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Planning, Implementation and Monitoring of a Nationwide Campaign to Deliver Long-Lasting Insecticidal Nets in the Gambia

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Abstract

In 2022, The Gambia conducted a nationwide long-lasting insecticidal nets (LLINs) distribution campaign. This article describes the planning, implementation and monitoring of the campaign. The campaign was jointly conducted with Senegal as part of cross border collaboration towards malaria elimination. A cross-sectional descriptive design was used for reporting the campaign. It was a collaborative approach, involving government and non-governmental organizations and communities. The DHIS2 tracker was used for digital data collection with mobile phone devices to register households and issue coupons for one LLIN per two persons as distribution criterion. The campaign was implemented in two phases, household registration and distribution phases. This approach allowed registration and distribution of LLINs at the same time along the borders of the two countries and for continuous improvement of implementation quality. A total of 1,164,552 LLINs were actually distributed between June to July 2022, corresponding to 90% of projected LLIN needs. This result is an indication of a national coverage of 72% of the registered population, lower than the universal campaign coverage of 80%. The joint coordination and planning process among campaign players allowed the national malaria control program (NMCP) and partners to successfully conduct a synchronized campaign with the neighbouring country Senegal. This campaign has increased access to LLINs in households which is likely to result in increased LLIN use with continuous education on the benefits. Consequently, a reduction of the malaria burden in the country, thus contributing to the achievement of the country's goal of malaria elimination.

Keywords*: Distribution Campaign, Long-Lasting Insecticidal Nets, Malaria, The Gambia.*

Introduction

Malaria is a disease of major public health concern in The Gambia and the entire population is at risk [1]. Transmission is perennial with seasonal variation. The Gambia made significant progress in the reduction of malaria morbidity and mortality over the years. This was achieved through scaling up of key interventions among the general population as a result of increased funding and partnership. The National Malaria Strategic Plan (NMSP) 2021-2025 seeks to consolidate the gains made moving The Gambia towards malaria elimination achieving zero locally acquired cases of malaria and zero deaths by 2025 [2, 3].

The use of LLINs is one of the core interventions under the integrated vector management component of the NMSP. The intervention is delivered through routine distribution at health facility level targeting children under one year and pregnant women. Additionally, mass LLIN distribution campaigns which are conducted every two/three years to reach universal coverage targets among the general population as

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recommended by WHO [4]. Hence, the reason for conducting the 2022 mass LLIN distribution campaign. The campaign was led by Ministry of Health (MOH) through the National Malaria Control Program (NMCP) and implemented with partners.

Given the importance of cross border collaboration in malaria elimination, The Ministries of Health for The Gambia and Senegal signed a memorandum of understanding in 2019 to conduct joint initiatives towards malaria elimination. Hence, both countries agreed to synchronize the 2022 mass LLIN campaign, being the second after 2019 campaign. Consequently, joint planning meetings were held in both countries to harmonize the campaign implementation process. In The Gambia, the campaign had the following objectives [5]

1. Provide 1,057,309 LLIN to every two persons in 5 health regions (North Bank East Region, North Bank West Region, Western Region 1, Western Region 2, and Lower River Region) over a period of 45 days to improve access to LLINs.
2. Provide 346,720 piperonyl butoxide (PBO) nets to every two persons in Central River Region (CRR) and Upper River Region (URR) over a period of 45 days to improve access to LLINs.
3. Mobilize communities and advocate for high-level political support in malaria control in general and the distribution of LLINs.

Hence, this article is meant to describe the entire process of the 2022 LLIN distribution campaign in The Gambia. The specific objectives are: (i) to describe the planning process; (ii) to describe the implementation and monitoring outcomes; (iii) to document and share challenges, lessons learnt and recommendations for future campaigns.

Methodology

A cross-sectional and descriptive design was used for reporting the planning, implementation and monitoring of the 2022 mass LLIN distribution campaign. The description is divided into three sections: planning and coordination, implementation and monitoring components. The campaign was a collaborative approach, involving government and non-governmental organizations, civil society partners, regional and district authorities and communities. The District Health Information System 2 (DHIS2) tracker was used for digital data collection with mobile phone devices to register households and issue coupons for one LLIN per two persons as distribution criterion. The campaign was implemented in two phases, household registration phase and distribution phase, see below flow chart showing campaign process in figure 1. This approach allowed registration and distribution of LLINs at the same time along the borders of the two countries. This is important to ensure adequate coverage of LLINs in the border communities and also, allowing continuous improvement of implementation quality by applying lessons learnt from each phase.

