

Factors associated with refusal and reluctance to Indoor Residual Spraying on Bioko Island, Equatorial Guinea

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Indoor Residual Spraying (IRS) has proven to be a robust control measure against malaria, and until 2015 it was the primary vector control strategy under the Bioko Island Malaria Control Project (BIMCP). However, its effectiveness strongly depends on public acceptance by the targeted populations. This study aims to describe IRS acceptance and to investigate factors related to refusal and reluctance amongst the populations of Bioko Island. A secondary data analysis of the 2017 annual Malaria Indicator (MIS) survey; which collected valid data on 4,835 random households, selected from every community on the Island was conducted. The multinomial logistic regression was used to assess factors associated with IRS refusal and reluctance. 39% percent of households were reported to have been sprayed (not all communities are targeted for spraying). When respondents were asked if they will like their houses to be sprayed during the next IRS round, 81.1% accepted, while 11.1% refused and 7.8% were reluctant (don't know). The reasons mostly evoked for refusals were "IRS causes ill effects" (50%) and "IRS is disruptive or annoying" (25%). Respondents belonging to the middle and high wealth categories were more likely to refuse or to be reluctant to IRS; those living in households with heads having post-secondary educations were more likely to refuse IRS, and those who were not sure if their households were sprayed in the past were more likely to be reluctant to IRS. However, respondents living in the districts of Baney, Luba, and Riaba were less likely to refuse or to be reluctant to IRS when compared to Malabo. Individuals living in households that have been sprayed in the past were less likely to refuse or to be reluctant to IRS, and those previously exposed to malaria sensitization messages were less likely to be reluctant to IRS. Refusal and reluctance to IRS is almost 20% in households on Bioko Island, and are associated with socioeconomic, geographic, and educational factors. There is a need to improve malaria sensitization strategies, targeting every social class to increase IRS uptake.

Character count with no space: 1,712

Factors associated to refusal and reluctance to Indoor Residual Spraying by Program Participants Living on Bioko Island, Equatorial Guinea

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RATIONAL

Indoor Residual spraying (IRS) is a powerful control measure against malaria, and is a primary tool in the Bioko Island Malaria Control Program (BIMCP) prevention strategy. The WHO recommends this intervention if 85% of the target population receives IRS. The BIMCP has deployed IRS as a large scale interventions on Bioko since 2004; and together with other interventions like Long Lasting Insecticidal Nets (LLINs) distribution, case management, vector monitoring, behavioral change communication, and larviciding, has contributed a reduction in malaria prevalence from 45% in 2004 to 11% in 2017 (Cooks *et al.*, 2015). Since 2015 a stratification model in which only communities with a malaria prevalence >10% and with high population densities received the intervention. In pursuit of achieving malaria elimination on Bioko, there is a need to refine core interventions. One refinement is to increase the effectiveness of IRS through increased and durable acceptance of IRS by the targeted participant population.

This poster analyses factors related to IRS acceptance and identifies factors predicting refusal, e.g. outright refusal of the intervention, and reluctance, e.g. requiring multiple visits by both community outreach teams and IRS spray teams before household accepts intervention, amongst targeted populations on Bioko to receive IRS.

METHODS

- In 2017, 17,569 houses and 68,772 rooms were sprayed in 110 communities using an organophosphate insecticide (Actellic 300CS); for a total spray coverage of 75% of the targeted population.
- Each year, the BIMCP and the Ministry of Health and Social Welfare (MoHSW) conduct an annual Malaria Indicators Survey (MIS) to evaluate the project's impact.
- Data included in this study are: household characteristics (age, gender, wealth, head of household education level), residency in an urban or rural district, past IRS acceptance, exposure to malaria mass communication messages, and knowledge about IRS to determine odds of IRS acceptance (both refusal and reluctance).
- A secondary data analysis of the 2017 MIS data (n = 4,835 households), using a multinomial logistic regression assessed factors associated with IRS refusal and reluctance. Principal component analysis was used to develop a composite score for Wealth index and ORs were used to measure association.

