# Campaign Management Information System (CMIS) for LLIN Mass Distributions

Guillermo Garcia, MCDI

Creciendo Sin Paludismo en Guinea Ecuatorial

Geneva, January 26, 2015

Ministerio de Sanidad y Bienestar Social · Ministerio de Minas, Industria y Energía · Marathon Oil Corporation · ne · Atlantic Methanol · EG LNG · Sonagas Sociedad Nacional de Gas, G.E. · GEP · MCDI · Texas A&M University · IVCC Combating Insect Borne Disease · SANARIA Malaria Eradication Through Vaccination · IHI Ifakara Health Institute research | training | services · La Paz

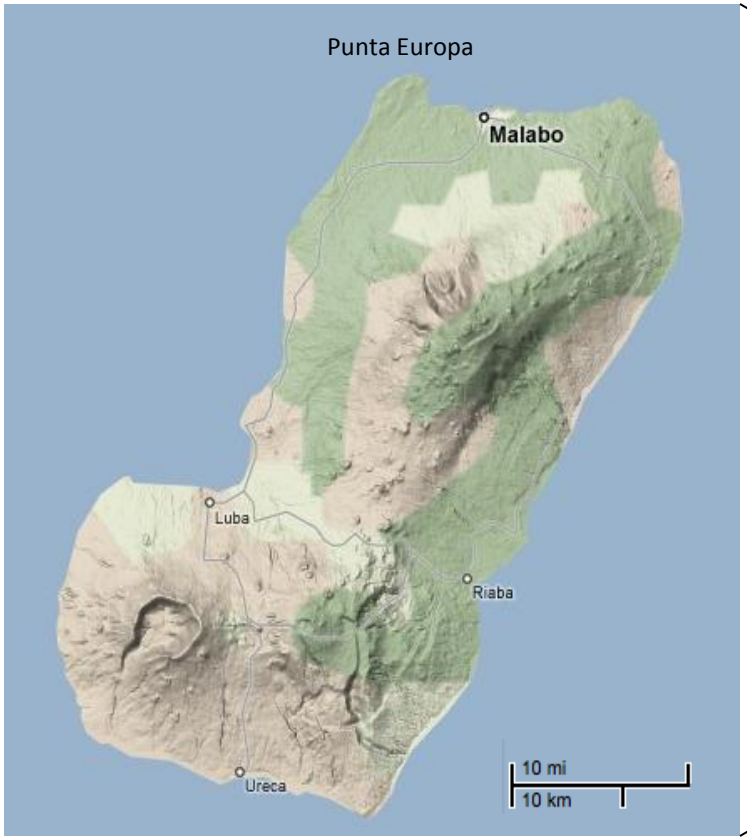
# Contents

- Bioko Island Malaria Control Project
- Malaria on Bioko
- 2014/2015 Mass LLIN Top Up Distribution Campaign
- CMIS Overview
- Architecture of the CMIS
- Logging into CMIS
- How does the CMIS work?
- CMIS and the BIMCP Mapping system
- Benefits of the CMIS
- Costs implications of the CMIS

Creciendo Sin Paludismo
en Guinea Ecuatorial

# Bioko Island, Equatorial Guinea

- Small volcanic island (2000 km$^2$)
- Population: 180,000 – 220,000 (est. 2008)
- Center of petroleum production
- **Malaria is highly endemic and has been the dominant health burden**

