LLIN DISTRIBUTION REPORT

West Kasai, Democratic Republic of Congo

September to December 2014

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1. Executive Summary

During October to December 2014, IMA World Health carried out a mass distribution of nets in Tshikapa Health District, West Kasaï Province, DRC, with nets funded by the Against Malaria Foundation (AMF) and non-net costs funded by the UK's Department of International Development (DFID).

624,532 long-lasting insecticide-treated nets (LLINs) were distributed to 256,000 households, achieving 98% sleeping space coverage, protecting 1.1 million people.

The nets were distributed using a 'Hang-Up and Track' (HUT) strategy in which nets were hung at the time of distribution.

Smartphones were used to collect registration information from all households receiving nets. This allowed a significant quantity of data to be captured directly in electronic form.

The data collection process proved very effective overall. It was not without problems but, importantly, demonstrated significant potential for future distributions.

- 91% of the nets distributed had data recorded electronically
- 96% of the household data records were without error

We consider this a very strong outcome. This was the first use of smartphone data collection in a challenging distribution environment. It is also a strong basis from which to build.

We are broadly confident the 9% of nets for which we do not have data in electronic form were distributed as intended.

A separate Technology Report provides significant detail on the use of smartphones for data collection.

Acknowledgements

2. Background

Malaria is the most deadly disease in DRC, costing close to 500 lives a day, the majority children. Research has shown that the use of long-lasting insecticidal nets (LLINs) is effective in preventing malaria. IMA is working to rebuild the health infrastructure and help prevent diseases, and in 2013 was granted US$283m from the UK Department for International Development (DFID) for a project called 'Access to Primary Heath Care' (Projet d'Accès aux Soins de Santé Primaire, ASSP). The non-net costs for the LLIN campaign were funded as part of this project while the cost of the nets was funded by AMF.

Tshikapa Health District, located in the north west of West Kasaï, has nine Health Zones (HZs):

Banga HZ	Kitangwa HZ
Kalonda West HZ	Mutena HZ
Kamonia HZ	Nyanga HZ
Kamuesha HZ	Tshikapa HZ
Kanzala HZ	

In the eight HZs excluding Nyanga, are 185 Health Areas (HA; Aires de Santé, AdS) and 1,495 villages with a total population of 1,673,060. For this distribution, Nyanga was considered a pilot area and a separate net distribution was conducted there shortly before the other HZs received nets.

In West Kasai the fight against malaria involves the distribution *and* hang-up of LLINs, a so-called 'Hang-Up' strategy, in which volunteer Community Health Workers (CHWs) distribute the nets and hang them at the same time. This is in contrast to strategies that simply hand out the nets.

A modified version of the Hang-Up strategy, called a 'Hang-Up and Track' (HUT) strategy, was used on this distribution. With the HUT approach, in addition to distribution and hang-up, information on each net hung is captured using smartphones equipped with a data collection program.

The program is used to capture the geographic (GPS, Global Positioning System) coordinates of each household, demographic data, the prevalence of malaria, the number of sleeping places and the number of good quality nets already hung, amongst other data.

IMA selected 22 Field Supervisors (FSs) from Tshikapa Health District to help manage and supervise the distribution. A one day workshop trained the FSs on the use of the smartphones and data collection program and on the management of data collected.

Each FS was given responsibility for one HA and selected 20 to 40 CHWs, depending on the size of the HA, and trained them on the use of the smartphones and data collection program. Across all eight HZs, more than 4,000 CHWs were involved. The FSs completed the data collection in one HZ at a time covering 22 HAs simultaneously.

3. Pre-Distribution

1. Logistics
2. Technology
3. Liaising with local leaders
4. Selection and training of staff
5. Community information activities

1. Logistics

1. International

676,000 nets were ordered from two suppliers. Their progress was as follows:

19 Mar 2014:   Nets ordered by AMF
Mar/Apr 2014: Nets produced by Vestergaard (341,000) and Sumitomo (335,000)
12 May 2014:   Nets shipped
12 Jul 2014:   Nets arrived at Matadi Port, DRC
22 Jul 2014:   Nets arrived in Kinshasa (350kms from Matadi)

2. Domestic

i) Domestic Arrival

Nets arrived in Kinshasa on 22 Jul 2014 in 21 x 40HC shipping containers each containing approximately 32,000 nets.

ii) Secure storage

The nets were securely stored at Lofice, the transport company used with the following security: 24 hour guards, secured enclosure and secured internal warehouse. The nets remained in their containers and on the trucks for a week before onward road travel to Tshikapa District.

iii) Swap of two Health Zones

In October 2014, concern was raised by the NMCP/PSI regarding IMA distributing nets in two Health Zones, Mikope and Njokos Punda. This was because the nature of the contemporaneous IMA 'distribution and hang-up' method might be confusing to householders in these two districts who had been exposed to public information messages broadcast via radio and included on posters, explaining it was important to air their nets outside for 24 hours in advance of hanging

them in the household. This method of distribution was being coordinated by another distribution organisation, Population Services International (PSI), who were distributing nets in a series of adjoining Health Zones but whose broadcast messages were being heard in the two 'IMA' health Zones.

It was therefore decided to 'swap' two Health Zones and have PSI take responsibility for distributing nets in Mikope HZ and Njokos Punda HZ, and IMA would assume responsibility for distributing nets in Kalonda HZ and Tshikapa HZ. Hence the list of Health Zones included on page 3 and below.

iv) Domestic transport

The nets travelled 800 kms by road over the next three days and arrived in Tshikapa District with individual trucks driving directly to eight individual locations in each of the Health Zones where the relevant quantity of nets needed for the distribution in that district were pre-positioned.

The quantity of nets pre-positioned and their locations were as follows:

Health Zone	Location	Number of nets
1. Banga HZ	Bureau Centrale Dépôt	47,400
2. Kalonda West HZ	Bureau Centrale Dépôt	123,900
3. Kamonia HZ	Bureau Centrale Dépôt	117,800
4. Kamuesha HZ	Bureau Centrale Dépôt	132,100
5. Kanzala HZ	Bureau Centrale Dépôt	73,200
6. Kitangwa HZ	Bureau Centrale Dépôt	73,800
7. Mutena HZ	Bureau Centrale Dépôt	83,400
8. Tshikapa HZ	Bureau Centrale Dépôt	110,900

Total		762,500

This total included the 676,000 AMF-funded nets and 86,500 LLINs from IMA stocks.

3. Method of estimating the number of nets needed per Health Zone

IMA obtained population data for the year 2012 from the Ministry of Health and applied the MOH's estimate for population growth of 3% per annum.

4. Calculating quantities of, and organizing additional, supplies needed during the distribution phase

Supplies of equipment needed for the distribution were listed and quantities estimated.

The number of phones was determined by the number of CHWs needed to perform the distribution. It was estimated that CHWs could register 50 households per day. This estimation was taken from the

average number of households RECOs registered in one day during the pilot distribution in Nyanga.

As for other supplies, the following estimates were used:

- One hammer per team of CHWs
- 4 meters of rope per net
- Five nails per net

5. 6,000 nets for hospitals

6,000 nets were distributed to hospitals in November 2014. See attached spreadsheet for hospitals and quantities. The nets were distributed in the 52 Health Zones across 4 Health Zones covered by the ASSP project.

- 1,000 in Equateur Province
- 3,000 in Kasai Occidental
- 2,000 in Maniema

The nets were distributed in 135 Health Centres de Reference and 51 Reference General Hospitals.

2. Technology

Smartphones with a data collection programme, created on open source software, were used for household level registration.

The principal technology-related decisions were:

1. Specific data collection software and programme to be used
2. Electronic devices (hardware) to be used, which are typically smartphone or tablet devices.
3. Selection of additional equipment required for operational efficiency and data transfer (spare batteries, battery chargers, protective cases, laptops, WiFi connection devices).

The following sections describe the choices made and the reasons.

Software

The Open Data Kit (ODK) brand of software was chosen to collect and aggregate the data.

The selection criteria were:

1. Required functionality
2. Customizable (with 'skip logic'*)
3. Easily run on a smartphone or tablet

4. Reliable – bug free
5. Strong reputation
6. Free (open source software)

The required functionality was simple data entry through drop down menus, radio buttons (yes/no choices) or entry of data into pre-established fields. It was intended that the significant majority of the data to be entered would be through operators making selections rather than typing in data using a keyboard for efficiency and to minimize day entry error.

Technical note
* Skip logic' is a feature that changes (during a questionnaire) what question or page a respondent sees next based on how they answer the current question. Also known as "conditional branching" or "branch logic", skip logic creates a custom path through a questionnaire that varies based on a respondent's answers.

Additional background

The ODK product started as a trial product at Google.org in 2008 and was developed with the University of Washington. An open source product, and therefore free to use with code available to the public, it has developed a strong user base which has led to a) the software having a suite of applications and templates developed by others (publicly available for free) and b) the underlying software being largely bug free.

Data Collection Application (app)

The ODK Collection application (app) is downloaded and installed on each data collection device. The app takes up only 7.3Mb (this is small). The data collection forms to be used are then downloaded to the device.

Designing the Data Entry Forms

The data entry forms themselves can be built using the Build (https://opendatakit.org/use/build/) web application or by using XLSForm – this takes an Excel spreadsheet of the relevant format and converts it into an ODK form. In this case XLSForm was used as recommended for larger forms.

This task is best carried out by a tech-savvy individual liaising with others on the distribution team who can specific exactly what data is needed, how it should be laid out and with what sort of data entry option (Drop down lists; Multiple choice – either 'pick one' or 'pick many'; or text entry, which can be validated and/or restricted to a certain format: numbers, text etc.)

The questionnaire can be set so each question must be answered in turn and the inputs can be validated or checked against previous answers (in cases where a later answer contradicts an earlier one – for example; there are 2 people in the household, but later answers include 3 under5s) and present data entry warnings to eliminate 'inconsistency' data entry errors.

Fig 1. Screenshot of part of the data collection form creation process

We have asked for additional screenshots of the data collection screens and will add them here in an updated version of this report.

Hardware

The hardware employed in the data collection and processing was:

1. Basic smartphones
2. Standard portable (laptop) computers
3. WiFi routers
4. Additional rechargeable batteries for the smartphones and battery chargers

1. Basic smartphones

A smartphone was chosen rather than a tablet given it could carry out the task required and was smaller and cheaper than a tablet.

Required features of the phone included:
1. Android device (It has to be an Android device for open source s/w to be used.)
2. GPS functionality (embedded GPS chipset)*
3. GPS functionality that would work in DRC*
4. Built in WiFi features

5. Camera with flash function (given photos were going to be taken at each household)
6. Robustness of the phone (particularly the screen, availability of a protective case) given the environment in which it would be working.

In addition, the ability to source several hundred smartphones at one time without significant delay (not more than two months) was important.

Technical note
* Phones that are A-GPS (which stands for Assisted-GPS) capable only are not adequate as they rely on the presence of an internet network and in the DRC context (and many other net distribution contexts) would not provide GPS functionality

Devices bought

The devices selected were android Samsung GT-S7582 and GT-7582L smartphones (known as the Samsung Galaxy S Duos).

430 smartphones were purchased. Additional information on the price of the phones and the supplier/s has been requested and we hope to add that information here in an updated version of this report.

The number of phones required and therefore bought was calculated according to the number of CHW teams needed to perform the distribution and hang-up in two days per health zone. We estimated that each CHW team would be able to cover 40 households per day. Therefore the total number of households was divided by 80 to determine the number of phones required. The calculation did not specifically include a reserve quantity in case of failure/out of service phones.

