

Factors Associated with Community Engagement towards Indoor Residual Spraying for Malaria Control in Bugesera District, Rwanda

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Abstract

This study was conceptualized with the main aim to determine the level of community engagement (CE) towards IRS for malaria control in Bugesera District in Rwanda. Across sectional study was applied to determine the level and factors associated with CE. Cluster sampling technique was used to select 385 participants where sector served as a cluster. Data collectors (CHWs) used structure questionnaire to interview study participants. Data were analyzed using SPSS version 21. The mean-score of study respondents help to determine the level of CE where participants scored < mean-score presented low level and those scored > mean-score presented the high level of CE. The associated factors for CE were determined using chi-square test and the strength of association was assessed using logistic regression. Generally, study findings revealed that 52% presented the high level of engagement towards IRS. Among numerous factors associated with CE towards IRS, gender, occupation, history of allergy to pesticide and IRS operators' behavior were statistically associated with community engagement towards IRS in Bugesera District with P-value < 0.005 range calculated to 95% CI. Although, the households who were not allergic to pesticides were more likely to be engaged towards IRS implementation [AOR = 3.750, 95%CI = 1.306-10.766 and P = 0.014] compared to those who were allergic to pesticides. To ensure community engagement towards IRS, it needs to establish a platform for the community to give opinions and report IRS related complains for better and timely response..

Keywords: Malaria; Indoor Residual Spraying; Community Engagement

Introduction

Indoor residual spraying (IRS) is one of the primary malaria control interventions targeting vector to reduce and interrupt malaria transmission [1]. Since 1940s, IRS has started with Dichlorodiphenyltrichloroethane (DDT) which had been an insecticide of choice until 1960s to alter the burden of malaria infection expended in most parties of the world mainly South America, south Asia and Africa WHO regions [2]. The effectiveness of IRS has been evidenced and made possible the introduction of malaria eradication programme since 1955 and recent assessment by world malaria programme (2006) has realized that IRS has contributed to eradicate malaria over 700 million people from 37 countries among others who were exposed on the globe [3]. The high cost of insecticides (more than a third of IRS campaign) and increased insecticidal resistance force to alternate from low costing pesticides up to 19 times costing insecticides, and this, remains the global challenge of expanding IRS more often to the countries with limited resources [3]. In Africa, since the implementation

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of malaria eradication program (1955 - 1969), some African countries started piloting project of IRS where South Africa, Mozambique, Zimbabwe and Swaziland were among them; Eritrea, Ethiopia and Madagascar were added to the list as the countries where malaria was highly seasonal disease [2]. Currently, analytical studies show that between 1997 and 2017, IRS countries had increased from 26% (1997) to 63% (2017) of sub Saharan African countries with the total of 952 country years of IRS [3]. Despite the effectiveness of IRS in WHO Africa region that marked an effect of 38% reduction in malaria incidence between 2000 and 2019 [4], there are some countries like DRC which still reporting zero country year of deploying IRS while it contains itself 12% of Africa malaria cases [5].

Regionally, the East Africa community (EAC) met for common vision to reduce 30% of child mortality as per 2030 sustainable development goal (SDGs) established since 2015, hence, each country member of EAC contribute to protect its population from Malaria which is among the first causes of under-five related deaths and disabilities [6]. IRS in Burundi has contributed to malaria control since the 2011 to 2015 strategic plan with coverage of 80% of targeted households [2], whereas in Tanzania, to date, over 94% of 536,368 targeted structures for IRS which give protection against malaria burden to 2,138,536 people in Tanzania [7]. Nearly, in Kenya (2017) IRS has been resumed and extended up to 14 sub-countries compared to six sub-countries sprayed before relapsing of malaria burden, and up March 2020, 92% of 551,689 targeted structures were successfully sprayed to protect about three quarter of Kenyan population exposed to malaria [8].

In Rwanda, malaria burden had dramatically declined between the year 2005 and 2011 consecutive to the successful implementation and scale-up of comprehensive interventions for malaria control. In 2005, Malaria was number one cause of morbidity among children under five years, number three in 2008 and the fourth cause of morbidity among under five years' children by 2012. Also, it has noted an overall reduction of 85% in malaria incidence and eight of thirty districts had achieved malaria pre-elimination with less 5% of slide positivity rate [9,10]. Since 2012, malaria trend had reversed increasingly from 48‰ up to 403% of malaria incidence rate in 2016, nearly 10 times higher in almost 4 years period [9]. In that year (2016), Rwanda recorded over four and half millions of cases comparatively to approximate of two hundred and fifty cases reported in 2011 (18 times higher), and two times higher in malaria death from 380 deaths occurred in 2011 up to 715 malaria related deaths by the years of 2016 [9].

