

Guinea School ITN Distribution Pilot Report and Evaluation

November 2018

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Abbreviations

|  |  |
| --- | --- |
| ANC | Antenatal Care |
| BCC | Behavioral Change Communication |
| SBCC  CERCO  CI | Social behavior change communication  *Cabinet d’Études, de Recherches et de Conseils* (research firm)  Confidence Interval |
| DHS | Demographic and Health Survey |
| EPI | Expanded Program on Immunization |
| IRB | Institutional Review Board |
| ITN | Insecticide-treated net[[1]](#footnote-1) |
| LLIN | Long-Lasting Insecticidal Nets |
| MERG | Monitoring and Evaluation Reference Group |
| MICS | Multi-Indicator Cluster Survey |
| MILDA | Moustiquaire Imprégnée à Longue Durée d’Action |
| MIS | Malaria Indicator Survey (Enquête sur les indicateurs du paludisme) |
| NGO | Non-Governmental Organization |
| NMCP | National Malaria Control Program |
| PCA | Principle Component Analysis |
| PMI | President’s Malaria Initiative |
| PNLP | Programme National de Lutte contre le Paludisme |
| PPS | Probability Proportionate to Size |
| PW | Pregnant Woman |
| RBM | Roll Back Malaria |
| SNP | School Net Program |
| U5 | Child under five years |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |

# Summary

Despite universal coverage campaigns and the introduction of routine distribution, national access to a long-lasting insecticide-treated net (LLIN) remained at 68.8% immediately following the 2016 universal coverage campaign[[2]](#footnote-2). Malaria stakeholders in Guinea convened in February 2017 to discuss and design the 2018-2022 National Malaria Strategic Plan. These stakeholders identified the introduction of continuous distribution channels as a priority to increase LLIN access in Guinea.

This evaluation study aimed to provide the National Malaria Control Programme (NMCP) and relevant stakeholders with information regarding the performance of the school distribution pilot; and offer insights on whether school insecticide treated net (ITN) distribution is an effective channel for maintaining ITN access in Guinea. To evaluate the ITN school distribution pilot, which provided ITNs to students in classes 1, 3 and 5 in the Boffa district in April 2018, VectorWorks conducted a household survey in Boffa (intervention) and Dubreka (control) districts in May 2018. The survey employed a standard two stage cluster sampling design, included 1,040 households. Key survey results are included in the summary table below.

### Table 1: Key Findings

| **Indicators** | **Total** | **Boffa** | **Dubreka** |
| --- | --- | --- | --- |
| **Household size and composition** |  |  |  |
| Mean # of household (HH) members\*\* | 5.2 | 5.4 | 4.9 |
| % of HH with at least one student in primary school | 44.8 | 44.0 | 45.7 |
| % of HH with students in classes 1, 3 and 5 | 28.6 | 28.0 | 29.1 |
| **Primary School Attendance** |  |  |  |
| % of primary school aged children | 29 | 30 | 29 |
| % of primary school aged children in school\*\*\* | 49 | 43 | 57 |
| % of primary school aged children in classes 1,3 and 5\*\* | 25 | 22 | 29 |
| **Exposure to community mobilization activities** |  |  |  |
| % of HH heads who heard messages on School ITN Distribution\*\*\* | 30 | 56 | 3 |
| % of HH heads who heard messages on ITN use and/or care\*\*\* | 27 | 48 | 3 |
| **School Distribution outcomes** |  |  |  |
| Households that own a school distribution ITN\*\*\* | 10 | 19 | 2 |
| % of all nets that are school distribution ITNs\*\*\* | 9 | 14 | 2 |
| **ITN ownership/access** |  |  |  |
| Households with at least 1 ITN\*\*\* | 66 | 80 | 53 |
| Households with at least 1 ITN for every 2 people\*\*\* | 26 | 31 | 21 |
| Defacto population with access to a ITN\*\*\* | 48 | 58 | 38 |
| **ITN use- population level** |  |  |  |
| Defacto population that slept under an ITN last night\*\*\* | 37 | 47 | 24 |
| Children under 5 that slept under an ITN last night\*\*\* | 33 | 50 | 19 |
| Children 5-15 that slept under an ITN last night\*\*\* | 27 | 35 | 18 |
| Pregnant women that slept under an ITN last night\*\*\* | 50 | 68 | 21 |
| **ITN use- ITN level** |  |  |  |
| ITNs currently owned used last night\*\*\* | 78 | 81 | 73 |
| Mass campaign ITNs used last night\*\*\* | 80 | 85 | 74 |
| School distribution ITNs used last night | 64 | 64 | 58 |
| **ITN ownership/access** |  |  |  |
| Households with at least 1 ITN\*\*\* | 66 | 80 | 53 |
| Households with at least 1 ITN for every 2 people\*\*\* | 26 | 31 | 21 |
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| Children 5-15 that slept under an ITN last night\*\*\* | 27 | 35 | 18 |
| Pregnant women that slept under an ITN last night\*\*\* | 50 | 68 | 21 |
| **ITN use- ITN level** |  |  |  |
| ITNs currently owned used last night\*\*\* | 78 | 81 | 73 |
| Mass campaign ITNs used last night\*\*\* | 80 | 85 | 74 |
| School distribution ITNs used last night | 64 | 64 | 58 |
| \* p<0.05, \*\* p<0.01, p<0.001 | | | |

# Introduction

## Context

Guinea is a West African coastal country with a population of 12.7 million[[3]](#footnote-3), all at risk of malaria[[4]](#footnote-4). According to the Guinean Ministry of Health, malaria is the major cause of consultations, hospitalizations, and deaths in the general population[[5]](#footnote-5). Malaria transmission is year-round with high transmission from July through October in most areas and most of infections are caused by Plasmodium falciparum. The Guinea NMCP’s first large scale LLIN net distribution occurred in 2009. Since becoming a PMI focus country in 2011, Guinea’s malaria program implemented two universal coverage campaigns with long-lasting insecticide-treated nets (ITNs) in 2013 and 2016 distributing 5.2 million LLIN nationwide in 2013 and 6.9 million LLIN in 2016. The National Malaria Strategic Plan also involves free continuous distribution of ITNs to sustain universal coverage once scale-up is achieved with mass campaigns through antenatal care, vaccination clinics, and continuous distribution channels. Antenatal care and immunization clinics began distributing LLIN in November 2014 to improve coverage among pregnant women and young children. Despite universal coverage campaigns and the introduction of routine distribution, access to a LLIN remained at 68.8% immediately following the 2016 universal coverage campaign[[6]](#footnote-6). Malaria stakeholders in Guinea convened in February 2017 to discuss and design the 2018-2022 National Malaria Strategic Plan. These stakeholders identified the introduction of continuous distribution channels as a priority to increase LLIN access in Guinea.

Figure 1: Map of Guinea

The VectorWorks Project conducted a national continuous distribution feasibility assessment in January 2017. VectorWorks staff interviewed health facility, community, and education personnel from the national to local levels to assess the feasibility of introducing new channels to improve access and coverage. The assessment team recommended pursuing school ITN distribution as the continuous distribution channel to be piloted in Guinea. VectorWorks collaborated with the NMCP on plans to implement a school ITN distribution pilot in the Boffa district, in the Boké Region.