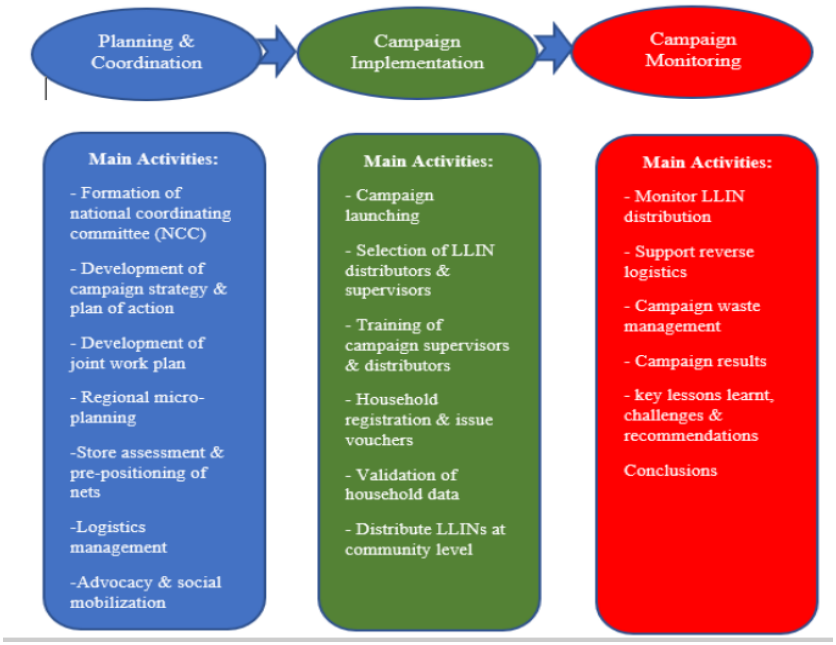

Figure 1. Flow Chart of Campaign Process

Planning and Coordination

Effective planning and coordination are important elements for any successful LLIN campaign [6, 7]. Mass distribution activities require intense and constant action to be successful. Coordination of activities and partners is critical for ensuring that planning and implementation remain on schedule. The planning and coordination process harnessed the participation of in-country skills, personnel, and resources to achieve the set objectives of the campaign. The NMCP team took leadership of the planning and coordination process of the campaign. In-house preparatory meetings were held at NMCP prior to the main planning meetings with partners and stakeholders. The following key activities were accomplished under the planning and coordination component of the campaign.

Formation of a National Coordinating Committee

At the national level, campaign planning and coordination was led by the National Coordinating Committee (NCC), as highlighted in the campaign strategy [5]. The composition and formation as well as defining roles and responsibilities of the NCC was based on the comparative strengths of partners within the country Roll Back Malaria (RBM) partnership. The committee comprised MOH personnel from different technical programs and directorates as well as partners from other government departments, non-governmental organizations (NGOs), the private sector, the United Nations (UN) agencies and Country Coordinating Mechanism (CCM) of the Global Fund grants. A broad range membership was meant to ensure that partners bring specific expertise to facilitate effective planning and implementation of the campaign. Membership of the NCC was formally established by MOH to take responsibility for overall planning and coordination of campaign activities. The CCM Executive Secretary was chair of the NCC with NMCP and Catholic Relief Services (CRS) playing key roles as lead institutions for the campaign. The NCC met frequently to discuss campaign issues. However, it was noted that no fixed meeting schedule was developed and shared among members to ensure that meetings are held as planned and for follow up actions. Inadequate documentation of NCC meeting notes and reports for campaign related activities. Early formation of NCC is important to the success of the campaign as it allows

planning to begin early and ensures involvement of key partners in all phases of the campaign planning and implementation. A minimum of six months is required for campaign planning. However, the NCC was lately established giving it limited time for planning of the whole campaign process. Key roles and responsibilities of the NCC as defined in the 2022 national ITN distribution strategy [5] included the following:

1. Validate campaign plan, timeline and budget, including human resources and logistic requirements.
2. Track progress of sub-committees against the established timeline.
3. Validate the guidelines and data, supervision and monitoring tools for the campaign.
4. Coordinate central and regional planning processes of the campaign.
5. Validate the campaign micro-plans of the regions.
6. Oversee supervision and monitoring of campaign activities.
7. Resolve major bottlenecks arising in the campaign.
8. Ensure post-distribution campaign activities are conducted.

Development of the Campaign Strategy and Plan of Action

The framework for the campaign strategy was developed and planning meetings were conducted to review and finalize the campaign strategy. The campaign strategy clearly defined the means by which individuals will be allocated LLINs which is by counting the number of people in a household and allocating one LLIN to every two persons in a household and issuing a voucher as means of identification at the fixed distribution points.

Different sub-groups were formed based on partner expertise to review the different components of the strategy such as LLIN needs quantification, communication, logistics, monitoring & evaluation. Hence, a second draft campaign strategy was produced. The strategy was subjected to further review by external team of Alliance for Malaria Prevention (AMP) and the Global Fund. Comments received were reviewed and incorporated by NMCP and partners and a final strategy including a detailed plan of action was produced which guided the entire campaign process.

Development of Joint Work-Plan

Given the fact that malaria disease knows no boundaries and the importance of cross border collaboration in malaria elimination for neighbouring countries [8, 9]. The Gambia and Senegal are closely collaborating in different intervention areas particularly in the context of malaria elimination. The two countries agreed to synchronize mass LLIN distribution campaigns since 2019 and as such the 2022 campaign was the second synchronized campaign. The national malaria programs of the two counties coordinated and planned campaign activities jointly. Joint planning meetings were held at different levels in both countries. This led to the development of joint workplans as well as monitoring plans for the harmonization of key activities during implementation.