Since 2016, Rwanda has followed global initiatives for malaria control and adopted extension of district to be sprayed up to 15 targeted IRS districts which are highly burdened by malaria in Rwanda [11].

Methods

Study design

Quantitative research was applied in this study throughout a cross sectional study design as the framework to determine the level of community engagement, test the relationship between associated factors and attempt to answer the research questions of this study.

Study population

According to the Rwanda Malaria and NTD annual report 2019/2020, the last IRS session conducted in Bugesera in March 2020 was targeting 376,365 population living in 93,306 structures (MoH, 2020). Specifically, this study targeted one of family member, preferably chief of the household where applicable regardless their status in line with last IRS.

Sample size and sampling procedure

The study was conducted in Bugesera District and a total of 385 chiefs of the household from selected sectors was recruited to participate in the study. This study, probability sampling throughout cluster sampling technique was applied based on each sector as administrative entity. The size of sample was determined from target population regardless their sectors, but during sampling procedure, sample was taken representatively in a way each sector was represented in sampled number.

Data management

Data analysis started up with data processing including gathering questionnaire, data entry into computer software program which was Statistical Package for the Social Sciences (SPSS. V21), cleaning and coding for quantitative data.

Data analysis and ethical consideration

Deep analysis was carried out through different chapters of that software based on evaluated variables. Univariate analysis with the help of frequency, mean and percentage was performed. The associated factors for community engagement were determined using chi-square test and the strength of association was assessed using multilogistic regression. Confidence interval of 95% and p-value less than 5% was considered statistically significant for those regressions of associated factors. After obtaining permission from MKUR research ethical committee to conduct this research thesis, researcher proceeded to seek for authorization from Bugesera District authority before any attempt of data collection. Thereafter, researcher clearly explained to the participants the purpose of this study, procedure, benefit and risk related to data collection and data management, and then ask for their informed Consents to participate voluntarily in this study.

Ethical consideration

After obtaining permission from MKUR research ethical committee to conduct this research thesis, researcher proceeded to seek for authorization from Bugesera District authority before any attempt of data collection.

Results

Socio-demographic and economic characteristics of respondents

Bugesera district comprise 15 administrative sectors. As indicated in chapter three, the representativeness of research findings would be based of sample taken from each sector according to the study sample size versus size of sector population. The following table 1 indicates socio-demographic and economic characteristics of 385 (100%) respondents. All of them had been reached and data collected through face- to- face interview by data collectors.

Variables		Frequency	Percentage (%)
Age group (Mean age = 41 years)	Under 22	6	1
	22 - 34	109	28
	35 - 47	173	44
	48 - 60	67	17
	61 and Older	30	7
Gender	Male	231	60
	Female	154	40
Marital status	Single	43	11
	Married	288	74
	Widow(er)	36	9
	Divorced	6	1
	Separated	12	3
Chief of the household	Yes	296	76
	No	89	23

Level of education	Illiterate	46	11
	Primary	244	63
	O’Level	21	5
	Secondary	55	14
	University	19	4
Religion	No religion	28	7
	Christian	332	86
	Muslim	25	6
Occupation	Famer	316	82.1
	Student	10	2
	Business	35	9.1
	Civil servant	20	5
	Security agent	4	1
	Total	385	100

Table 1: Socio-demographic and economic characteristics of respondents.
Source: Primary data.

As indicated in table 1, of 385 respondents in this study, 173 (40%) were aged between 35 and 47 years old and the lower portion was under 22years aged group with 1% while the mean-age of all respondents was 41 years. It also shows that 231 (60%) were male, 154 (40%) were female and 288 (74%) of respondents were married by marital status. The proportion of 76% of the respondents were chief of household and most of respondent 244 (63%) completed primary education. Farming is the predominant occupation/profession with 82.1% followed by businesspersons with only 9.1% while the lowest portion was security agent with only 1% of all respondents.

Presentation of findings

In this study, findings were presented according to the research objectives, which are to determine the level of community engagement, identify approaches used by IRS technical team for community mobilization towards indoor residual spraying, and to determine factors contributing to the community engagement towards indoor residual spraying for malaria control in Bugesera District of Rwanda.

