PROCEDURES FOR ASSESSING THE QUALITY OF INSECTICIDE-TREATED NET (ITN) MASS DISTRIBUTION CAMPAIGN HOUSEHOLD REGISTRATION AND ITN DISTRIBUTION ACTIVITIES USING CLUSTERED LOT QUALITY ASSURANCE SAMPLING (CLQAS)

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Expanding the ownership and use of mosquito nets

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NOTES

These procedures have been developed by the Alliance for Malaria Prevention (AMP) in response to demand from national malaria programmes for guidance and easy-to-use tools for planning and implementing approaches for assessing the quality of household registration during their ITN campaigns, as well as the quality of their ITN campaign during and post-distribution. The information is intended for use by the national campaign coordination committee of the national malaria programme, the ITN campaign monitoring and evaluation (M&E) sub-committee and other personnel and partners involved in the assessment of the quality of the processes and outcomes of household registration and ITN distribution during a mass ITN campaign.

Annex 1 contains a **Glossary of terms** that are used throughout these procedures, with a description that aims to provide a common understanding of how AMP defines these terms.

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CONTEXT

Maintaining high coverage of ITNs for populations in need is important to provide community-level protection from malaria vectors. ITN mass distribution campaigns successfully achieve a rapid increase in ownership of and access to ITNs. However, in some cases, households (HH) do not receive any ITNs or receive an incorrect number of ITNs (fewer or more than planned in relation to the campaign ITN allocation rules), leading to lower than expected ITN coverage following campaigns. Reasons for the discrepancy between ITN mass distribution campaign plans and actual results may be due to real or perceived ITN shortages, or errors or inconsistencies in household registration (HHR) and/or ITN distribution activities.

National malaria programmes identify the campaign strategy which best responds to geographic, operational and health security factors and in conjunction with the campaign's National Coordinating Committee make a final determination on the approach to be implemented. Strategies for conducting ITN mass distribution campaigns currently include but are not limited to:

1. A **fixed-site distribution** approach includes a separate HHR process, in which HHs often receive a voucher or other means of identification to exchange for the requisite number of ITNs at a pre-determined ITN distribution site, usually at a date closely following the HHR. Fixed-site distribution may take place immediately following the registration (e.g. **a single-phase campaign** in which, for example, HHs registered on day one of the campaign can redeem their vouchers for ITNs on day two) or a **double-phase campaign** in which the registration and distribution may occur separately.

2. A **"door-to-door"** approach in which HHR and distribution are conducted either during a single-phase campaign, which involves HHR and ITN distribution during a single visit, or during a double-phase campaign, which involves a first visit to the HH to conduct HHR and a second visit for ITN distribution. The double-phase campaign may or may not include the use of vouchers, while the single-phase campaign does not require vouchers to be provided as the ITNs are distributed during the same visit as the registration. However, while there is no requirement for vouchers with a single-phase campaign, national malaria programmes may include them to reinforce the tracking of ITNs distributed and accountability for the ITNs by campaign implementers.

Door-to-door approaches have been used more frequently in recent years to mitigate risks of COVID-19 and align to guidance for infection prevention and control (e.g. physical distancing, limiting external contacts). Several national malaria programmes have noted that door-to-door approaches improved ITN coverage versus fixed point distribution as the teams directly provide ITNs to households rather than households having to attend distribution points on days and during hours that may not be convenient. While households were missed with vouchers during household registration for two-phase campaigns, single-phase campaigns have made it more difficult for households to be missed as the ITNs are visible during the door-to-door transport and communities and households themselves can see the ITNs and directly follow-up with campaign staff.

Regardless of the strategy or mix of strategies adopted, HHR, ITN distribution and social and behaviour change (SBC) activities may not fully ensure that ITNs are distributed to all eligible households and/or that a correct number of ITNs is distributed to households. In that case, ITN coverage and use following the mass campaign may be lower than expected. In some cases, poor quality activities, such as incomplete or inaccurate recording of household information during HHR, or delivery of unclear or incorrect SBC messages for the ITN campaign may lead to potential wastage, inefficiencies and inequitable distribution of ITNs, which may also cause national malaria programmes and partners to miss campaign and ITN access and use targets.

Where possible, including operational assessment(s) to track the quality and coverage of HHR and ITN distribution activities and to make corrective actions is important for increasing population access to ITNs and improving the efficiency of ITN mass campaigns.

While ITN access and use are generally evaluated in malaria-endemic countries through national population surveys such as Demographic and Health Surveys (DHS), Malaria Indicator Surveys (MIS) and Multiple Indicator Cluster Surveys (MICS), these large surveys are generally conducted every two to three or more years and provide a snapshot of coverage at that time rather than an assessment of the achievements of the mass campaign. To reinforce operational quality of ITN campaigns, national malaria programmes and partners have indicated the need for cost-effective and efficient methods and monitoring approaches to generate data to inform operational decision-making and improve campaign outcomes.

Frequently collecting data during key activities supports national malaria programmes and health authorities at all levels to make better decisions about ITN deployment. Assessments can be used as a programme management tool, allowing for ongoing monitoring of ITN distribution and use. The focus of these procedures is thus providing a harmonized set of procedures to generate reliable ITN access and use data.

Rapid assessment methods can also measure ITN access and use at health facility, community, and/or school levels and among vulnerable groups and hard-to-reach populations[1]. These assessment procedures can be implemented in coordination with other quantitative and qualitative evaluation and monitoring methods, including the Malaria Matchbox Tool which examines how "social, economic, cultural and gender-related inequities" shape malaria and malaria services in a country or region[2].

Household registration

Operationally, ITN campaigns aiming for high coverage of targeted populations require registering all HHs and the number of occupants (or sleeping spaces) to determine the number of ITNs to allocate to each HH. When HHR is organized as a separate activity phase, with ITN distribution (either fixed-site or door-to-door) taking place as a separate, later phase, the results of the HHR are used to determine the quantity of ITNs required at each distribution or pre-positioning site. HHR, if well planned, implemented and supervised, provides the best quality data possible to estimate the number of ITNs needed for the mass campaign. A multi-country study identified HHR as the most important factor in HHs receiving any net or enough nets to cover all HH members and ensure equitable distributions across populations. While HHR was equitable in several of the countries studied, in two countries the poorest HHs were less likely to have been reached[3].

AMP has provided significant planning and operational information and resources for HHR since the World Health Organization (WHO) adopted universal coverage for ITN programmes. Nevertheless, important operational gaps and questions remain in systematically achieving high coverage of populations targeted for ITNs. It is important that national malaria programmes and implementing partners review HHR activities and identify optimal and efficient ways to plan and conduct HHR to achieve that high coverage. Detailed planning will ensure a process which is both accurate and complete and will ensure that feedback is provided in a timely manner allowing for corrective action to be taken.