The phones were purchased from three sources. Even with the popularity and wide availability of the Samsung brand, it was difficult to source all the phone models from one source. 70 phones proved to be faulty and unusable. In retrospect, this problem occurred because one of the suppliers was an unproven vendor, and that vendor delivered a faulty batch of phones. The distribution campaign continued with 360 smartphones and it was still possible to finish the distribution in a timely fashion.

2. Standard portable (laptop) computers

These were the devices at each Health Area facility to which all data from the smartphones was uploaded for aggregation and analysis.

Each laptop was loaded with 'recipient' ODK software so the data collected could be uploaded i.e. transferred from each smartphone to the laptop. The data from each was then exported to a spreadsheet and combined into one master sheet for each Heath Zone.

The model used in this distribution was the Lenovo T430. The number of laptops required was 20.

These laptops act as a portable data hub where, after each day's registration activity, data collected on the smartphones are uploaded to the laptop using the 'ODK Aggregate' server software. ODK Aggregate is displayed using any standard web browser, so it is user friendly.

Additional information on the price of the laptops and the supplier/s has been requested and we hope to add that information here in an updated version of this report.

Technical note
Reading from the ODK Developer website, since we deployed our Lenovo using VM-based ODK Aggregate server software, the front-end App Engine deployment requires a system that is equipped with 600MHz with 128MB of memory. VM back-end requires 256MB of memory.

3. WiFi routers

Uploading the data collected to the laptop computer required a simple WiFi router to connect the smartphone and laptop. The router was programed with the unique address of the laptop computer to allow each smartphone to connect without interference to that specific laptop (only). The power for the WiFi router was supplied via a USB cable that connects it to the laptop computer.

The router model bought was the TP-Link Wireless N Nano router. 20 routers were bought. Each router cost US$18.

The same number of routers was bought as laptops because each laptop requires a router in order for the phones to upload the data through WiFi.

An advantage of the Nano router is it is USB-powered, so the power consumption is low and the router can be plugged directly into the USB port meaning an additional electrical socket is not needed to power the router.

4. Additional rechargeable batteries (for the smartphones) and battery chargers

The lifetime of the smartphone battery (after a full charge) was between 5 and 8 hours. To ensure smartphones would not be unusable through a lack of battery power, additional rechargeable batteries were bought and close attention paid the night before each distribution day that spare batteries were fully charged.

In the pilot distribution in Nyanga Health Zone, supervisors would swap unused phones during the data collection when a smartphone ran out of charge. Furthermore, once the net distribution team was in the field, the ability to recharge the phones (finding a generator, solar installation, logistics) was reduced drastically. Many supervisors would travel back (for some, a 2 hour roundtrip) each night to recharge the phones because power sources in the villages were non-existent. Others were able to rent power generators locally.

Thus, for this distribution, additional batteries were bought.

The battery model chosen was the ALLPOWERS 15600mAh external battery. The cost per unit was approximately USD$23. 430 units were bought to match the number of smartphones.

The Samsung smartphones came with 1500mAh batteries so, in theory, the external battery wold be able to fully recharge the smartphone 10 times. The realistic expectation, however, was the external battery might be able to recharge the smart phones 5 to 6 times. This would be more than adequate for the average time spent in the field per health zone.

Note: A separate document 'West Kasai: Technology Report' assesses in detail the performance of the technology, procedures and data collected and makes recommendations for future projects.

3. Liaising with local leaders

Meetings were held with local leaders to seek permission and support for the distribution.

- **District-level leaders (1 day)**
  The team shared and discussed the vision and plans for the distribution with political administrative leaders (Autorités Politique Administratives, APA), opinion and religious leaders.

- **Community leaders (1 day)**
  After meetings with district-level leaders, sub-teams met with village-level and Health Area leaders such as village chiefs and heads of other notable groups in order to achieve active participation of the community and encourage each community to embrace the HUT strategy for the fight against malaria.

- **Social mobilizers (1 day)**
  These meetings discussed how community messaging would best communicate the aims of the campaign to achieve the desired impact and response from the communities. Messaging needed to be in the local language and take into account the communication mechanisms, customs and languages of each community, with messages translated into multiple languages as necessary.

4. Selection and training of staff

Two categories of staff were required for the distribution. Field Supervisors (FSs), who had a management responsibility in each HA, and Community Health Workers (CHWs) who were responsible for visiting beneficiary households to collection registration information, hand out *and* hang the nets.

1. Selection

For the successful implementation of the HUT strategy it was necessary to select responsible and reliable individuals to manage and supervise the household registration and identify appropriately skilled individuals to carry out the household registration and hanging of nets.

i) Field Supervisors (FSs)

22 FSs were selected from permanent and senior health staff in Tshikapa Health District.

ii) Community Health Workers (CHWs) – data collectors

Each of the 22 FSs had the responsibility of recruiting, in each HA they were designated, enough CHWs to gather household data and hang nets.

Two primary recruitment criteria were literacy and familiarity with using a mobile phone.

The number of CHWs recruited depended on the size of the HA and the number of households to be visited. The aim was to recruit enough CHWs to carry out the entire registration and hang-up, once it commenced, in a five day period. Between 20 and 40 CHWs were recruited by each FS for a total of 4,000 CHWs across the 8 HZs (8 HZs x 20 HAs x 25 CHWs per HA = 4,000 CHWs).

2. Training

For the successful implementation of the HUT strategy it was necessary for the FSs and CHWs to undergo training.

i) Field Supervisors (1 day)

The 22 FSs were brought together to undergo one days' training covering the following:

1) Explanation of the aims and methods of the net distribution, specifically that every household in each village should be visited with no households missed.

2) Explanation of the triple task of data collection from each household, distribution of the right quantity of nets for each household and hang-up of the nets handed out.

3) Guidance on how to explain to each householder the purpose of the data collection and distribution and gain permission from the householder to collect data.

4) Instruction on what to do if access could not be gained to a household or there was no-one present in a household in which case data could not be collected.

5) Instruction on, and familiarization with, the role and correct use of the smartphones and the on-screen data entry forms and information required to be collected. Advice on some methods of troubleshooting in use of the smartphones i.e. what to do if error screens were seen, the smartphone froze, how to restart the phone and what to do if the smartphone ran out of battery power.

6) Guidance on how to check data entered was accurate.

7) Instruction and guidance on how to a) select and b) train the CHWs who would collect data.

ii) Community Health Workers (CHWs) – data collectors (2 days)

Those selected to be CHWs in a Health Area were brought together to undergo two days' training covering the first five points mentioned above.

5. Community Information activities

For the successful implementation of the HUT strategy it was necessary to make sure communities were aware of the distribution and that nets would be distributed household by household.

This meant both formal and informal methods of communication were needed to key groups and the wider public.

Formal methods included information sessions to specific groups of influence in the community, such as the leaders of the villages, the teachers and churches. Informal methods included multiple public radio broadcasts, public gatherings and the use of mobile megaphone messaging from vehicles. Messages included the timing of the HUT campaign, its importance (in preventing malaria), its specific goals (every sleeping space covered in every household with households receiving exactly the number of nets they needed to protect everyone) and what would happen during a household visit (the collection of household-level data, the handing out nets *and* the hanging of the nets, all at the same time).

There was also an official public launch of the distribution campaign during which a major public awareness campaign took place, including variously across the Health Zones, Health Areas and villages, the following awareness and educational activities: theatre, dance, traditional poems and local cultural ceremonies.

4. Distribution

1. Dates
2. Participants and roles
3. Distribution stages
   ### i) Household registration, Handing out and hanging nets
   ### ii) Data collection, transfer/compilation, verification and analysis
4. Security of LLINs

1. Dates

The contemporaneous household registration, handing out of nets and hanging of the nets took place according to the following schedule.

Health Zone	Distribution dates
1. Kitangwa HZ	05 – 17 October 2014
2. Banga Lubaka HZ	16 – 28 October 2014
3a. Kamonia HZ	23 – 27 October 2014 (Stopped, Ebola)
4. Kanzala HZ	29 October – 04 November 2014
5. Tshikapa HZ	05 – 11 November 2014
6. Kalonda West HZ	12 – 20 November 2014
7. Mutena	18 – 24 November 2014
3b. Kamonia HZ	20 – 23 November 2014 (Restarted)
8. Kamuesha HZ	24 November - 04 December 2014

2. Participants and roles

PARTICIPANTS	ROLES PLAYED
IMA – Focal Person, Malaria	Overall coordination of hang-up activity
IMA – Specialist, Communications	Coordination of hang-up communication
IMA – Manager, Technology/Data	Collection, processing and analysis of data
IMA – Asst. Mgr. Technology/Data	Collection, processing and analysis of data from smartphone
Médecine Chef du District (MCD)	Accompanying activities
Médecine Chef du Zone (MCZ)	Organization, planning and carrying out activities.
Senior Nurse	Organization of activities in the Health Area
Social Mobilizer	Education of communities on hang-up
Independent Supervisor	Review/supervision of IT activities in the Health Area

Community Volunteers (CHW)	Responsible for data collection and net hang-up
NMCP National	Overviewing of activities for the NMCP at national level
NMCP Provincial	Overviewing of activities for the NMCP at provincial level
SANRU – Focal Person	Facilitate the conduct of the campaign

3. Distribution Stages

There were two stages to the distribution.

1. Household registration, handing out and hanging nets (3 days)

Teams of three or four CHWs visited households sequentially.

This was a crucial stage of the net distribution that consisted of collecting relevant household data for every single household in the distribution catchment area including, but not limited to, the following 'must have' information:

- Name of household head
- Number of people in the household
- Number of sleeping spaces ('for the purpose of nets'*)
- Number of perfectly good nets with at least two years of life left in them
- Location of household (GPS coordinates)
- Household identifier**

The last two pieces of information were to facilitate later identification of the individual household for post-distribution check-up work.

* When assessing the number of sleeping spaces it is important to avoid confusion between the number of separate areas in which individuals might sleep and, given nets distributed are 'double' nets that will accommodate two people, the number of sleeping spaces that is equal to the number of nets that are needed. For example, in a household with mum plus dad, four children aged eight, four, six and two and a grandfather there may be six separate sleeping areas: mum plus dad, one each for the four children and one for the grandfather. However, for the purposes of nets, there would be four sleeping spaces: one for mum and dad, one for the two older children, one for the two younger children and one for the grandfather.

**Creating a household identifier is necessary as many households do not have clear addresses. For example, it is frequently the case in rural and semi-rural locations that street names and household numbers do not exist. The household identifier was created as one long number, as follows:

Day of distribution + Unique number of the smartphone being used to collect the data +

Household number for that day's distribution + Number of sleeping spaces + Number of nets installed. For example: 171115-2365714-015-04-04

The household identifier was marked in chalk on the front of the household where it could be found subsequently.