Level of community engagement towards IRS in Bugesera district

The objective one was to determine the level of community engagement towards IRS for Malaria control in Bugesera District of Rwanda and was measured by score assessment variables as presented in the below table. Series of eight statements in the table 2 were used to determine the level of community engagement, all statements are positive with an overall score of 24, and its mean is “8” for community engagement.

Variables	Not at all n (%)	Sometimes n (%)	Frequently n (%)	Most frequent n (%)
To attend IRS meeting	87 (22)	194 (50)	88 (22)	16 (4)
To accept house spraying	9 (2)	83 (21)	182 (47)	111 (28)
Involved in planning for IRS	50 (12)	276 (71)	53 (13)	5 (4)
Involved in scheduling for house spraying	330 (85)	52 (13)	3 (1)	0 (0.0)
Involved in implementation of IRS	41 (10)	244 (63)	89 (23)	11 (2)
Chance to provide feedback about complaints	210 (54)	164 (42)	11 (2)	0 (0.0)
Occasion to provide opinions regarding IRS	208 (54)	160 (41)	14 (3)	3 (0.99)
Feel comfortable with methodology used during IRS	11 (2)	42 (10)	212 (55.1)	120 (31)

Table 2: Community engagement scores.
Source: Primary data.

The above table 2 of community engagement score shows that 194 (50%) of respondents had sometimes attended IRS meeting while 87 (22%) did not and only 16 (4%) had most frequently attended meeting talking about IRS implementation. More than 75% did frequently accept house spraying whilst only 9 (2%) did never accept freely house spraying. Of 385 respondents, almost 71% had sometimes involved in planning but about 330 (85%) had never involved in scheduling for house spraying. Greatly, the majority of respondents (63%) had sometimes involved in implementation of IRS. Withal, majority of respondents (54%) did never get chance to provide feedback and or IRS related complaints and the same portion also did never get chance to provide their opinions regarding the good implementation of IRS. But happily, most of respondents 212 (55.1%) had always felt comfortable with methodology used during IRS implementation.

Overall score of the level of community engagement towards IRS in Bugesera district

As described in table 2, eight (8) positive statements were used to determine the level of community engagement where the overall score was 24 and the mean-score was “8” for community engagement. All respondents with score less than the mean had been considered to have low level whilst those with score greater than the mean had been considered to have high level of engagement within indoor residual spraying implementation in Bugesera district of Rwanda. The scores were zero, one, two and three for Not at all, Sometimes, Frequently and Most frequent respectively. The results were presented in the following figure 1.

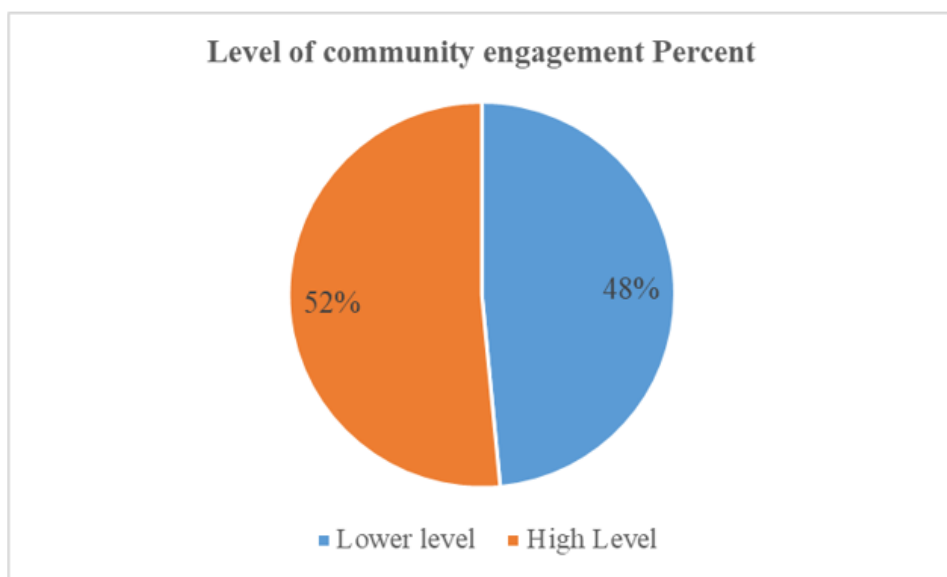


Figure 1: Overall score of the level of community engagement towards IRS.

Above figure 1 indicates that slightly more than half of the respondents 52% had high level of engagement while another portion like 48% had low level of engagement as community in IRS implement to control malaria in Bugesera District, Rwanda.