At the regional and district levels, cross border joint planning meeting was held and attended by key partners like the non-government organizations, Security Personnel, Customs Border Officers, Local Government Authorities, Regional Health Directorates, and other high level government officials of both countries in a bid to enhance smooth planning and implementation of the campaign. However, consultations between the Regional Health Directorates (RHD) of the two countries on campaign planning and coordination were limited.

During the development process, all communities, and settlements as well as health facilities bordering the two countries were mapped out. The mapping of communities also guided identification of distribution points

along the borders. The outputs of the joint work-plan included pre-campaign, campaign, and post campaign activities with timelines. The joint work-plan was periodically reviewed and updated by the two countries as necessitated by the prevailing circumstances. See below table 1 joint workplan of the campaign.

Regional Micro-Planning

RHDs are the arms of the MOH responsible for planning, coordination, implementation, monitoring, and supervision of health programs at the sub-national level. Hence, engaging the operational levels of the health system is critical for a successful campaign [10, 11]. As such, RHDs were responsible for conducting microplanning for the campaign at regional and district levels. The joint planning sessions were coordinated by the RHDs, and participants included health facility staff, Public Health Officers, Community Health Nurses, NGOs operating at regional level, local government partners, and key community volunteers.

Prior to the conduct of the regional microplanning, the NMCP and partners held preparatory meetings at the NMCP office to agree on the format and agenda for the regional microplanning process. Planning templates were developed and used by the regions to input all needed data for the campaign microplanning. The template captured key variables required for effective planning and implementation. It also helped to standardize the planning outputs for easy harmonization. The microplanning process included putting together relevant information required for the campaign at regional, district and community levels.

These included lists of settlements, population estimates, personnel required for implementation, transportation needs, availability of storage facilities at different levels, number of days required, fuel, other supplies required, data recording and reporting tools, and social mobilization. The microplanning meetings were held at the regional offices. The micro plans developed by the seven health regions were then consolidated to form one composite plan. This was further validated at the NCC level and a master plan for the campaign was produced. See below table 2 consolidated micro-plan of the campaign.

Procurement of LLINs

Under the current Global Fund New Funding Model 3 (NFM3) grant, the quantities of LLINs required by year for both routine and campaign were already quantified based on most recent population projection. These quantifications were reviewed at the macro level as well as during the microplanning process at regional level to determine the amount of LLINs required by each health region.

Table 1. Joint Workplan of the Campaign

No.	Activity	Time frame		Implementation Phases
		Start Date	End Date	
1	Training of Supervisors	23rd May	24th May	Registration
2	Training of Distributors at regional level	27th May	28th May	
3	Deployment of teams to clusters in the border areas	29th May	30th May	
4	Registration of households together with Senegal on the border communities	31st May	8th June	
5	Validation of data from the household registration	10th June	11th June	

6	Registration of households in the interior of the country: WR1 and part of WC2	12th June	20th June	
7	Validation of data from household registration	21st June	22nd June	
8	Distribution of LLINs together with Senegal on the border communities	23rd June	30th June	Distribution
9	Distribution of LLINs in the interior of the country: WR1 and part of WR2	1st July	7th July	
10	Validation of campaign results	11th July	12th July	

Table 2. Consolidated Micro Plan of the Campaign

The Gambia Mass LLIN Campaign 2022 Summary Micro plan												
Health region	**MLLIN class**	**Phase**	**No. of district**	**No. clusters**	**No. Cluster store**	**No. villages under PPS/cluster store**	**No. distribution points**	**NQC pop 2022**	**No. Households**	**No. LLIN allocated**	**No. Bales**	**No. Distribution points**
URR	URR	Phase 1	7	64	64	435	577	297,491	34,944	165,225	3,295	565
CRR	CRR-S	Phase 1	7	41	40	399	335	142,712	17,378	82,208	1,644	335
CRR	CRR-N	Phase 1	5	32	32	339	353	116,851	13,747	65,083	1,302	353
LRR	LRR	Phase 1	6	30	30	157	186	83,428	9,815	46,416	928	186
NBWR	NBWR	Phase 1	3	28	28	156	185	134,360	15,807	74,720	1,494	185
NBER	NBER	Phase 1	4	37	28	189	220	137,549	16,182	76,514	1,513	211
WR2	K/Central	Phase 1	1	11	11	73	74	235,011	27,648	130,600	2,612	75
WR2	K/South	Phase 1	1	12	12	73	82	173,573	20,420	96,458	1,929	82
WR2	K/East	Phase 1	1	9	9	40	49	67,639	7,958	37,597	752	40
WR2	Fonis	Phase 1	5	23	23	172	234	118,198	13,906	70,272	1,315	234
WR1	WR1	Phase 2	5	55	55	324	338	1,025,566	120,655	569,933	11,399	338
Total			**45**	**342**	**332**	**2,267**	**2,633**	**2,537,379**	**298,461**	**1,415,026**	**28,200**	**2,604**

The quantifications included standard LLINs for five health regions as well as Piperonyl butoxide (PBO) nets for two regions (CRR and URR). The change in net in these two regions was because of insecticide resistance established in the eastern part of the country [12]. Procurement of LLINs were done using the Global Fund Voluntary Procurement

Mechanism (VPM) facility. A total of 1,057,309 standard LLINs and 346,720 PBO nets were procured for the campaign and delivered to MOH. The National Pharmaceutical Services (NPS) of the MOH consequently cleared the LLINs and delivered the products to the CRS central warehouse in Kanifing. The different LLINs were separately stored at the central warehouse to avoid mixing. As part of risk mitigation efforts, smoke alarms and fire extinguishers were provided in the stores for safety.

