Creating Interventions to Transition Long Lasting Insecticide Net Distribution in Ghana

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Abstract

Objective

Mass Long Lasting Insecticide Net (LLIN) distribution campaigns are rolled out, as a part of the Ghana Malaria Strategic plan (2021–2025) which seeks to protect at least 80% of the population at risk with effective malaria prevention interventions. Although, the mass LLIN distribution campaign indicates a comprehensive stakeholder engagement approach, it does not systematically transition into the basic primary health care structures within the Ghana Health Services. This paper presents the process and outcome of creating an innovative social intervention, which focuses on community mobilization and capacity building of Community Health Officers.

Methods

This study employed a concurrent triangulation mixed methods approach conducted across six districts in Eastern and Volta regions, Ghana. Findings were synthesized, grouped, and further distilled to guide the participatory co-creation workshops. Co-creation involved participatory learning in action technique which is a practical, adaptive research strategy which enabled diverse groups and individuals to learn, work and act together in a co-operative manner.

Results

The results suggest the establishment of a Community Health Advocacy Team (CHAT). This would be necessary in efforts aimed at transitioning LLIN distribution campaign in communities. The role of the CHAT would be centred on key elements of community/social mobilisation and capacity building, all nested in a Social and Behaviour Change Communication strategies.

Conclusion

The research team is in the process of assessing the acceptability and feasibility of the CHAT intervention with all stakeholders in the various communities. Assessment of the effectiveness of the CHAT intervention would be done at a later time.

Key Messages
What is already known on this topic?

- Periodically, the National Malaria Control Programme rolls out Mass LLIN distribution campaigns in communities. However, it has not been embedded into the primary health care structures. This study seeks to co-create an intervention that hinges on community mobilization and Community Health Officers playing key roles in the distribution campaigns.

What this study adds

- This study suggests a Community Health Advocacy Team to provide support services to transition Long Lasting Insecticide Net distribution campaign within communities

How this study might affect research, practice or policy

- Long Lasting Insecticide Net distribution campaign would be transitioned into the Community-based Health Planning and Services, improve use of Long Lasting Insecticide Net within communities, thereby reduce malaria morbidity and mortality.

Introduction

Malaria continues to be endemic in most parts of Africa, including Ghana, causing millions of lives to be lost across age categories.\(^1\)\(^2\) There was however progress between 2016–2019 where Ghana made significant progress in malaria control. Cases decreased by 32% (from 237 cases per 1000 of the population at risk to 161 cases), and deaths decreased 7% (from 0.4 per 1000 of the population at risk to 0.37).\(^3\) Mass Long Lasting Insecticide Net (LLIN) distribution campaigns are rolled out, as a part of the Ghana Malaria Strategic Plan (2021–2025) which seeks to protect at least 80% of the population at risk with effective malaria prevention interventions. In spite of progress made in overall LLIN ownership, challenges still remain. The Ghana Malaria Indicator Survey shows 67% access to a LLIN, with 43% use.\(^4\) The inference therefore is that people have not taken up LLIN despite the distribution campaign. Although these campaigns expose high proportions of the Ghanaian community to LLIN interventions, they hardly lead to desired health-related behaviours (i.e., LLIN use).

Some barriers to LLIN use have been documented to include distribution challenges where there is inadequate number of nets per household, limited Social and Behaviour Change Communication (SBCC) activities as well as lack of continuous malaria education.\(^5\)\(^–\)\(^8\) At the community level, there is knowledge gap on malaria prevention, inability to hang LLINs in many households due to housing type and sleeping places. There is also misuse and repurposing of LLINs.\(^9\)\(^–\)\(^10\) Health-worker challenges have also been reported to include lack of adequate training on community mobilization skills, minimal number of staff and lack of follow-up, community engagement, and supervision.\(^11\)\(^–\)\(^12\)

Thus, ability to achieve desired outcomes from LLIN campaigns may require adoption of social innovative approaches which support behaviour change within communities.\(^13\)

Social Innovation is described as a collective process enabling the generation of ideas by people who participate collaboratively to improve delivery strategies in the community or health facility.\(^14\) The social
objective emphasizes the engagement of concerned communities within which interventions will be diffused with innovative approaches meeting both social and medical needs.\textsuperscript{14} Community directed programmes provide opportunities for government, health services, social actors and individuals to work closely with populations directly affected by diseases, especially infectious conditions. One such example is the Community-based Health Planning and Services (CHPS) program in Ghana, which seeks to ensure accessible, equitable, efficient and good quality health care services.\textsuperscript{15} The CHPS concept involves the provision of door-to-door primary health care services to community members by trained nurses known as Community Health Officers (CHOs).\textsuperscript{15-17} CHOs provide antenatal care, family planning, health education, outreach clinics for delivery of child welfare services, and school health services.