School ITN distribution features students as a vehicle to bring ITNs into the home and pass key messages to household members. Implementers typically introduce school distribution as a complimentary channel to mass campaigns and routine distribution, but in some regions of Tanzania large-scale school distribution has replaced universal coverage campaigns. VectorWorks has planned and implemented school distribution in Ghana, Nigeria, Mozambique, and Tanzania, bringing lessons learned from those programs to inform the pilot in Guinea.

Primary education in Guinea includes six classes and is governed by the Ministry of Pre-University Education and Literacy. As of 2016, 68% of children aged 7-13 attended primary school[[7]](#footnote-7) nationally including 63% of girls. The education sector has regional, district, and sub district offices that collect data and implement program and policies within their jurisdiction. The young population structure of Guinea meant that 15.8% of the population was registered in primary school in 2016.

The VectorWorks Project led early planning meetings in October and November 2017. Early meetings focused on building the network of partners who would be involved in planning and implementing the pilot and developing a timeline. Parallel coordination committees were developed at the national and district level. The national coordination committee provided strategic direction for the pilot and verified that tools and materials fit the National Malaria Strategic Plan. The district coordination committee provided knowledge of local environment and health and education structures and validated that tools were appropriate for the local context. The distribution was scheduled to take place in March 2018 to classes 1, 3, and 5 (CP1, CE1, and CM1) in all public and private primary schools in Boffa.

## School ITN Distribution Objectives

1. Evaluate the feasibility of implementing school ITN distribution at-scale in Guinea
2. Increase household ownership of at least one ITN and population access to an ITN in the implementation district
3. Develop logistics, training, and supervision materials and strategies that could be scaled up with school ITN distribution
4. Develop a communications campaign to inform the community of the school ITN distribution

# Planning and Coordination

## Overview of Coordination

VectorWorks and the Guinea NMCP initially discussed the coordination for the school pilot at a meeting in October 2017. Both sides agreed that a national coordination committee and a local coordination committee should be formed. The national coordination committee would focus on ensuring that the pilot followed national strategic objectives and guidance. The local coordination committee focused on ensuring that national strategies and policies were effectively implemented in the local context. After the two coordination committees were formed, both committees met in a joined coordination effort and introduction of the activity in November 2017, in Boffa. VectorWorks representatives who sat on both committees continued to ensure open communication between both committees throughout the activity.

## National Coordination Committee

VectorWorks and the NMCP agreed that national coordination committee members should be composed of a wide range of stakeholders. Meeting participants agreed that this would give both the pilot and future scaled-up distributions a better chance at success. The national coordination committee was composed of members from:

* National Malaria Control Program (behavior change communication, logistics management, vector control officer)
* VectorWorks Guinea
* President’s Malaria Initiative
* StopPalu+
* Catholic Relief Services
* GHSC-PSM Guinea
* Guinea Central Pharmacy
* Ministry of Education/Office of School Health
* Peace Corps Guinea

VectorWorks facilitated a meeting in Boffa from November 21-23, 2018 that included both the local and national coordination committees. Participants were able to meet one another and clarify the function of each committee and how they were expected to collaborate.

## Local Coordination Committee

The local coordination committee is composed of people from organizations who directly participated in the pilot. All of the organizations are active in all districts across Guinea. Therefore, this structure should be repeatable in a scaled-up school distribution. The local coordination committee included members from:

* District health office (training officer, school health focal point, and the NMCP district focal point)
* District education office (training officer, statistics officer, and pedagogy development officer)
* Sub-district education offices (representing 2 sub-districts)
* District Parent Teacher Association President
* Health facility heads from district facilities

Members met monthly for the first few months and then on a more frequent ad-hoc basis. As distribution drew close, the committee met weekly. The local coordination committee validated communication materials, validated school enrollment figures, and formed the backbone of the distribution supervision team.

## Strengths

**Early Coordination meeting with national and local committees:** After forming the national and local coordination committees, a joint meeting was held in Boffa. The meeting provided an opportunity for all members to meet one another and discuss how they would coordinate their activities. The pilot enjoyed strong communication and collaboration and the initial three-day meeting was critical to this success.

**Diverse group of stakeholders:** Ministry of Health and Ministry of Education offices are both critical to school distribution success. Both sectors were involved in the planning and formed part of the national and local coordination committees. In addition, the presence of all implementing malaria program partners improved the quality of distribution activities and set a foundation for future school distribution programs in Guinea.

## Weaknesses

**Perceived lack of buy-in:** Throughout the planning and coordination stages, the members of the local coordination committee participated wholly in monthly, and then more frequent, meetings. However, there were challenges in getting certain information from them, including accurate number of students registered in each sub district. Though challenging to understand while in the throes of planning, once at the project launch and during the actual distribution, we learned that some coordination members did not believe that we would actually distribute the ITNs. Previous experience had taught them that projects come, collect information and never return. For some, this perceived lack of buy-in continued throughout the pilot leading to challenges during the distribution day due to incorrect quantification numbers and/or teachers who were not at all informed about the activity.

# Communication Strategy

## Objectives

1. Provide all community members in Boffa with the relevant school ITN distribution pilot information including:
   1. Date of distribution
   2. Eligibility requirements to receive an ITN
   3. Rationale for selecting classes 1, 3, and 5.
2. Share key communication messages on malaria prevention, specifically ITN use and care.
3. Create excitement and acceptance of the pilot strategy in the community to ensure that the distribution is not disrupted and ITNs reach the household.
4. Invite parents of eligible students to come and receive the ITNs on behalf of the students during the distribution day at the school, particularly for younger students.

## Communication Channels

### Community Health Agents

Community health agents, or *agents de santé communautaire* (ASC) provide health education and basic treatment in communities across Guinea. There were 86 ASCs in the intervention zone, each supervised by a health facility supervisor at one of the seven health centers in Boffa. VectorWorks convened the ACs at health facility meetings to introduce the school-based ITN distribution and discuss the implementation timeline and key messages to communicate with households. The training team provided each AC with a job aid with the five key messages to be communicated to the household and a picture to help demonstrate the message. VectorWorks adapted the monitoring form used by ACs to monitor school distribution sensitization activities and asked ACs to record the number of households sensitized per community

### Local Radio

Residents of Boffa identified radio rural as a key mode of communication in the district. According to the radio station its broadcasts reach all of Boffa and spill into neighboring districts. The radio program will be split into four components:

1. **Microprograms**: A 2-minute scripted role play describing that school-based distribution will be occurring in the district of Boffa in March and demonstrating the importance of ITNs. Will be broadcast for 45 days surrounding the distribution in Susu, Bagga, and Pular, four times per day (twice in the morning and twice in the evening).
2. **Round Tables**: A 30-minute program led by prefectural coordination committee that includes prefectural health and education authorities. This will be played twice immediately before the distribution and will be a more in-depth program intended to sensitize the community on distribution and discuss the value of ITN use and the impact malaria can have on the community if it is not prevented.
3. **Interactive Programs:** Similar to the round tables, but will have an interactive component. Community members will be able to call in and pose questions to the local experts and pilot organizers. This will be a 40-program and will occur twice, once each in the two weeks preceding distribution.
4. **Radio Announcements**: The radio station played ITN use and care messages four times per day in the same three languages as the microprogram. These messages also served as a reminder of the upcoming school distribution and provided listening households with details on what to expect. These additional radio announcements were aired both pre- and post-distribution.