1. Vulnerable groups and hard-to-reach populations include populations living in remote areas, poor peri-urban or urban areas; HHs with persons who are disabled or chronically ill; female-headed HH; child-headed HH; internally displaced, mobile and nomadic populations; and seasonal workers.
2. RBM Partnership to End Malaria and the Global Fund, Malaria Matchbox Tool: *An equity assessment tool to improve the effectiveness of malaria programs*.
3. Zegers de Beyl C, Koenker H, Acosta A, Onyefunafoa EO, Adegbe E, McCartney-Melstad A, et al. 'Multi-country comparison of delivery strategies for mass campaigns to achieve universal coverage with insecticide-treated nets: what works best?' Malaria Journal 2016; 15:58.

The quality and accuracy of HHR data are influenced by[4]:

- Mapping of communities, neighbourhoods, vulnerable groups and hard-to-reach populations carried out during microplanning to plan adequate resources (time, budget, appropriate transport, qualified/trained personnel) as well as sufficient and detailed planning to reach all HHs, particularly those in remote or hard-to-reach areas or marginalized groups.

- Recruiting appropriately skilled personnel, e.g. ability to read, write and undertake basic calculations; gender balanced; proficient in using digital devices; and sufficiently trained to calculate and allocate the number of ITNs due to a given HH where digitalization is not used, depending on the campaign strategy (e.g. number of HH members divided by two, rounding up, applying the policy on capping)

- Quality of training for HHR personnel (e.g. inclusion of practical exercises; post-tests to ensure familiarity with process and tools; providing HHR teams with a clear definition during training of what is considered a household e.g. polygamous, headed by a female, single persons sharing, other non-standard family, special population groups)

- Design and timing for production and delivery of the HHR documents, as well as quantification of needs (e.g. in time for training and sufficient for implementation)

- Sufficiency of SBC activities to explain to populations the reasons for and timing of the registration visits and address any community concerns about the ITNs that will be distributed

- Cooperation of the population (e.g. religious beliefs, concerns about security, availability at the time of the HHR)

- Providing timely feedback on the data collected, which is often not done in real-time, impeding appropriate corrective actions in time to improve the HHR or ITN distribution while in progress; for example, confirming that the number of HH members identified by HHR teams is not artificially inflated and that "ghost" (e.g. non-existent) HHs are not registered to receive ITNs[5]

ITN distribution

It is also important to support a smooth process during door-to-door or fixed-site distribution, including mobilization of the population to accept their allocated ITNs at the door, to visit their correct distribution sites, and to confirm that ITN recipients understand the procedures for them to receive their ITNs and what to do with the ITNs when they reach home. Additionally, data collection and accountability for ITNs The quality of ITN distribution is influenced by:

distributed must be prioritized, particularly now that many national malaria programmes are increasing the deployment of new types of nets with different active ingredients in specific areas according to the insecticide resistance level[6,7]. With many hundreds of distribution points or pre-positioning sites where ITNs will be stored and managed, the risks for variable quality of the distribution and ITN accountability are high.

4. AMP (2020). *Assessment Protocol developed for the monitoring of ITN mass campaign processes: Household registration and ITN distribution in Sierra Leone, 2020 (AMP ITN Campaign HHR and ITN Distribution Global and Country Resources).*
5. The potential issue of "ghost" households, in which HHR personnel register non-existent households on the registration form and other tracking tools (e.g. voucher books) to inflate the number of ITNs to be delivered to distribution sites, should be considered by national malaria programmes. As assessment approaches described in this document are based on random sampling of households in each cluster and do not refer to or rely on the registration forms for selection of households, they will not directly capture ghost households. To address ghost households, ITN campaign teams would need to return to assessment areas and attempt to find and re-visit households on a registration or distribution list.
6. Campaigns may include pyrethroid-only ITNs, pyrethroid-piperonyl butoxide ITNs, and/or new types of ITNs containing more than one active ingredient (AI) in addition to pyrethroid insecticide.
7. See AMP guidance and documentation on multi-product campaigns

- Effective advocacy and coordination with campaign stakeholders at national and sub-national levels
- Availability of sufficient numbers and types of ITNs to meet the demand of every HH registered, without significant overstocks in some geographic areas and understocks in other areas
- Well-organized distribution sites with designated waiting areas and clear flow through the distribution area to avoid crowding, including appropriate security personnel
- Well-trained door-to-door distribution personnel with route maps to ensure that all HHs are covered (including organization and use of HHR forms [whether paper-based or digital], where the approach is a double-phase door-to-door campaign)
- Effective SBC to ensure HHs are aware of the ITN campaign and know how to receive their ITNs, however distributed
- The ability of HHs to send a representative to a distribution site during its operating hours and at a distance that is feasible for the HH
- Sufficient planning by campaign teams (during microplanning and in advance of the ITN distribution) to identify and reach vulnerable groups and hard-to-reach populations with ITNs

The roles of assessment and corrective action

Ensuring the quality of HHR and ITN distribution activities is vital to protect and maximize investments, increase access to and use of ITNs for populations in need, and contribute to reductions in malaria transmission, morbidity and mortality. To achieve this, assessment of campaign HHR and ITN distribution:

- Determines whether campaign objectives have been achieved
- Determines whether the expectations of populations receiving ITNs have been met
- Establishes whether HHs have correctly received and understood key HHR and ITN distribution information to fully participate in the ITN campaign and receive the correct number of ITNs
- Reduces the likelihood of errors or inconsistencies during HHR that can jeopardize the quality and accuracy of the ITN distribution
- Collects real-time data to track the quality and coverage of HHR and ITN distribution and make corrective actions in a timely manner[8]
- Provides near-real-time valid data to ITN campaign staff to help strengthen supervision and monitoring of the quality of HHR and ITN distribution
- Validates registration results to ensure high and equitable population access to ITNs by reducing over- or underestimation of ITNs needed to cover HHs and communities

8. AMP (2020). *Assessment Protocol developed for the monitoring of ITN mass campaign processes: Household registration and ITN distribution in Sierra Leone, 2020.*

- Reviews operational lessons learned for planning, logistics, training, SBC and ITN distribution to generate recommendations for future campaigns

- Assesses accountability and tracking of ITNs distributed to identify areas to strengthen in future

- Identifies areas where additional activities (HHR, ITN distribution, SBC) are needed because targets were missed

Assessment can be conducted during HHR and ITN distribution activities as part of **in-process assessment** or after ITN campaign activities have been completed as part of **end-process assessment**. Where financial and human resources are available and activity timelines allow, in-process assessments provide several advantages. These include identifying strengths and better practices from some campaign areas to inform solutions and improvements in other campaign areas; identifying and resolving operational issues through **corrective action** early in the campaign process; and identifying and addressing issues identified early, which may mitigate challenges and improve campaign outcomes.