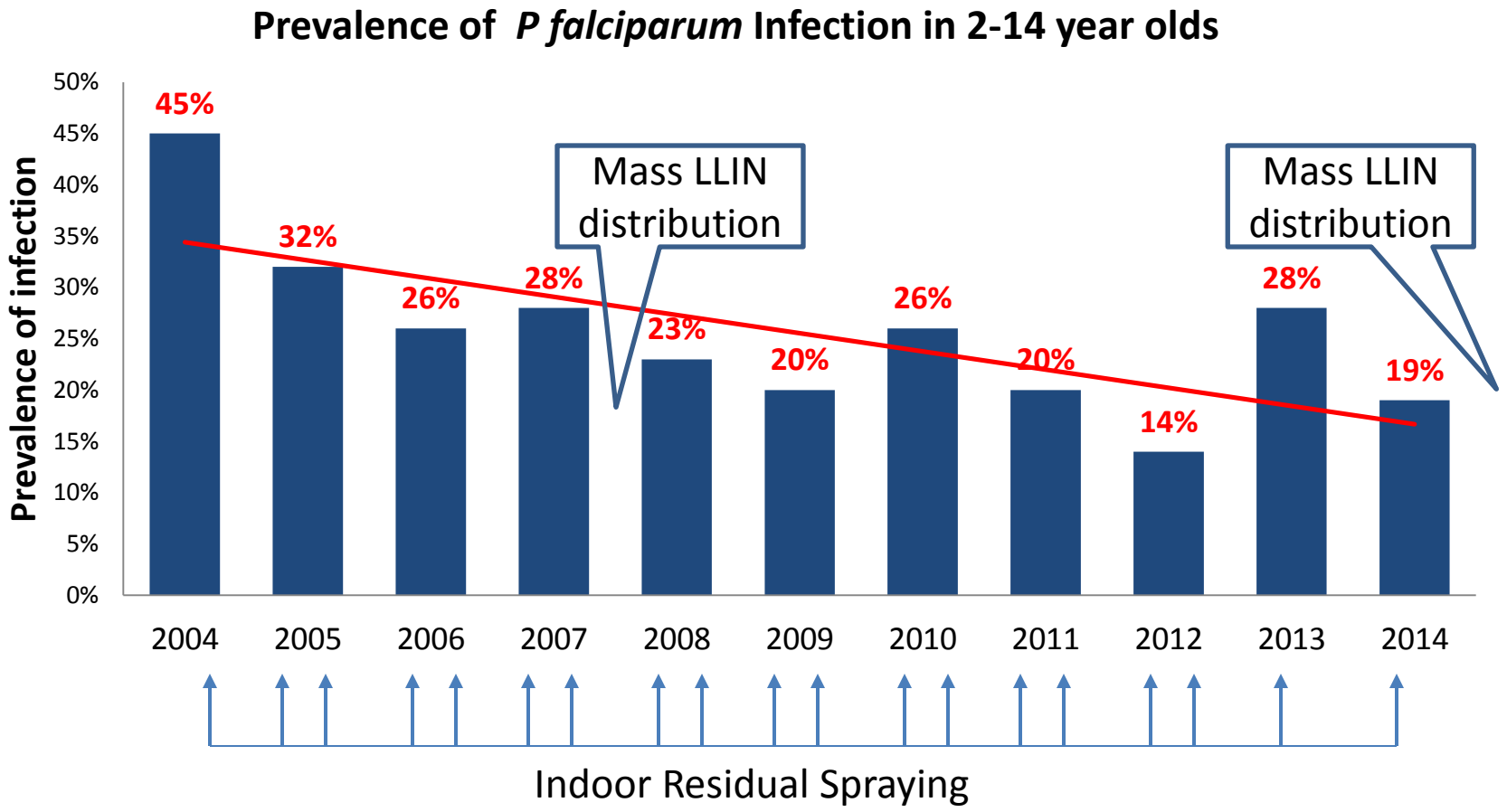


# Bioko Island Malaria Control Project

- BIMCP phase 1: 2003-2008 ($15.8 million)
- BIMCP phase 2: 2009-2013 ($28 million)
- BIMCP phase 3: 2014-2018 ($36.9 million)

- **Private Public Partnership**
  - **Donors:**
    - 65%
      - Marathon Oil Corporation
      - Atlantic Methanol (AMPCO)
      - Noble Energy
      - GEPetrol
      - SONOGAS
    - 35%
      - Government of Equatorial Guinea
  - **Implementing organizations:**
    - Ministry of Health and Social Welfare, Government of Equatorial Guinea
    - Medical Care Development International (MCDI)
    - London School of Hygiene and Tropical Medicine
    - Texas A&M University
    - Innovative Vector Control Consortium (IVCC)
    - University of Southern Maine

# Malaria on Bioko Island




- Year round transmission
- Primary vector: *Anopheles gambiae s.s.*

# 2014/15 Mass LLIN Top Up Distribution

- **Goal**: 85% coverage and utilization of LLINs
- **Distribution**: 150,000 LLINs to 220,000 people (0.7 nets per person; 2.5 nets per household; 1 net per sleeping area)
- **Timeline**: December 1st – May 31st 2015 (break from December 14 – January 26th)
- **Distribution Strategy**: House-to-house distribution by BIMCP + community team, with support of community leaders
- **Human Resources**: 200 community agents, 50 team leaders, 4 zonal supervisors; 2 store keepers; 2 coordinators
- **Logistics**: 5 pickups + 3 minibuses + 2 land cruisers
- **IEC**: mass media; engagement of local women leaders; community talks; door-to-door messaging
- **CMIS** to plan, manage and monitor LLIN distribution

# Campaign Information Management System (CMIS)

- Android based tablet application leveraging the OpenHDS and Motech platforms in an integrated application designed to plan, manage and monitor any service delivery campaigns at the household and individual level.
  - Long term goal in Bioko is to eventually use the CMIS for planning, managing and monitoring a mass malaria vaccine campaign using Sanaria's whole-sporozoite vaccine currently undergoing trials in Bioko and elsewhere.
  - Took advantage of the 2014/15 mass LLIN distribution campaign to field test the CMIS.
  - Will use the CMIS to plan, manage and monitor the 2017 mass LLIN distribution in Bioko.

# CMIS Design

- **Component 1**: **Census application** linking individuals to geo-referenced houses using tablets & cloud server
- **Component 2**: **Updating Individual identification system** (for future campaigns that require tracking individual participation – e.g., focused screening and treatment, vaccination)
- **Component 3**: **Campaign participation application** tracking households and/or individuals through stages of campaign using tablets & cloud server (e.g., LLIN distribution to households; individual participation in vaccination)
- **Component 4**: **Household and/or individual notification system** to inform target beneficiaries of campaign related activities (e.g. distribution dates; when and how to obtain LLINs if their house was missed during primary distribution campaign) via cell-phone message or calls.