Approaches used for community mobilization

The second objective of this study was to identify approaches used by technical team to mobilize community for IRS implementation. Those approaches were identified through frequency analysis and presented in frequency table 3 as shown below.

Variables		Frequency	Percent (%)
Ways of communication for IRS	Radio	30	7.0
	Posters	2	0.0
	CHWs	183	47.0
	Church	30	7.0
	Local leaders	140	36.0
Informed about IRS schedule	Yes	251	65.0
	No	134	34.0
IRS Operators behaved well	Yes	363	94.0
	No	22	5.0
House sprayed	Yes	348	90.0
	No	37	9.0
Reason to not be sprayed	Refused	8	2.1
	Absent	13	3.0
	Unknown reason	2	0.0
	Have newborn	10	2.0
	Other reason	4	1.0
	Missing	348	90.0
Present at home during house spraying	Yes	326	84.0
	No	59	15.0
Where you have been	Farming	8	2.1
	House not sprayed	25	6.0
	At market	4	1.0
	At work	17	4.0
	To the hospital	4	1.0
	Missing	327	84.0
IRS benefit	Malaria prevention	293	76.0
	Prevent house's insects	11	2.0
	Killing mosquitoes	81	21.0
IRS efficacy	No efficacy	7	1.0
	Moderate efficacy	153	39.0
	High efficacy	225	58.0
Willingness to uptake IRS	Strongly agree	274	71.0
	Agree	103	26.0
	Disagree	5	1.0
	Strongly disagree	3	0.0
Desired IRS frequency	Quarterly	64	16.0
	Every six months	252	65.0
	Yearly	59	15.0
	Every two years	2	0.0
	Never again	8	2.1

Table 3: Approaches used for community mobilization.

Source: Primary data.

Throughout the above table 3 helped to identify main ways of communication used by technical team prior IRS implementation where the majority 183 (47%) of respondents had been communicated through CHWs followed, 140 (36%) reported to be communicated through local leaders and radio and churches' communication reached to 7% each while only 2 (0.0%) had been communicated through IRS posters. Also, in the table 2 shows that 65% had were informed on IRS schedule and 84% were present during their house spraying. However, 76% of respondents know well the benefit from IRS, 58% reported that IRS has high efficacy and 71% were strongly agree to uptake IRS.

Factors associated with community engagement towards IRS in Bugesera district

Objective three of this study was to determine factors contributing to the community engagement towards indoor residual spraying for malaria control in Bugesera District and was calculated using score assessment of variables presented in the following table 4.

Variables		Lower-level n (%)	High Level n (%)	p-Value
Gender	Male	95 (41)	136 (58)	0.001
	Female	91 (59.1)	63 (40.0)	
Age Group	under 22	4 (66.0)	2 (33.0)	0.211
	18 - 34	76 (52.4)	69 (47.6)	
	35 and above	110 (45.8)	130 (54.2)	
Marital status	Single	21 (48.0)	22 (51.0)	0.005
	Marrried	128 (44.0)	160 (55.0)	
	Widow (er)/ Divorced/ Separated	37 (68.0)	17 (31.0)	
Chief of the household	Yes	130 (43.0)	166 (56.1)	0.002
	No	56 (62.0)	33 (37.1)	
Educational level	Illiterate	29 (63.0)	17 (36)	0.103
	Primary	113 (46.3)	131 (53.7)	
	Secondary and beyond	44 (46.3)	51 (53.7)	
Religion	No religion	14 (50.0)	14 (50.0)	<0.001
	Christian	163 (49.1)	169 (50.0)	
	Muslim	9 (36.0)	16 (64.0)	
Occupation	Famer	144 (45.6)	172 (54.4)	0.001
	Civil servant	12 (40.0)	18 (60.0)	
	Private	30 (76.9)	9 (23.1)	
Chronical illness	Yes	50 (51.0)	48 (48.0)	<0.001
	No	136 (47.0)	151 (52.0)	
Allergy to pesticide	Yes	21 (80.0)	5 (19.0)	0.001
	No	165 (45.0)	194 (54.0)	
Living house	Own house	144 (46.8)	164 (53.2)	0.221
	Rent	42 (54.5)	35 (45.5)	
Ways of communication for IRS	Mass media	19 (59.4)	13 (40.6)	0.372
	CHWs	89 (48.6)	94 (51.4)	
	Local leaders	78 (45.9)	92 (54.1)	
Willingness to uptake IRS	Agree	178 (47.2)	199 (52.8)	0.372
	Disagree	8 (100.0)	0 (0.0)	