CRS as sub recipient responsible for the LLIN distribution of the malaria Global Fund grant took all necessary steps to ensure security of the LLINs at the central warehouse. Inventory control systems were put in place to tract LLIN movements from the central warehouse to the regional and community stores and eventually to the distribution sites.

Store Assessment and Pre-Positioning of LLINs

Prior to the transportation of the LLINs to the regional and community stores, an assessment of the stores at these levels was conducted by CRS and NMCP to determine availability and suitability of these stores. Community stores were identified with the help of village heads (Alkalos) for storage of LLINs. A main challenge was obtaining stores in the urban areas therefore the CRS warehouses were also used to supply nets in urban areas for distribution. Overall, 342 community stores were assessed and used as net supply points during the campaign. In addition, store hands were also provided for loading and off-loading of nets and gathering waste during distribution. Prior to the campaign, the quantities required in each of the community stores were determined during micro planning. See below table 3 - showing the number of community stores.

LLINs were thereafter transported from the CRS warehouse and prepositioned to the regional and community stores by hired transporters as per the campaign distribution plan. CRS was responsible for the inventory and tracking of LLINs along the supply chain from the central warehouse to the community stores in the regions.

Table 4. Showing the Number of Community Stores

Health Region	**No. of Districts**	**No. Pre-positioning sites**
Upper River Region	7	64
Central River Region South	7	41
Central River Region North	5	32
Lower River Region	6	30
North Bank West Region	3	28
North Bank East Region	4	37
Western Region 2 Central	1	11

Western Region 2 South	1	12
Western Region 2 East	1	9
Western Region 2 Fonis	5	23
Western Region 1	5	55
Total	**45**	**342**

However, in process monitoring on the community stores conducted during the campaign highlighted key observations that need to be addressed in subsequent campaigns. These included the following:

1. LLINs were not escorted by designated officers during transportation to the community stores.
2. No receipt or delivery notes were issued or signed upon delivery at the community stores visited.
3. Delivery dates were not communicated to community members responsible for the stores to make themselves available to receive the LLINs.
4. Some of the community stores did not have adequate space for storage of LLINs.
5. LLINs in some community stores were not well arranged and labeled.

Logistics Management

Logistics are important components of any campaign. As such, a sub-committee within the NCC was formed to determine and oversee logistics management at the macro level. The detail logistics required for the campaign were determined during the micro planning at the regional level based on the campaign strategy. The logistics plan included human resource, vehicles, mobile phone devices for data collection, social & behaviour change communication (SBCC) materials etc. required to efficiently implement the campaign. However, vehicle mobilization from government and partners could not mobilize adequate quantities and therefore additional vehicles were hired.

The sub-committee ensured that the required materials for the LLIN distribution were provided to the campaign teams through their respective district and regional supervisors prior to the campaign. Each district supervisor was allocated a vehicle to support team movements during registration and distribution. Fueling for campaign was managed with the use of vouchers. Fuel vouchers were taken to a contracted petroleum dealer (Jah Oil) with fuel dumps and filling stations in all regions of the country.

Advocacy and Social Mobilization

Communication is a vital activity before, during and after an LLIN campaign [13, 14]. The NCC communication subcommittee was responsible for promoting campaign activities and ensuring that there is understanding and support for the campaign among partners and the general population. Key communication activities conducted included:

Advocacy targeting political leaders, local government authorities and key partners to foster political will and support for the campaign as well as resource mobilization at national and regional level.

Social Mobilization at community level to mobilize community support and participation for the campaign. These activities focused on sensitizing communities about campaign strategy, dates for household registration and LLIN distribution, distribution points and importance of LLIN use. The subcommittee used different channels of communication at various levels including radio, social media, influential community leaders, traditional communicators,

and community volunteers. At the regional level, social mobilization activities included community sensitization meetings targeting different segments of the community. The local press significantly contributed to social mobilization activities. The campaign strategy guided communication activities and that messages were clear and supportive of MOH campaign efforts. The subcommittee actively worked with private radio stations at different levels and free radio airtime was provided for social mobilization activities. A WhatsApp group was also created by the subcommittee and updates on communication activities were regularly posted to keep the larger campaign group aware of the campaign activities that were going on at different levels.

Campaign Budget and Financing

The Global Fund financed the 2022 mass LLIN distribution campaign. In the NFM3 grant (i.e., 1st July 2021 to 30th June 2024), mass LLIN campaign was part of the key activities costed under the multi-prevention component. The total campaign budget at the macro level was US$1,023,906 but following the microplanning and consolidation of the microplanning budgets the final campaign budget increased to US$1,074,722. The consolidated budget was reviewed and approved by the Global Fund. The main cost drivers of the budget were allowances for campaign teams, fuel, procurement of other campaign logistics and hire of private vehicles to support implementation. In-country partners supported the campaign by providing human resources and logistics to support campaign activities. At the regional level, other partners like PATH/MACEPA, WHO and AMP provided support through technical assistance for planning, implementation, and monitoring of the campaign.