Using assessment results to inform corrective actions for improved quality of HHR and/or ITN distribution, as described further in Step four, is vital to improving the quality of campaign operations. Both in- and end-process assessments should include plans and budgets (as applicable) for implementation of corrective actions.

Several assessment methods are described in AMP guidance document narratives and related Excel-based decision matrices for HHR and ITN distribution assessments, located in Annexes 4 and 5[9]. National malaria programmes should use these decision-making matrices to score each of the potential assessment methods and, based on the scoring, select the method most suited to their context and needs from one or more of the recommended approaches.

Drawing from country experience to date and in line with methods used by national malaria programmes over the past several years to improve quality assurance of HHR and ITN distribution activities, **these assessment procedures are focused on the clustered lot quality assurance sampling (cLQAS)** with lot-level corrective action sampling method, described in Steps four to ten. **LQAS** is a rapid survey method to assess the quality of coverage following a health intervention in pre-defined areas such as health districts or sub-districts (i.e. lots) using a small sample size. LQAS or cLQAS may not meet the needs of the national malaria programme and in this case, other methods should be identified, and appropriate technical support identified to ensure strong sampling, implementation, data analysis and reporting.

9. See also AMP guidance: https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_HHR_quality_assessment_26062021_EN.pdf, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_HHR_quality_assessment_tool_and_method_choice_decision_matrices_26062021.xlsx, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_post-campaign_assessment_26062021_EN.pdf, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_post-campaign_tool_and_method_choice_decision_matrices_26062021.xlsx

TEN STEPS FOR ASSESSING HHR AND ITN DISTRIBUTION

Ten key steps have been identified for ITN campaign assessment decision-making, design, planning, implementation, reporting and dissemination of results. The steps have been placed in the approximate order of implementation, noting also that some steps may happen simultaneously with others, particularly if they are led by different teams (e.g. the financial team can develop the financial plan and, at the same time, the ITN campaign M&E sub-committee can lead questionnaire development).

Figure 1: Timeline and ten steps to a quality ITN campaign assessment

Given the highly specialized nature of certain elements of the assessment process, these procedures also identify where outside resources from technical, statistical and monitoring and evaluation experts may be needed and criteria and processes for identifying and/or hiring these.

STEP 1

Review ITN campaign coordination structure and identify common understanding of campaign and assessment needs

1.1. Establish the ITN campaign M&E sub-committee

At the start of the campaign planning process, the coordination structure for the campaign should be defined, followed by the establishment of the National Coordinating Committee and the different technical sub-committees required to ensure detailed planning, budgeting and follow-up on campaign planning and implementation. Monitoring and evaluation are typically either integrated into the "technical sub-committee" or established as a separate M&E sub-committee.[10] The ITN campaign M&E sub-committee should include national malaria programme staff and partners overseeing and implementing the M&E of ITN campaign activities. In preparation for potential ITN campaign assessments, the assessment data analyst who leads the finalization of the mobile application questionnaire, coding and analysis of assessment data should be identified early and included as a key member of the ITN campaign M&E sub-committee. See Step 3 (section 3.5) for further details of the role of the assessment technical working group (TWG).

1.2. Develop a common understanding of campaign and assessment needs

In considering whether to implement ITN campaign HHR and/or ITN distribution assessments, it is important to begin by reviewing the campaign plan of action and other planning and operational guidance. This will provide stakeholders with a common understanding of campaign goals and objectives, the capacity of campaign actors to effect change, and where the campaign fits within the larger national health context. These are important components of describing the programme, which is a key initial step in programme evaluation[11]. The decision to undertake one or more assessments and subsequent planning should begin **at least 12 months** prior to the ITN campaign, as ITN campaign macroplanning commences, to ensure that sufficient resources are allocated to the activities. This will allow the planned assessment(s) to be included in the M&E section of the ITN campaign plan of action (or in the M&E plan of action), timeline, risk assessment and mitigation plan and budget. Additionally, should the assessment identify gaps or problems during the implementation of HHR or ITN distribution activities, it will be important to determine options for corrective actions and add a budget line to be used as needed for improving campaign outcomes.

10. This document assumes that the sub-committee that oversees assessment is called the ITN campaign M&E sub-committee.
11. Centers for Disease Control and Prevention. Framework for program evaluation in public health. MMWR 1999;48 (No. RR-11).

STEP 2

Identify assessment goals and approach, objectives and primary ITN campaign indicators for a potential assessment

2.1. Identify assessment goals and approach

For efficient ITN distribution campaigns and equitable population access to ITNs in targeted areas, **goals of assessing HHR** are to identify gaps in quality and facilitate corrective action during and/or after HHR in areas with unacceptable registration quality. Likewise, **goals of ITN distribution assessment** are to validate that the ITN campaign has achieved its targets during and/or after distribution. Where targets have not been met, the national malaria programme and sub-national Ministry of Health (MOH) authorities implementing the campaign will need to determine **follow-up and corrective actions** to ensure maximum uptake and use of nets[12] during and/or after HHR and ITN distribution.

To achieve these goals, AMP recommends that national malaria programmes consider both in-process and end-process assessment approaches. Each approach has strengths and challenges, summarized in Table 1 below.

Table 1: In-process and end-process assessment approaches

Assessment approach	Description and recommended timing	Strengths	Challenges
In-process	Conducted during activity implementation and designed to flag potential programmatic issues for further investigation and action during the HHR and/or ITN distribution process **Timing:** During initial two to four days of HHR and/or ITN distribution activities planned for up to seven days, or five to seven days for activities planned for up to fifteen days	• Identifies strengths and better practices implemented in some campaign areas which may inform solutions and improvements in other campaign areas • Allows identification and resolution of operational issues through corrective action early in the campaign process • Allows for early mitigation of identified issues to improve HHR and ITN coverage	• Staff resources may be insufficient, limiting the opportunities to conduct the assessment(s) during campaign activities • Attention might be diverted from other campaign monitoring and supervision efforts during the campaign

12. AMP (2020). *Assessment protocol developed for the monitoring of ITN mass campaign processes: Household registration and ITN distribution in Sierra Leone.*

Assessment approach	Description and recommended timing	Strengths	Challenges
End-process	Provides a means to validate achievement of key campaign activities and is conducted at the end of the implementation of a campaign phase or all campaign activities, with results and lessons learned used to inform future plans **Timing**: Start within three to five days of the last day of HHR and/or ITN distribution activities	• Provides an extensive post-activity or campaign evaluation, lessons learned for future activities, and ITN hanging and use data if implemented post-distribution	• Less likely to allow for corrective actions to improve performance of the current campaign • Difficulty in addressing underperforming assessment lots • Difficulty in budgeting and planning for corrective actions after the campaign has ended

2.2. Identify assessment objective

The overall objective of assessing ITN campaign HHR and/or ITN distribution activities is to determine if the campaign has achieved the desired level of performance in a given area in order to take corrective actions as needed, either during or after implementation of activities.