### Parent Teach Associations

Individual parent teacher associations support each primary school in Guinea. Their level of involvement and coordination varies significantly, but they are viewed as a good channel to communicate messages to community members. The *Associations de Parents d’Élèves et Amis de l’École* (APEAE), referred to as Parent Teacher Association, president from each school was invited to attend the DSEE-level training. They received the same training as the school director and teachers involved in the distribution. The APEAE received a training guide to facilitate discussion in the community, particularly among the parents of primary school children. The APEAE was encouraged to speak with the local imam about providing communication during Friday prayer.

### Religious Organizations

Religious leaders are a key stakeholder in Guinean society and have potential to reach a large audience. They were asked to provide distribution details and ITN use and care messages at Friday mosque the week before and after distribution. Communication centered on distribution details: date of distribution, inclusion criteria for ITN distribution, inviting parents to come to school with their student to receive the ITN, and the rationale for the pilot. Pilot organizers asked imams and priests to provide support for the distribution and encourage community members to respect the distribution as it was intended to be implemented.

The prefectural League Islamic of Boffa is well-coordinated and can pass messages to local imams. VectorWorks met with local leadership to discuss the collaboration and invited League Islamic leaders to participate in later prefectural coordination committee meetings. Religious leaders were also mobilized via parent-teacher association (APEAE) in each community. The APEAE president was asked to provide local imams with school distribution information and to transmit messages to be shared before prayer.

## Strengths

**Engagement with Community Agents:** Each health facility has a strong network of about 10 ACs which cover the population within a certain distance from the facility. The ACs are well-trained in community mobilization and know their communities well. StopPalu+ and the NMCP work closely with these networks and VectorWorks engaged the NMCP’s prefectural focal point early to coordinate activities with Boffa’s various AC networks. This was a very successful method for community engagement and could be repeated in a scaled-up school distribution.

**Radio Microprograms in Local Languages:** VectorWorks wanted to ensure that distribution messages reached as many people as possible. The local coordination committee recommended transmitting messages in Susu, Pular, and Bagga languages. The Rural Radio Network station in Boffa recorded microprograms in the three languages and kept a schedule that ensured each language was played at least once per day.

## Challenges

**Late Collaboration with Religious Organizations:** Religious leaders were brought into the local coordination committee in the final weeks before distribution. Distribution organizers felt that bringing in the League Islamic and Christian leaders earlier would have allowed for better coordination of messages and increased the number of messages shared in mosques and churches.

**Increased Formative Research in strategy development:** The Local coordination committee provided important information on key channels to transmit messages in Boffa. However, if budget and timelines permit, more key informant interviews and focus groups could improve the communications strategy. Coordination committee members have valuable insight, but may not represent all of the populations in the distribution area.

# Implementation

## Overview

School authorities recommended March or April for LLIN distribution to prevent the distribution from disrupting exams or occurring during a school holiday break. The distribution was scheduled to take place over two days in early March. Due to a teacher’s strike, the distribution was delayed and took place the first week of April 2018.

## Transportation of LLINs

VectorWorks contracted a third-party logistics firm to manage the transportation of LLINs. The firm moved the nets from the Guinea Central Pharmacy directly to the sub-district education offices, where they were signed for by the appropriate sub-district education offices and stored in the supply room. VectorWorks staff recommended bypassing the district level for warehousing to streamline distribution of nets to the schools. School directors and teachers transported the nets to the school-level after they completed the training at the sub-district level. All of the trainees from a school were responsible for getting the nets back to the community to reduce the chance of fraud.

## Training

VectorWorks and partners rolled out the training in a two-stage cascade training. The NMCP and VectorWorks led the training of trainers in Boffa for 31 participants the week prior to distribution. Participants included members of the local coordination committee, the sub-district education officers, and heads of health facilities. The facilitators instructed on the distribution strategy, how to use reporting and monitoring tools, the pilot objectives, and general malaria prevention.

The newly trained trainers traveled to the sub-district level and provided the training to school-level participants two days after the training of trainers. Five people were invited from each school: the school director, teachers from the classes receiving LLINs, and the school president of the parent teacher association. The training material was focused on how distribution should be done at the school and corresponding key messages that should be shared with the students on the day of distribution. In total, 673 participants from the 184 primary schools in the distribution took part.

## Supervision

Members of the local coordination committee and national coordination committee played a supervisory role during training and LLIN distribution. Two supervisors were present at each of the eight DSEE-level trainings for school directors, teachers, and APEAE. Supervisors checked to make sure that the message conveyed during the training of trainers were communicated to participants and verified that the correct number of LLINs were transported to the correct primary school.

During distribution, the team of supervisors was divided into eight groups to oversee distribution activity in each of the eight sub-districts. Supervisors used a daily supervision tool to verify that the following elements of the distribution occurred and to highlight issues and lessons, including:

1. Did the distributing school communicate key malaria and LLIN messages to students during or before distribution?
2. Did all of the registered students in eligible classes receive LLINs?
   1. Did the students sign for their LLIN?
3. Where parents of class one present to receive LLIN for their student?
4. Where there any problems encountered during distribution?
   1. If so, what was the corrective action?
5. What are the lessons learned from distribution at this school?

Supervisors were able to visit more than half of the 184 primary schools throughout the district of Boffa, where distribution took place. If Guinean malaria authorities decide to continue with scaled up school distribution, then the national coordination committee will probably not be able to provide as much quality assurance. Instead, prefectural and regional coordination committees would be responsible.

## Implementation strengths

**Inviting five people per school to the sub-district training:** Distribution organizers thought about only inviting the school director to the sub-district education office for training. Instead, the teachers involved in distribution, and the president of the parent teacher association were invited to take part in the training also. Trainers felt this increased the likelihood of the correct messages and procedures taking place during distribution and provided a measure of fraud mitigation. Five people, instead of one, were charged with taking the LLINs back to the school for distribution.

**Transporting LLIN directly to the sub-district level:** The private logistics company skipped a warehouse stop in the district capital, Boffa. This measure reduced cost, paperwork, and decreased the chances of LLIN being lost during distribution. LLIN were transported to all eight sub-districts in a single day from Conakry. It should be noted that some of these sub-district offices were across difficult terrain, but were still able to be reached.

**Strong local coordination committee in supervision:** Members of the local coordination committee know the district well and were critical during supervision of the sub-district training and LLIN distribution. If Guinea scales up school distribution, the supervision team will need to be heavily composed of local coordination committee members.

**Distribution and communication done by experienced facilitators:** The teachers and school directors were responsible for distributing LLIN in the classroom. Both groups know their audience (school classes) well and have lots of experience lesson planning and communicating with messages. This was viewed as a major positive and allowed the training to focus more on distribution and key messages than on facilitation skills.