Campaign Implementation

Campaign Launching

Malaria elimination requires advocacy at the highest level to galvanize political support and commitment [11, 15]. As a synchronized cross border campaign, the launching was done to attract much attention in both countries and internationally. A high-level launching was conducted to give it the desired prominence and galvanize community participation and involvement. The campaign was launched in Karang, a border town in Senegal on the 8th May 2022. It was a high-level launching attended by the Ministers of Health of The Gambia and Senegal, Honourable Dr Ahmadou Lamin Samateh and Honourable Abdoulie Diouf Sarr respectively. The ministers were each accompanied by high level delegations comprising UN partners, government officials, other RBM partners, community leaders and various representatives from both countries.

In their launching statements, both ministers affirmed their support for malaria elimination to enable the two countries reach malaria elimination objectives enshrined in their malaria strategic plans. The ministers also reiterated the importance of cross border collaboration in malaria elimination to sustain and consolidate the gains made in the two countries. Given the importance of the media in disseminating health messages [16, 17], the launching had good media coverage to facilitate information dissemination in both print and electronic media as well as community radios. Other speakers included WHO, Plan International, the Global Fund, CRS, and community influential leaders. All speakers echoed the fact that malaria is a public health concern and emphasized the need to accelerate efforts to reach universal coverage targets, scale-up of best practices, strengthening cross-border collaboration, resource mobilization and effective utilization of malaria interventions by populations leading to eventual elimination.

Traditional communicators, popular local musicians and students were given opportunity to disseminate key malaria messages through songs, poems and drama performances during the event. As a symbolic gesture marking the official launch of the campaign, LLINs were issued to a community member from each country by the Honourable Ministers of Health.

Selection of LLINs Distributors and Supervisors

The selection criteria for the campaign volunteers were developed, reviewed, and finalized at the NCC level. Subsequently, the criteria were used to identify suitable participants as campaign teams and supervisors. Basically, consideration was given to participants of the previous campaigns and gender considerations. The supervisors were selected from among NMCP, CRS, RHDs and implementing partner staff. In total, 912 distributors and 114 supervisors were identified.

Training of Campaign Supervisors and Distributors

Training is an important element in the implementation process as it builds the capacities of the field staff and volunteers for effective implementation. In order to ensure consistency and provide guidance during training process, training contents with clearly defined concepts based on the campaign strategy were reviewed and finalized. Emerging issues like COVID-19 prevention measures and lessons learnt from the 2019 campaign were also incorporated into the training guide.

Training for the campaign was conducted in two phases: training of trainers (TOT) and stepdown trainings held at regional level. For the TOT, participants were central level supervisors meant to provide training support to the regional health staff. A total of 114 supervisors were trained for two days. Important to note that regional stepdown trainings were also conducted immediately after the TOT targeting data collectors and net distributors. A total of 912 data collectors and net distributors were trained and this included use of mobile devices for data collection.

Registration of Households and Issuing of LLIN Vouchers

Following the training of data collectors and net distributors at regional level, the registration of household commenced. Household registration was conducted in two phases. Phase I registration started simultaneously in all the regions bordering Senegal from 31st May to 8th June 2022. Phase II covered the interior part of the country which was from the 12th to 20th June 2022. The approach used was house-to-house visit conducted by campaign teams to count and register all the people resident in the country. The following targets were set for teams to reach per day:

1. 44 households per team per day in the urban areas.
2. 43 households per team per day in the rural areas.

Teams of two enumerators were posted in the different districts and mobile devices with in-built DHIS2 tracker were used to capture data. Village clustering conducted during the microplanning was used to assign campaign teams based on population size and geographical location. Data collected during the registration included; name of household head, total number of people living in the household, and number of LLINs to be issued per household. Each household registered was issued a voucher which contains a QR code. These vouchers were to be presented to the campaign teams to be issued nets during the distribution phase. Household registration was conducted concurrently with community sensitization on the campaign.

Validation of Data from Household Registration

Following the completion of the household registration, a one-day validation workshop was

held at the NMCP office and was attended by regional supervisors, IT team, partners and consultants. The meeting was meant to review and validate the data collected during the household registration. Findings of the review indicated that in certain regions, there were variances in the number of targeted households by region compared to the number of households registered during the process. Hence, recommendations were made to address the issues identified during the registration as well as data collected. See below table 5 - Validated household registration data.

Distribution of LLINs

Phase I of the distribution of LLINs started from 23rd – 29th June 2022 simultaneously along the borders of the two countries while phase II started from the 1st – 7th July 2022. In both phases, campaign teams used fixed-post distribution strategy within communities where people issued with vouchers during the registration collect their nets. Distribution teams moved in vehicles from one community to another as per the established movement plan. Teams transport nets in their vehicles from the pre-positioning sites to the identified static locations in each community and returned any leftover nets to the pre-positioning sites at the end of each day. In certain instances, team movements were hindered by lack of fuel in some hired commercial vehicles. Communities were informed about the distribution strategy and dates using different channels of communication including community radios, traditional communicators, influential community leaders and campaign volunteers.