The M&E sub-committee should further identify country-specific objectives and key indicators of interest for potential assessment and present these to members of the national campaign coordination structure. This will help to inform stakeholder decisions in Step three regarding whether to undertake the assessment and how the results will be used during and after the campaign.

Objectives developed as part of previous ITN campaign assessments include to:

- Monitor the HHR and ITN distribution process to ensure that all areas and HHs within the targeted geographic areas were covered according to a pre-specified coverage threshold
- Measure geographical coverage in real time, in terms of reaching all targeted areas
- Determine the number of HHs missed by the registration teams or not provided with a voucher during the visit
- Measure the correctness of the ITN allocation per HH and corresponding vouchers in compliance with decisions taken and communicated during training and in campaign guidelines about number of nets per HH
- Assess the quality of the HHR visit and ITN distribution, including the retention of campaign information communicated to HH members
- Identify successes, innovations or problems for daily feedback to the HHR and ITN distribution team supervisors to reinforce or improve campaign activities
- Identify problems with concepts and procedures that could be improved for future HHR activities
- Assess campaign coverage of HHs with at least one ITN; with the correct number of ITNs based on the ITN campaign allocation rules; with sufficient ITNs to reach national targets; as well as use or non-use of ITNs received during the campaign by HH members

2.3. Select priority assessment indicators and targets and plan corrective actions

Assessment indicators are drawn from the validated set of indicators for the ITN campaign. Indicator selection is a critical step in the development of survey protocols and tools that are feasible to implement and will produce clear, actionable results to inform in-process or post-process mop-up actions where needed.

It is important for indicators to be clear and focused on one item to be measured. To give an example of lack of focus, during an HHR assessment in one country, it was learned that the indicator "Percentage of HH correctly registered" required several criteria to be met, including the correct number of ITNs noted on the ITN distribution voucher and the correct marking of the HH code at the end of the registration visit. During the assessment, results showed that several HHR agents had difficulty in uniformly marking the HH code while most HHR agents noted the correct number of ITNs on the distribution voucher. As the responses to these two questions were compiled into one indicator, the results showed low levels of correct HHR when the issue was with HH marking and not incorrect completion of the coupons/vouchers.

In general, it is recommended to prioritize a small number of indicators, which will simplify and increase speed of data collection, analysis and feedback for corrective action. Table 2 provides a list of some recommended assessment indicators, with further detail in section 4.6 regarding indicator needs for in- and end-process assessments and single- and double-phase campaigns.

Table 2: Indicators for ITN campaign assessments for consideration by the National Coordinating Committee

Household registration	• Percentage of HHs registered • Percentage of HHs that received voucher(s) • Percentage of HHs that received voucher(s) with ITN allocation consistent with ITN campaign allocation rules
ITN distribution	• Percentage of HHs that received any ITNs during the distribution • Percentage of HHs that received the correct number of ITNs according to ITN campaign allocation rules
ITN use	• Percentage of ITN use by children under five years • Percentage of ITN use by pregnant women • Percentage of ITN use by others, over five years • Percentage of ITN use by total population
Cross-cutting SBC indicators for HHR and ITN distribution	• Percentage of HHs that received any information about the ITN campaign ↘ If HH received information, percentage who heard about the campaign from: a volunteer, town crier or motorized street announcer, religious leader, health facility worker, community health worker (CHW), neighbour, friend, radio, other media, and/or other (respondent may select more than one source) • Percentage of HHs that know the correct location of their ITN distribution point • Percentage of HHs that received information about how to hang, use and care for the ITNs

The indicator "Percentage of HHs that received voucher(s)" should be included in HHR assessments which use vouchers or other means of identification to exchange for the requisite number of ITNs at a pre-determined ITN distribution site. In some campaigns, where the number of ITNs and the number of people per HH are written on the voucher, or if one voucher is given per ITN, an indicator should be included in the assessment regarding the correct number of ITNs or vouchers. This is to determine if the number of ITNs recorded on the voucher or number of vouchers is in line with, greater than, or less than the number defined in the ITN campaign allocation rules (e.g. one ITN for every two people with no maximum per HH). These should be included on the main indicator list, and related questions incorporated into the questionnaire. After indicators have been selected, target coverage levels can be set for each indicator, as described further in Step four.

A note on SBC indicators. Table 2 includes three cross-cutting indicators related to HHR and ITN activities, including "Percentage of HHs that received any information about the ITN campaign"; "Percentage of HHs that know the correct location of their ITN distribution point"; and "Percentage of HHs that received information about how to hang and use the ITNs". National malaria programmes are encouraged to include additional indicators, and associated questions in the questionnaire, to measure the quality and reach of SBC activities, HH exposure to key messages and the accuracy of the messages received, as well as SBC outcomes in encouraging participation in ITN distribution activities and subsequent use of campaign ITNs. The additional SBC indicators and questions selected should be linked to the objectives of the ITN mass campaign and to the planned SBC messaging before and during the campaign. They should also reflect the ITN campaign SBC strategy, audiences, channels and messages adopted for the campaign. Additional indicators should be precisely linked to questions added in the SBC sub-section of the questionnaire to reflect the indicators.

Using assessment data to inform corrective actions for improved quality of HHR and/or ITN distribution, as described further in Step four, is a vital component of the assessment and of improving the quality of campaign operations. Both in- and end-process assessments should include planning for implementation of corrective actions, for example to return to register HH during or following the HHR in areas missed; to manage situations at distribution points for HH without vouchers or who missed receiving their vouchers; to enhance SBC where assessments identify that populations have not received appropriate, correct or complete information in advance of ITN distribution; and to manage issues which arise during ITN distribution or following the campaign.