## Implementation weaknesses

**Supervision was strong, but not able to reach every school:** Supervisors were not able to visit each participating school for a quality assurance visit during or after the school pilot. Distribution organizers feel that increased supervision during distribution will be difficult to attain. However, it is recommended in the future that more post-distribution spot checks are performed to validate high quality distribution across the district.

**Small gaps in training:** VectorWorks generally felt that the cascade training at the sub-district level was successful. However, for some schools there was limited participation. For future school distribution, the NMCP and stakeholders should create a back-up plan that lists who should replace the school directors, teachers, or parent teacher presidents at the training if they are not able to attend. This measure would verify that each school has been properly trained and is prepared for distribution.

**Movement of LLINs occurred before distribution dates were confirmed**: The logistics firm contracted to transport LLINs to the sub district level transported LLINs in early March, in anticipation of a mid-March distribution. However, the Guinea teacher’s union was on strike which ultimately led to the delay of distribution until the first week of April. The LLINs were kept at the sub-district education office for nearly a month. The sub-district education officers ensured that the nets were stored in a safe, dry environment that would not put them at risk of theft or damage. However, in the future it is recommended that LLIN not be moved from the central or regional warehouses until the date of distribution is confirmed.

## Evaluation of ITN School Distribution Pilot

In May 2018, a cross sectional household survey was conducted to evaluate the ITN school distribution pilot in partnership with a local research firm, *Cabinet d’Études, de Recherches et de Conseils* (CERCO). As this study aims to understand the context of ITN access and ownership in households following a school distribution campaign. The evaluation focused on outcomes that can be measured immediately after the distribution campaign. Thus, the evaluation was conducted soon after the distribution at schools to ensure that participants correctly recall which nets in their households were gotten from schools. The primary objectives of the evaluation study were:

1. To measure the effect of a school-based ITN distribution on access and ownership to ITNs in Guinea by capturing key LLIN ownership and use indicators following a school ITN distribution in Boffa.
2. To explore the effectiveness of the ITN school distribution pilot.

The secondary objectives were:

1. To describe major behavioral aspects of LLIN use in the context of the school-based distribution.
2. To investigate the proportions of nets that are from the mass campaign or primary schools.
3. To investigate the proportions of households who exposed to the school distribution social behavior change communication (SBCC) messages.

The results of the survey are expected to provide the NMCP and relevant stakeholders with valuable information on the performance of the school distribution pilot. This evaluation intends to help malaria stakeholders in Guinea determine if school ITN distribution is an effective channel for maintaining ITN access in the Guinea.

Methods

## Study overview

The evaluation of the school distribution pilot employed a cross-sectional household interview survey with a two-stage cluster sampling design, in two neighboring districts of two neighboring regions: Boffa and Dubreka, in Boké and Kindia, respectively. Dubreka was selected as a control area based on similar sociodemographic characteristics with Boffa. The proportion of the population with access to an ITN in Boké Region was 77.9% in the 2016 MICS.

Study participants were heads of households or a responsible adult living in the household. Eligible study participants included households with head of household or representative 18 years or older that consented to be interviewed and for study team to evaluate nets. Exclusion criteria included: household heads or representatives without the capacity to understand questions and respond intelligibly; that were not available on the day of survey or that did not consent to be interviewed.

Figure 2: Map showing Boké region of Guinea

## Sampling

The following assumptions are underlying the calculations of sample size which were carried out using standard formulas:

* Confidence interval 95% (alpha-error 0.05) for two-sided test
* Power 80% (beta-error 0.2)
* Design effect of 2
* Household non-response rate 5%

For both the **control** and **intervention areas** a sample size of 520 households was required to obtain a precision of +/- 7-8%-points for ITN access at endline compared to baseline (as measured in the MICS) in each site, respectively. This resulted in a sample of 26 clusters with 20 households each for the intervention area and the control, for a total of 52 clusters (1040 households).

**Stage 1: Selection of clusters**

For the selection of clusters, 2014 census data base from the districts of Boffa and Dubreka was used. A cluster was defined as an Enumeration Area (EA) from the census. The selection of clusters was conducted using probability proportional to size and was done based on the EA census population. In total, 26 clusters were selected for both the intervention area and the control area (52 clusters in total).

**Stage 2: Selection of households**

Within each selected EA or community, 20 households were selected in the intervention and control areas using the following methodology: if the community was small (less than 100 households), the field team mapped the whole village, and compiled a list of eligible households from which the supervisor randomly selected 20 households with equal probability for each household. In addition, 6 replacement households were sampled. If the community was large, i.e. exceeding 200 households, an equal size section-approach was used. With the help of local chiefs, the community was divided in sections of approximately equal size each with 40-60 compounds. One of these sections was randomly selected by the supervisor and within this section all households were mapped and households selected as above. The definition of a household was “people eating from the same pot”.

## Data collection

Interviewers and supervisors were carefully selected to be culturally acceptable, to have good knowledge of the local language, and to have experience conducting household surveys. The field team was comprised of two teams of seven and eight respectively headed by a supervisor. The week before the fieldwork, the field team was trained for four days. The training covered the purpose and exact procedures of the interviews (following the interview guide) and involved role playing and mock interviews. All members of field teams also went to communities not included in the sample to conduct a pilot interview. Local authorities were contacted for approval to conduct the survey prior to data collection. Visits were made to the relevant heads of communities and the purpose and procedures of the survey were explained to them. In all cases, the head of community granted authorization and either personally notified the relevant heads of villages or referred the team to the heads of village who were then also informed of the survey objectives and procedures.

The survey interviews were conducted from May 5-16, 2018 and data collected with the use of tablets. Each selected household was visited and the head of household or responsible adult was interviewed. At least three attempts were made to reach a respondent but if this was unsuccessful, the household was dropped and replaced, using the list of replacement households. Each interviewed household received a unique identification number consisting of the cluster and the household’s number. The respondents were specifically asked for their oral informed consent with emphasis on voluntary participation and that they could refuse at any time. The interview was then carried out. The questionnaire for the household interviews included the following sections: Household characteristics (composition, assets, etc.); Net roster and Exposure to communication campaigns. The interviews lasted about 40 minutes on average. At the end of each day of data collection, the team supervisor reviewed all questionnaires for completeness and possible inconsistencies and ensured that missing information was corrected while still in the field.

## Data processing and analysis

Data was collected using the SurveyCTO data collection platform and analysis was done using STATA 14.0 software based on the previously defined outcome indicators disaggregated by background characteristics, including place of residence (urban and rural) and socio-economic status (wealth quintiles). Since sampling probability proportionate to size was used, the sample did not need sampling weights. The wealth index was computed at the household level using principal component analysis (PCA). The variables for household amenities, assets, livestock, and other characteristics that are related to a household’s socioeconomic status were used for the computation. All variables were dichotomized except those of animal ownership where the total number owned was used. The first component of the PCA was used as the wealth index. Households were then classified per their index value into quintiles. For analysis of individual members of the household or for nets, the quintile allocation of the household was applied.