# Vision of CMIS for future LLIN distributions

**MONTHS BEFORE DISTRIBUTION**

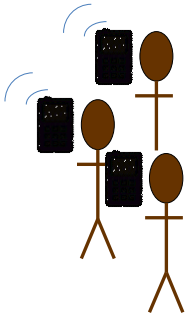
**CENSUS (OpenHDS)**: All households / individuals recorded in geo-referenced database with phone numbers

Tablet

**CENSUS (OpenHDS)**: Local leaders identified with contact info / phone numbers

**WEEK BEFORE DISTRIBUTION**

**MOTECH**: Community Leaders receive text message with timing of orientation and LLIN distribution in their area



**DAYS BEFORE DISTRIBUTION**

**MOTECH**: Residents receive text message in their language informing them when LLIN teams will be in their area

**DISTRIBUTION DAY**

**ODK**: Distribution teams visit designated areas / households, update CENSUS, record # of LLINs distributed

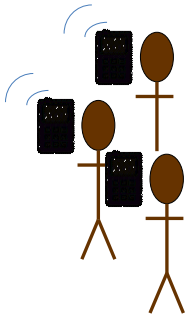
Tablet

**Server**: Data sychronized from tablets to server via cloud

**PENTAHO**: List of households that did not receive LLINs are compiled for each distribution area

Cloud Server

**MOTECH**: Community Leaders and LLIN distribution teams receive geo-referenced listing of all households that did not receive an LLIN



**MOTECH**: Households that did not receive an LLIN receive a message indicating timing of next distribution and encouraging them to be available

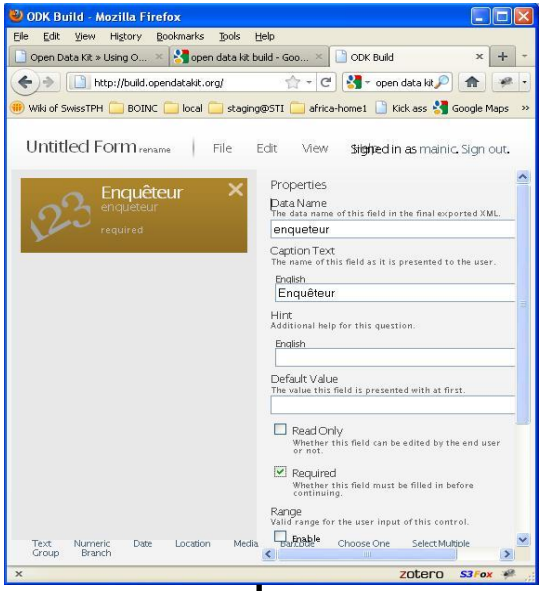
**PENTAHO**: Summary coverage reports by distribution area