To allow ITN campaign operational teams time to implement the recommended corrective actions, AMP has used the **third day delay approach**[13]. Third day delay has been used to pause HHR and could be used to pause ITN distribution during implementation, usually on the third day of the campaign activity, to allow time to review the first two days of assessment results and take immediate corrective actions at the lot level before continuing and completing the registration (or distribution).

13. The Third Day Delay innovation was developed by Dr. Jorge Alexandre Harrison Arroz (MD, MPH, PhD), Technical Advisor for the World Vision Global Fund Malaria program in Mozambique.

In one country, the ITN campaign assessment found that more than twenty per cent of the assessed lots failed to meet the targets set by the national malaria programme. As these performance issues were identified post distribution, options for corrective action were limited.

HHR and ITN distribution activities may be planned to take place over a range of timeframes, generally lasting between seven and 15 days, depending on the campaign strategy adopted. An effective assessment of HHR and/or ITN distribution can be conducted within approximately one-third to one-half of the number of days planned for HHR and ITN distribution activities. For example, during a seven-day HHR and ITN distribution, the assessment can be **conducted during two to four days** at the start of or just after the start of the activities. Likewise, for a 15-day activity, the assessment can be conducted **during five to seven days** at the start of or just after the start of the HHR and/or ITN distribution activities. This should allow sufficient time to collect data and identify trends while also optimizing budget and staff resources during the timeframe when most issues will be identified and with sufficient time to take corrective action.

Recommendation

Where funding allows, AMP recommends considering ITN campaign quality assessments during two to four or five to seven days at the start of or just after HHR activities (or HHR and ITN distribution in the case of single-phase campaigns). Where funding allows, AMP also recommends prioritizing in-process assessment for HHR and end-process assessment for ITN distribution activities. Where in-process assessment will be conducted, built-in operational pauses, such as the third day delay approach, should be considered to allow for corrective action to be undertaken. As much as possible, in- and end-process assessments should be independent of campaign staff and other personnel.

In planning for corrective actions, it will be important to ensure that accompanying ITN campaign operational and coordination structures, as well as sufficient budgets, are in place for the data analyst, supervisors, surveyors and other campaign personnel, as well as decision-making and troubleshooting mechanisms, to analyse results and quickly implement programmatic changes (Steps four, five and six).

STEP 3

Decide whether to undertake an assessment

Determining whether to undertake an assessment is an important step. Planning and implementing assessment(s) will require time and dedicated person hours to design the protocols and questionnaires, collect, compile, analyse, report and map data, as well as for supervision of the overall process. An **ITN campaign assessment decision tree** to support the review of key information to make this decision is included in Annex 2.

3.1. Review ITN campaign assessment needs and resources

It is important to clearly define the relevance and benefits of planned assessments alongside estimates of required costs and resources, the overall calendar for other health interventions or surveys, and availability of human and financial resources at sub-national levels to support the assessment and any associated corrective actions. In reviewing data from previous campaign implementation, as well as planned information and data sharing during HHR and ITN distribution supervision and monitoring, national malaria programmes may identify geographic areas that have data showing ITN access below or above what is expected. Key MOH staff, partners, campaign donors and other stakeholders need this detailed information so that they can give their feedback to inform decision-making and possibly prioritization of geographic areas for assessment activities.

The questions below and illustrative replies taken from AMP's General guidelines for process evaluation for a mass ITN distribution campaign provide elements to consider for decision-making on whether to undertake HHR and/or ITN distribution assessment.

Table 3: Examples of information that assessments provide

What do you need an assessment to show?	• How well the HHR and/or ITN distribution is working • The extent to which the HHR and/or ITN distribution is being implemented as designed • Whether the registration and ITN distribution teams are accessible and acceptable to target populations • Reasons why the campaign (due to HHR, ITN distribution or other broader aspects) may not be reaching its targets

A campaign assessment may help to identify specific implementation challenges that are leading to failures in achieving priority targets. These challenges may include for example:

- Insufficient mapping of the intervention area, weak daily route planning, or poorly located fixed distribution points
- Lack of access or inequitable access to HHR and/or ITN distribution by vulnerable groups or wealth quintiles, possibly due to insufficient attention to these elements during macro and microplanning
- Inaccurate numbers of ITNs allocated and/or distributed to each HH and/or ITN distribution or pre-positioning sites due to the non-adjustment of ITN needs based on microplanning and/or HHR data

Table 4: Examples for uses of assessment information

Why would an assessment be useful?	• Provides an early warning for potential problems • Allows for changes to be made in subsequent phases or activities to improve service delivery • Allows for targeting of limited resources available for mop-up or intensified SBC efforts

An assessment can identify challenges for HHR and ITN distribution that may necessitate corrective action during the activity and/or mop-up post-activity. To do this, sufficient resources need to be available to hold daily review meetings during key activity phases, to be able to take decisive action to revise ITN campaign plans if necessary and to implement corrective action.

Questions:

- Is a dedicated budget available for the assessment of HHR and/or ITN distribution?
- Are sufficient human/physical/administrative resources available for the assessment? (Annex 13 provides a list of assessment budget considerations)
- If the assessment determines a need for corrective action during HHR or ITN distribution, will there be available time in the campaign implementation calendar and are sufficient budget, human, physical and administrative resources available to undertake those corrective actions?
  - During recruitment and training, HHR teams should be told there is an assessment and if work is of sub-optimal quality they will be asked to correct the errors in line with MOH and campaign norms without additional payment. Alternatively, a budget should be set aside for any needed mop-up based on the assessment findings. What skills do those staff that will plan and implement the assessment already have (including those involved in developing the protocol and questionnaire(s) or overseeing or conducting the assessment)? (Step six provides recommended skills for assessment staff)
- Are mobile phone and internet network coverage sufficient to support a digitalized assessment?

If sufficient budget, staff time and capabilities, physical and administrative resources are in place, this supports the feasibility of conducting the assessment. If these elements are in place but would only cover one assessment, then the M&E sub-committee will need to consider each option and select the assessment most likely to support campaign quality. As the assessment of HHR activities identifies challenges that may lead to households not receiving ITNs, this assessment is of greatest importance for ensuring that ITN campaign objectives are met. Results of previous campaigns may be helpful in identifying specific challenges which the current campaign may also face. This review of previous campaign challenges may assist in pinpointing areas where the assessment should focus, for example on HHR coverage, allocation of the correct number of vouchers per HH, or ITN distribution gaps.