ITNs were defined as the following net brands as seen on the brand ticket: PermaNet, Dawa Plus, Olyset, Duranet, Interceptor, Netprotect, Magnet, Royal Sentry, Yorkool and Safenet. For nets in which brand information was absent, they were classified as ITN if their source was from a campaign or from the school distribution as only ITNs were available from either source.

## Ethical considerations

Ethical clearance for the survey was obtained from the Guinea *Comité National D’Ethique Pour la Recherche en Santé (CNERS)* as well as the Institutional Review Board of the Johns Hopkins Bloomberg School of Public Health (IRB No: 8630).

# Results

The data collection team visited all targeted households and obtained 1,040 completed questionnaires. The results of the survey are presented under the following headings: household characteristics, source of nets, net use, exposure to the SBCC campaign.

## Household characteristics

This section summarizes the sociodemographic characteristics of the sampled households including: age and gender of residents; size and composition of households, and socioeconomic status of households.

### Age and gender of household residents

Among all sampled households, 5,390 persons were registered on the household member’s roster; 97% were usual residents in the household and 95% stayed in the house the previous night. The population distribution by gender and age, as presented in Figure 5, is comparable to the demographic distribution in the African context, with a large proportion of the population under 15 and significantly fewer elderly people.

Figure 3: Study Population Pyramid

### Primary school students

Primary school aged children (defined as children aged 5-15 years) accounted for 29% of the study population(N=1,561). This proportion was similar in both the districts of Boffa and Dubreka (p>0.05). About half of all children primary school aged children were not attending primary school and this was significantly higher in Boffa compared to Dubreka (57% and 44% respectively, p<0.001). In addition, 25% of all school aged children were currently in classes 1, 3 or 5 and this was also significantly lower in Boffa compared to Dubreka (22% and 29% respectively, p<0.01) as shown in the figure.

Figure 4: Primary School Status of Children 5-15 years

Data Highlight: Though school attendance was low in Boffa (49%), the school-based distribution of ITNs was effective at achieving a coverage rate of 80%. Theoretically, school-based programs have been developed and implemented in areas where school attendance is greater than 70%. However, the success of this pilot in Boffa may provide evidence that lower school attendance can achieve similar results.

### Household size and composition

The average size of households was 5.2 persons; however, this was slightly higher in Boffa (5.4) compared to Dubreka (4.9, p<0.05). Overall, 45% of all households surveyed had a student currently enrolled in primary school (44% and 46% in Boffa and Dubreka, respectively). Similarly, 29% of households (28% and 29% in Boffa and Dubreka, respectively) had at least one student in classes 1, 3 or 5. More information is provided in Table 1 below.

Table 2: Household Size and Composition

|  |  |  |  |
| --- | --- | --- | --- |
| **Household Characteristics** | **Total**  **(N= 1040)** | **Boffa**  **(N= 521)** | **Dubreka**  **(N= 519)** |
| **Household size** |  |  |  |
| Mean # of household (HH) members\*\* | 5.2 | 5.4 | 4.9 |
| % of HH with 1-3 members\* | 26.5 | 20.2 | 33.0 |
| % of HH with 4-6 members | 49.5 | 52.6 | 46.4 |
| % of HH with 7+ members | 23.9 | 27.3 | 20.6 |
| **Household Composition** |  |  |  |
| % of HH with at least child less than 5 years | 53.6 | 51.8 | 55.3 |
| % of HH with at least one school aged child 5-15yrs\* | 70.2 | 73.5 | 66.9 |
| % of HH with at least one student in primary school | 44.8 | 44.0 | 45.7 |
| % of HH with students in classes 1, 3 and 5 | 28.6 | 28.0 | 29.1 |
| % of HH with at least one pregnant woman\*\* | 15.7 | 19.0 | 12.3 |
| Notes: \* p<0.05; \*\*p<0.01; \*\*\*p<0.001 chi square test of association between characteristics by location. | | | |

### Household socioeconomic status

The education level of the heads of households was generally low. Overall, 73% (76% and 71% in Boffa and Dubreka, respectively) had no formal education while only 18% of heads of households had a secondary or higher level of education (17% and 19% in Boffa and Dubreka, respectively). About half (49%) of households overall (50% and 49% in Boffa and Dubreka, respectively) had a radio while 87% of all households (88% and 85% in Boffa and Dubreka, respectively) had a telephone. On the other hand, few households (19%) overall and especially in Boffa (8%) had a television. Significantly higher proportion of households in Dubreka (30%, p<0.05) had a television. In addition, more households in Boffa (27%) compared to Dubreka (15%) were in the lowest wealth quintile. Conversely, fewer households in Boffa (12%) compared to Dubreka (27%) were in the highest wealth quintile. This is highlighted in Table 2 below.

Table 3: Socioeconomic Status of Households

| **Characteristics** | **Total**  **(N= 1040)** | **Boffa**  **(N= 521)** | **Dubreka**  **(N= 519)** |
| --- | --- | --- | --- |
| Education of head of household |  |  |  |
| No formal education | 73.1 | 75.6 | 70.5 |
| Primary | 8.3 | 7.5 | 9.1 |
| Secondary or higher | 18.1 | 16.9 | 19.3 |
| Unknown\* | 0.6 | 0.0 | 1.2 |
| Ownership of Mass media/communication |  |  |  |
| Radio | 49.2 | 49.5 | 48.9 |
| Television\*\*\* | 18.9 | 8.1 | 29.9 |
| Telephone | 86.5 | 87.7 | 85.4 |
| Wealth quintile |  |  |  |
| Lowest\* | 20.6 | 26.7 | 14.5 |
| Second | 19.4 | 20.2 | 18.7 |
| Third | 20.0 | 21.7 | 18.3 |
| Fourth | 20.3 | 19.4 | 21.2 |
| Highest\*\*\* | 19.7 | 12.1 | 27.4 |
| Notes: \* p<0.05; \*\*p<0.01; \*\*\*p<0.001 chi square test of association between characteristics by location. | | | |

**Data Highlight**: `All socioeconomic indicators demonstrate that Dubreka is slightly wealthier than Boffa. Given the proximity of Dubreka to Conakry, some of its neighborhoods are inhabited by people who work in the capital; this may explain the larger percentage in the highest wealth quintile (27.4% in Dubreka, versus 12,1% in Boffa). It is also probable that improved housing conditions (which includes window and door screens, fans and air conditioning) in the wealthier Dubreka may account for the lower ITN use. Lower perceived susceptibility and threat of malaria typically seen among wealthier populations may be other reasons for the reduced ITN use observed in Dubreka

## Exposure to community mobilization messages

This section highlights respondents’ exposure to the school distribution community mobilization activities.

### Messages on School ITN Distribution

Overall, 30% of all households received information on mosquito net distribution in primary schools. This was significantly higher among households in the implementation area of Boffa (56%) compared to only minimal households in Dubreka (3%). Given that these messages were focused in the intervention area, Boffa, this makes sense. Among all households who received information on mosquito net distribution (n=311), the most common sources of information were the community health agents (44%), other health workers (30%), radio (28%) and community leader (19%).

