	1 = Low knowledge
Familiarity with the symptoms of malaria	Two of the three answers are correct = 2	2 = Medium knowledge
	All three answers are correct = 3	3 = High knowledge

Attitudes

Awareness of the severity of malaria	None of the three answers is correct = 0	0 = No attitude
Belief about antimalarial medications in case of malaria	Only one of the three answers is correct = 1	1 = Low attitudes
Belief about the effectiveness of impregnated mosquito	Two of the three answers are correct = 2	2 = Medium attitudes
	All three answers are correct = 3	3 = High attitudes

Practices

Possession of an impregnated mosquito net	None of the four answers is correct = 0	0 = No practice
Proper use of the impregnated mosquito net	Only one of the four answers is correct = 1	1 = Poor practices
Use of the impregnated mosquito net for the whole family	Two of the four answers are correct = 2	2 = Moderate practices
Adoption of malaria prevention measures during travel	Three of the four answers are correct = 3	3 = Good practices
	All four answers are correct = 4	4 = High practices

Score index for relevant questions selected from the study on knowledge, attitudes and practices