CRS distribution team members use a mini-iPad and a scanner to register beneficiary information and issue a voucher for a LLIN (long lasting insecticidal nets) during a nationwide campaign in the Gambia. Photo by Ebrima Jarjou/CRS 2015.

Electronic Data Collection in The Gambia for Seasonal Malaria Chemoprevention and Insecticide-Treated Nets Campaigns

FROM IFORMBUILDER & ZOHO REPORTS TO COMMCARE & POWER BI TO DHIS2

Overview

The Gambia & Malaria

The Gambia is a small country in West Africa. Stretching 450 km along the Gambia River, the country (all 10,689 square kilometers of it) is surrounded by Senegal, except for a 60-km Atlantic Ocean front. The country has a population of 2.1 million. With 176 people per square kilometer, it is one of the most densely populated countries in Africa. Most of the population (57%) is concentrated around urban and peri-urban centers.

The Gambia is one of six countries in the World Health Organization Africa Region that has achieved the 2020 milestone of reducing malaria cases and deaths by 40% compared to 2015. The Malaria Indicator Survey (MIS) of 2017 showed that usage of Insecticide Treated Nets (ITNs) in children under five and women was 62% and 69%, respectively. Additionally, 40% of pregnant women received three doses of intermittent preventive therapy to prevent malaria during pregnancy. These figures point out that more work is needed to ensure universal coverage of malaria control services in the country.

CRS is one of the few international organizations in The Gambia, where we focus much of our work on malaria prevention. CRS has been supporting the elimination of malaria in The Gambia since 2004.

From Paper to Digital: The Why

CRS' 2011 LLIN distribution required a huge staff of 2,700 teams to collect data on the number of households/ household members, household members' details, how many nets have been distributed and/or are needed where, etc. by hand on paper forms. On top of the huge number of staff required to collect data, CRS needed 12 filing cabinets to store 36,000+

completed forms! It took six months to transfer the information on the forms to a database, clean, and analyze the data. This was done by sitting down with the paper forms one sheet at a time and entering the information into a computer database per village, per district, etc. Other disadvantages of paper forms included legibility, aggregation, and human error. Mistakes in data processing and long lag times between data collection and analysis made the process time-consuming and sometimes inaccurate. An example of this can be seen when a community health worker or distributor would record the wrong date or the wrong number of nets being distributed, and subsequently pass the information up to their supervisors to aggregate. Then, that supervisor potentially could make mistakes as well, which would be compounded by the fact that the data he received was inaccurate in the first place. These types of issues could cause resupply lag times in areas where inaccurate data was reported on the number of nets distributed and when – making the campaign take longer and not go as smoothly as it could. Overall, the 2011 campaign achieved 70% coverage of LLINs in the target regions.

In 2014, CRS supported The Gambia's National Malaria Control Program (NMCP) in distributing long-lasting insecticidal nets (LLINs) throughout the country as part of a five-year grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria. For the 2014 distribution, CRS sought a solution that would ensure high quality data on the number of nets distributed (and where) that could be accessed in real time to inform decision making and enable strategy changes on the fly. CRS also wanted faster and more accurate data processing and analysis along with increased accountability. The solution? Electronic data collection.

History of Electronic Data Collection in The Gambia

iPads, iFormBuilder, & Zoho Reports for ITN and SMC Campaigns

For the aforementioned 2014 campaign, CRS used iPad tablets configured with iFormBuilder, a cloud-based mobile data collection platform, to streamline household registration, LLIN tracking, and distribution. Program staff registered eligible recipients using electronic forms that recorded the location and the number of LLINs needed per household. This information was used to load delivery trucks, ensuring that the right type and number of nets were sent to the right place at the right time. Unique bar-coded vouchers (one per net) were issued to the head of household. During distribution, vouchers were redeemed by scanning bar codes into the system, which sent the data to a remote server for processing. In areas with no internet access, the data was stored on the iPads until it could be uploaded. The data was exported from iFormBuilder to Zoho

In the Gambia in 2015, CRS used iPad tablets configured with iFormBuilder with beneficiary cards to easily record SMC recipient data on the first visit and quickly retrieve the same recipient's data on subsequent visits.

Reports, an online platform that enabled staff to create reports, charts, and dashboards for easy analysis.

Based on the success of the 2014 LLIN distribution campaign's digitization, the same methodology was adapted for use in the Gambia's 2015 UNITAID-funded ACCESS-SMC project, led by the Malaria Consortium in partnership with CRS, to support The Gambia's NMCP efforts to scale up access to SMC for children.