### Messages on ITN use and/or care

Exposure to messages on ITN use and/or care was similar to exposure to messages on the school ITN distribution. Specifically, 27% of all households received information on mosquito net use and/or care. This was significantly higher among households in the implementation area of Boffa (48%) compared to only minimal households in Dubreka (6%). Among all households who received information on mosquito net use and/or care (n=284), the most common sources of information were the community health agents (57%), other health workers (40%), radio (35%) and community leader (18%).

Figure 5: Exposure to community mobilization messages

**Data Highlight**: Interpersonal communication, via community health agents, other health workers and other community members, had much higher coverage than radio messaging. Though radio messaging is often seen as a gold standard in sub-Saharan Africa, Guinea’s strength in its community networks benefited this program. The absence of a clear border between Boffa and Dubreka, plus the strong kinship between households in the two areas gave some in Dubreka an opportunity to benefit from the pilot.

## Nets Surveyed

This section presents the ownership of nets, characteristics and sources of all the nets surveyed.

### Household Ownership of any Net

About two-thirds (69%) of all household heads reported that their household had a mosquito net. This was significantly higher in Boffa (81%) compared to Dubreka (57%, p<0.001). Among households with mosquito nets (n=719), the average number of nets noted by the heads of households was 2.5 (2.8 and 2.1 in Boffa and Dubreka, respectively, p<0.001). The reported net ownership was very similar to the observed nets in the household. Overall, 68% of households had at least one net which was seen by a data collector. Similarly, this was higher in Boffa (80%) compared to Dubreka (56%, p<0.001).

Figure 6: Reported and Observed Net Ownership

**Data Highlight**: Reported and observed behavior data points do not always match. However, in both Boffa and Dubreka, the reported and observed ITN ownership figures were very similar, validating the data collection.

### Household Ownership of ITN from Key Sources

ITN ownership was similar to ownership of any net. Specifically, 66% of all households had at least one ITN. This was significantly higher in Boffa (80%) compared to Dubreka (53%, p<0.001). Over half of all households (56%) had a mass campaign ITN and this was significantly higher in Boffa compared to Dubreka (62% versus 51% respectively, p<0.01). A tenth of all households had a school distribution ITN and this varied significantly by location (19% in Boffa versus 2% in Dubreka, p<0.001). A more conservative definition of school distribution ITN which included the shape (rectangular) and age (six months or less) of the net showed that 9% of households had the validated school distribution ITN (16% in Boffa and 0.3% in Dubreka, p<0.001).

Figure 7: Household Ownership of ITNs by source

### Characteristics of Nets Owned

A total of 1,535 nets were surveyed in 719 households. The majority (88%) were inspected by data collectors. This section highlights the following characteristics of the nets surveyed: source; shape and color; age and price; and use.

#### Source of Nets

Of all nets surveyed, 82% were mass campaign nets, 9% from the primary school distribution (with 5% of all nets being validated school distribution ITNs based on their source, shape and age), 5% from antenatal care (ANC), 3% from other and 1% from unknown sources. Of note, the proportion of nets from ANC and primary school distribution was higher in Boffa while the proportion of mass campaign nets were higher in Dubreka (p<0.05). Specifically, 79% and 87% of nets were mass campaign nets in Boffa and Dubreka, respectively. ANC nets accounted for 7% and 1% of nets in Boffa and Dubreka, respectively (p<0.001) while primary school distribution nets accounted for 14% and 2% of nets in Boffa and Dubreka, respectively (p<0.001), as demonstrated in the figure below. Of note the validated school distribution nets were 8% versus 0.2% in Boffa and Dubreka respectively (p<0.001) however, this report focuses on nets identified by respondents as received from the school distribution.

Figure 8: Sources of Nets Surveyed

N= 1535 nets surveyed

#### Age and Price of Nets

Most (85%) of nets were more than two years old (60% and 87% in Boffa and Dubreka, respectively, p<0.001) while 14% of all nets were less than two years (16% and 11% in Boffa and Dubreka, respectively, p<0.001. The overwhelming majority of nets (99%) were reported as free (99% versus 98% in Boffa and Dubreka, respectively). Of note, all primary school distribution nets were reportedly free.

### Use of Nets

Overall, 76% of all nets surveyed were used the previous night. Net use was significantly higher in Boffa compared to Dubreka (81% versus 70% respectively, p<0.001). For the nets not used the previous night (n=361), the most common reasons given for non-use include “too hot” (36%) and “no mosquitoes” (14%). Many of all nets surveyed (72%) were used every night in the preceding week (77% versus 66% in Boffa and Dubreka, respectively, p<0.001). Similarly, many (71%) of the nets surveyed were used every month of the year (75% versus 64% in Boffa and Dubreka, respectively, p<0.001).

**Data Highlight**: The high levels of year-round ITN use suggest that residents perceive a continuous risk of malaria and are consistent in their malaria prevention behavior. Up until early 2017, Boffa was considered a severe malaria transmission areas which may have helped solidify their culture of net use.

Figure 9: Percent of All Nets Used by District

#### ITN use by source

Among all ITNs surveyed, 78% were used the previous night and this was significantly higher in Boffa compared to Dubreka (81% versus 73%, p<0.001). This trend also persisted for ITNs from mass campaigns (80% overall, 85% in Boffa and 74% in Dubreka, p<0.001). However, use of school distribution ITNs was lower than that of mass campaigns. Furthermore, the use of school distribution ITNs did not vary significantly by location (64% overall, 64% in Boffa and 58% in Dubreka). This is presumably because there is insufficient sample size of school distribution nets, particularly in Dubreka (n=12), to detect significant differences.

Figure 10: Percent of ITNs used by source

## Universal access and use indicators

This section summarizes key ITN access and use indictors across the study population by location.

### ITN access

Overall, 66% of all households had at least one ITN (80% versus 53% in Boffa and Dubreka, respectively, p<0.001) while 26% of households had at least one ITN for every two residents (31% versus 21% in Boffa and Dubreka, respectively, p<0.001). About half (49%) of the population had access to an ITN and this varied significantly by location. Specifically, population level access was 58% in Boffa and 39% in Dubreka (p<0.001).

Table 4: ITN access indicators by location

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicators** | **Total**  **(N= 1040)** | **Boffa**  **(N= 521)** | **Dubreka**  **(N= 519)** |
| Household level access |  |  |  |
| % of households owning ≥1 ITN \*\*\* | 66 | 80 | 53 |
| % of households owning ≥1 ITN for every two members\*\*\* | 26 | 31 | 21 |
| Population level access | **Total**  **(N= 5134)** | **Boffa**  **(N= 2636)** | **Dubreka**  **(N= 2498)** |
| % of defacto population with access to a ITN\*\*\* | 48 | 58 | 38 |
| Notes: \* p<0.05; \*\*p<0.01; \*\*\*p<0.001 chi square test of association between characteristics and location. | | | |

#### Household ITN access by wealth quintile

In Boffa and Dubreka, ITN ownership did not vary significantly across wealth of households. However, the proportion of households with an ITN for every two members (household ITN access) varied by wealth of households. Specifically, in Boffa, household ITN access was least among households in the lowest quintile while in Dubreka, household ITN access was least among households in the highest wealth quintile. This is shown in Figure 14.

