The use of a Campaign Information Management System for rapid and efficient mass distribution and monitoring of Long Lasting Insecticidal Nets in an urban setting of Bioko Island

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It is well established that long-lasting insecticidal nets (LLINs) can be used as a core vector control tool to reduce malaria transmission in endemic countries. LLINs provide both personal and community protection against malaria. For LLINs to provide community protection, universal coverage of every household having at least one LLIN for every two people in a given population is recommended. Ensuring universal coverage during mass distribution campaigns, and monitoring the use and durability of nets in urban settings characterized by high population density and mobility, particularly where houses are not enumerated, poses a major challenge. The Bioko Island Malaria Control Project (BIMCP) developed an Open Data Kit (ODK) and Geographical Information System (GIS) based Campaign Information Management System (CIMS) in 2014 for efficient and rapid household enumeration, LLIN distribution, and campaign monitoring on Bioko Island. The CIMS continues to be used in 2018 to carry out a mass LLIN distribution campaign on Bioko Island. Approximately 175,000 LLINs will be distributed door-to-door to a population of about 330,000 people in 85,000 households during a five-month period by a team of 50 enumerators and 100 volunteers. This system helps to identify enumerated households for field teams, facilitates revisiting closed or rejecting households to increase coverage, and can track nets distributed at the household level. Household information can be captured and analyzed in near-real-time to estimate coverages within defined geographic areas and used to allocate and mobilize additional resources if desired coverages have not been reached. The use of the CIMS tablet application has required substantial training for enumerators, but has ultimately increased operational efficiency and programmatic integrity, and has been adapted for use in multiple concurrent large-scale campaigns.
ABSTRACT

Background

Long-Lasting Insecticidal bed nets (LLINs), a core vector control tool, have been used to reduce malaria transmission in malaria endemic countries. LLINs provide both personal and community protections against malaria. For LLINs to provide community protection, universal coverage of every household having at least one LLIN for every two people is recommended in a given population (WHO, 2015). Attaining universal coverage during mass distribution campaign and monitoring the use and durability of the nets in urban settings in Africa where housing units are not properly demarcated and most often characterized by high population density and mobility is a major challenge.

Objective

To use GIS-based Campaign Information Management system (CIMS) for efficient, rapid distribution and monitoring of LLINs during mass distribution campaign on Bioko Island.

RESULTS

• During the Mass Distribution Campaign, census of households and the population was carried out on Bioko with the CIMS.
  • A total of about 70,000 houses were counted capturing a population of 238,711.
  • Taking into consideration the population of the Island, 155,855 of LLINs were distributed during the 2018 mass distribution campaign.
  • The percentage of houses that received at least 1 LLIN was 85% (Fig 7).
  • Average number of LLINs distributed per house is 2.2 (Fig 7).
  • Others important indicators that were captured using the CIMS were following:
    • Average number of persons per LLIN is 1.5
    • LLIN utilization among the general population was 47.3% (3 months after distribution) (Fig 8)
    • LLIN utilization among pregnant women was 51.9%
    • LLIN utilization among children under 5 years old was 54.6%

<table>
<thead>
<tr>
<th>District</th>
<th>Number of houses</th>
<th>Number of LLINs distributed</th>
<th>Percentage utilization</th>
<th>LLIN distribution in households</th>
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<td>100%</td>
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</tr>
</tbody>
</table>

Fig 7: 2018 LLINs coverage

Fig 8: LLINs utilization (2015 and 2018)

DISCUSSION

• The system is efficient in identifying each household for the field team, avoids duplication of nets in households, and can tracks nets distributed to individuals at the household level.
  • It provides in real time the population of the Island and the number of houses necessary for estimating the number of LLIN to purchase for mass distribution.
  • In addition, the system facilitates the collection, storage, processing and analysis of information within a very short period after the distribution.
  • Universal coverage of LLINs on Bioko island achieved during the 2018 distribution campaign however LLIN utilization remain low.

Conclusion

The GIS-CIMS in use in Bioko is efficient and adaptable operational model for massive campaign activities in large urban cities for malaria control interventions and monitoring.

REFERENCES


ACKNOWLEDGEMENTS

• Ministry of Health and Social Welfare, Equatorial Guinea,
  • Bioko Island Malaria Control Project Team and MCDI