A courteous and effective interaction between the CHWs and the heads of the benefitting households is important to carrying out a successful distribution as is an accurate recording of the necessary household information. The tasks for CHWs at each household were as follows:

Steps	Details
Introduction	CHWs take the time to introduce themselves to the head of household and explain the reason for their visit in order to gain the householders' permission to collect the required household information, distribute and hang the nets.
Data collection	The CHW responsible for entering household data (CHW with the smartphone) gathers the required data with the help of the head of household. The CHW asks for additional information not contained in the registration questionnaire (incidents of malaria, socio-demographic information, what type of medication they took for malaria and information on the demographic make-up of the household to enable the collection and integration of the data.
Hang-up of LLINs	The CHW responsible for the hanging of the nets does so with the help of the head of household and/or other household members, using the string and nails brought along if necessary. A net is hung over each sleeping space (two people per sleeping space) and then rolled up out of the way (for example off the ground) during the day to help avoid unnecessary wear and tear or damage. It is then rolled down at night.
Household marking	In order to both a) avoid returning to a household that had already received nets and b) be able to identify the household during subsequent post-distribution follow-up, a CHW marked a unique household identifier using chalk on the outside of the household in an easily visible place (for example on a doorframe, door or other front area).
Education on correct net use and care	The final step for the CHWs was to pass on information to as many household members as possible regarding the correct use of the net, including: tucking the net under mats or mattresses at night; not leaving any gaps through which mosquitoes could pass; rolling up the net during the day to minimize damage; avoiding causing holes and rips in the net; the importance of repairing the net if holes develop; and lastly, the ability to wash to net 20 times in the next 3 years.

2. Data collection, transfer/compilation, verification and analysis

Household data went through the following steps:

1. Data collected at the household by a CHW
2. Independent supervisor uploaded the data from the smartphone to a laptop.
3. The supervisor reviewed the data and corrected obvious mistakes or inconsistencies.
4. The data across a Health Area was compiled into one data set
5. The data was transported to the Health Zone central office via a USB memory stick and compiled to give a complete data set for the Health Zone. There were between 17 and 28 Health Areas in a Health Zone.
6. The data was sent by USB memory stick and hard disc from the Health Zone level to the Assistant Data Manager at the central level for overall compilation
7. The data was analysed by the Data Manager and Assistant Data

i) Data transfer /compilation

At the end of each distribution day each smartphone was brought to the Health Area's main health centre and, via a WiFi connection, the data collected on the smartphone was uploaded (transferred) to a locally located laptop.

ii) Data Verification

After the distribution had been completed in a Health Area and all data uploaded from the smartphones, the data team compared the electronic data with the paper data collected by each distribution site in each health area. At the end of the day each CHW returned undistributed nets to the supervisor and depot manager and reported the number of nets they distributed. These numbers were recorded on paper.

iii) Data Analysis

The IMA Monitoring and Evaluation (M&E) team is currently in the process of analysing data for other indicators such as prevalence of malaria and will distribute a separate IMA report of the findings.

4. Security of LLINs

1. Signing nets in and out

In each health area there were at least two storage sites for supplies (nets plus other materials). Daily movement of nets was strictly recorded in the daily stock ledger so that it was known how many nets had gone to each Health Area or village. Any nets remaining after the distribution were returned to the secure storage locations.

Any movement of nets involved manual counting of the bales of nets with two individuals having to sign for the precise quantity leaving, or being received at, the secure storage area and being loaded on, or unloaded from, the transport vehicle.

The same process was required to be done when the nets arrived at a distribution location, with the transport driver and the individual in charge of the distribution location, both counting and signing for the nets.

2. Anti-theft measures

The following procedures were carried out to ensure no misappropriation of nets:

1. CHWs worked in teams of 3 or 4 to ensure mutual peer control
2. Only after the household registration was complete were the number of nets required given to the household
3. At each net storage site there was a warehouseman who wrote down the quantity of nets entering or leaving. Specifically, the number of bales was counted in/out (rather than a verbal statement of quantity by one person being accepted) and two signatures placed against the number recorded.
4. The CHWs visiting beneficiaries kept a hard copy list of the household information entered in the smartphone in case of data failure or a need to check data.

5. Lessons Learned

What went well?

Lessons learned during the pilot distribution stage in Nyanga influenced us to change a few things for these distributions. Specifically:

1. We purchased WiFi routers which made for quicker uploading of data.

2. The following changes made in the ODK survey produced much cleaner data:

- Skip patterns (see comment on page 8 re skip logic)
- Duplications – Most questions were changed to have a drop-down list of answers so that the CHW only had to choose the answer rather than type the answer.
- Missed data – The survey was developed so that a CHW had to answer the question before continuing on to the next question.

3. Registering the household (collecting data) and distributing the nets at the same time allowed us to complete the distribution at a much faster pace.

What did not go so well?

1. Over-estimate of number of nets needed

In a significant majority of Health Areas more nets were pre-positioned than were needed. The estimates of population were not accurate enough.

Lesson Learned
There should be a critical assessment of the population numbers used to determine net numbers.

2. Issues relating to smartphones

i) Faulty smartphones
Initially 430 smartphones were bought but 97 of these proved to be faulty and unusable. In retrospect, the smartphones were not bought form a reliable source.

Lesson learned
A strong recommendation, to avoid duplicate effort, delays and unnecessary cost, is to ensure the phones are bought from a highly reliable source with each one tested out of country prior to shipment to country. Identify vendors that can deal with bulk purchases.

ii) Spare rechargeable batteries required
The lifetime of the smartphone battery was between x and y hours. To ensure smartphones would not be unusable through a lack of battery power, additional rechargeable batteries were bought

and close attention paid the night before each distribution day that spare batteries were fully charged.

Lesson learned
Consideration should be given to sufficient spare rechargeable batteries to avoid registration delays.

iii) Inappropriate equipment used in charging phones
Rather than this being unsuitable 'phone chargers', this problem related to generators being used to generate the electricity from which the phones were charged. Unfortunately 'constant voltage' transformers were not used and as a result of the fluctuating/surging charging voltage from the generators, some of the phones (and several laptops) 'burn out'.

Lesson learned
Care needs to be taken when charging devices where there are power outages and generators may be need. Constant voltage transformers should be given serious consideration.

Also
Consider using tablets instead of cell phones due to bigger screens and potentially equal or lower cost. The bigger screen may make data entry quicker and clearer.

3. CHW related issues

i) Incorrect allocation of responsibilities
It became apparent during the first stages of the distribution that some CHWs were quicker and more accurate at entering data using the smartphones. Others took much longer and slowed the rate at which households could undergo registration and hang-up. As a result, the responsibilities of CHWs were re-organized. A smaller number of CHWs were tasked with data entry and a greater number of CHWs were given responsibility for net hang-up. Rather than data-entry CHWs waiting for nets to be hung before moving to the next household, they would enter data for a household and move on immediately to register the next household. This speeded up household registration. This was not something that had been observed during the pilot distribution in Nyanga HZ during which phase other areas for improvement had been identified.

Lesson Learned
More extensive assessment is required in the selection of those CHWs who will be given smartphones and take responsibility for household registration and data collection. Close monitoring of individual CHWs responsible for data collection is required with the flexibility in the field to adjust the roles of CHWs.

ii) House identification marking
There was confusion regarding how to mark each household with their identification mark. In a material number of cases the agreed structure of the identifier was not followed. For example, the number of the household was found to be replaced by the number of the telephone or the

number of sleeping spaces was confused with the number of people in the household. If the identifier is not marked, and marked correctly, it risks compromising the ability to uniquely identify a household for follow-up during the post-distribution check-up phase.

<u>Lesson Learned</u>
Greater emphasis in training is required to ensure CHWs responsible for data collection are clear on a) the need to mark a household that has received nets and b) the structure of the identifier to be used.

iii) CHW pay
The CHWs complained they were not paid enough. The CHWs were paid $5 per day and this was considered appropriate.

<u>Lesson Learned</u>
Establish clearly the daily pay rate and ask, as CHWs are selected, they accept that daily rate.

6. Health Zone Summaries

Health Zones

1. **Kitangwa HZ**

2. **Kamuesha HZ**

3. **Banga Lubaka HZ**

4. **Kamonia HZ**

5. **Kanzala HZ**

6. **Tshikapa HZ**

7. **Mutena HZ**

8. **Kalonda West HZ**

For each

1. **Pre-distribution**

2. **Distribution**

3. **Lessons Learned**

4. **Summary Data**

1. Kitangwa HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

Before carrying out the distribution the following activities took place:

- Briefing of the Health Zone's Chief Medical Officer (MCZ, Médicine Chef de Zone)

  The MCZ is the HZ's coordinator of mass net distributions. He is the liaison between IMA World Health, SANRU, the Community Health Workers (CHWs) and other community partners. Before beginning activities in the HZ, we met with the MCZ to discuss the recruitment of CHWs, transport needs (car, bikes, fuel etc) and other logistical questions. During this briefing we took the opportunity to inform the MCZ of the distribution methodology and the timing. After the briefing the MCZ informed all the HZ managers of the distribution about to take place and asked them to liaise with the health teams in each Health Area to help recruit the required number of CHWs and for CHWs to be ready to be trained on a particular date.

- Training of Community Health Workers (CHWs)

  The FSs returned to their HAs and met with individuals selected by the Health Centre's Head Nurse to determine whether they satisfied the criteria mentioned above. 410 CHWs were then trained on a) the correct usage of the smartphones and ODK-based household-data registration forms and b) how to correctly hang nets.

- Training FSs how to collect household-level registration information, the management of data collected and the training of CHWs
- Meeting with Dr Saturnin at the HQ of SANRU at Tshikapa
- While in Tshikapa for FS training, the central management team met with Dr Saturnin to organize vehicles needed for the distribution, calculate fuel needs and prepare budgets for the distribution.
- Preparation of other equipment needed for the distribution.
- Charging of 430 smartphones
- Preparation by the CHWs of the number of bales needed for each Health Area

2. Distribution

The following activities took place during the distribution:

- On each distribution day a member of the community was hired to travel around in a car and deliver, via megaphone, a message to all households that CHWs would be coming round to all households in the next few days to hang anti-malarial mosquito nets. *See 'Megaphone Messaging' below for the text of the message delivered.
- Each morning the CHWs gathered with their FS to collect their smartphones, nets, hammers and nails. The FS noted on an excel spreadsheet, the name of the CHW being given a smartphone and the unique identification number of that smartphone.
- CHWs were assigned distribution areas within each Health Area
- CHWs visited each household within their allocated distribution area

- For each household the CHWs carried out the following:

  1. Marked using chalk each household with their unique household identifier. The identifier was constructed from the following elements: date of the distribution + the number of the telephone + the number the household was being visited that day i.e. the 'nth'
  2. Entered into the smartphone the information required to complete the registration of the household. This included the demographics of the household (name of the head of household, the number of people, their age and whether male/female, the number of sleeping spaces (for the purpose of nets), whether anyone had malaria, the number of perfectly usable nets, the number of nets needed and the GPS coordinates of the household.
  3. After the registration was complete, the CHWs went into the house to hang the appropriate number of nets.
  4. Once hung, the CHW took a photo using the smartphone to record an image of the successfully delivered and hung nets. If the householder did not want to be in the photo, just a photo of the net was taken.

- At the end of each day, the CHWs returned the smartphones to the Field Supervisor and the data was imported into a computer using a WiFi router connection. The Field Supervisor checked the data to make sure the household registrations had been carried out correctly.

*Megaphone Messaging (English and French version beloe but deliverd in French)

Dear mothers, fathers, brothers and sisters-

Today we will be distributing insecticide treated bed nets in your village. As many of you know, malaria is a very serious disease that is caused by mosquitos that bite at night. In DRC, it kills 500 people per day, the majority of them children. Malaria transmission can take place year round and everyone is susceptible, although children under five and pregnant women are most vulnerable.

The mosquitos that bite at night are the only cause of malaria. The easiest way to prevent malaria is to sleep under an insecticide treated bed net every night and all year long. Using these nets is an easy, effective and long lasting way to protect yourself and your family from malaria.