In order to create a people centered intervention, the project (Improving the Effectiveness of Mass Long Lasting Insecticide-treated Net Distribution Campaigns Through Community-based Health Planning and Services Programme in Ghana) seeks to leverage on the CHPS to ensure community involvement and ownership of the LLIN Mass Distribution Campaigns in Ghana. Although some community health workers (e.g., health volunteers, community health nurses) participate in the registration of households, list potential beneficiaries, and distribute LLINs during the campaigns, their involvement is paid for on a contractual basis. To ensure sustainability, the need to transition this campaign into CHPS has become imperative as the National Malaria Control Programme continues to rollout the 2021 campaign, amidst the COVID-19 pandemic. This paper presents the process and outcome of the co-creation of an innovative social intervention which would transition the Mass LLIN distribution campaign into CHPS by focusing on community mobilization and capacity building.

**Methods**

**Study site**

A total of six communities, one community per district across two regions in southern Ghana, participated in the study. These were communities in districts where the 2021 Point Mass Distribution (PMD) campaigns of LLINs, are ongoing. PMD is one of the strategies adopted by the Ghana Health Service and its partners whereby only designated sites are noted for distribution of LLINs. This was to avoid possible biases with regard to community engagement by ensuring that components align with the timelines of the National Malaria Control Programme (NMCP) and the funder. The study was conducted in districts with the highest prevalence of malaria as reported in the District Health Information Management System (DHIMS2), a comprehensive web-based application for remotely compiling data across different levels of a health system into a central storage point: Ho West (Tsito-90%), Ho (Takla Hokpeta-75%) and Agortime Ziope (Kpetoe-100%) in the Volta Region; and Birim South (Apoli-94%), Achiase (Achiase-94%) and Abuakwa North (Kukurantumi-93%) in the Eastern Region (data source: District Health Information Management System 2 - DHIMS 2).

**Patient and public involvement**
Participants in this study were not involved in setting the research question or the outcome measures. However, they were closely involved in the creation of the CHAT. Participants were also involved during inauguration of CHAT which helped to motivate community involvement during the study.

**Population and sample**

The study population consisted of household heads, community leaders, Non-Governmental Organisation (NGO) representatives, Community Health Officers (CHOs), as well as officers from the National Malaria Control Programme (NMCP) and the Ghana Health Service (GHS).

**Study Design**

We employed a concurrent triangulation mixed methods research design, involving participatory approaches within an implementation research framework. A desk review, survey, In-Depth Interviews (IDIs), Key Informant Interviews (KIIIs), Focus Group Discussions (FGDs), and Participatory Workshops (PWs) were organized concurrently, albeit at different times.

**Data Collection**

**Desk Review**

A desk review was done to identify documents (i.e., articles and reports) containing guidance and recommendations on effective strategies relating to Mass LLIN Distribution Campaigns adopting community-based approaches in Ghana and elsewhere. This involved a comprehensive literature search and review to identify relevant published and grey literature. A desk review guide was used to collect appropriate data by initially presenting these in an extraction sheet that outlined potential barriers, enablers, lessons learnt and recommendations from similar interventions. Documents included scholarly journals, Ministry of Health documents and reports, Ghana Health Service documents and reports, National Malaria Control Programme documents and reports, WHO/TDR documents, and reports, as well as documents and reports from the coalition of NGOs in health, an umbrella and coordinating body overseeing activities of all registered NGOs and Community Based Organisations (CBOs) in the health sector of Ghana.

**Focus Group Discussions (FGDs)**

FGDs (14) were organised to contextualize and explore the barriers to, and enablers of Mass LLIN Distribution Campaigns in the context of community mobilization, capacity building and SBCC. FGDs involved purposively selected household heads (4), caregivers of children under 5 (4), and Community Health Officers (6).