The campaign teams comprised two volunteers, a data collector and a net distributor. The distribution sites were organized to ensure a smooth process, safety of the commodities and campaign teams. Community volunteers (store hand) supported the distribution teams with site organization as well as handling of the LLINs. COVID-19 prevention measures were observed during the distribution. Campaign teams were provided with face mask and hands sanitizers. Campaign teams also re-sensitized communities during net distribution on the importance of consistent use as well as caring for the nets.

Campaign Monitoring

Monitoring and supervision are crucial during mass LLIN distribution to ensure quality of activities and success in the roll out of the campaign [18, 19]. Supervision was important during the LLIN distribution, particularly on the first days when the majority of beneficiaries came to the distribution sites to receive their nets, with potential crowd control issues.

The AMP Toolkit, 2021 [10] was adapted and used by supervisors to monitor the campaign. Monitoring and supervision were conducted during the campaign by the central, regional levels and team supervisors. Monitoring process also looked at social mobilization activities, logistics and supply management issues at central, regional and community levels. It was meant to enhance the implementation process as certain issues identified were addressed onsite. Additionally, monitoring and supervision aided in ensuring that communities were reached and people were aware of distribution dates and points. Feedback was also provided to the campaign supervisors and NMCP team to address key issues identified as the campaign progressed.

Campaign Waste Management

The packaging for the LLINs procured for the campaign using the VPM facility came in bails of 50 without any plastic pre-packaging thus significantly reducing the amount of waste generated during the campaign. This was a lesson learnt from the previous 2019 campaign which generated significant amount of plastic waste, thus had posed prodigious disposal challenges. During the training, the teams were sensitized to pack all the empty bails and ropes cut from the bails at the distribution sites. These wastes were collected daily and transported to

the community stores and eventually transported to the centralized sites identified for final disposal using the MOH incinerators.

Results

Net distribution data collected electronically was synced daily in the DHIS2 tracker which was subsequently reviewed and analyzed. This enabled review of coverage data by districts. A total of 3,179,189 people were registered countrywide corresponding to a total of 1,678,319 actual LLIN need. This is above the country's population projection of 2,527,251 and a corresponding total of 1,404,047 projected LLIN need. A total of 1,164,552 LLINs were actually distributed between June to July 2022, corresponding to 90% of projected LLIN needs. This result is an indication of national coverage of 72% of the registered population. A further analysis of the results showed that 83% of the campaign target of the standard nets (i.e. 876,394/1,057,309) and PBO nets (i.e. 288,158/346,720) have been distributed. Additionally, only 33% of the 42 districts achieved the universal campaign coverage of 80%. See details of the results in table 4 below.

Discussion

A nationwide LLIN distribution campaign is conducted every three years in The Gambia since 2011. However, to synchronize mass net distribution campaign with Senegal as part of cross border collaboration towards malaria elimination, the 2022 was the second joint campaign with Senegal following the first one which was conducted in 2019. The distribution campaign is a key strategy to achieving universal campaign coverage. The 2022 mass distribution campaign conducted resulted to a distribution of 72% of LLIN needs based on household registration data, covering 90% of the projected population. Based on the household registration, a total of 1,678,319 LLIN needs was established compared to a total of 1,404,047 projected LLIN need. Hence, a variance of 24% between projected and registered population need. A further review or analysis is therefore necessary to better estimate the real population need.

Micro planning was conducted simultaneously in all the seven health regions in the country. This was a hectic exercise, as it required ensuring that all the regional stakeholders remained strongly engaged and highly active during all the campaign phases. Real time communication through various channels (WhatsApp, email, telephone) enabled the central level team to coordinate with all the regional level teams and provide necessary and appropriate technical support, even when not physically present in some instances.

Training of campaign teams was conducted in two phases, i.e., a TOT and stepdown trainings. This approach provided a useful opportunity to segment supervisors from distributors who were indeed at different capacity levels since supervisors were mostly heath workers and understand better the reasons for conducting such a campaign. Whilst the stepdown training participants were mostly volunteers (non-health workers) and need greater depth of training in simplified format for better comprehension. The training approach also provided another opportunity to use and address lessons learnt from the TOT during the stepdown trainings. Additionally, incorporating COVID-19 prevention measures during the training was equally helpful to equip the campaign teams to take adequate measures to protect themselves and communities during household registration and distribution. The criteria of selection developed prior to the campaign helped in identifying suitable campaign participants, most of whom participated in the previous campaign and therefore familiarity with the household registration and distribution processes were ensured.

Conducting house-to-house registration throughout the country was tedious but quite

important and ensured that no community was left out. But the fact that some of the compounds were closed during the day for work and school related activities made it prudent for a re-visit to those compounds in the evening. This experience was more prominent in the urban grossly populated areas. Hence, close monitoring and supervision was required to ensure good coverage and quality of the data collected. Furthermore, monitoring and supervision during the registration process was vital to identify issues and provide corrective actions. There were different levels of supervisors during the registration to ensure that all areas were reached and that there were no duplications/gaps. However, supervision at the level of the teams were sub-optimal leading to the following key observations:

1.Variations between projected number of households per region and total number of households registered during the registration exercise.