The distributors will be going house to house with nets, hammers, nails and ropes. They will be hanging the nets for you for free. Please accept their assistance and be ready to invite them into your home to hang the nets for you.

This message comes to your from IMA, the Ministry of Health, and MCP Kasai.

Thank you for your attention.

Chers mères, pères, frères et sœurs-

Aujourd'hui, nous allons distribuer les moustiquaires imprégnées dans votre village. Comme beaucoup d'entre vous le savent, le paludisme est une maladie très grave qui est causée par les moustiques qui piquent pendant la nuit. En RDC, il tue 500 personnes par jour, la majorité des enfants. La transmission du paludisme peut avoir lieu toute l'année et tout le monde est sensible, bien que les enfants de moins de cinq ans et les femmes enceintes sont les plus vulnérables.

Les moustiques qui piquent pendant la nuit sont la seule cause du paludisme. La meilleure façon de prévenir le paludisme est de dormir sous une moustiquaire traitée moustiquaire chaque nuit et toute la durée d'un an. L'utilisation de ces moustiquaires est un moyen durable facile, efficace et longtemps pour vous et votre famille de la malaria protéger.

Les distributeurs seront vont de maison en maison avec des filets, des marteaux, des clous et des cordes. Ils seront suspendus les filets pour vous gratuitement. S'il vous plaît accepter leur aide et être prêt à les inviter dans votre maison pour accrocher les filets pour vous.

Ce message vient à partir IMA, le ministère de la Santé, et MCP Kasaï.

Merci pour votre attention

3. Lessons learned

What went well?

1. Faster household registration process

The new method of carrying out the distribution, i.e. performing the household data entry and the

handing out and hanging of the nets at the same time worked very well and saved time. In the pilot distribution in Nyanga the registration took place on the first day and the distribution of the nets required took place on the second day.

2. Improved data entry forms

The modification of the data entry forms made after the pilot distribution in Nyanga HZ led to cleaner data (more accurate, fewer errors). The merger of the two questionnaires (= data forms), namely for registration and for distribution reduced the time of the interview at each household and removed duplicate questions.

What went less well?

1. Over-estimate of the HZ's population

The population was in fact half of that estimated.

Lesson learned
Greater attention needs to be given to the accuracy of population information and assumptions for developing estimates which are in turn used to order nets and drive logistics costs. A separate pre-distribution phase should be considered in which detailed numbers (e.g. population, net need) are established. This may be a better solution to allow an accurate number of nets to be moved and distributed.

2. Several logistics issues

i) Too few net pre-position storage areas
Kitangwa HZ covers a large area geographically and two pre-position sites were not enough. The number was increased to four.

Lesson learned
Consider the extent of the geographic area when deciding on the number of pre-position sites.

ii) A lack of transport to move nets
There weren't enough trucks available which made movement of nets more difficult than desirable.

Lesson learned
More attention needs to be given to this in initial logistics planning.

3. CHW and Field Supervisor management issues

i) Selection of CHWs – Individuals without the required skills selected

Many of the Health Area permanent nurse and health staff selected members of their family and friends to be CHWs rather than making the selection on the basis of established criteria*. This caused a problem as many of those recruited were not literate and did not know how to use a phone or smartphone. Because this was the first HZ, the FSs had not developed the ability to determine whether an individual was suitable to be trained as a CHW. Many of the FSs went ahead with the training of individuals unsuited to be CHWs and this caused problems during the distribution phase. In some cases the FSs had to recruit new CHWs and organise another round of training.

Training had been forecast to take two days. The FSs noticed that selected CHWs either knew how to use the smartphones or not. For those that did, a second day of training was unnecessary. For those that did not, three days were required. This pointed to the issue of avoiding selecting unsuitable people to be CHWs and/or the need to recognise that some individuals could only be useful CHWs if they were not required to enter registration data on the smartphone.

 * Hiring Criteria of CHWs

- Must be well known in the community
- Speaks French and Tshiluba
- Can read and write
- Preferably a community health worker, teacher, nurse, village chief or pastor of the church
- An honest and trustworthy person
- Must be in good health
- Must have a strong desire to help improve the health and well-being of their community
- Must be a good communicator
- Must be available for the length of the health area distribution

Lesson learned
It is important to ensure a) CHWs are selected based on the criteria laid out (literate, able to use a mobile phone and therefore easily able to be trained on use of a smartphone and the data entry process) and b) check right at the start of the training process that all individuals selected to be CHWs have these skills. Greater oversight is needed during CHW recruitment. Given the importance of this activity and the potential pitfalls, it is recommended a senior member of the management team should be present throughout the CHW recruitment and training process.

ii) CHWs asked for higher pay
CHWs asked to be paid $10 a day rather than $5 a day after they had already accepted the role and its terms. Some CHWs said they needed more than two days to carry out the distribution. In most cases, it was apparent the CHWs were saying this simply to be able to earn more money. The majority of the CHWs found two days sufficient.

Lesson learned
Establish clearly the daily pay rate and ask, as CHWs are selected, they accept that daily rate.

iii) CHWs selected who could not read or write
The Field Supervisors had to recruit new CHWs and organise another round of training.

<u>Lesson learned</u>
Ensure CHWs are qualified to do the job before training starts.

iv) One Field Supervisor not doing his job
A Field Supervisor was found to be sitting under a tree and not working rather than supervising CHWs. He was dismissed and sent back to Tshikapa.

<u>Lesson learned</u>
Monitoring Field Supervisors' performance is important.

v) Inebriated CHWs
Some CHGWs were found to be inebriated during working hours. This was found to be linked to a number of nurses and health staff had recruited family members and friends rather than individuals qualified to be CHWs. The individuals were dismissed, unpaid.

<u>Lesson learned</u>
Monitoring CHWs is important.

4. Other operational issues

i) Lack of location to write the household identifier
In certain cases the CHWs complained there wasn't an appropriate place (an easily visible place on the front of the household) to mark the household identifier.

<u>Lesson learned</u>
CHWs were writing the household identifier in too large a handwriting and so were running out of space to write it on the door. They were told to use smaller handwriting.

4. Summary data

	1. Health Zone: Kitangwa	Population	# Villages	# Households	# Sleeping Spaces (SS)	# Usable LLINs	# LLINs required	Initial # LLINs estimated	# LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
1	Kabunda	3,672	6	787	1,817	301	1,516	4,300	1,516	0	83	2,784	35%	2,784	2.02
2	Kakhumu	4,051	4	801	1,833	217	1,616	2,000	1,616	0	88	384	81%	384	2.21
3	Kamatoma	4,040	3	778	1,851	146	1,705	2,400	1,705	0	92	695	71%	695	2.18
4	Kamungindu	4,484	4	899	2,035	169	1,866	2,500	1,866	0	92	634	75%	634	2.20
5	Kandumba	1,437	3	326	706	9	697	2,300	697	0	99	1,603	30%	1,603	2.04
6	Kayongo CMCO	3,016	3	627	1,435	203	1,232	2,000	1,232	0	86	768	62%	768	2.10
7	Kayongo Etat	2,830	3	626	1,425	100	1,325	2,600	1,378	53	97	1,222	51%	1,222	1.99
8	Khuyi teteji	3,031	4	601	1,563	23	1,540	2,400	1,540	0	99	860	64%	860	1.94
9	Kimbangu	3,339	4	592	1,811	177	1,634	2,600	1,634	0	90	966	63%	966	1.84
10	Kitangua	7,581	3	1,238	3,205	18	3,187	2,400	3,187	0	99	-787	133%	-787	2.37
11	Kitembo	5,287	3	1,165	2,575	202	2,373	2,400	2,325	-48	90	75	99%	75	2.05
12	Kombo	7,466	4	1,380	3,307	12	3,295	3,000	3,295	0	100	-295	110%	-295	2.26
13	Malundu	2,413	4	443	1,216	41	1,175	3,000	1,143	-32	94	1,857	39%	1,857	1.98
14	Mbuambua	3,625	3	719	1,645	346	1,299	2,400	1,299	0	79	1,101	54%	1,101	2.20
15	Mbuji	4,665	4	861	2,462	43	2,419	2,600	2,419	0	98	181	93%	181	1.89
16	Mukala	4,445	5	888	2,232	265	1,967	3,300	1,967	0	88	1,333	60%	1,333	1.99
17	Ndjindji	7,129	5	1,297	3,022	561	2,461	3,700	2,461	0	81	1,239	67%	1,239	2.36
18	Ngoya	2,449	3	492	1,157	76	1,081	1,800	1,081	0	93	719	60%	719	2.12
19	Ngulungu	2,177	4	448	882	25	857	2,700	857	0	97	1,843	32%	1,843	2.47
20	Nyangu	6,172	3	1,061	3,107	58	3,049	2,300	3,049	0	98	-749	133%	-749	1.99
21	Sashila	3,951	3	787	1,908	218	1,690	2,200	1,690	0	89	510	77%	510	2.07
22	Shakafulu	3,021	3	647	1,370	174	1,196	2,300	1,196	0	87	1,104	52%	1,104	2.21
23	Shambuanda	6,136	4	883	2,840	77	2,763	2,600	2,763	0	97	-163	106%	-163	2.16
24	Shayitengo	4,025	5	1,123	2,070	43	2,027	3,400	2,028	1	98	1,372	60%	1,372	1.94
25	Tshingila	2,831	4	501	1,532	27	1,505	2,400	1,505	0	98	895	63%	895	1.85
26	Tshitepa	4,598	5	1,173	2,573	236	2,337	3,500	2,337	0	91	1,163	67%	1,163	1.79
27	Tshiwandawanda	3,123	2	669	1,741	19	1,722	2,300	1,722	0	99	578	75%	578	1.79
28	Tundu	2,317	4	376	1,145	10	1,135	2,600	1,135	0	99	1,465	44%	1,465	2.02
		113,311	105	22,188	54,465	3,796	50,669	74,000	50,643	-26	93	23,357	68%	23,357	2.08

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

2. Kamuesha HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

Before carrying out the distribution the following activities took place:

- Briefing of the Independent supervisors in each Health area
- Meeting with the Health Zone (HZ) central team
- Sensitization of communities
- Review and mark-up of the HZ distribution areas
- Training of Community Health Workers (CHWs)
- Testing of equipment - 470 smartphones, additional batteries and cases

- Briefing of the independent supervisors

Even though we had just come from conducting a distribution and hang-up in another Health zone, there was a complete run through of the work needed to be done and what items needed to be paid attention to. The meeting also acted as a planning meeting.

- Logistics planning by the core central office Health Zone team

The hang-up activities were overseen by the Health Zone's Heath Director (MCZ, Médecine, Chef de Zone) and his team. Logistics Planning took place covering logistics planning taking into account natural boundaries, distances of Health Areas form each other, the best access to individual Health Areas, the specific characteristics of each Health Area such as the number and location of CHWs and any particular customs of the communities.

- Sensitization

In all health areas a public awareness meeting took place involving all community leaders including religious leaders. In addition, songs, dance, theatre and other outreach methods were used to disseminate information about long-lasting insecticidal nets and their correct use. A slogan was invented by the Community Health Workers (CHWs) and used at the launch "Hang up, Mbata wa tshiamua" in the Palu language which translates as "Hang up, Slap down the mosquito". One by one each leader raised their hand and repeated this phrase in their own language in the spirit of the communities sharing their language and traditional values.

- Planning (with maps) of the distribution and hang-up by heath area

  Kamuesha has 26 Health Areas and, for each, distances and accessibility are completely different. Planning included assessing the number of nets needed per Health Area and the procedures and numbers for deployment of supervisors for the training of CHWs.