**Key Informant Interviews (KIIIs)**

A semi-structured interview guide was used to conduct ten KIIIs with purposively selected NMCP and Ghana Health Service focal persons at the regional and district levels to assess LLIN campaign delivery processes.
Baseline survey

A baseline survey (N = 800) across the six districts was done to identify baseline parameters to be used for assessing the effectiveness of our co-created intervention. These parameters included LLINs ownership, usage (regular, occasional and non-user), malaria morbidity among children under five and pregnant women. Data were collected using REDCap software on android tablets.

Intervention Co-creation

Findings from the Desk Review, FGDs, KIIIs, and baseline surveys were synthesized, and grouped according to relevance. This was then distilled and formed the basis for developing a participatory workshop guide aimed at co-creating a LLIN campaign intervention involving various stakeholders (i.e., investigators, NGO representatives, School Health Education Programme Coordinators, ANC nurses, Disease Control Officers, District Health Management Teams (DHMTs), CHOso, community leaders and opinion leaders). Six participatory workshops were conducted employing the participatory learning in action technique, which is a practical, adaptive research strategy that enables diverse groups and individuals to learn, work and act together in a co-operative manner, to focus on issues of joint concern, identify challenges and generate positive responses in a collaborative and democratic manner.\textsuperscript{15}

Findings from the participatory workshops (Fig. 1) were further synthesized to co-create our intervention.

Ethical Approval

The protocol for this study was approved by the Ghana Health Service Ethics Review Committee (GHS-ERC: 002/06/21).

Data Analysis

As part of the statistical analyses, we initially performed correlation and frequency analyses to identify and prioritise elements in LLIN campaign processes to inform the content of our participatory workshop guide. Also, thematic framework analysis was used to identify emerging themes to guide the establishment of Community Health Advocacy Teams (CHAT), focusing on community mobilization, capacity building and SBCC (Figure 2). We used NCapture and query functions in the NVivo Programme to display data and findings in the form of word clouds for easy visualization.

Results

Socio-demographic Characteristics of Participants

A total of 106 participants comprising 50 women and 56 men, aged between 20 and 77 years were involved in the participatory workshops. Participants were mainly NGO representatives, School Health Education Teachers, ANC nurses, Disease Control Officers, DHMTs, CHOso, Community leaders/Assemblymen, and opinion leaders (Table 1). Participants for the PW were from Kukurantumi,
Achiase and Apoli in the Eastern Region as well as HoKpeta, Tsito and Kpetoe from the Volta Region of Ghana.

Table 1: Socio-Demographic Characteristics of Participatory Workshop Participants.
<table>
<thead>
<tr>
<th>Characteristic of Participants</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community of Residence</strong></td>
<td></td>
</tr>
<tr>
<td>Kukurantumi</td>
<td>18</td>
</tr>
<tr>
<td>Achiase</td>
<td>20</td>
</tr>
<tr>
<td>Apoli</td>
<td>19</td>
</tr>
<tr>
<td>HoKpeta</td>
<td>17</td>
</tr>
<tr>
<td>Tsito</td>
<td>17</td>
</tr>
<tr>
<td>Kpetoe</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>106</strong></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
</tr>
<tr>
<td>Male</td>
<td>56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>106</strong></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;20years</td>
<td>-</td>
</tr>
<tr>
<td>20-29years</td>
<td>10</td>
</tr>
<tr>
<td>30-39years</td>
<td>61</td>
</tr>
<tr>
<td>40-49years</td>
<td>18</td>
</tr>
<tr>
<td>50+years</td>
<td>17</td>
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<tr>
<td><strong>Total</strong></td>
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</tr>
<tr>
<td><strong>Educational Level</strong></td>
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<td>Primary</td>
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<tr>
<td>JHS/Secondary/Middle School</td>
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<tr>
<td>Tertiary</td>
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<tr>
<td><strong>Total</strong></td>
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<tr>
<td><strong>Marital Status</strong></td>
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<tr>
<td>Single</td>
<td>28</td>
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<tr>
<td>--------------</td>
<td>----</td>
</tr>
<tr>
<td>Married</td>
<td>77</td>
</tr>
<tr>
<td>Divorced/Widowed/Separated</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>106</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of Stay in Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20years</td>
</tr>
<tr>
<td>20-29years</td>
</tr>
<tr>
<td>30-39years</td>
</tr>
<tr>
<td>40-49years</td>
</tr>
<tr>
<td>50+years</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