2.Difficulties in accessing certain households in the urban areas to register them due to the fact that most go out for work or other businesses during the day.

3.Volunteers not sensitizing household heads adequately on the importance of giving accurate data on the number of people per house leading to perceived over estimations.

4.Some volunteers count number of beds instead of number of people per household.

Conducting household registration in phases also helped synchronize registration along the borders of the two countries. Campaign teams were able to meet at the border and ensured that all households were reached. This process also enabled streamline communication and synergy during registration.

LLIN distribution strategy used a fixed post system and communities were expected to visit pre-positioned distribution sites with their coupons issued them during registration to receive their nets. Hence, continuous sensitization during the process was quite important for communities to know when and where to collect their nets. The campaign communication messages included reminding communities of the process for receiving the nets, who should collect the nets, distribution dates, as well as hours that the distribution sites were opened. Despite community sensitizations, children were observed to be collecting nets in some distribution centres. Due to the variances between the total projected population and total registered population, inadequate quantities of nets were pre-positioned in some distribution sites resulting to temporal shortages of nets in those sites. Logistics management challenges were also realized notably inadequate number of vehicles also contributing to net shortages and delays in movement of campaign teams. Hiring of some commercial vehicles became an option but monitoring of fuel allocated posed some challenges.

Table 4. Results of Coverage by District

Region	**District**	**Pop Projection**	**Registered Pop**	**Pop Variance (%)**	**LLIN Projected need**	**Actual LLIN need**	**LLIN Need var (%)**	**Actual LLIN sent to District**	**LLIN Distributed by district**	**Projected Coverage**	**Actual Coverage**
Central River	Janjanbureh	4,332	5,455	26%	2,407	2,903	21%	2,400	2,474	103%	85%
Central River	Lower Fulladou West	50,148	71,156	42%	27,860	37,304	34%	27,900	25,417	91%	68%

Central River	Lower Saloum	18,459	25,781	40%	10,256	13,502	32%	10,450	11,291	110%	84%
Central River	Niamina Dankunku	6,955	10,260	48%	3,865	5,381	39%	3,950	4668	121%	87%
Central River	Niamina East	27,830	36,898	33%	15,462	19,353	25%	15,200	10,271	66%	53%
Central River	Niamina West	8,165	12,096	48%	4,537	6,374	40%	2,100	3,911	86%	61%
Central River	Niani	33,873	41,658	23%	18,819	21,656	15%	18,950	15,68	83%	72%
Central River	Nianija	11,803	16,196	37%	6,558	8,441	29%	6,900	6,965	106%	83%
Central River	Sami	29,118	42,685	47%	16,177	22,076	36%	16,400	13,978	86%	63%
Central River	Upper Fulladou West	55,494	65,824	19%	30,830	34,530	12%	27,400	25,483	83%	74%
Central River	Upper Saloum	22,316	32,741	47%	12,398	17,003	37%	12,350	12,085	97%	71%
Lower River	Jarra Central	9,287	13,304	43%	5,160	7,020	36%	5,150	6,273	122%	89%
Lower River	Jarra East	17,851	27,068	52%	9,918	14,196	43%	7,950	9,829	99%	69%
Lower River	Jarra West	29,185	42,956	47%	16,214	23,271	44%	16,150	20,015	123%	86%
Lower River	Kiang Central	9,643	13,002	35%	5,357	6,994	31%	4,650	6,593	123%	94%
Lower River	Kiang East	7,572	11,914	57%	4,207	6,420	53%	2,400	5,453	130%	89%
Lower River	Kiang West	16,689	20,097	20%	9,272	10,671	15%	9,400	9,030	97%	89%
North Bank East	Central Badibu	24,129	31,472	30%	13,405	16,627	24%	13,400	10,529	79%	63%
North Bank East	Lower Badibu	22,235	32,731	47%	12,357	17,221	39%	12,400	9,208	75%	53%
North Bank East	Sabach Sanjal	29,374	42,665	45%	16,319	22,284	37%	16,250	12,086	74%	54%
North Bank East	Upper Badibu	60,189	100,150	66%	33,439	52,823	58%	34,450	30,855	92%	58%