Figure 11: Household ITN Access by Wealth Quintile

### ITN use

Over a third (36%) of all household residents slept under an ITN the preceding night (47% in Boffa and 24% in Dubreka, respectively, p<0.001). ITN use remained similar among children under five (33% overall, 50% and 19% in Boffa and Dubreka, respectively, p<0.001). Overall, 27% of children aged 5-15 years that slept under an ITN last night (35% in Boffa and 18% in Dubreka). ITN use was slightly higher among pregnant women. Specifically, half of all pregnant women slept under an ITN the previous night and this was significantly higher in Boffa (68%) compared to Dubreka (21%, p<0.001). This is highlighted in Table 5 below.

Table 5: Universal ITN indicators

| **Universal coverage indicators** | **Total** | **Boffa** | **Dubreka** |
| --- | --- | --- | --- |
| Defacto population that slept under an ITN last night\*\*\* | 36 | 47 | 24 |
| Children under 5 that slept under an ITN last night\*\*\* | 33 | 50 | 19 |
| Children 5-15 that slept under an ITN last night\*\*\* | 27 | 35 | 18 |
| Pregnant women that slept under an ITN last night\*\*\* | 50 | 68 | 21 |
| N=5134 household members; 801 children under 5; 1087 children aged 5-15; and 161 pregnant women that stayed the previous night; 1484 ITNs, 1261 campaign ITNs and 139 school distribution ITNs \* p<0.05, \*\* p<0.01, p<0.001 | | | |

### Multivariate regressions

After adjusting for wealth quintile and education of the head of household, residents in Boffa had a significantly higher mean ITN access (Adjusted Beta coefficient: 0.19; 95% CI: 0.17, 0.22) and odds of sleeping under an ITN (Adjusted Odds Ratio (AOR): 2.91; 95% CI: 2.56, 3.30). Increasing household wealth was associated with reduced ITN access while a secondary level of education was associated with increased ITN access. On the other hand, increasing household wealth was associated with increased odds of ITN use while the education of the head of household did not influence the odds of ITN use. This is presented in Table 6 below.

Table 6: Multivariate regression showing factors associated with ITN access and use

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **ITN access (adjusted Beta coefficient, 95% CI)** | **ITN use (adjusted Odds Ratio, 95% Confidence Interval** |
| **District** | | |
| Dubreka | 1.00 (reference) | 1.00 (reference) |
| Boffa | 0.19 (0.17, 0.22) | 2.91 (2.56, 3.30) |
| **Household Wealth Quintile** | | |
| First | 1.00 (reference) | 1.00 (reference) |
| Second | 0.10 (0.07, 0.13) | 1.38 (1.14, 1.67) |
| Third | 0.13 (0.09, 0.16) | 1.25 (1.03, 1.52) |
| Fourth | 0.11 (0.07, 0.14) | 1.50 (1.24, 1.82) |
| Highest | 0.04 (-0.00, 0.07) | 1.56 (1.27, 1.92) |
| **Head of Household Education** | | |
| None | 1.00 (reference) | 1.00 (reference) |
| Primary | -0.05 (-0.09, -0.01) | 1.16 (0.93, 1.44) |
| Secondary | -0.02 (-0.06, 0.01) | 0.91 (0.75, 1.09) |
| Higher | 0.03 (-0.02, -0.08) | 1.26 (0.96, 1.66) |
| N= 5134, covariates included in the regression model include: district, household wealth and education level of head of household | | |

Of note, the higher ITN use in Boffa was also seen among sub-groups of residents. Children aged 5-15 years of age had about 3 times the odds (AOR: 2.89; 95% CI: 2.22, 3.76); children under five had over 5 times the odds (AOR: 5.25; 95% CI: 3.73, 7.39) and pregnant women had over 8 times the odds (AOR: 8.39; 95% CI: 3.86, 18.2) of sleeping under a net compared to their counterparts in Dubreka.

## Effect of SBCC on ITN indicators

Exposure to messages on ITN use and/or care was associated with key ITN outcomes. Households in which the head was exposed to SBCC messages had higher levels of ownership of at least one ITN (41%) compared to unexposed households (21%, p<0.001). Similarly, exposed households had higher rates of household ITN access (i.e., ownership of at least one net for every two members) (85%) compared to unexposed households (60%, p<0.001). Also, a higher proportion of members living in exposed households reported using an ITN the previous night (50%) compared to their unexposed counterparts (30%, p<0.001).

Logistic regressions were used to further explore the association between exposure to SBCC messages and ITN use in Boffa only. After controlling for population level access, household wealth and education, members living in exposed households had higher odds of using an ITN the previous night (adjusted odds ratio (aOR): 1.37; 95% confidence interval (CI): 1.22, 1.67).

Table 7: Effect of SBCC messages on ITN use in Boffa

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **aOR of ITN use** | **95% Confidence Interval** |
| **Household Exposed to SBCC** |  |  |
| No | 1.00 | N/A |
| Yes | 1.37 | 1.22, 1.67 |
| **Household Wealth Quintile** |  |  |
| First | 1.00 | N/A |
| Second | 1.08 | 0.83, 1.42 |
| Third | 0.49 | 0.37, 0.65 |
| Fourth | 0.62 | 0.47, 0.84 |
| Highest | 0.77 | 0.54, 1.09 |
| **Head of Household Education** |  |  |
| None |  | N/A |
| Primary | 1.44 | 1.00, 2.07 |
| Secondary | 0.91 | 0.67, 1.23 |
| Higher | 1.25 | 0.82, 1.90 |
| **Mean ITN access** | 34.45 | 25.64, 46.28 |
| N= 2636, Pseudo R2: 0.23 | | |

**Data Highlight**: These findings were corroborated in the overall population, using logistic regressions in which after controlling for location, household wealth and education, exposed members had higher odds of using an ITN the previous night (AOR: 1.47; 95% confidence interval: 1.27, 1.70). However, once population level ITN access is included in the model, the role of SBCC ceases to be significant (note: the pseudo R2 changes from 0.05 to 0.28).

## Comments

The school distribution pilot evaluation obtained information from households in the districts of Boffa and Dubreka on their exposure to the ITN school distribution community mobilization activities, their access to-, and use of- nets. To ensure that questions were understood, and responses were valid, the questionnaire was pre-tested prior to implementation. Some methodological considerations to this study include the fact that the evaluation took place within a month after the school distribution. Thus, study findings reflect immediate post- distribution achievements. Also, as with any survey that relies on interviews with household respondents about events that occurred in the past, there may have been recall biases for a few questions. However, survey results were consistent in many ways within the dataset regarding patterns of practices of net ownership and use. For example, households’ reported and observed ownership of at least one net was very similar. Given the survey methodology used, this consistency of results was expected, and the survey results can be considered valid as described above.