**DAY(S) AFTER DISTRIBUTION**

# Architecture

## OpenHDS

## Form Design Tool




## Update Information

## Download Form

## Upload Data

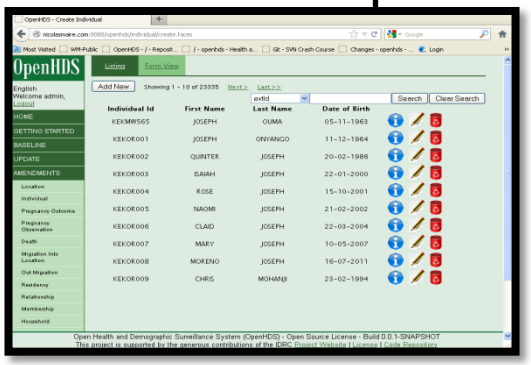
## Download HH Information

## Publish form

## ODK Aggregate Server

mirth

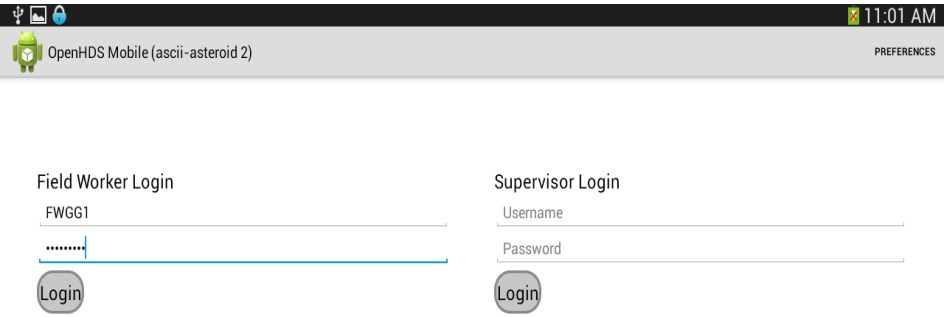
## Sync Data



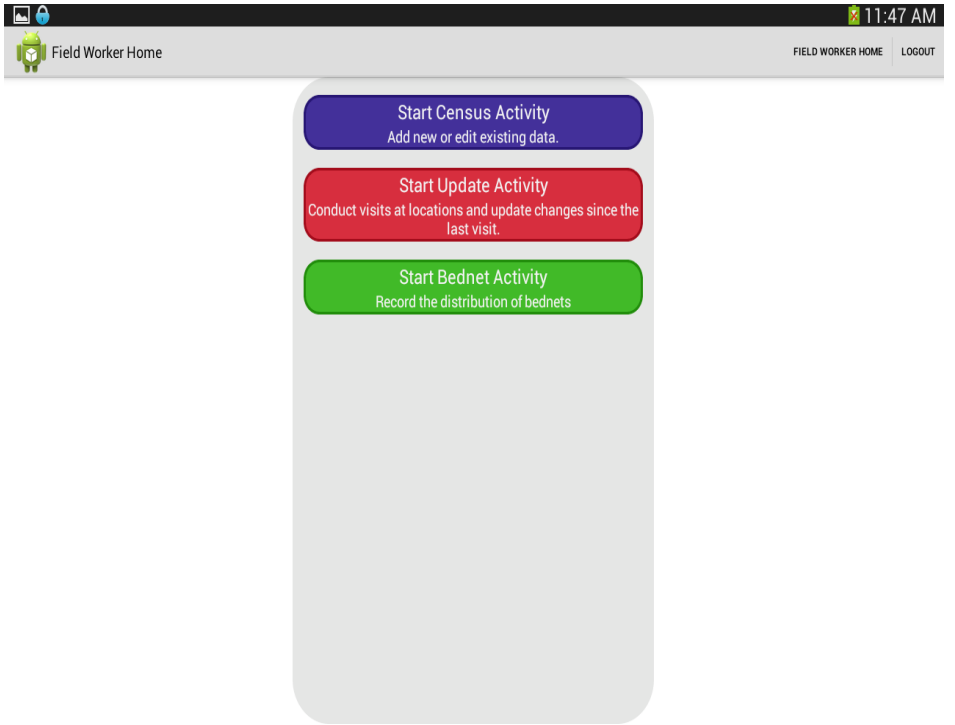