IRS benefit	Killing mosquitoes	179 (47.9)	195 (52.1)	0.302
	Killing house's insects	7 (63.6)	4 (36.4)	
IRS side effect	Yes	25 (78.0)	7 (21.0)	<0.001
	No	161 (45.0)	192 (54.0)	
Desired IRS frequency	Less yearly	135 (42.7)	181 (57.3)	<0.001
	Yearly	43 (70.5)	18 (29.5)	
	Never again	8 (100.0)	0 (0.0)	
Present at home during last IRS	Yes	144 (44.0)	182 (55.0)	<0.001
	No	42 (71.0)	17 (28.0)	
IRS operators behaved well	Yes	167 (46.0)	196 (53.0)	<0.001
	No	19 (86.0)	3 (13.0)	

Table 4: Factors associated with community engagement towards IRS in Bugesera District (Bivariate analysis).
Source: Primary data.

As indicated in the above table 4, gender, chief of household, religion, occupation and chronic illness were statistically associated with community engagement towards IRS in Bugesera District with P-value range between < 0.001 - 0.005 as calculated to 95% CI. Also, history of allergy to pesticide, group of residence, IRS side effect, desired IRS frequency, to be present at home during last IRS, as well as behavior of IRS operators shown statistical significance association with community engagement with P-value < 0.001 calculated to 95% CI.

Variables		AOR Lower	95% C.I. for AOR		P-Value
			Upper		
Gender	Male	2.141	1.408	3.254	< 0.001
	Female	Ref			
Marital status	Single	2.280	0.995	5.224	0.051
	Married	2.721	1.464	5.055	0.002
	Widow (er)/Divorced/Separated	Ref			
Chief of household	Yes	3.000	1.000	8.033	0.005
	No	Ref			
Religion	No religion	0.484	0.157	1.491	0.206
	Christian	0.501	0.211	1.188	0.117
	Muslim	Ref			
Occupation	Farmers	3.891	1.830	8.660	< 0.001
	Civil servants	5.000	1.762	14.192	0.002
	Private	Ref			
Chronic illness	Yes	Ref			
	No	1.000	0.001	1.120	< 0.001
Allergy to pesticide	Yes	Ref			
	No	3.750	1.306	10.766	0.014
IRS side effect	Yes	Ref			
	No	2.506	0.995	6.312	0.051
Informed about IRS schedule	Yes	2.303	1.479	3.587	< 0.001
	No	Ref			
IRS operators behaved well	Yes	4.000	1.013	16.000	0.048
	No	Ref			
IRS benefit	Killing mosquitoes	Ref			
	Killing house's insects	0.525	0.151	1.822	0.310

Table 5: Factors associated with community engagement towards IRS in Bugesera District (Logistic regression analysis).
Source: Primary data.

The study findings revealed that, males are more likely to be engaged towards IRS implementation with [AOR = 2.141, 95%CI = 1.408 - 3.254 and P = < 0.001] compared to females. For marital status, the participants who were married, widower and divorced were 2 times more likely to be engaged towards IRS implementation [AOR = 2.721, 95%CI = 1.464 - 5.055 and P = 0.002] compared to separated ones. Farmers and civil servants were more likely to be engaged towards IRS implementation [AOR = 3.891, 95%CI = 1.4830 - 8.660 and P = <0.001] and [AOR = 5.000, 95%CI = 1.762 - 14.192 and P = 0.002] respectively, compared to participants who have been working privately. The households who were not allergic to pesticides were more likely to be engaged towards IRS implementation [AOR = 3.750, 95%CI = 1.306 - 10.766 and P = 0.014] compared to those who were allergic to pesticides. The participants who had been informed before about IRS schedule were more likely to be engaged towards IRS implementation [AOR = 2.303, 95%CI = 1.479 - 3.587 and P = < 0.001] compared to participants had been not informed before about IRS schedule. The way that IRS operators behaved has been shown to be the factor which contributed to engagement of participants towards IRS implementation, where they behaved well, the participants were more likely to be engaged towards IRS implementation [AOR = 4.000 95%CI = 1.013 - 16.000 and P = 0.048] compared to participants whose their IRS operators didn't behave well.

Discussion and Conclusion

This section contained discussion of similarities and contrast between key finding from this study and what other studies had revealed previously according to the study objectives, which was to determine the level of community engagement towards IRS, identify approaches used by IRS technical team to mobilize community and to determine factors associated with CE towards indoor residual spraying for malaria control in Bugesera District of Rwanda.