Results:

Using iPads and electronic reporting and analysis increased speed, effectiveness, and accountability. CRS distribution teams delivered and accounted for 941,821 LLINs. Because couples and families may sleep together under the nets, the distribution called for one LLIN for every two people. Therefore, the project achieved 94% coverage. Technology improved the cost and efficiency of human resources. The 2011 analog campaign employed 2,700 teams working for 13 days (35,100 team days). In 2014, 100 teams worked 112 days (11,200 team days). The CRS and NMCP management teams monitored the distribution remotely in real-time. Because they could see exactly where teams were working and how they were performing, managers were able to alter daily workplans and strategies as needed.

Android Tablets & CommCare

In May of 2017, CRS decided to adopt a new standard electronic data collection platform known as CommCare – replacing iFormBuilder. Subsequently, Zoho Reports were also replaced with Power BI for extended and more advanced reporting. This was done in order to increase manageability, support, and to reduce operational costs (Android tablets are much cheaper than Apple's iPads). While both CommCare and iFormBuilder are designed to collect, report, and store data in an offline environment, there are key differences that led to the decision to switch. First, CommCare is unique in its attention to case management, or tracking multiple interactions with the same

person over time by 'case', which is more suited to CRS' needs in the field. Second, iFormBuilder requires more programming knowledge and start-up training for full functionality and is generally more complex than CommCare, which caters to users without an IT background.

Since 2015, CRS in collaboration with The Gambia's NMCP has carried out annual Seasonal Malaria Chemoprevention (SMC) campaigns using mobile technology to improve timeliness and accuracy of data. By the 2019 SMC campaign, The Gambia was already using CommCare and Power BI instead of iFormBuilder and Zoho Reports. Data collectors were given Android devices equipped with CommCare that *can* integrate data with **DHIS2** (a health management information system intended to aggregate health data at national scale); however, this type of integration capability was not native to either platform and had to be added by the vendor. This integration was necessary because DHIS2 has become a government standard and is used by The Gambia's Ministry of Health – with whom CRS routinely shares its data.

The Gambia trained 300 distributors and 58 supervisors for their 2019 SMC campaign, which was able to reach almost all of their targeted population. 150 teams went door-to-door to distribute SMC doses working for five days per month/cycle. Each team consists of one Village Health Worker (VHW) – the administrator of the SMC dose – and one data collector who records data using an Android tablet equipped with the CommCare platform.

Data collection in these types of campaigns is a three-step process: 1) beneficiary registration during the first day of SMC drug administration; 2) issue of barcoded beneficiary cards; 3) SMC drugs distributed and monitored in real time. On subsequent monthly cycles, the distributor scans the child card's barcodes. In the electronic registry, each child has an individual line and unique code; rather than re-entering each child's information every month, the data collector can immediately pull up the child record and simply record the new cycle. This also enables Project Managers and Ministry of Health staff to assess whether the same child has taken all four monthly SMC doses. Central teams from CRS and the NMCP analyze the data, including GPS, coming in from the SMC distribution using Power BI. Relevant data from the Power BI monitoring dashboard is manually transferred to the DHIS2 system once it has undergone a regional and national validation process.

Results:

Despite some challenges such as poor mobile connections (to upload data to the Cloud) and electricity problems (for charging devices) in rural communities, the SMC campaigns benefit tremendously from the use of mobile devices. Real-time or near-real-time data with visualization tools are available during the distribution, allowing for timely decision-making, providing periodic feedback to field teams, and improved allocation of limited resources. In addition to being able to track the distribution of SMC in real-time, the system is able to track performance of data collectors which is subsequently used as reference for their payment. The data generated are of high quality and accuracy, and using a digital platform allows for greater data security and archiving, which is especially important for ensuring data transparency and conducting data audits. Finally, using mobile devices allows for faster data compilation, analysis, and reporting than the paper-based approach used during similar campaigns in the past. The Gambia's NMCP continues to use this technology for both SMC and LLIN campaigns, and to collect data for the MIS.

Looking Ahead

DHIS2 Tracker

CRS and the Gambia's NMCP is currently piloting the use of **DHIS2 Tracker** for its SMC campaigns, the DHIS2 app for individual-level (or case-based) transactional data. It supports data collection, case monitoring and follow-up, analysis, and reporting — all within one's DHIS2 system. The pilot project is meant to assess whether using DHIS2 tracker will streamline the process of moving data from CommCare in country's National and Regional DHIS2 system, which CRS and the NMCP believe will be the case. On top of this, DHIS2 has become a government standard. Pending the results of the pilot program, DHIS2 Tracker may soon replace CommCare in The Gambia for SMC campaigns!

CRS continues to strengthen its knowledge and skills with DHIS2 and DHIS2 Tracker in order to improve our internal support capabilities to better support countries seeking to use either or both solutions.

External Resources:

1. The Gambia Overview: Development news, research, data | World Bank
2. The Gambia Draws the Line Against Malaria & Gears to Eliminate it | World Health Organization – Gambia
3. DHIS2 & Catholic Relief Services | CRS
4. Tracker Overview | DHIS2