- Training of the Community Health Workers (CHWs)

  There are a significant number of volunteer CHWs in Kamuesha – 939 CHWs and 26 Senior Nurses and they were all trained in three separate rounds (batches) of training.

2. Distribution

The following activities took place during the distribution:

- Morning debriefing of teams before Field Supervisors went out to the field
- Pre-positioning of the appropriate (estimated) quantity of nets in each distribution location.
- Teams sent to each location to carry out the distribution comprised of: Smartphone operator to gather household data; Net hanger to assist the household in hanging the net; House marker to mark the house as having received net/s with the unique household identifier. In addition, there was a team on bikes following behind the distribution and net hanging team with supplies of nets.
- The Field Supervisors, not having consistent and reliable means of telephone communication, followed the teams closely to help with questions, issues and troubleshooting so any problems were dealt with quickly. For example, if there were shortages of nets or other equipment, e.g. nails/string, a volunteer could be sent form the village to gain help and support.

3. Lessons learned

What went well?

1. The pre-registration went well

The operational elements of the pre-registration phase went very well and all teams behaved impeccably.

What went less well?

1. Several logistics issues

i) Accurate estimates of distances
The estimates of distances between the central location, where staff would meet at the start of each day and the health areas to which they would travel, were not accurate leading to delays

Lesson learned
Double-checking of estimated distances to ensure they are sufficiently accurate.

ii) Late pre-positioning of nets and too few nets
Nets were deployed notably late in many instances. Only 20% of Health Areas had sufficient nets delivered in a timely fashion.

Lesson learned
Greater attention is needed to proper organisation and logistics management.

iii) Vehicle breakdowns
This affected the movement of field supervisors and delayed some supervision activities. Private vehicles had to be rented.

Lesson learned
Consideration of the vehicles and their reliability in the planning process.

2. CHW and Field Supervisor management issues

i) Insufficient CHW training
The level of instruction given to the CHWs was so low that additional training sessions had to be organised, covering familiarity with the equipment and its practical use to ensure the CHWs were fully familiar with the smartphone and the ODK Collect registration programme and what information had to be collected. The additional training included practical use of the smartphone.

Lesson learned
Greater attention needs to be given to the initial training.

ii) CHWs concern over their pay being too low.
Some CHWs complained the pay was not enough for the work they were asked to do and this seemed to slow down the work done.

Lesson learned
Establish clearly the daily pay rate and ask, as CHWs are selected, they accept that daily rate.

3. Other operational issues

i) Problems with smartphones
The two problems experienced with some phones were: i) they were no longer in good working order and data could not be entered into the phones or the ODK programme would not run; ii)

they would not retain energy for beyond the first hour of two of the day's work. This led to the number of teams working on any one day being reduced and increased the number of days over which the work had to take place.

Lesson learned
Greater attention needs to be paid to how the smartphones are treated and consideration could be given to the robustness of the phones. Consideration should be given in selecting appropriate phones how they perform in high ambient temperature environments.

ii) Problems with re-charging the batteries/phones
A mistake was made in using an over-powerful generator to recharge the phone that led to some burning out due to the excessive voltage used.

Lesson learned
Attention needs to be paid to the voltage used in charging phones/batteries. This is important information that has been noted for inclusion in all future briefing sessions.

iii) Coordination of data and results between the field and the central office
The coordination between the two was not as good as it should have been at times leading to gaps in information and understanding of work carried out.

Lesson learned
Better coordination to ensure the central location is fully aware, and in a timely fashion, of the data from the field.

iv) Too few days for field operations
The task of counting and distributing nets took longer than planned.

Lesson learned
Schedule more time for net counting activities.

v) Unclear lines of responsibility across areas
The Kamuesha HZ is the largest in the district of Tshikapa and effectively functions as two separate HZs, but because this separation has not occurred officially it caused some operational confusion.

Lesson learned
Ensure during pre-planning that operational responsibilities over specific areas are clear.

4. Summary data

4. Health Zone: Kamuesha														
Aire de Sante	Population	#Villages	#Households	#Sleeping Spaces (SS)	#Usable LLINs	#LLINs required	Initial # LLINs estimated	#LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
1 Biakabomba	11,406	14	2,384	4,519	180	4,339	5,800	4,339	0	96	1,461	75%	1,461	2.52
2 Dibala	11,373	14	1,658	4,576	33	4,543	4,600	4,543	0	99	57	99%	57	2.49
3 Kabelekese	7,025	14	1,223	3,098	1	3,097	3,800	3,097	0	100	703	82%	703	2.27
4 Kakumba	13,289	19	2,531	4,983	8	4,975	5,600	4,975	0	100	625	89%	625	2.67
5 Kalumbu	6,431	15	1,132	2,446	365	2,081	6,100	2,081	0	85	4,019	34%	4,019	2.63
6 Kamba Nk.	8,041	17	1,573	3,270	4	3,266	4,000	3,266	0	100	734	82%	734	2.46
7 Kamuesha	14,860	23	1,915	6,432	5	6,427	6,700	6,427	0	100	273	96%	273	2.31
8 Kasanzu	2,081	13	421	907	95	812	5,600	812	0	90	4,788	15%	4,788	2.29
9 Kasonga T.	14,424	15	2,198	6,607	130	6,477	4,000	6,477	0	98	-2,477	162%	-2,477	2.18
10 Katalayi	8,736	13	1,396	3,843	323	3,520	4,600	3,520	0	92	1,080	77%	1,080	2.27
11 Katanda	6,524	8	1,237	2,376	39	2,337	6,400	2,337	0	98	4,063	37%	4,063	2.75
12 Katshimu	9,281	13	1,477	4,015	34	3,981	4,300	3,981	0	99	319	93%	319	2.31
13 Katumba	8,116	6	1,449	3,185	280	2,905	4,900	2,905	0	91	1,995	59%	1,995	2.55
14 Luenda B	6,483	8	1,302	2,502	0	2,502	4,200	2,502	0	100	1,698	60%	1,698	2.59
15 Lungonzo	11,627	16	2,211	4,516	2	4,514	6,000	4,514	0	100	1,486	75%	1,486	2.57
16 Lunyeka	23,661	23	4,110	9,224	97	9,127	12,600	9,127	0	99	3,473	72%	3,473	2.57
17 Masangu 4	6,148	17	1,216	2,290	1	2,289	4,400	2,289	0	100	2,111	52%	2,111	2.68
18 mayi_munene	12,528	19	2,287	4,498	30	4,468	6,700	4,468	0	99	2,232	67%	2,232	2.79
19 Mbolondo	8,152	18	1,357	3,564	16	3,548	3,700	3,548	0	100	152	96%	152	2.29
20 Mpampa	9,596	18	1,746	4,011	461	3,550	4,800	3,550	0	89	1,250	74%	1,250	2.39
21 Muila Mbu.	6,083	13	1,073	2,824	0	2,824	3,400	2,824	0	100	576	83%	576	2.15
22 Mukambu	6,396	12	1,243	3,233	46	3,187	4,000	3,187	0	99	813	80%	813	1.98
23 Muladila	9,200	12	1,776	4,330	50	4,280	4,300	4,280	0	99	20	100%	20	2.12
24 Mutumba	4,776	7	885	1,985	28	1,957	3,900	1,957	0	99	1,943	50%	1,943	2.41
25 Ntumba Kap.	6,269	14	1,083	2,811	1	2,810	3,600	2,810	0	100	790	78%	790	2.23
26 Tshiela Mata	9,285	13	1,257	3,721	13	3,708	4,000	3,708	0	100	292	93%	292	2.50
	241,791	374	42,140	99,766	2,242	97,524	132,000	97,524	0	98	34,476	74%	34,476	2.42

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

3. Banga Lubaka HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

Before carrying out the distribution the following activities took place:

1. A meeting of the health team in each Health Area to develop plans for the pre-positioning of nets and for operations.

2. A meeting with local community leaders to ask for and coordinate their involvement with community sensitization activities.

3. The launch of the campaign using a motorized convoy.

2. Distribution

As for other HZs, after training of the CHWs and prepositioning of the nets, the distribution and hang-up of the nets took place.

What was different in Banga Lubaka, due to the relative inaccessibility of some Health Areas, was the transport challenges. Some areas were not accessible by main road or by bike. For particularly isolated villages either due to distance or accessibility, nets were pre-positioned in secondary sites to ease distribution operations as much as possible.

3. Lessons learned

What went well?

1. The majority of the campaign

The majority of the campaign went well, from the initial meetings with the health teams, collection of data, hanging of nets and the evaluation of the campaign, apart from some elements that meant it did not go entirely as planned.

What went less well?

1. Several logistics issues

i) Bad condition of the roads
This made travel more difficult and caused delays in the distribution.

Lesson learned
Consideration of the condition of the roads in the planning process.

ii) Vehicle breakdowns
The permanent break down of some vehicles and motorbikes slowed down supervisions.

Lesson learned
Consideration of the vehicles and their reliability in the planning process.

2. CHW and Field Supervisor management issues

i) CHWs selected who were not up to the job
Certain CHWs, even after training, were not up to the level required to carry out the job well.

Lesson learned
Ensure better initial screening and selection of the CHWs before training starts.

3. Other operational issues

i) Lack of easy communication to report a lack of nets (plus nails/string)
This caused delays and inefficiencies.

Lesson learned
Attention to means of communication to avoid delays. Attention also to planning elements so sufficient nets and other materials are present where needed to avoid problems.

ii) Lack of consistent electricity
This caused delays.

Lesson learned
Allowances needed in the timetable for potential delays that are caused by elements beyond the control of the team. Develop 'What if?' scenarios so if there are problems or delays there is a plan of how to respond and/or decisions can be taken more quickly.

iii) One-off loss of some data
When crossing a river a package of household data on paper was lost.

Lesson learned
Careful attention to the original data.

4. Summary data

5. Health Zone: Banga Lubaka

	Aire de Sante	Population	# Villages	# Households	# Sleeping Spaces (SS)	# Usable LLINs	# LLINs required	Initial # LLINs estimated	# LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
1	Banga Banneux	4,556	4	910	2,451	13	2,438	2,600	2,438	0	99	162	94%	162	1.86
2	Banga Lubaka	11,330	6	1,847	5,544	158	5,386	2,700	5,386	0	97	-2,686	199%	-2,686	2.04
3	Banyanga	4,912	4	929	2,321	112	2,209	3,000	2,209	0	95	791	74%	791	2.12
4	Biponga	7,020	5	1,256	3,392	103	3,289	4,200	3,289	0	97	911	78%	911	2.07
5	Ibombo iyeye	3,872	5	776	2,078	76	2,002	2,300	2,002	0	96	298	87%	298	1.86
6	Ipunda	4,404	4	879	2,228	56	2,172	2,200	2,172	0	97	28	99%	28	1.98
7	Kalunga	4,509	5	896	2,078	5	2,073	2,200	2,073	0	100	127	94%	127	2.17
8	Kanyunyu	2,837	4	508	1,400	24	1,376	2,200	1,376	0	98	824	63%	824	2.03
9	Lunduba	2,553	4	528	1,340	39	1,301	2,200	1,301	0	97	899	59%	899	1.91
10	Mamanya	7,031	7	1,287	2,972	69	2,903	2,600	2,903	0	98	-303	112%	-303	2.37
11	Mashashana	3,627	5	753	1,898	0	1,898	2,600	1,898	0	100	702	73%	702	1.91
12	Mayamba	2,186	4	433	1,082	38	1,044	2,000	1,044	0	96	956	52%	956	2.02
13	Mayimbi	9,206	4	1,470	3,942	124	3,818	4,400	3,818	0	97	582	87%	582	2.34
14	Mbondjare	2,721	5	490	1,573	33	1,540	2,200	1,540	0	98	660	70%	660	1.73
15	Nganda	3,526	4	766	1,839	11	1,828	2,200	1,828	0	99	372	83%	372	1.92
16	Pungu II	4,491	6	832	2,130	127	2,003	2,600	2,003	0	94	597	77%	597	2.11
17	Shandala	5,825	5	1,054	2,857	25	2,832	3,000	2,832	0	99	168	94%	168	2.04
18	Vatican	2,201	4	387	1,104	26	1,078	2,300	1,078	0	98	1,222	47%	1,222	1.99
		86,807	85	16,001	42,229	1,039	41,190	47,500	41,190	0	98	6,310	87%	6,310	2.06

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

4. Kamonia HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

Before carrying out the distribution the following activities took place:

- Meeting and planning with the Health Zone's central team
- Meeting with community leaders
- Official launch of the campaign by the NMCP National Director
- Pre-test and selection of CHWs
- Training of CHWs
- Storage and delivery planning
- Evaluation
- Data validation

2. Distribution

As for other HZs, after training of the CHWs and prepositioning of the nets, the distribution and hang-up of the nets took place.