## OpenHDS

# Let's log in

## Login Screen

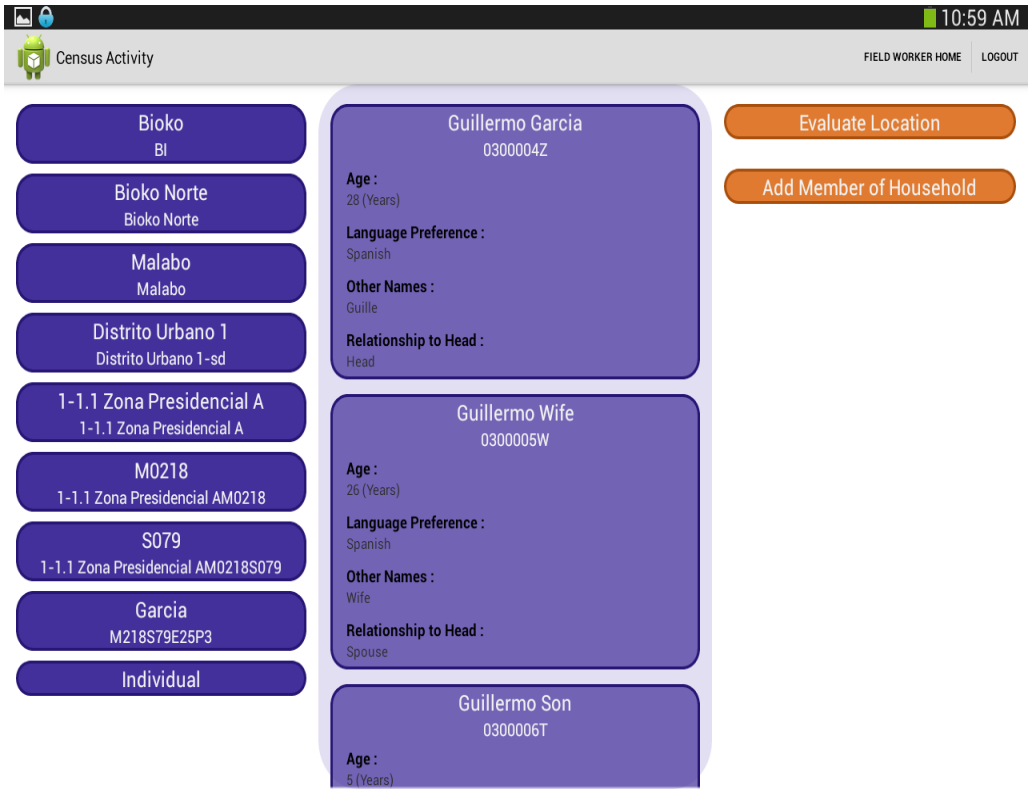



## Main Menu



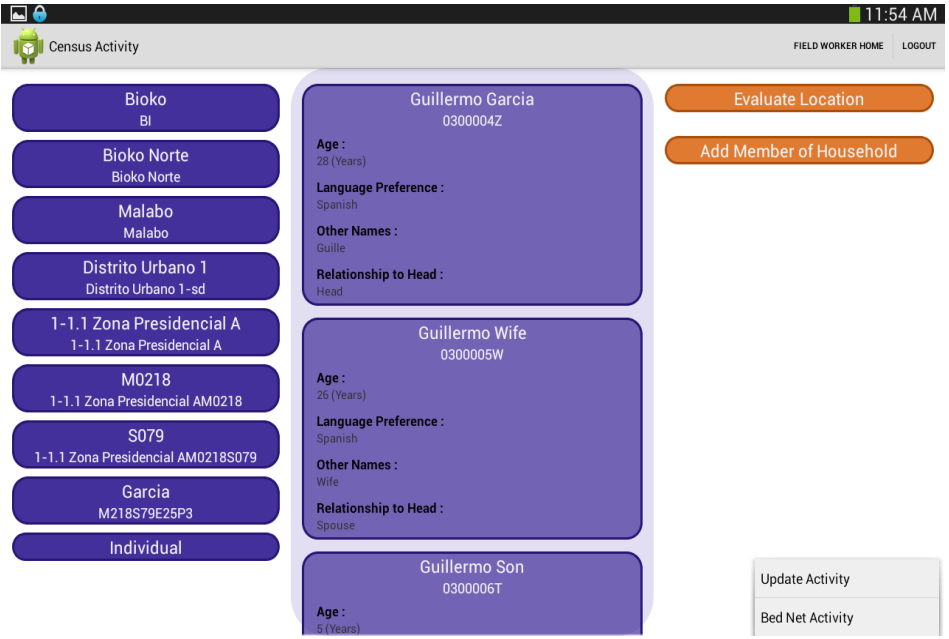
# CMIS – How does it work?

- Utilizes a Geographical Location Hierarchy as the backbone of the application.
  - Down to the Individual Level
  - Linked to geo-referenced household listings