RESULTS

Table 1. Factors associated to refusal and reluctance to IRS

Factors	Would you want your house to be sprayed next year?				aOR (95% CI)	
	Total	Accepted (%)	Refused (%)	Reluctant (%)	Refused	Reluctant
Age in Years						
<20	310	66.8	16.5	16.7	Ref	Ref
20-29	1697	76.4	12.6	10.9	0.6 (0.4 – 0.9) *	0.6 (0.4 – 0.9) *
30-39	1383	83.6	11.1	5.3	0.5 (3.7 – 7.9) *	0.3 (0.2 – 0.4) *
40-49	673	85.8	8.9	5.2	0.5 (3.1 – 7.7) *	0.3 (0.21 – 0.5) *
50+	773	88.6	7.5	3.9	0.4 (0.3 – 0.7) *	0.2 (0.1 – 0.4) *
Gender						
Male	2086	84.2	8.4	7.4	Ref	Ref
Female	2750	78.8	13.2	8.0	1.6 (1.3 – 2.0) *	1.0 (0.8 – 1.3)
Wealth index						
Lowest	978	85.4	7.8	6.7	Ref	Ref
First	960	83.4	10.3	6.3	0.9 (0.7 – 1.4)	0.8 (0.5 – 1.3)
Second	966	82.1	10.5	7.4	0.9 (0.7 – 1.4)	0.9 (0.7 – 1.4)
Third	970	79.9	12.5	7.5	1.2 (0.8 – 1.6)	1.1 (0.7 – 1.6)
Highest	962	74.5	14.5	10.9	1.3 (0.9 – 1.8)	1.6 (1.1 – 2.3) *
District						
Urban (Malabo)	3558	78.5	13.0	8.5	Ref	Ref
Semi Urban (Baney)	646	83.9	8.1	8.1	0.6 (0.4 – 1.1)	1.0 (0.5 – 1.8)
Semi Urban (Luba)	437	92.5	4.1	3.4	0.4 (0.3 – 0.7) *	0.5 (0.3 – 0.9) *
Rural (Riaba)	194	93.8	2.1	4.1	0.2 (0.07 – 0.7) *	0.6 (0.3 – 1.3)
Level of education of household head						
None	111	84.7	5.4	9.9	Ref	Ref
Primary	723	87.4	7.5	5.1	1.2 (0.5 – 2.8)	0.5 (0.2 – 1.1)
Secondary	1987	83.4	10.5	5.9	1.6 (0.6 – 3.5)	0.5 (0.2 – 1.0)
Post-secondary	1188	77.1	14.1	8.8	1.8 (0.7 – 4.2)	0.6 (0.3 – 1.2)
Don't know	826	75.2	12.1	12.7	1.5 (0.6 – 53.8)	0.9 (0.4 – 1.8)
Household sprayed 12 months before interview						
No	2401	77.1	15.3	7.5	Ref	Ref
Yes	1909	90.1	5.5	4.4	0.3 (0.2 – 0.4) *	0.5 (0.4 – 0.8) *
Not sure	525	66.5	12.6	20.9	0.9 (0.7 – 1.2)	3.1 (2.4 – 3.9) *
Exposure to malaria message						
No	2560	79.7	11.5	8.9	Ref	Ref
Yes	2123	83.1	10.6	6.3	0.9 (0.7 – 1.1)	0.7 (0.5 – 0.9) *
Don't remember	152	77.6	11.8	10.5	1.1 (0.6 – 1.8)	1.2 (0.7 – 2.2)
Knowledge of IRS as malaria prevention method						
No	4055	80.6	11.4	7.9	Ref	Ref
Yes	780	83.7	9.6	6.7	0.8 (0.6 – 1.0)	0.7 (0.5 – 1.0)

* p value <0.05

In the multinomial logistic regression, the category "accepted" was set to be the base outcome and results are presented as adjusted OR (95% CI)

DISCUSSION

- 39.5% (95% CI: 38.1% - 40.9%) of houses were reported to have been sprayed. This seems very low because not all communities on the Island were sprayed during round 24 in 2017; whereas communities which were not eligible for IRS were also included in the MIS sampling frame.
- When respondents were asked if they would like their houses to be sprayed during the next IRS round, 81.1% affirmed that they would, while 11.1% refused and 7.8% were reluctant/hesitant (don't know). Refusals cited "IRS causes ill effects" (25%) and "IRS is disruptive or annoying" (23%) as the main reasons for refusal.
- Wealthier respondents and respondents under the age of 20 were more likely to be reluctant to accept IRS.
- Respondents under the age of 20 and female respondents were more likely to refuse IRS.
- Respondents living semi urban and rural areas (Baney, Luba and Riaba); older respondents were more likely to accept IRS; those living in households that reported having been sprayed in the past 12 months; and those who had been exposed to malaria related messages in the past were more likely to have accepted IRS.
- Findings in Uganda, indicate that perceived adverse effects of IRS a common reason for refusing the intervention (Wadunde *et al.*, 2018).

Conclusion

Behavioral change communication should target urban residents, females, and head of households under the age of 20 to reduce the likelihood of reluctance and/or refusal of IRS. The wealthiest households on Bioko might be excluded from future IRS campaigns. Communication strategies may have to address safety concerns, and this message might be further targeted based on urban/rural residency and gender. Further study is required, and ideally will seek to conduct predictive models in the future.

REFERENCES

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ACKNOWLEDGEMENTS

- Ministry of Health and Social Welfare, Equatorial Guinea,
- Bioko Island Malaria Control Project Team and MCDI
- The Funders: Marathon Oil Noble Energy, Atlantic Methanol, GEPetrol, Sonagas and the Government of Equatorial Guinea.