A team of three CHWs went from community to community with individual responsibilities for i) capturing household data on the smartphones ii) in hard copy, and iii) hanging the nets distributed and marking on the exterior the household to indicate clearly where the distribution had taken place.

3. Lessons learned

What went well?

- The sensitization went well and was particularly helped by the presence of the head of the National Malaria Control Program who launched the hang-up campaign in the presence of all the local personalities and leaders
- The selection of CHWs
- The training of CHWs and other team members
- The work of the CHWs in the field

- The social mobilization work
- The community participation

What went less well?

1. Under-estimation and over-estimation of the number of households in a number of areas

This led to too few or too many nets pre-positioned and led to a need to a re-movement of nets.

Lesson learned
Greater attention needs to be given to the accuracy of population information and assumptions for developing estimates which are in turn used to pre-position nets.

2. Logistics related

i) Bad condition of the roads
This made travel more difficult and caused delays in the distribution.

Lesson learned
Consideration of the condition of the roads in the planning process.

3. Other operational issues

i) Pause due to Ebola outbreak in the HZ
All distribution activities had to be stopped due to an Ebola outbreak. A period of one month after the last Ebola case was identified had to be identified before the distribution could restart and be completed. The pause was for 8 weeks.

Lesson learned
Relevance of thinking during the planning phase (in the province more widely) of how plans and schedules can be rearranged if a major delay is necessary in one HZ.

ii) Some phones did not work
Not all of the phones worked all of the time causing delays and inefficiencies and some data loss.

Lesson learned
It is very important the smartphones are reliable and there are backup phones in case they are needed.

ii) Problems with charging smartphones and batteries
There were problems charging the phones and spare batteries which led to insufficient battery life during the day and some phones not working. Sometimes this was caused by generators, used for recharging, breaking down.

Lesson learned

Greater attention needs to be given to ensuring phones work, batteries can be charged so running out of battery power does not occur. Consideration should be given to back-up phones that can be used when particular phones do not work so the important work to be done and data gathered is not disrupted.

iv) Access was difficult for people and equipment
This a HZ bordered on all sides by rivers meaning the boat was an important method of transport.

Lesson learned

Consideration of the best methods of transport should always be part of planning in different zones.

v) Misuse of nets
There were instances of nets being used for other purposes such as fishing and for trapping winged ants.

Lesson learned

More attention to correct use of nets in the sensitization may be necessary in some communities and emphasis on correct use of nets across the community in follow up work of the CHWs and in their normal contact with communities.

4. Summary data

3. Health Zone: Kamonia

	Aire de Sante	Population	# Villages	# Households	# Sleeping Spaces (SS)	# Usable LLINs	# LLINs required	Initial # LLINs estimated	# LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
1	Kabangu	304	16	52	137	1	136	5,800	136	0	99	5,664	2%	5,664	2.22
2	Kabilengu	8,930	8	1,781	4,442	1	4,441	6,500	4,441	0	100	2,059	68%	2,059	2.01
3	Kabungu	19,538	8	3,644	8,171	33	8,138	4,900	8,138	0	100	-3,238	166%	-3,238	2.39
4	Kamabonza	5,274	7	1,198	2,028	88	1,940	3,100	1,940	0	96	1,160	63%	1,160	2.60
5	Kamako I	11,573	13	2,313	4,620	38	4,582	5,400	4,582	0	99	818	85%	818	2.50
6	Kamako II	8,086	9	1,537	3,142	13	3,129	4,400	3,129	0	100	1,271	71%	1,271	2.57
7	Kamonia	7,046	4	1,250	2,958	24	2,934	5,000	2,934	0	99	2,066	59%	2,066	2.38
8	Kandjaji	3,350	5	677	1,565	2	1,563	2,300	1,563	0	100	737	68%	737	2.14
9	Kasai Lubemba	4,611	20	954	1,846	59	1,787	2,400	1,787	0	97	613	74%	613	2.50
10	Kasekue	8,467	6	1,475	3,304	54	3,250	3,100	3,250	0	98	-150	105%	-150	2.56
11	Katopa	3,513	7	772	1,681	0	1,681	2,800	1,681	0	100	1,119	60%	1,119	2.09
12	Luanga Tshimu	8,183	5	1,545	3,453	151	3,302	3,500	3,302	0	96	198	94%	198	2.37
13	Lubami	12,976	14	2,593	5,803	158	5,645	5,700	5,645	0	97	55	99%	55	2.24
14	Luyembe	4,506	9	815	2,036	24	2,012	2,400	2,012	0	99	388	84%	388	2.21
15	Mayanda	6,581	14	1,397	2,844	5	2,839	5,100	2,839	0	100	2,261	56%	2,261	2.31
16	Mpasu	5,099	9	1,011	2,144	15	2,129	3,300	2,129	0	99	1,171	65%	1,171	2.38
17	Mudiadia	8,311	5	1,675	3,730	368	3,362	4,000	3,362	0	90	638	84%	638	2.23
18	Mukuandjanga	9,634	18	1,968	4,014	73	3,941	6,300	3,941	0	98	2,359	63%	2,359	2.40
19	Mungamba	7,446	15	1,617	3,396	20	3,376	7,400	3,376	0	99	4,024	46%	4,024	2.19
20	Nsokombe	6,583	16	1,345	2,953	149	2,804	6,500	2,804	0	95	3,696	43%	3,696	2.23
21	Nsumbula	28,542	25	5,592	11,554	17	11,537	13,600	11,537	0	100	2,063	85%	2,063	2.47
22	Ntambua	5,823	7	1,213	2,398	0	2,398	2,900	2,398	0	100	502	83%	502	2.43
23	Tshimeya	5,148	14	1,036	1,864	36	1,828	3,200	1,828	0	98	1,372	57%	1,372	2.76
24	Tshinota	6,059	13	1,266	2,867	150	2,717	6,000	2,717	0	95	3,283	45%	3,283	2.11
25	Tshitambeji	5,606	6	1,143	2,541	13	2,528	2,400	2,528	0	99	-128	105%	-128	2.21
		201,189	273	39,869	85,491	1,492	83,999	118,000	83,999	0	98	34,001	71%	34,001	2.35

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

5. Kanzala HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

Before carrying out the distribution the following activities took place:

- Meeting and planning with the Health Zone's central team
- Meeting with community leaders
- Official launch of the campaign in the HZ
- Pre-test and selection of CHWs
- Training of CHWs
- Storage and delivery planning
- An evaluation of the work done
- Data validation

2. Distribution

After CHW training and prepositioning of nets, the distribution and hang-up of the nets took place.

A team of three CHWs went from community to community with individual responsibilities for i) capturing household data on the smartphones ii) in hard copy, and iii) hanging the nets distributed and marking on the exterior the household to indicate clearly where the distribution had taken place.

3. Lessons learned

What went well?

- The sensitization went very well, because the HZ is located in the centre of Tshikapa town and the media kept broadcasting awareness information and messages day and night.
- Social awareness networks relayed hang up message using pictures
- The selection of CHWs
- The training of CHWs and other team members
- The work of the CHWs in the field
- The social mobilization work
- The community participation

What went less well?

1. Some dishonesty

i) Some householders tried to invent sleeping spaces
Some householders tried to increase unfairly the number of nets they would receive.

<u>Lesson learned</u>
The registration process finds out these situations.

i) Some CHWs tried to divert ties, nails and hammers
This would be theft for personal benefit and the loss of hammers would be a cost and cause inconvenience to the distribution.

<u>Lesson learned</u>
Counting equipment and ensuring return, and not assuming return, is important.

2. Several logistics issues

i) Bad condition of the roads
This made travel more difficult and caused delays in the distribution.

<u>Lesson learned</u>
Consideration of the condition of the roads in the planning process.

3. Other operational issues

i) Pause due to Ebola outbreak in the HZ
All distribution activities had to be stopped due to an Ebola outbreak. A period of one month after the last Ebola case was identified had to be identified before the distribution could restart and be completed. The pause was for 8 weeks.

<u>Lesson learned</u>
Relevance of thinking during the planning phase (in the province more widely) of how plans and schedules can be rearranged if a major delay is necessary in one HZ.

ii) Some phones did not work
Not all of the phones worked all of the time causing delays and inefficiencies and some data loss.

<u>Lesson learned</u>
It is very important the smartphones are reliable and there are backup phones in case they are needed.
iii) Problems with charging smartphones and batteries

There were problems charging the phones and spare batteries which led to insufficient battery life during the day and some phones not working. Sometimes this was caused by generators, used for recharging, breaking down.

Lesson learned
Greater attention needs to be given to ensuring phones work, batteries can be charged so running out of battery power does not occur. Consideration should be given to back-up phones that can be used when particular phones do not work so the important work to be done and data gathered is not disrupted.

iv) Problems with some data entry
There were problems with some data entered in the smartphones and taken down on paper.

Lesson learned
Data checking is important.