The present study findings found that a bit higher than half (52%) of respondents were scored with high level of community engagement towards indoor residual spraying for Malaria control in Bugesera District of Rwanda. Of them, over 70% were highly willing to uptake IRS and most of them either 76% were correctly aware of IRS benefit and 58% ranked IRS to be highly effective. However, this study revealed that almost 90% of respondents reported that their houses were sprayed during previous IRS and only 15% were absent during their house spraying.

Similarly, to study conducted in Tororo District of Uganda in 2018, whereas researcher used a household survey to assess the willingness and factors associated to IRS uptake. His study findings revealed that 78% were willing to uptake IRS but they did not determine the level of community engagement towards IRS [12]. In the same country but different researchers within different study area, results of the study conducted from Soroti District shown that less than half of the respondents 48% were knowledgeable about IRS compared with 76% of community awareness towards IRS in Bugesera District of Rwanda [13]. In Mozambique, study findings revealed that barriers related to the IRS refusal were but not limited to the performance of IRS operators, negative experience from previous IRS, difficult to remove some heavy household assets and these parameters were not mentioned in this present study [14].

Nevertheless, this study has identified approaches used by IRS technical team to mobilize community, and it revealed that most of respondents had been communicated about IRS through CHWs 47% and local leaders 36%. Although, more than 80% of respondents reported that they were frequently comfortable with methodology used during house spraying and 94% of respondents reported that IRS operators behave well. Differently, in Tororo District of Uganda, study findings shown that most of community were communicated through churches [12]. And in Mozambique, study finding revealed that the most barriers to IRS acceptance were related to IRS operator's performance, conflict between leaders and peoples and the methodology used during IRS intervention [14].

Furthermore, the present study findings shown that involvement of the community in planning, scheduling and implementation were correlated with community engagement. Moreover, this study revealed that gender, occupation, history of allergy to IRS pesticide, communication of IRS schedule in the village and behaviour of IRS operators were statistically evidenced as factors associated with community engagement. Besides, study conducted from Uganda has revealed other factors different from these shown in this present, whereas advanced age (> 35 years), high socio-economic status and low knowledge about IRS benefit [12]. In otherwise, study conducted in South

Africa and Mozambique shown that main factors associated with low level of community engagement towards were involvement of community in IRS, methodology used during IRS implementation and limited knowledge about IRS benefit and efficacy [4,14].

Bibliography

1. PAHO. Manual for Indoor residual spraying in Urban area for *Aedes aegypti* control. In Journal of Materials Processing Technology (Volume 1) (2019).
2. PMI. President's Malaria Initiative - Rwanda Country Profile (2018): 3-4.
3. Tangena JAA., *et al.* "Indoor residual spraying for malaria control in sub-Saharan Africa 1997 to 2017: An adjusted retrospective analysis". *Malaria Journal* 19.1 (2020): 150.
4. Bath D., *et al.* "Effectiveness and cost-effectiveness of reactive, targeted indoor residual spraying for malaria control in low-transmission settings: a cluster-randomised, non-inferiority trial in South Africa". *The Lancet* 397.10276 (2021): 816-827.
5. WHO. "World malaria report 2019". In WHO Regional Office for Africa (2019b).
6. Hategeka C., *et al.* "Effects of scaling up various community-level interventions on child mortality in Burundi, Kenya, Rwanda, Uganda and Tanzania: a modeling study". *Global Health Research and Policy* 4 (2019): 16.
7. AIRS. Tanzania - Africa IRSTanzania - Africa IRS (2016).
8. PMI. Kenya - Vector Link (2021).
9. MoH. National Malaria Contingency plan 2016-2020.....Wikischolars.Columbia.Edu (June) (2016): 1-34.
10. MOH. Malaria Indicator Survey (MIS) 2017 (2017): 158.
11. MoH. Malaria annual report 2019-2020. Fresenius.Com (December) (2020): 2.
12. Wadunde I., *et al.* "Factors associated with willingness to take up indoor residual spraying to prevent malaria in Tororo district, Uganda: A cross-sectional study". *Malaria* 17.1 (2018): 5.
13. Ediau M., *et al.* "Community knowledge and perceptions about indoor residual spraying for malaria prevention in Soroti district, Uganda: A cross-sectional study". *Malaria Journal* 12.1 (2013): 170.
14. Magaço A., *et al.* "Community knowledge and acceptance of indoor residual spraying for malaria prevention in Mozambique: A qualitative study". *Malaria Journal* 18.1 (2019): 27.

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