**Community Health Advocacy Team (CHAT)**

Findings from this study suggested that the establishment of a Community Health Advocacy Team (CHAT) will be very important in facilitating LLIN distribution campaigns within communities in Ghana (Fig. 1). CHAT will be made up of significant actors whose influences are recognized within communities. They will include Community Health Officers, religious leaders, School Health Education Programme coordinators, assemblymen/women, community information officers, representatives from any of the security services, community-based organizations and traditional authorities. The anticipated role of CHAT would be three-pronged. These are community/social mobilization, capacity building and social and behaviour change communication which will lead to improved use of LLIN. We found that the CHAT meetings are to be best convened quarterly, preferably by a Community Health Officer. Although it was emphasized that CHAT’s efforts would not be compensated, there was a strong opinion among study participants that CHAT members be motivated tangibly or intangibly. For example, that they are given parcels of land where they could build (tangible) or be acknowledged publicly during community events (intangible).

**Community/Social Mobilization**

The National Malaria Control Programme (NMCP) in Ghana through its focal persons reach out to community members during LLIN distribution campaigns. These efforts could however be complemented by the CHAT since their positioning in the community make them readily available to support the NMCP.
For CHAT to play this role creditably, its members must ensure the maintenance of NMCP’s programming and its benefits over time.

**Capacity Building**

Findings reveal that CHAT must be trained by the NMCP as part of their capacity building efforts. CHAT would therefore need to be trained along the themed capacity building areas (training, registration, SBCC, logistics, distribution, and supervision) of the NMCP. In addition, CHAT members would be given skill enhancing strategies in leadership, communication, and community mapping, as well as record keeping competencies.

**Social and Behaviour Change Communication**

The NMCP offers Social and Behaviour Change Communication (SBCC) as part of the LLIN distribution campaign efforts. This study however revealed that the SBCC efforts could be strengthened if CHAT is actively involved at different stages of the campaign. For example, there could be SBCC activities prior to the campaign, during and after the campaign. Some of the channels identified include the use of posters, community information centers, home visits, and in churches and mosques. This would ensure that communities are well sensitized before and after the campaign.

**Discussion**

This study used a participatory process\textsuperscript{18,19} to develop a framework (campaign transitioning strategy) that could transition LLIN distribution into the Community-based Health Planning and Services structure, which is the Primary Health Care system in Ghana. We actively involved various stakeholders to strengthen the development of an intervention that has the potential to systematically address real-world problems,\textsuperscript{16} and to achieve sustainable outputs and impact\textsuperscript{20,21} in malaria prevention and control. This would also help to achieve the global agenda of eliminating malaria.

From a practical point of view, this framework will shape the policy on LLINs distribution to ensure a continuous all year-round campaign on the regular use of LLINs. This would not only help address the challenges associated with periodic campaign rolled out during the PMD but ensure a reduction in the access to use gap. Another practical contribution of this framework would be the development of a guideline and training manuals on capacity building that support the transfer of CHAT to other communities. The use of local resources makes the intervention sustainable and easily integrated into the health care delivery system in Ghana. If adopted, the CHAT could become one of the flagship malaria prevention and control interventions which can contribute toward malaria elimination. The framework would also be suitable during public health emergencies that tend to disrupt facility-based service delivery.\textsuperscript{22} Disruptions to malaria control programmes during public health emergencies have been linked to over 75 major resurgences arising from the 1930s through the 2000s.\textsuperscript{23}
In summary, the present foundational study provides a framework for transitioning LLINs campaign into the primary health care system in LMIC settings. In doing so, it will add value to implementation science and practice concerning the scaling up and advancement of such strategies to address challenges in LLINs campaigns. The next step is for investigators to assess the acceptability and feasibility of the CHAT campaign transitioning intervention. We are mindful of an obvious limitation which will be to consider contextual issues (malaria prevalence, social and cultural) that may relate to particular communities.

Declarations

AUTHORS’ CONTRIBUTIONS

All authors participated in designing the study with NYP and GMC providing technical support. PBA revised the final protocol. FG, EA and PTT collected and analysed the quantitative data while PDG was in charge of qualitative data collection and analysis. AN carried out the desk review. RH revised and finalized the CHAT framework. All authors participated in the Participatory Workshops. All authors contributed to writing the manuscript and approved of the final draft.

Competing Interests

The authors declare that they have no competing interests.

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Data Sharing

Data are available upon reasonable request.

References


**Figures**

**Figure 1**

Images of Participatory Workshops held in the communities

**Figure 2**

Community Health Advocacy Team (CHAT) for LLIN Campaign Intervention