3.2. Key considerations

It will be important for the M&E sub-committee to examine the points below when determining whether to undertake assessment(s):

- **Geographic scope of the assessment.** It is ideal to implement the same assessment method uniformly across all geographic zones nationally. However, in cases where resources or context do not allow this, national malaria programmes may decide to conduct the assessment only in specific sub-national areas, possibly to assess areas where there are greater concerns, according to the results of previous campaigns or current contextual challenges due to security issues, or weaknesses noted during past ITN or other health campaigns or activities.

- **Plans for DHS, MIS, MICS or other surveys that can incorporate assessment of ITN coverage.** Often, if these surveys will be occurring within one year of the ITN distribution, then national malaria programmes may decide that a post-campaign ITN assessment is not needed and resources could be allocated to HHR in-process assessment.

- **Identification of the data analyst.** The data analyst is a key member of the ITN campaign M&E sub-committee and will work closely with other sub-committee members and the assessment coordinator to finalize the mobile application questionnaire including the skip and calculation logic; set up the coding in preparation for data cleaning and analysis; develop the summary data tables; share the results of data collection for corrective action and provide the final report at the end of the assessment. The role of the data analyst is further described in Step six. National malaria programmes will need to consider internal capacity, expertise within other MOH departments or campaign partner organizations, or whether to engage an external consultant for this important role.

- **Corrective action during or after HHR and/or ITN distribution activities**. If corrective actions will be taken, it will be important to define the roles of health facility directors as well as district and regional health teams, to ensure standardized review of data and decision-making as assessment results are shared. Actions may include communication regarding the importance of key SBC messages which should be reinforced, or providing additional voucher booklets to HHR teams, or in rare cases may include re-conducting some or all HHR and/or ITN distribution activities in progress. Generally, it will be important to ensure that sufficient resources for rapid communication of any changes have been considered during the macro budgeting process. Budgeting for costs for addressing the potential range of results should be explored.

3.3. Summarize key reasons and resource needs for the National Coordinating Committee to make and validate decisions

The responses to these priority questions and considerations, particularly reasons for the assessment and availability of required resources, should give national malaria programmes and their partners sufficient information to decide on undertaking assessment(s) or not. It is important to clarify how the results of the assessment(s) will be disseminated and used both for immediate action and to feed into future campaign planning. The M&E sub-committee should present plans to National Coordinating Committee members for review, discussion and validation.

3.4. Decide

If the decision is reached to move forward with an assessment, the M&E sub-committee should then review available information and documents, including these procedures, as well as other tools and resources, and develop an overall plan and timeline for designing and implementing the assessment(s) and corrective actions as needed. The **ITN campaign assessment planning checklist** in Annex 3, can be adapted to country, campaign and assessment contexts; used to track each of the key steps listed below; and used to identify which activities may be on- or off-track. This checklist includes a Gantt chart to track the timing and responsible parties for key milestones, activities and sub-activities. It can be edited and adapted to each campaign and context.

If a decision is reached not to go ahead with an assessment, the national malaria programme should inform stakeholders.

3.5. Consider forming an assessment technical working group

Once the decision has been made and validated to proceed with the assessment, the M&E sub-committee may decide to form an **assessment technical working group (TWG).** The assessment TWG can take the lead in conducting Steps four to ten below, including development of the assessment protocols, tools and financial plan, and oversight of implementation, in collaboration with and reporting to the M&E sub-committee. All plans and results should be validated by the National Coordinating Committee. An assessment TWG may not be needed where the M&E sub-committee is small and composed of individuals with experience and expertise to lead Steps four to ten.

The assessment TWG may include:

- A staff member identified by the national malaria programme coordinator to oversee and manage HHR and/or ITN distribution assessment(s) and report to her/him on a regular basis. This person is referred to as the "**assessment coordinator**" in this document and is a member of the M&E sub-committee. The roles of the assessment coordinator are further described in Step six.

- **External or independent assessment experts,** who may provide expertise and support the assessment coordinator. These independent experts are typically outside the national malaria programme and may be based, for example, at the national statistics office, within implementing partner organizations, or operate within the structures of bilateral or multilateral donor organizations (such as the Global Fund, the Gates Foundation, or the United States President's Malaria Initiative [US-PMI]), technical (such as WHO) or external evaluation agencies. Funding to support external or independent assessment experts may be provided by their organizational resources or may be included in the assessment budget, resources permitting.

Roles of the M&E sub-committee are listed below. The M&E sub-committee may decide to delegate some or all roles to the assessment TWG.

- Understand and align with key deadlines and dates in the ITN campaign timeline, as assessment(s) will either occur during or shortly after HHR or ITN distribution are implemented
- Support timely quality data analysis and use of the assessment results
- List the full range of technical and programmatic expertise needed to design and conduct the assessment; identify in-country expertise that could be engaged; identify where complementary external assessment expertise may be needed; and consult with in-country, regional and global research experts and technical partners to establish plans for any technical assistance (TA) that may be required
- Propose the methodology, approaches, data collection and analysis, financial plans and timelines for assessments for validation by the National Coordinating Committee
- Support the national malaria programme to submit the assessment protocol for review by national or local institutional review boards, as further described in Step four
- Develop terms of reference to clarify the responsibilities of all organizations and actors involved in the assessment(s)
- Identify key decision-makers and users of the data and collect information on their needs and planned use of the data
- Organize regular meetings to coordinate assessment planning, design, implementation, analysis, reporting and dissemination of results

During the assessment, the M&E sub-committee and/or assessment TWG should review assessment results from the data analyst daily and coordinate with the national malaria programme technical staff, sub-national MOH authorities and supervision teams regarding corrective actions needed during the HHR and/or ITN distribution activities.

STEP 4

Design the assessment and develop assessment protocol

Several decisions need to be made to design the assessment, culminating in a validated assessment protocol document. Key steps for assessment design are outlined below.

4.1. Select assessment tools and methods

Several methods may be used to assess HHR and ITN activities. AMP has worked with Tropical Health and partners to develop two documents to describe each of the different assessment methods and related Excel-based decision matrices to support the selection of the method which is best suited to country context and needs[14]:

- Annex 4: **Choosing tools and methods for assessment of the quality of household registration** for ITN distribution campaigns, in MS Word, and household registration quality assessment tool and method choice decision matrices, in MS Excel.
- Annex 5: **Choosing tools and methods for post-campaign assessment** of ITN coverage, access, and use, in MS Word, and post-campaign tool and method choice decision matrices, in MS Excel.

Both AMP documents describe three areas: (1) Collecting information and evaluating context, (2) Choosing the tools to collect data, and (3) Choosing the sampling strategy to use. The AMP documents also provide Excel decision-making matrices to score the tools and methods according to a national context analysis. Short descriptions and links for each of the data collection tools mentioned in the two AMP guidance documents are included in the **List of paper and digital data collection tools** (Annex 6).