4. Summary data

	6. Health Zone: Kanzala														
	Aire de Sante	Population	# Villages	# Households	# Sleeping Spaces (SS)	# Usable LLINs	# LLINs required	Initial # LLINs estimated	# LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
1	Aéroport	7,609	7	1,259	3,454	46	3,408	3,600	3,408	0	99	192	95%	192	2.20
2	Clinique	10,283	10	1,804	4,932	59	4,873	5,200	4,873	0	99	327	94%	327	2.08
3	Kabungu	3,487	10	781	1,547	16	1,531	2,700	1,531	0	99	1,169	57%	1,169	2.25
4	Kankala	4,145	8	860	1,829	25	1,804	2,200	1,804	0	99	396	82%	396	2.27
5	Kanzala	11,888	10	1,892	5,215	44	5,171	5,200	5,171	0	99	29	99%	29	2.28
6	Lunyanya	6,198	19	1,157	2,731	85	2,646	3,800	2,646	0	97	1,154	70%	1,154	2.27
7	Menonite	11,605	10	1,806	5,110	101	5,009	5,300	5,009	0	98	291	95%	291	2.27
8	Mutshi	11,381	10	1,777	5,651	97	5,554	5,300	5,554	0	98	-254	105%	-254	2.01
9	Muyombo	3,582	8	617	1,708	13	1,695	2,100	1,695	0	99	405	81%	405	2.10
10	Nzambe Malamu	13,377	8	2,323	5,798	304	5,494	4,700	5,494	0	95	-794	117%	-794	2.31
11	Salambote	7,752	8	1,693	3,080	86	2,994	4,600	2,994	0	97	1,606	65%	1,606	2.52
12	Sami 1	10,406	4	1,577	4,520	25	4,495	4,700	4,495	0	99	205	96%	205	2.30
13	Sami 2	18,423	8	2,986	7,881	279	7,602	5,800	7,602	0	96	-1,802	131%	-1,802	2.34
14	Stade 1	3,025	8	542	1,355	10	1,345	4,400	1,345	0	99	3,055	31%	3,055	2.23
15	Stade 2	14,225	8	2,379	6,288	14	6,274	5,800	6,274	0	100	-474	108%	-474	2.26
16	Tshibemba	7,298	7	1,273	3,788	4	3,784	2,900	3,784	0	100	-884	130%	-884	1.93
17	Tshikapa	12,561	8	2,240	5,562	8	5,554	5,000	5,554	0	100	-554	111%	-554	2.26
		157,245	151	26,966	70,449	1,216	69,233	73,300	69,233	0	98	4,067	94%	4,067	2.23

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

6. Tshikapa HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

Before carrying out the distribution the following activities took place:

- Briefing of the independent supervisors
- Meeting with the HZ's central health team
- Sensitization of the communities
- Planning geographically, consulting maps
- Training of CHWs
- Preparation of materials
  - Telephones, batteries, telephone cases

2. Distribution

The following activities took place during the distribution:

- Morning debriefing of teams before Field Supervisors went out to the field
- Pre-positioning of the appropriate (estimated) quantity of nets in each distribution location.
- Teams sent to each location to carry out the distribution comprised of: Smartphone operator to gather household data; Net hanger to assist the household in hanging the net; House marker to mark the house as having received net/s with the unique household identifier. In addition, there was a team on bikes following behind the distribution and net hanging team with supplies of nets.
- The Field Supervisors, not having consistent and reliable means of telephone communication, followed the teams closely to help with questions, issues and troubleshooting so any problems were dealt with quickly. For example, if there were shortages of nets or other equipment, e.g. nails/string, a volunteer could be sent form the village to gain support.

3. Lessons learned

What went well?

1. The pre-registration went well

The operational elements of the pre-registration phase went very well and all teams behaved impeccably.

2. The distribution went well

The steps went well even though some took more effort than anticipated.

What went less well?

1. Planning issues

i) Net need was over-estimated
There were many occasions where the number of nets needed for a community was overestimated. This was discovered in the registration and hang up because of diligent work done.

Lesson learned
Better population estimates are needed and 1.8 people per nets should be the ratio always used.

ii) Distances were underestimated
The estimates of distances between the central location, where staff would meet at the start of each day and the health areas to which they would travel, were not accurate leading to delays

Lesson learned
Double-checking of estimated distances to ensure they are sufficiently accurate.

2. CHW and Field Supervisor management issues

i) Poor CHW selection in some cases
There was too much influence over selection by some community leaders and those selected were not good enough to do the job.

Lesson learned
Greater attention needs to be given to the initial selection to ensure those selected as capable for the training and the job.

ii) Insufficient CHW training
The level of instruction given to the CHWs was so low that additional training sessions had to be organised, covering familiarity with the equipment and its practical use to ensure the CHWs were fully familiar with the smartphone and the ODK Collect registration programme and what information had to be collected. The additional training included practical use of the smartphone.

Lesson learned
Greater attention needs to be given to the initial training.
iii) CHWs concern over their pay being too low.

Some CHWs complained the pay was not enough for the work they were asked to do and this seemed to slow down the work done.

<u>Lesson learned</u>
Establish clearly the daily pay rate and ask, as CHWs are selected, they accept that daily rate.

3. Several logistics issues

i) Late deployment of some nets
This occurred while the distribution was going on and led to wasted time.

<u>Lesson learned</u>
Pre-positioning of nets in the correct quantities is important.

ii) Vehicle breakdowns
This affected the movement of field supervisors and delayed some supervision activities. Private vehicles had to be rented.

<u>Lesson learned</u>
Consideration of the vehicles and their reliability in the planning process.

4. Other operational issues

i) Some phones did not work
Not all of the phones worked all of the time causing delays and inefficiencies and some data loss.

<u>Lesson learned</u>
It is very important the smartphones are reliable and there are backup phones in case they are needed.

ii) Coordination of data and results between the field and the central office
The coordination between the two was not as good as it should have been at times leading to gaps in information and understanding of work carried out.

<u>Lesson learned</u>
Better coordination to ensure the central location is fully aware, and in a timely fashion, of the data from the field.

iii) Too few days for field operations
The task of counting and distributing nets took longer than planned.

<u>Lesson learned</u>
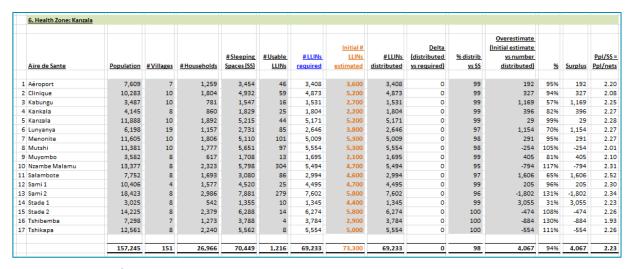Schedule more time for net counting activities.

iv) Unclear lines of responsibility across areas

The Kamuesha HZ is the largest in the district of Tshikapa and effectively functions as two separate HZs, but because this separation has not occurred officially it caused some operational confusion.

<u>Lesson learned</u>

Ensure during the pre-planning phase that operational responsibilities over specific areas are clear.

4. Summary data

	6. Health Zone: Kanzala															
	Aire de Sante	Population	# Villages	# Households	# Sleeping Spaces (SS)	# Usable LLINs	# LLINs required	Initial # LLINs estimated	# LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
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2	Clinique	10,283	10	1,804	4,932	59	4,873	5,200	4,873	0	99	327	94%	327	2.08
3	Kabungu	3,487	10	781	1,547	16	1,531	2,700	1,531	0	99	1,169	57%	1,169	2.25
4	Kankala	4,145	8	860	1,829	25	1,804	2,200	1,804	0	99	396	82%	396	2.27
5	Kanzala	11,888	10	1,892	5,215	44	5,171	5,200	5,171	0	99	29	99%	29	2.28
6	Lunyanya	6,198	19	1,157	2,731	85	2,646	3,800	2,646	0	97	1,154	70%	1,154	2.27
7	Menonite	11,605	10	1,806	5,110	101	5,009	5,300	5,009	0	98	291	95%	291	2.27
8	Mutshi	11,381	10	1,777	5,651	97	5,554	5,300	5,554	0	98	-254	105%	-254	2.01
9	Muyombo	3,582	8	617	1,708	13	1,695	2,100	1,695	0	99	405	81%	405	2.10
10	Nzambe Malamu	13,377	8	2,323	5,798	304	5,494	4,700	5,494	0	95	-794	117%	-794	2.31
11	Salambote	7,752	8	1,693	3,080	86	2,994	4,600	2,994	0	97	1,606	65%	1,606	2.52
12	Sami 1	10,406	4	1,577	4,520	25	4,495	4,700	4,495	0	99	205	96%	205	2.30
13	Sami 2	18,423	8	2,986	7,881	279	7,602	5,800	7,602	0	96	-1,802	131%	-1,802	2.34
14	Stade 1	3,025	8	542	1,355	10	1,345	4,400	1,345	0	99	3,055	31%	3,055	2.23
15	Stade 2	14,225	8	2,379	6,288	14	6,274	5,800	6,274	0	100	-474	108%	-474	2.26
16	Tshibemba	7,298	7	1,273	3,788	4	3,784	2,900	3,784	0	100	-884	130%	-884	1.93
17	Tshikapa	12,561	8	2,240	5,562	8	5,554	5,000	5,554	0	100	-554	111%	-554	2.26
		157,245	151	26,966	70,449	1,216	69,233	73,300	69,233	0	98	4,067	94%	4,067	2.23

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

7. Mutena HZ

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

In Mutena HZ the campaign began with a meeting of the central health team to decide on where nets would be prepositioned and in what quantities. The operational plan was decided. Then there were meetings with community leaders to determine the details of sensitizing the communities to the distribution. The distribution was officially launched with a motorized procession with announcements.

2. Distribution

As for other HZs, after training of the CHWs and prepositioning of the nets, the distribution and hang-up of the nets took place.

As in Banga Lubaka, due to the relative inaccessibility of some Health Areas, there were transport challenges. Some areas were not accessible by main road or by bike. For particularly isolated villages either due to distance or accessibility, nets were pre-positioned in secondary sites to ease distribution operations as much as possible.

3. Lessons learned

What went well?

1. The majority of the campaign

The majority of the campaign went well, from the initial meetings with the health teams, collection of data, hanging of nets and the evaluation of the campaign, apart from some elements that meant it did not go entirely as planned.

2. The distribution went well

From the data obtained after the distribution, it went very well, from the pre-positioning of nets through to the dual action of registration and net hanging.

What went less well?

1. Planning issues

i) The loss due to fire of some documents for field planning
Certain reference documents were lost in a fire at the central office of the health zone which made certain planning more difficult.

Lesson learned
Consider which documents should be duplicated to avoid problems if the only copies are lost.

ii) Distances were underestimated
The estimates of distances between the central location, where staff would meet at the start of each day and the health areas to which they would travel, were not accurate leading to delays

Lesson learned
Double-checking of estimated distances to ensure they are sufficiently accurate.

2. CHW and Field Supervisor management issues

i) Poor CHW selection in some cases
There was too much influence over selection by some community leaders and those selected were not good enough to do the job.

Lesson learned
Greater attention needs to be given to the initial selection to ensure those selected as capable for the training and the job.

3. Several logistics issues

i) Bad condition of the roads
This made travel more difficult and caused delays in the distribution.

Lesson learned
Consideration of the condition of the roads in the planning process.

ii) Vehicle breakdowns
This affected the movement of field supervisors and delayed some supervision activities. Private vehicles had to be rented.

Lesson learned
Consideration of the vehicles and their reliability in the planning process.

4. Other operational issues

i) Some phones did not work
Not all of the phones worked all of the time causing delays and inefficiencies and some data loss.

Lesson learned
It is very important the smartphones are reliable and there are backup phones in case they are needed.

ii) Coordination of data and results between the field and the central office
The coordination between the two was not as good as it should have been at times leading to gaps in information and understanding of work carried out.

Lesson learned
Better coordination to ensure the central location is fully aware, and in a timely fashion, of the data from the field.

iii) Lack of easy communication to report a lack of nets (plus nails/string)
This caused delays and inefficiencies.

Lesson learned
Attention to means of communication to avoid delays. Attention also to planning elements so sufficient nets and other materials are present where needed to avoid problems.

Lesson learned

v) Staff health issue
One supervisor was hospitalized with hypertension and malaria.

vi) Lack of consistent electricity
This caused delays.

Lesson learned
Allowances needed in the timetable for potential delays that are caused by elements beyond the control of the team.