North Bank West	Jokadu	27,621	35,336	28%	15,345	18,492	21%	15,250	14,355	94%	78%
North Bank West	Lower Nuimi	70,627	97,954	38%	39,262	51,397	31%	37,400	40,540	103%	79%
North Bank West	Upper Nuimi	38,228	46,736	22%	21,238	24,451	15%	21,600	21,329	100%	87%
Upper River	Basse(Fulla du East)	61,862	78,880	28%	34,368	42,048	22%	34,400	33,875	99%	81%
Upper River	Jimara	54,755	64,187	17%	30,420	33,263	9%	31,850	29,515	97%	89%
Upper River	Kantora	48,321	64,525	34%	26,846	34,422	28%	26,400	26943	100%	78%
Upper River	Sandu	29,807	43,901	47%	16,560	22,813	38%	16,750	15,138	91%	66%
Upper River	Tumana	46,875	53,360	14%	26,042	28,146	8%	26,750	25,169	97%	89%
Upper River	Wuli East	29,748	35,761	20%	16,527	18,355	11%	16,200	13,588	82%	74%
Upper River	Wuli West	27,498	37,971	38%	15,277	19,882	30%	18,700	11,769	77%	59%
Western 1	Banjul City	27,857	35,094	26%	15,476	18,726	21%	17,150	12,631	82%	67%
Western 1	Kanifing Municipality	435,050	516,405	19%	241,695	274,456	14%	254,250	181,860	75%	66%
Western 1	Kombo North	558,930	715,099	28%	310,517	377,058	21%	311,600	250,802	81%	67%
Western 2	Foni Bintang Karanai	28,194	27,031	-4%	15,664	14,270	-9%	10,050	16,618	106%	116%
Western 2	Foni Bondali	12,480	16,652	33%	6,934	8,560	23%	7,250	5,529	80%	65%
Western 2	Foni Brefet	23,918	22,015	-8%	13,288	11,529	-13%	12,050	5,880	44%	51%
Western 2	Foni Jarrol	11,336	10,393	-8%	6,298	5,540	-12%	6,250	1,821	29%	33%
Western 2	Foni Kansala	23,263	29,282	26%	12,924	15,254	18%	12,650	7,112	55%	47%
Western 2	Kombo Central	230,618	254,813	10%	128,122	135,598	6%	129,750	92,765	72%	68%
Western 2	Kombo East	69,715	86,206	24%	38,731	45,054	16%	37,600	31,217	81%	69%

Western 2	Kombo South	175,859	211,839	20%	97,700	112,955	16%	96,450	74,064	76%	66%
Total		**2,577,251**	**3,179,189**	**31%**	**1,404,047**	**1,678,319**	**24%**	**1,406,550**	**1,164,552**	**90%**	**72%**

Lessons learnt, Challenges, Recommendations and Conclusion

Lessons Learnt

1. Use of social media (WhatsApp) platform helped to enhance communication among campaign teams, bottlenecks identified, and solutions proposed for quick remedial actions. It also helped in keeping the central level and supervisors informed about the campaign.
2. Multi-stakeholder involvement (security, regional administration, and other relevant organizations) helped ease cross-border movements and for smooth distribution in border communities.
3. Phased approach to the campaign allowed synchronization of both registration & distribution phase of the campaign along cross-border communities in both countries.
4. Constant monitoring and supervision are crucial for the success of the campaign.
5. Good supply chain management is necessary for the success of campaigns.
6. Involvement of community volunteers in the campaign improved mobilization and acceptance at community level.
7. Harmonization of campaign messages helped streamline cross-border communication for community mobilization and participation in the campaign.

Challenges

1. Limited time between planning and implementation of the campaign.
2. Inadequate social mobilization activities to keep communities aware of the campaign.
3. Inadequate supervision of teams during household registration and distribution.
4. Few households were left out during household registration and distribution due to sub-optimal performance of campaign teams and lack of access to some compounds particularly in the urban areas.
5. Logistics management issues making LLIN unavailable at some distribution points in some instances during the net distribution phase.
6. Hire of commercial vehicles with the risk of utilizing campaign fuel for commercial purposes.
7. Children sent to collect nets at the distribution centres affected sensitization on proper LLIN use .
8. Variances between total projected population and total registered population for better planning and pre-positioning of LLINs prior to the campaign.

Recommendations

1. Conduct post campaign evaluation to understand the reason(s) for the low coverage and conduct mop-up and fill-in net distribution in areas with low coverage.
2. Evaluate the cross-border LLIN campaign to learn lessons and make recommendations for future synchronize campaign.
3. Strengthen monitoring and supervision during implementation to ensure that campaign teams perform optimally and that all challenges identified on-site are addressed for more effective performance.
4. Training for volunteers should be conducted separately by component (household registration, data collection, LLIN distribution) to enhance effectiveness and better campaign performance.

5. Logistics management should be improved to ensure timely team movements and all required logistics including availability of LLINs at distribution points throughout the campaign.
6. Social mobilization and community sensitization activities should be intensified before and during campaign to ensure that households are well informed about key campaign activities and also children are not sent to receive LLINs.
7. Investigate and address the factors responsible for the variances between the total projected population and total registered population for better planning and pre-positioning of LLINs prior to the campaign.

Conclusion

The joint coordination and planning allowed the NMCP and partners to successfully conduct a nationwide campaign synchronized with the neighbouring country Senegal. The high-level engagement and support from government greatly contributed to the successful completion of the campaign. This distribution campaign has increased access to LLINs in households since over a million nets were distributed which is likely to result in increased LLIN use with continuous education on the benefits. Consequently, a reduction of the malaria burden in the country and ultimately contributing to the achievement of the country's goal of malaria elimination.

Ethics Approval and Informed Consent

This article makes use of secondary data and is not subject to ethics approval. Administrative approval was obtained from the National Malaria Control Program.

Conflict of Interest

I declare that there is no conflict of interest.

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