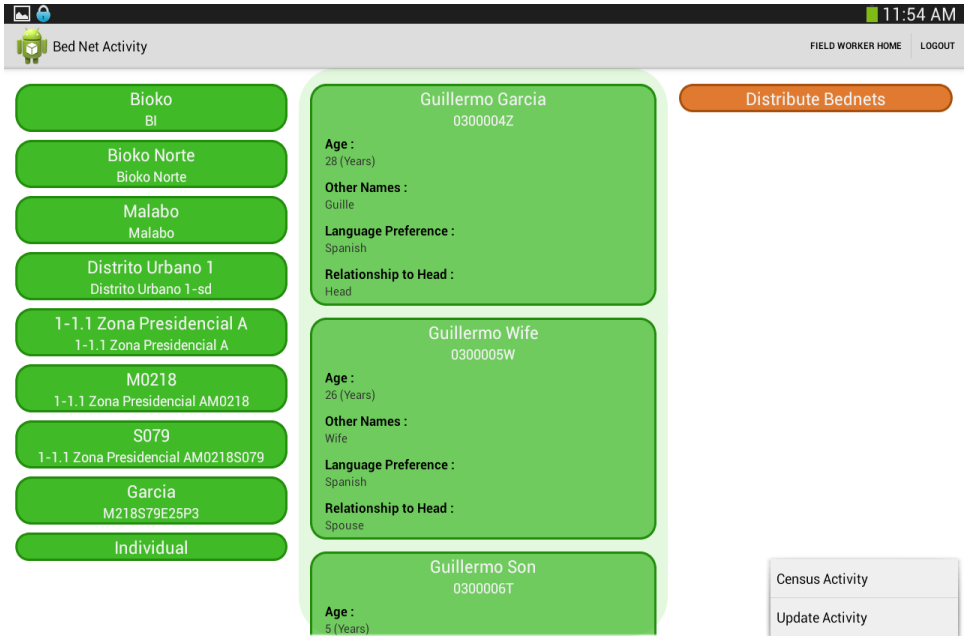


# User Interface

## Census Activity

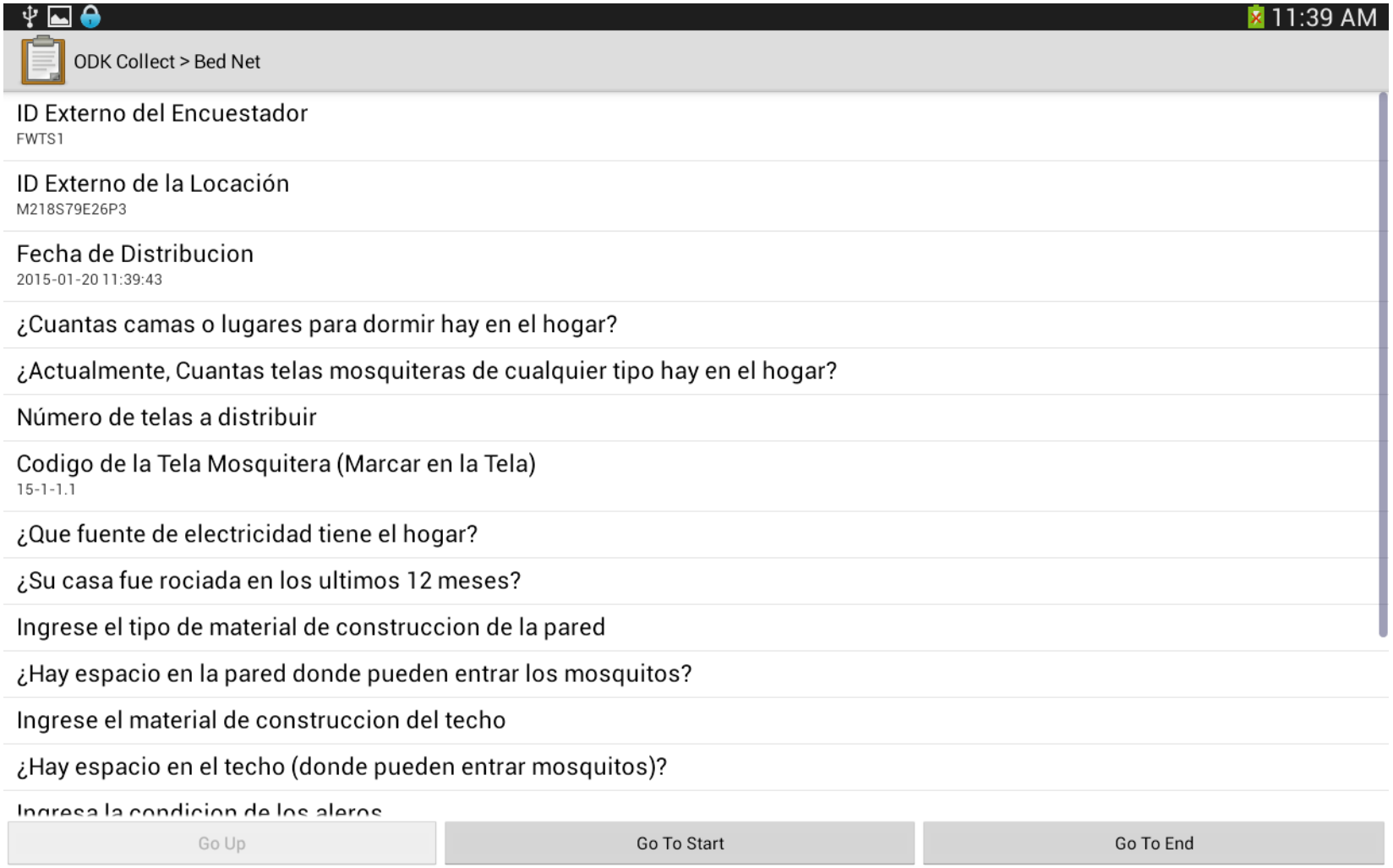



## Bed Net Activity




- Color Scheme used to facilitate data entry for beginner users

# ODK Form for Bed Net Distribution



# CMIS: Planning, Management, and Monitoring & Evaluation

- **Planning**: The household location (georeferenced maps), census and household-level LLIN distribution coverage data from the current round will provide the planning basis for the next LLIN distribution campaign in 2017.
- **Management**: Real time data on household-level LLIN distribution will enable us to efficiently and effectively manage the current distribution.
- **M&E**: Determining if we are achieving our coverage targets; determining if reaching vulnerable populations; monitoring productivity; and, evaluating our processes.