# Discussion

The school distribution pilot aimed to provide the NMCP and relevant stakeholders with information regarding the performance of the school distribution pilot; and offer insights on whether school ITN distribution is an effective channel for maintaining ITN access in the Guinea.

Schools are considered a promising channel for ITN distribution in Guinea for several reasons. Schools were typically located within every community and the reach into communities is often comparable, if not better than, that of health facilities. The number of students receiving ITNs was easily calculated based on the number of ITNs required to maintain coverage levels and could be easily adjusted by changing the number of classes receiving ITNs. Schools also had existing structures that made ITN distribution feasible such as student registers, lockable storage that temporarily stored ITNs, and teachers who serve as literate personnel with vested interests in the health of their students and communities. While the primary target beneficiaries for school distribution were household members, students served as channels to households. They transported ITNs from school to home, where household members allocated the ITN as needed. Students may have also shared messages on the importance of using nets with household members. While the rates of primary school enrollment were reported to be somewhat low at the evaluation (49%), the school distribution was still able to reach appreciable proportions of the community.

The table below presents key indicators from the evaluation:

### Table 8: Key program indicators

| **Indicators** | **Total** | **Boffa** | **Dubreka** |
| --- | --- | --- | --- |
| **Household size and composition** |  |  |  |
| Mean # of household (HH) members\*\* | 5.2 | 5.4 | 4.9 |
| % of HH with at least one student in primary school | 44.8 | 44.0 | 45.7 |
| % of HH with students in classes 1, 3 and 5 | 28.6 | 28.0 | 29.1 |
| **Primary School Attendance** |  |  |  |
| % of primary school aged children | 29 | 30 | 29 |
| % of primary school aged children in school\*\*\* | 49 | 43 | 57 |
| % of primary school aged children in classes 1,3 and 5\*\* | 25 | 22 | 29 |
| **Exposure to community mobilization activities** |  |  |  |
| % of HH heads who heard messages on School ITN Distribution\*\*\* | 30 | 56 | 3 |
| % of HH heads who heard messages on ITN use and/or care\*\*\* | 27 | 48 | 3 |
| **School Distribution outcomes** |  |  |  |
| Households that own a school distribution ITN\*\*\* | 10 | 19 | 2 |
| % of all nets that are school distribution ITNs\*\*\* | 9 | 14 | 2 |
| **ITN ownership/access** |  |  |  |
| Households with at least 1 ITN\*\*\* | 66 | 80 | 53 |
| Households with at least 1 ITN for every 2 people\*\*\* | 26 | 31 | 21 |
| Defacto population with access to a ITN\*\*\* | 48 | 58 | 38 |
| **ITN use- population level** |  |  |  |
| Defacto population that slept under an ITN last night\*\*\* | 37 | 47 | 24 |
| Children under 5 that slept under an ITN last night\*\*\* | 33 | 50 | 19 |
| Children 5-15 that slept under an ITN last night\*\*\* | 27 | 35 | 18 |
| Pregnant women that slept under an ITN last night\*\*\* | 50 | 68 | 21 |
| **ITN use- ITN level** |  |  |  |
| ITNs currently owned used last night\*\*\* | 78 | 81 | 73 |
| Mass campaign ITNs used last night\*\*\* | 80 | 85 | 74 |
| School distribution ITNs used last night | 64 | 64 | 58 |
| \* p<0.05, \*\* p<0.01, p<0.001 | | | |

It is noteworthy that there are some sociodemographic differences in the control and intervention areas Although household size and education level are similar between the two zones, Dubreka is comparably wealthier. It’s close proximity to Conakry and the fact that some of Dubreka’s population commutes to Conakry for work daily can explain the major difference in both education and income. In addition, without baseline knowledge of ITN access and ownership levels in the districts, one must interpret post-pilot results cautiously. Even with these methodological weaknesses, there are significant findings in this study that signify promise for school distribution as a complimentary distribution channel in Guinea.

Despite the fact that half of children aged 5-15 in surveyed households were not in school, school distribution still has the potential to reach a high proportion of households. At the time of the survey, 45% of households in Boffa and Dubreka had at least one student in primary school. If the pilot was implemented as a routine part of the ITN distribution strategy, that would equate to an average of at least two additional ITNs per household over a six-year period for nearly half of all households. Additional ITNs would be useful to help bridge the gap between the current population access (58% in Boffa and 38% in Dubreka) and the National Malaria Control Program’s Strategic Plan 2018-2022’s target population access of 90%. Therefore, introducing an additional channel to Guinea’s ITN distribution strategy will likely increase the number of people sleeping under an ITN.

Although comparison of ITN coverage between the implementation and control zone must be done cautiously, one can still look at the relative contribution made by this school pilot. Among all households in the implementation zone, 19% reported receiving an ITN from the school distribution, compared to just 2% in the control zone. In addition, 13% of all ITNs were from the school distribution. And these are the results with *only* three of six primary school classes being eligible for distribution as part of the pilot.. Campaign nets, presumably from the 2016 mass campaign, provide 62% of households with an ITN, compared to 51% in Dubreka. When the school distribution nets are added, this ownership of at least 1 ITN jumps to 80% in Boffa compared to 53% in Dubreka. The relative contribution of ANC, other and unknown nets is comparable (Figure 8).

The results of the communication campaign, as well, were promising. Of surveyed households, 56% of those in Boffa recalled hearing about the school distribution and 48% recalled messages on ITN use and care. In comparison, households in Dubreka recalled these messages at 3% and 6%, respectively. Table 7 indicates that households who recalled the ITN use and care messages were significantly more likely to sleep under an ITN the night before. Some of the communication practices and channels utilized during this pilot may be of use in future ITN distribution in Guinea.

# Conclusion

In summary, the school ITN distribution evaluation took place in the Boffa and Dubreka districts of Guinea, within weeks after a school distribution pilot, and 2 years after the 2016 universal coverage campaign. As a result, ITN ownership, as well as population level access and use were significantly higher in Boffa than Dubreka. More research is needed to evaluate the cost-effectiveness of such continuous distribution channels in combination with, or as a potential replacement for, subsequent mass campaigns. However, school-based ITN distribution can provide complementary reach and therefore play an effective role in closing the gap toward universal coverage. The results found in this pilot in Guinea do merit further consideration as the Government of Guinea continues to refine its strategy for the prevention of malaria.

1. In this document, “ITN” is used instead of “LLIN” to denote factory-treated nets with wash-resistance of at least 20 washes, per WHO standards. We consider the two terms interchangeable. [↑](#footnote-ref-1)
2. Malaria Indicator Cluster Survey 2016 [↑](#footnote-ref-2)
3. World Bank, Population Estimates & Projections 2017

   3 WHO, World Health Statistics 2017

   4 Multiple Indicator Cluster Survey (MICS) 2016 [↑](#footnote-ref-3)
4. WHO, World Malaria Report 2017 [↑](#footnote-ref-4)
5. PMI Country Profile- Guinea. 2017 [↑](#footnote-ref-5)
6. Malaria Indicator Cluster Survey 2016 [↑](#footnote-ref-6)
7. Guinea Statistical Service 2016 Annual Report [↑](#footnote-ref-7)