Community engagement and the use of household mapping to target sensitization and improve IRS coverage on Bioko Island

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Since its inception in 2004, the Bioko Island Malaria Control Project (BIMCP) has relied on Island-wide IRS as one of the major malaria vector control strategies. Since 2015, the strategy has focused on targeting high-risk communities for IRS. Communities are selected by stratification based on high prevalence of malaria. However, not only does IRS coverage depends on public acceptance, but it is also highly dependent on the veracity and the accuracy of the data. It is challenging to accurately monitor IRS field operations, refusals in the population, and perform quality control on IRS activities. To reduce these challenges, the BIMCP began using spatial data to improve intervention coverage and collaborating with community leaders to support and strengthen IRS sensitization across the Island. In 2014, the Island was mapped into official government recognized communities and divided into grid sectors. Each household was then enumerated and assigned a unique identifier, which was placed on a sticker on the front door. A Campaign Information Management System (CIMS) was developed to track interventions at the household level on a longitudinal basis. IRS field data were entered directly into the CIMS tablet application and uploaded to a cloud server, enabling multiple household interventions spanning multiple years to be linked by a common unique identifier. Before mapping was introduced, IRS coverages were reportedly very high (above 90%). After mapping was introduced and data entry standardized, IRS coverage dropped to 57% during round 19 in 2014 and subsequently to 41% during round 20 the same year. After the engagement of the Ministry of Interior of Equatorial Guinea, in charge of community leaders, the support provided by these community leaders during mobilization and sensitization activities, increased IRS coverage to 81%, 71% and 82% in 2015, 2016 and 2017 respectively. The use of the CIMS, the mapping of households to systematically track IRS activities and data, led to targeted mobilization and sensitization through community leaders in identified high refusal areas for IRS, resulting in increased coverage.

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BACKGROUND

For IRS interventions to provide a high level of community protection against malaria, sustained coverage of 85% or more of all structures in the community that are potential vector resting places should be sprayed with insecticides. Sustaining WHO recommended level of coverage remains a challenge for IRS campaign programs. Accurate data on households are needed to determine IRS coverage in a given population. IRS and long-lasting insecticidal nets (LLINs) has been used as core malaria vector control interventions since the implementation of the Bioko Island Malaria Control Project (BIMCP) in 2004. Together with effective case management these interventions have reduced malaria parasite prevalence on Bioko Island from 43.3% at baseline of the interventions in 2004 to 10.5% in 2016 (Bradley et al.2015; Cook et al., 2018). Over the years, the BIMCP IRS program has been refined to address challenges with tracking and reporting accurate IRS coverage and community adherence to IRS. Two important tools are Open Data Kit (ODK), and GIS-based Campaign Information Management System (CIMS). This poster presents findings on how the introduction of ODK and CIMS improved the accuracy of the BIMCP IRS coverage and the role community leaders played in IRS sensitization to improve community acceptance of IRS across the Island.

Objective
1. To find out if community engagement using community leaders could improve IRS adherence on Bioko Island.

RESULTS

- Before the use of GIS-CISM, spray operators reported coverage (mean coverage = 81.1%) was inconsistent with annual Malaria Indicator Surveys (MIS) reported coverage (mean coverage = 52.5%).
- When the GIS-CIMS was introduced in 2014, houses could easily be traced for verification, the IRS reported coverage (57%) aligned more closely with MIS reported IRS coverage (60%).
- BIMCP IRS coverage was confirmed to fall well below WHO recommended coverage (≥85) for community level protection against malaria.
- Using community leaders to advocate for IRS acceptance, the IRS coverage rose from 57.0% in 2014 to a mean of 80.9% between 2015 and 2018. GIS-CIMS ensured that these coverage rates are reliable.
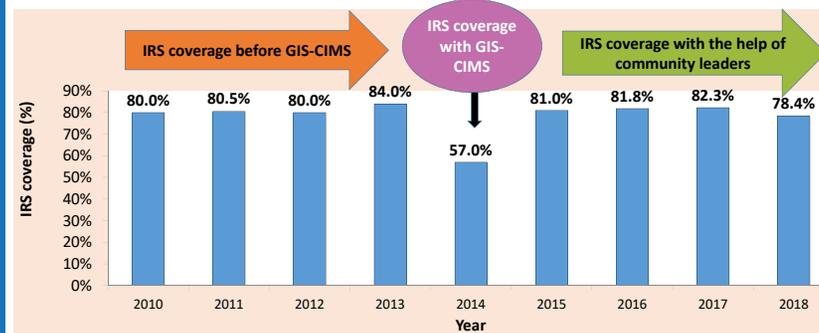
IRS coverage before GIS-CIMS → IRS coverage with GIS-CIMS → IRS coverage with the help of community leaders

Year	IRS coverage (%)
2010	80.0%
2011	80.5%
2012	80.0%
2013	84.0%
2014	57.0%
2015	81.0%
2016	81.8%
2017	82.3%
2018	78.4%

Fig 5. IRS coverage before, during and after the introduction of GIS-CIMS with and without the support of the community leaders

DISCUSSION

The high resolution satellite imagery introduced in 2014 has improved efficiency of resource deployment in space and over time.

The ability to easily and readily locate and verify houses reportedly sprayed, eliminated substantial falsification of data by spray teams.

Targeted mop-up rendered substantially more efficient because IRS outreach staff, community representatives, and sprayers were able to readily locate specific non-compliant houses.

Households that rejected IRS were easily tracked and residents could be further engaged for sensitization.

Review meetings show that the outcomes of the malaria indicator surveys motivated community leaders to be more involved in mobilizing their communities in future rounds.

Conclusion
Engaging community leaders in IRS campaigns have significantly improved IRS coverage on Bioko Island. This was made possible with the use of GIS-based Campaign Management System and ODK testing that verified quality of spraying.

METHODS

Bioko Island
Bioko is one of the main Islands of the republic of Equatorial Guinea . The Island is located 32 km off the coast of Cameroon with a population of approximately 335,000 people (Fig.1). Malaria transmission occurs throughout the year.

Community engagement
The project team and the Ministry of Health carried out community engagement using the government administrative hierarchy.

Community leaders were engaged, to sensitize residents on the importance of malaria and IRS as a tool to malaria control.

The community leaders mobilized the community in town hall meetings. The communities were informed on knowledge, attitudes, and practices on malaria and the need to adhere to IRS. (Fig.2)

Households that rejected IRS were tracked using the satellite maps and with the help of the communities leaders, residents were approached for further sensitization and mobilization.
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Fig 1. Map of the study area

Fig 2. Town hall meetings with community leaders

Fig 3. BIMCP IRS spray team

Fig 4. Stickers with Unique household IDs

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