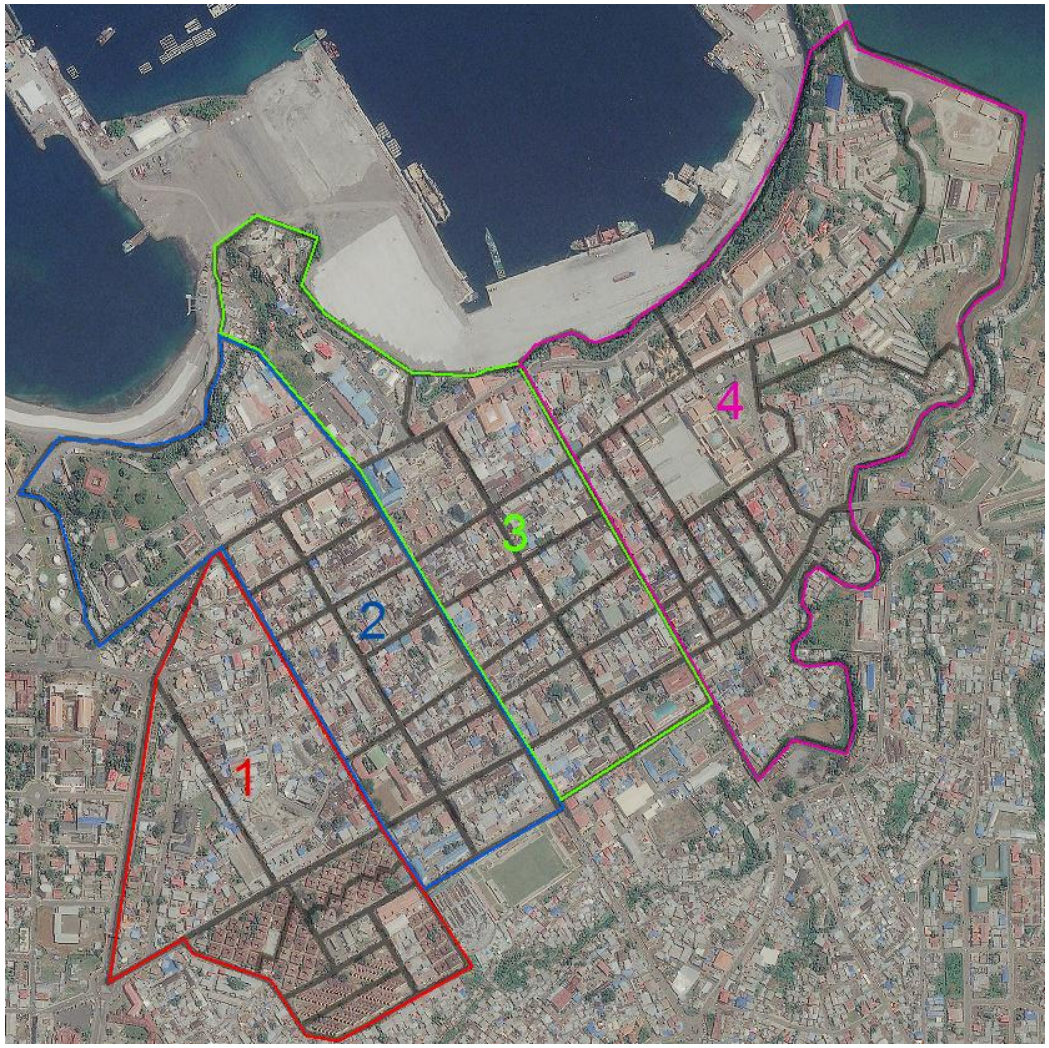
# CMIS and the BIMCP Mapping System

- CMIS is linked to geo-referenced listing of all households on Bioko Island.
  - Use of satellite imagery and GPS tracks to produce field maps
  - Every Household on the Island given a unique building identifier or **UNIQUEBID**
  - Households ascribed to hierarchical political sub-divisions on Island (districts, local government areas).

# Geographical Location Hierarchy:

## Malabo Urban District and Local Government Areas

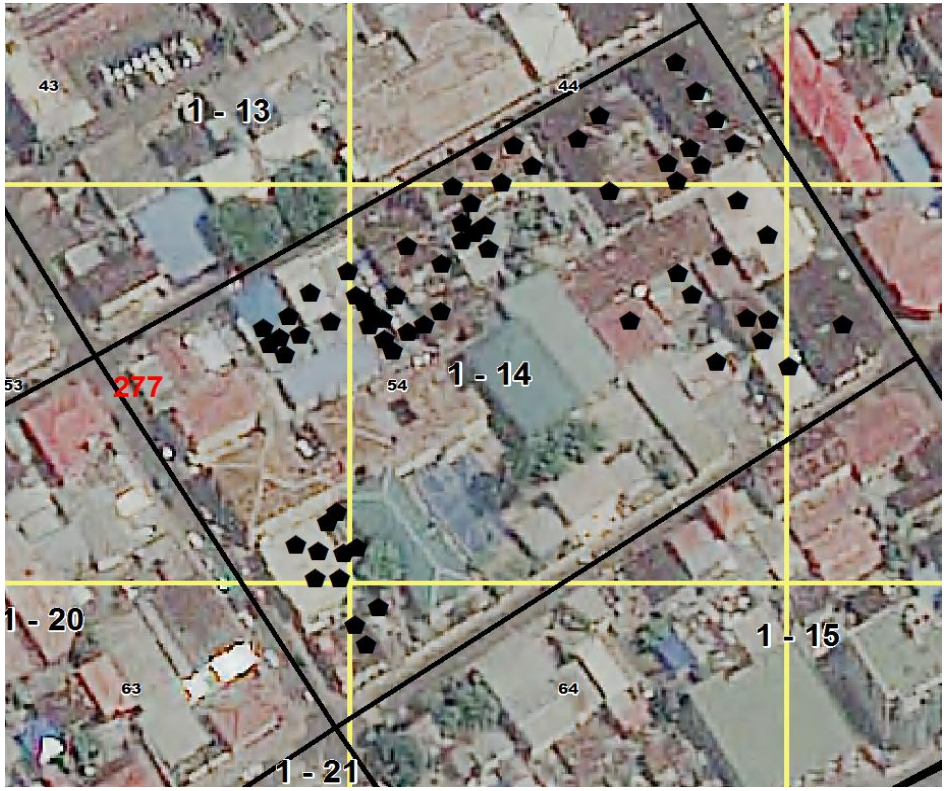
# Use of Maps to Plan and Organize field operations