Important note:

Based on this scoring of ITN campaign assessment methods, one or more tools may be recommended, and national malaria programmes and partners should undertake more detailed discussion and reflection to arrive at the one most suited to their context and needs.

After review of the potential data collection tools and sampling methods and associated Excel-based scoring tools in Annexes 4 and 5, programmes should select the data collection tool(s) and sampling method which they prefer to use for their assessment.

14. See AMP guidance: https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_HHR_quality_assessment_26062021_EN.pdf, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_HHR_quality_assessment_tool_and_method_choice_decision_matrices_26062021.xlsx, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_post-campaign_assessment_26062021_EN.pdf, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_post-campaign_tool_and_method_choice_decision_matrices_26062021.xlsx

Important note: These procedures are focused on the cLQAS with lot-level corrective action sampling method, described in Steps four to ten.

Clustered LQAS has been successfully used globally to assess a specific set of key indicators for polio vaccination campaign outcomes, even in remote and insecure settings. Several countries have used cLQAS approaches and elements of cLQAS to conduct assessments of their HHR and ITN distribution activities as part of ITN campaigns (for example Benin, Cameroon, Central African Republic, Liberia, Nigeria, Sierra Leone). This assessment procedures document is based on a review of those assessment protocols and reports and seeks to overcome gaps identified to harmonize a comprehensive set of methods and tools in line with global best practice for cLQAS.

Clustered LQAS has been described as the "fastest, least expensive method to evaluate a representative sample of the HHR population using HHR assessment teams. It is recommended for situations where HHR assessment aims to inform more accurate enumeration figures prior to ITN distribution, particularly when results are needed quickly and when the budget is more limited"[15]. It is important to note that the cLQAS methodology can be considered for more frequent collection of ITN indicator data (and other data) to inform decisions about timing for ITN replacement, potential channels that would be most suitable and quantities of ITNs needed.

If national malaria programmes prefer to use one of the other sampling methods described in the AMP "Choosing tools and methods" guidance documents, they should consult available resources and experts to provide guidance and technical support to ensure correct sampling and analysis. Examples of sources of technical assistance include:

- National malaria programmes and M&E stakeholders including national statistics departments
- University departments that conduct health and/or malaria research
- Independent research organizations
- Implementing partner research or M&E teams
- Technical and normative partners such as WHO

4.2. Design the assessment

Assessment design for cLQAS is described in detail in the Global Polio Eradication Initiative (GPEI) Field Manual, Assessing Vaccination Coverage Levels Using Lot Quality Assurance Sampling (LQAS). The manual is included in the AMP ITN Campaign HHR and ITN Distribution Global and Country Resources[16]. Key elements of the harmonized cLQAS assessment approach are described below and an **ITN campaign assessment protocol template**, in English and French and **ITN campaign assessment questionnaire templates** are available as a modifiable Word document (Annex 12) and modifiable Excel file (Annex 14). Additionally, examples of protocols previously developed for campaign assessments in Central African Republic, Liberia and Sierra Leone are included in the AMP ITN Campaign HHR and ITN Distribution Global and Country Resources folder for information.

15. Choosing tools and methods for assessment of the quality of household registration for ITN distribution campaigns and Choosing tools and methods for post-campaign assessment of ITN coverage, access and use. Annex (Excel:) post-campaign tool and method choice decision matrices. https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_HHR_quality_assessment_26062021_EN.pdf, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_HHR_quality_assessment_tool_and_method_choice_decision_matrices_26062021.xlsx, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_post-campaign_assessment_26062021_EN.pdf, https://allianceformalariaprevention.com/wp-content/uploads/2022/06/AMP_post-campaign_tool_and_method_choice_decision_matrices_26062021.xlsx
16. https://drive.google.com/drive/folders/1YGoCbxCPLszLGjOcCv6utbYeEFb5M396?usp=sharing

LQAS is a rapid survey method to assess the quality of coverage following a health intervention in pre-defined areas such as health districts or sub-districts (i.e. lots) using a small sample size. Traditionally, LQAS has been used with a simple random sample design.

Clustered LQAS (cLQAS), similar to random survey sampling, divides the sample (N) into smaller clusters (k) of n individuals, where N=k*n. For example, if a sample of N=60 is needed as a minimum standard in a district or lot, six villages would be selected first and then 10 individuals in each village, rather than randomly selecting 60 individuals throughout the district. The cLQAS approach increases the rapidity and efficiency for conducting the survey, but it reduces precision somewhat. For this reason, results are mostly presented as classification levels (good, uncertain, inadequate) which is in general sufficient for most programmatic decision-making during ITN campaign activities.

Clustered LQAS with lot-level corrective action: Clustered LQAS, similar to other "field" HH sampling procedures, uses multi-stage random sampling to classify adequate HHR and ITN distribution indicators at lot level. Planners can specify the desired sample size and must decide on upper and lower limits for clusters to be considered adequate or not in terms of the main indicators. Indicators are evaluated and corrective measures, such as re-registration or enhanced SBC, are taken at the lot level. Results from the lots can be combined to produce an overall district or higher-level point estimate of coverage.

Clustered LQAS sampling frame with the addition of supplemental lots. In contexts where more information is needed for specific geographic areas or sub-populations due to poverty, social norms, legal status, gender inequality, language and/or other barriers to ITN access, additional lots can be added. Households in these lots can be selected by probability or non-probability (convenience) sampling. If non-probability (convenience) sampling of households is done, then results should only be reported separately (and not combined with the original sampling frame). If probability sampling of households is done in the supplemental lots and the supplemental lot area(s) overlap with the original sampling frame, then results should be reported separately. If the probability sampling of households is done and the area or sub-populations were not part of the original sampling frame, then the results can be added to the original sampling frame. In essence, the original sampling frame would be extended to fill in gaps.

Identifying point estimates at the national, regional or district level: Clustered LQAS can be used to provide point estimates with sufficiently narrow confidence intervals at national, regional, district or other levels. This requires the **combined results across at least five lots**, including more than 300 HHs, and provides point estimates and confidence intervals for the aggregate level, not for each lot. This is a well-known approach, but one which has not been described specifically in documents or the literature. To support the data analysis for this approach, identification of an experienced data analyst with knowledge of statistical software is essential.