4. Summary data

2. Health Zone: Mutena														
Aire de Sante	Population	# Villages	# Households	# Sleeping Spaces (SS)	# Usable LLINs	# LLINs required	Initial # LLINs estimated	# LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
1 Diboko	9,515	5	1,755	3,857	45	3,812	4,500	3,812	0	99	688	85%	688	2.47
2 HGR	11,255	8	1,986	4,771	35	4,736	4,400	4,736	0	99	-336	108%	-336	2.36
3 Kamabanji	7,297	7	1,451	2,706	110	2,596	3,700	2,596	0	96	1,104	70%	1,104	2.70
4 Kampengele	10,266	7	2,042	4,262	0	4,262	3,900	4,262	0	100	-362	109%	-362	2.41
5 Katshiiloba	10,519	8	1,837	4,283	101	4,182	5,200	4,182	0	98	1,018	80%	1,018	2.46
6 Kolamoyo	3,691	11	759	1,696	8	1,688	4,200	1,688	0	100	2,512	40%	2,512	2.18
7 Lombe	5,442	8	957	2,684	14	2,670	4,500	2,670	0	99	1,830	59%	1,830	2.03
8 Luvula	12,459	8	1,466	5,777	144	5,633	5,900	5,633	0	98	267	95%	267	2.16
9 Muamuengo	7,972	8	1,014	3,664	54	3,610	5,000	3,610	0	99	1,390	72%	1,390	2.18
10 Mukuku	5,986	8	829	2,855	28	2,827	4,200	2,827	0	99	1,373	67%	1,373	2.10
11 Mutena	9,963	12	2,216	4,389	96	4,293	4,600	4,293	0	98	307	93%	307	2.27
12 Mutetela	6,282	8	1,122	3,028	321	2,707	4,000	2,707	0	89	1,293	68%	1,293	2.07
13 Mutshima	6,063	3	1,135	3,218	22	3,196	3,200	3,196	0	99	4	100%	4	1.88
14 Ndala Kalunga	9,349	6	1,730	4,008	19	3,989	4,200	3,989	0	100	211	95%	211	2.33
15 Ndambi	4,870	5	747	2,227	35	2,192	3,500	2,192	0	98	1,308	63%	1,308	2.19
16 Tshibangu	7,572	7	1,464	3,249	96	3,153	4,100	3,153	0	97	947	77%	947	2.33
17 Tshipata	4,257	4	771	1,862	0	1,862	3,300	1,862	0	100	1,438	56%	1,438	2.29
18 Tshisenge	7,023	4	1,481	2,800	94	2,706	3,700	2,706	0	97	994	73%	994	2.51
19 Tshisua Bantu	10,664	6	1,945	4,329	17	4,312	3,900	4,312	0	100	-412	111%	-412	2.46
20 Tshitende	4,008	8	802	1,704	26	1,678	3,500	1,678	0	98	1,822	48%	1,822	2.35
	154,453	141	27,509	67,369	1,265	66,104	83,500	66,104	0	98	17,396	79%	17,396	2.29

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**

8. Kalonda West

1. Pre-distribution
2. Distribution
3. Lessons learned
4. Summary data

1. Pre-distribution

As envisaged in the operational plan the following activities were carried out:

- Briefing of the independent supervisors
- Meeting with the HZ's central health team
- Sensitization of the communities
- Planning geographically, consulting maps
- Training of CHWs

2. Distribution

The following activities took place during the distribution:

- Morning debriefing of teams before Field Supervisors went out to the field
- Pre-positioning of the appropriate (estimated) quantity of nets in each distribution location.
- Teams sent to each location to carry out the distribution comprised of: Smartphone operator to gather household data; Net hanger to assist the household in hanging the net; House marker to mark the house as having received net/s with the unique household identifier. In addition, there was a team on bikes following behind the distribution and net hanging team with supplies of nets.
- The Field Supervisors, not having consistent and reliable means of telephone communication, followed the teams closely to help with questions, issues and troubleshooting so any problems were dealt with quickly. For example, if there were shortages of nets or other equipment, e.g. nails/string, a volunteer could be sent form the village to gain help and support.
- Distribution of nets
- Evaluation of the data

3. Lessons learned

What went well?

1. The pre-registration went well

The operational elements of the pre-registration phase went very well and all teams behaved impeccably.

2. The distribution went well

The steps went well even though some took more effort than anticipated.

What went less well?

1. Planning issues

i) Distances were underestimated
The estimates of distances between the central location, where staff would meet at the start of each day and the health areas to which they would travel, were not accurate leading to delays

Lesson learned
Double-checking of estimated distances to ensure they are sufficiently accurate.

ii) Too few days for field operations
The task of counting and distributing nets took longer than planned.

Lesson learned
Schedule more time for net counting activities.

iii) Ongoing 'correct use of nets' communication
Reinforce the ongoing promotion of sustained net use to ensure nets continue to be used and properly.

Lesson learned
Schedule more time for net counting activities.

2. CHW and Field Supervisor management issues

i) Poor CHW selection in some cases
There was too much influence over selection by some community leaders and those selected were not good enough to do the job.

Lesson learned
Greater attention needs to be given to the initial selection to ensure those selected as capable for the training and the job.

ii) CHWs concern over their pay being too low.
Some CHWs complained the pay was not enough for the work they were asked to do and this seemed to slow down the work done.

Lesson learned
Establish clearly the daily pay rate and ask, as CHWs are selected, they accept that daily rate.

3. Several logistics issues

i) Late pre-positioning of nets and too few nets
Nets were deployed notably late in many instances. Only 10% of Health Areas had sufficient nets delivered in a timely fashion.

Lesson learned
Greater attention is needed to proper organisation and logistics management.

ii) Vehicle breakdowns
This affected the movement of field supervisors and delayed some supervision activities. Private vehicles had to be rented.

Lesson learned
Consideration of the vehicles and their reliability in the planning process.

4. Other operational issues

i) Some phones did not work
Not all of the phones worked all of the time causing delays and inefficiencies and some data loss.

Lesson learned
It is very important the smartphones are reliable and there are backup phones in case they are needed.

ii) Lack of easy communication to report a lack of nets (plus nails/string)
This caused delays and inefficiencies.

Lesson learned
Attention to means of communication to avoid delays. Attention also to planning elements so sufficient nets and other materials are present where needed to avoid problems.

iii) Problems with charging smartphones and batteries

There were problems charging the phones and spare batteries which led to insufficient battery life during the day and some phones not working. Sometimes this was caused by generators, used for recharging, breaking down.

Lesson learned
Greater attention needs to be given to ensuring phones work, batteries can be charged so running out of battery power does not occur. Consideration should be given to back-up phones that can be used when particular phones do not work so the important work to be done and data gathered is not disrupted.

iv) Inappropriate equipment used in charging phones
Rather than this being unsuitable 'phone chargers', this problem related to generators being used to generate the electricity from which the phones were charged. Unfortunately 'constant voltage' transformers were not used and as a result of the fluctuating/surging charging voltage from the generators, some of the phones (and several laptops) 'burn out'.

Lesson learned
Care needs to be taken when charging devices where there are power outages and generators may be need. Constant voltage transformers should be given serious consideration.

v) Coordination of data and results between the field and the central office
The coordination between the two was not as good as it should have been at times leading to gaps in information and understanding of work carried out.

Lesson learned
Better coordination to ensure the central location is fully aware, and in a timely fashion, of the data from the field.

4. Summary data

	Aire de Sante	Population	#Villages	#Households	#Sleeping Spaces (SS)	#Usable LLINs	#LLINs required	Initial # LLINs estimated	#LLINs distributed	Delta (distributed vs required)	% distrib vs SS	Overestimate (Initial estimate vs number distributed)	%	Surplus	Ppl/SS = Ppl/nets
	8. Health Zone: Kalonda West														
1	3 Z	8,735	5	1,288	3,972	62	3,910	4,900	3,910	0	98	990	80%	990	2.20
2	bakilisto	12,584	7	1,954	5,751	170	5,581	6,500	5,581	0	97	919	86%	919	2.19
3	dienzelayi	13,011	13	2,372	5,302	251	5,051	5,500	5,051	0	95	449	92%	449	2.45
4	ditekemena	10,447	6	1,523	4,412	13	4,399	3,900	4,399	0	100	-499	113%	-499	2.37
5	inga	8,256	16	1,618	3,642	0	3,642	4,300	3,642	0	100	658	85%	658	2.27
6	kabambayi	4,114	16	762	1,891	83	1,808	5,600	1,808	0	96	3,792	32%	3,792	2.18
7	kabeya_lumbu	8,864	4	1,419	3,807	58	3,749	2,600	3,749	0	98	-1,149	144%	-1,149	2.33
8	kabuyi	10,551	2	1,526	4,733	6	4,727	3,900	4,727	0	100	-827	121%	-827	2.23
9	kalonda	6,112	8	1,148	2,632	39	2,593	3,000	2,593	0	99	407	86%	407	2.32
10	Kasai 2	7,979	5	1,193	3,590	27	3,563	4,900	3,563	0	99	1,337	73%	1,337	2.22
11	Kasai 1	8,552	5	1,377	3,532	18	3,514	3,200	3,514	0	99	-314	110%	-314	2.42
12	kasala	11,944	6	2,087	5,400	35	5,365	6,100	5,365	0	99	735	88%	735	2.21
13	katalushi	10,518	13	2,018	4,510	10	4,500	6,300	4,500	0	100	1,800	71%	1,800	2.33
14	katoka	6,710	8	1,319	2,940	59	2,881	2,600	2,881	0	98	-281	111%	-281	2.28
15	kele_kasai	13,901	13	2,150	6,227	328	5,899	6,900	5,899	0	95	1,001	85%	1,001	2.23
16	Lungudi	6,262	5	1,192	2,649	24	2,625	3,100	2,625	0	99	475	85%	475	2.36
17	Mairie	7,271	5	986	3,170	37	3,133	4,800	3,133	0	99	1,667	65%	1,667	2.29
18	makumbi	9,402	6	1,783	4,237	1	4,236	3,300	4,236	0	100	-936	128%	-936	2.22
19	mbau	9,573	16	1,627	4,399	34	4,365	5,400	4,365	0	99	1,035	81%	1,035	2.18
20	Mbumba	9,628	4	1,623	4,048	54	3,994	4,000	3,994	0	99	6	100%	6	2.38
21	mukuaya	12,614	19	2,260	4,955	36	4,919	5,100	4,919	0	99	181	96%	181	2.55
22	mulamba_tshionza	8,338	6	1,428	3,479	109	3,370	3,200	3,370	0	97	-170	105%	-170	2.40
23	mungenda	5,118	15	801	2,233	83	2,150	3,400	2,150	0	96	1,250	63%	1,250	2.29
24	tshimbinda 2	4,067	10	754	1,687	0	1,687	4,300	1,687	0	100	2,613	39%	2,613	2.41
25	tshimbinda_1	13,602	13	2,407	6,018	134	5,884	3,900	5,884	0	98	-1,984	151%	-1,984	2.26
26	tshindemba	11,159	13	1,790	4,873	58	4,815	4,300	4,815	0	99	-515	112%	-515	2.29
27	tujukayi	13,788	6	2,493	5,636	121	5,515	5,800	5,515	0	98	285	95%	285	2.45
28	tukunyema	10,102	10	1,419	4,099	15	4,084	3,500	4,084	0	100	-584	117%	-584	2.46
		263,202	255	44,317	113,824	1,865	111,959	124,300	111,959	0	98	12,341	90%	12,341	2.31

This data can be found at: **www.AgainstMalaria.com/Distributions/DRC/KasaiOcc2014**