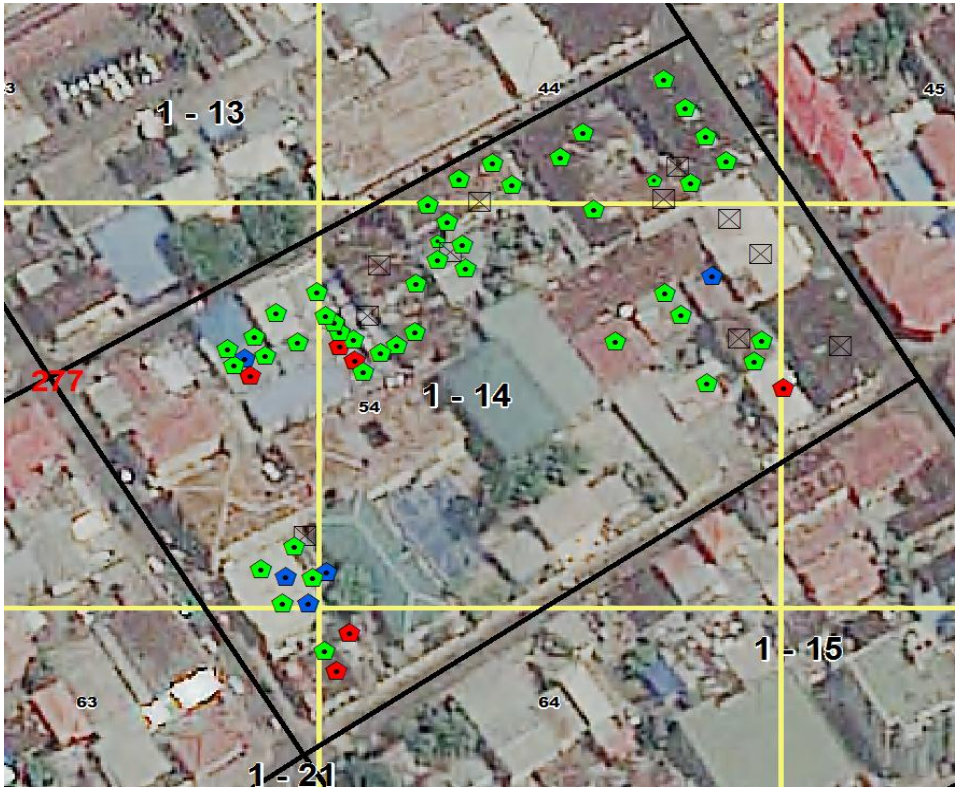

- Delimitation of work areas by geographical boundaries
- Pre-estimated household listing facilitates number of staff required per area
- Ability to supervise and track workers based on assigned work areas

# Pilot Area: Urban District Community 1-14

## Before Bed Net Distribution




## After Bed Net Distribution




## Legend

**Intervention Results**

- Total Available Households
- Household Received Bed Nets
- Closed Households
- Rejected Intervention
- Uninhabitted

**Community**

- 1-14 Manzana Pinto

**Map Section**

- Grid_Sectors

# Benefits of the CMIS

- Improved efficiency overall
- Reduce the cost and burden of paper data collection
- Improves the turnaround time for analysis and reporting
- Provide a sustainable solution for scaling up data collection
- Easier access to existing records (update phase)
- Validation rules and input constraints
- Real time data storage on a central database
  - Ability to track many performance indicators without a survey taking place (actual performance vs. estimates)
  - Remote progress monitoring by supervisor, statistician, etc.
  - Near-real-time quality assurance
  - Secure and central storage

# Costs implications of the CMIS

- Understand CMIS is relatively costly to set up and demanding to implement on various levels
- For Bioko it provides a tool that will enable us to more effectively and efficiently plan, manage, monitor and evaluate most of the BIMCP control interventions: LLINs, IRS, LSM, FSAT/HiFSAT, Vaccination
  - The incremental cost of introducing the CMIS is reduced by sharing the costs across multiple interventions
  - The average costs per beneficiary is reduced by
    - Improving BIMCP's ability to plan, manage and monitor efforts to scale up for impact – increased number of beneficiaries receiving integrated service package
    - Strengthening BIMCP's ability to communicate with potential beneficiaries by leveraging ubiquitous cell phones – increased coverage
    - Improving follow-up on activities at household/individual level BIMCP to prevent falsification by sprayers, distributors etc.
    - Improving BIMCP's ability to respond to heterogeneous transmission settings through stratification of intervention mix by area – better targeting of resources
    - Enabling BIMCP to track last cases and infection hot spots as we move to elimination focally and island-wide
    - Enabling BIMCP to plan, manage and monitor mass malaria vaccination campaign and certify coverage
- Highly adaptable to local needs and circumstances
  - ODK forms easy to generate and adapt
- Can be used for other non-malaria-related campaigns, thus further reducing the average cost per beneficiary

# *Thank you*