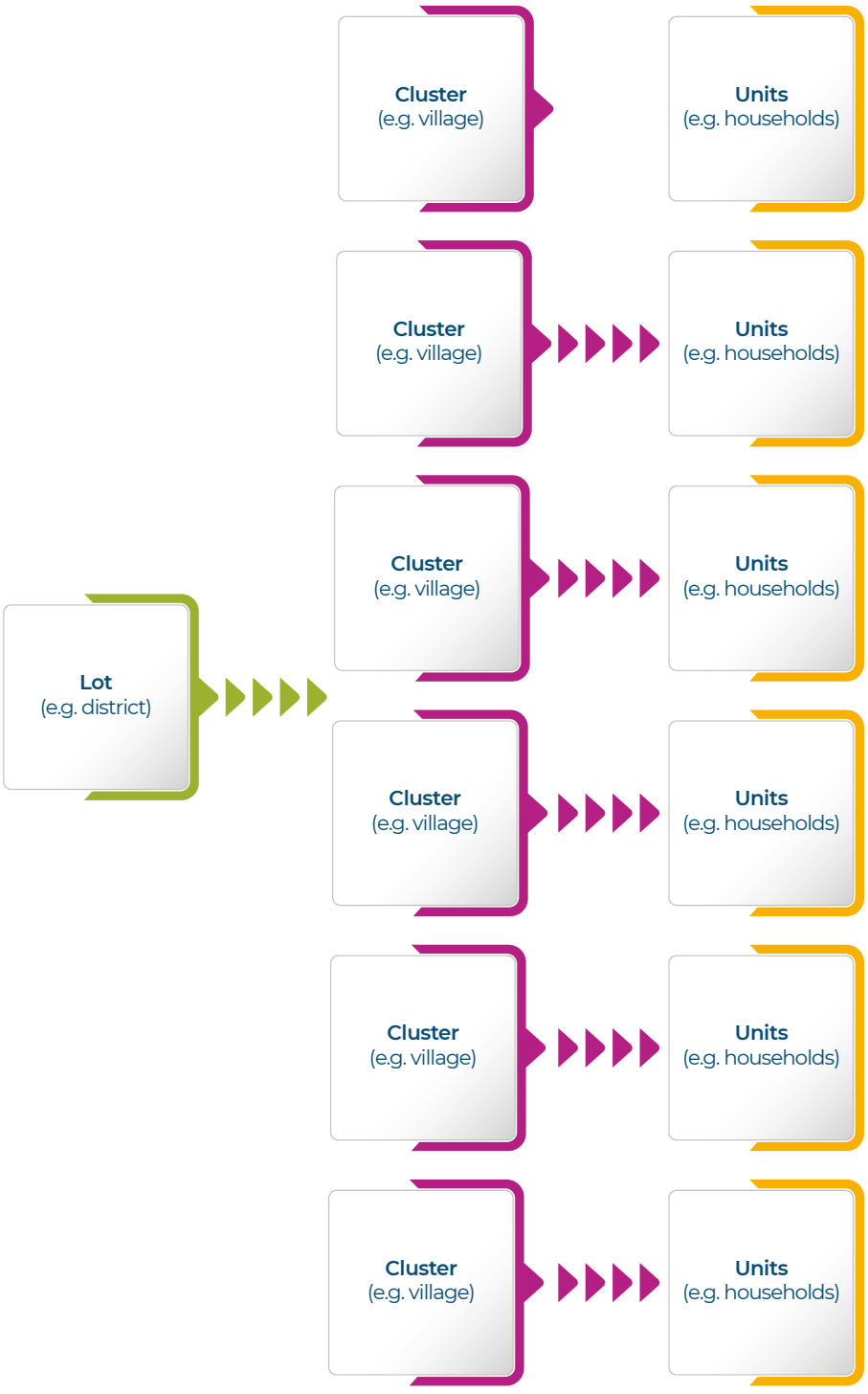
Operational definition of a household: It is important for the assessment design to use the same definition of a HH as determined during ITN campaign macroplanning. Depending on the country and context, a HH may be defined[17] in the same way as for the national census (e.g. a group of people who share the same cooking pot) or an operational definition of a HH may have been adopted to improve intra-household ITN access (e.g. in the case of polygamous families, each wife is defined as the head of HH with the husband associated with only one of the wives).

17. GPEI (2012). Assessing Vaccination Coverage Levels Using Lot Quality Assurance Sampling. Field Manual.

Sampling is used to choose a representative subset of areas covered by the ITN campaign. Sampling units used in cLQAS include:

- **Lot**= Usually an administrative area, such as a district, sub-district, health area or zone, or health facility catchment area. Each lot includes multiple smaller administrative units, or clusters
- **Cluster**= A group of units (typically HHs), often a sub-district, village or specific area
- **Unit**= Typically a HH

Figure 2: Example of sampling units



Lot-level results: Results from cLQAS will be relevant at the lot level. The lot is the district or sub-district area of intervention. If a lot is classified as failing, or inadequate, an immediate investigation would be needed to understand the reasons for the "inadequate" classification. Annex 7 shows steps to be considered for investigation of low-performing lots (sub-districts, districts).

cLQAS sampling frame: To help ensure that sampling is performed correctly, the definition of lots and primary sampling units (clusters) should be done at a central level with the M&E sub-committee and/or assessment TWG. The lot should be pre-defined "based on geographical, administrative, health or census boundaries"[18], which will inform and support corrective actions, considering the administrative and health authorities who will lead the corrections in their geographic areas. The lot for cLQAS is generally designed at the district or sub-district level.

Random sampling: cLQAS uses random sampling to select clusters or primary sampling units (PSU) and HH. As mentioned below, clusters are selected using probability proportional to size (PPS) sampling and HH are selected through segmentation, random sampling from a list and next-nearest-door approaches[19]. As mobile technology and satellite images become more accessible, these tools can be used to select segments and HH more precisely.

Probability proportional to size is a sampling method that gives a higher probability of selection to larger clusters. One result of PPS is that each household has an equal probability of selection.

Segmentation: Once clusters are selected using PPS, HHs need to be selected. The first step is segmentation of the cluster into four more or less equal segments and selection of one segment by simple random sampling. The selected segments can each be further divided into four more or less equal segments until segments of approximately twenty HH remain. Generally, two to three rounds of segmentation are needed to get to the cluster or village/settlement level. The final segment should have approximately 20 (15—25) HH.

Random selection of HHs: Once a final segment of approximately 20 HHs is selected, then the 20 HHs should be crudely mapped and numbered[20]. The first HH to be sampled is selected using simple random sampling. After the first HH is selected and surveyed, assessment teams should exit and turn right out of the first HH, skip the next HH, and select the one after in rural areas and every third HH in urban areas.

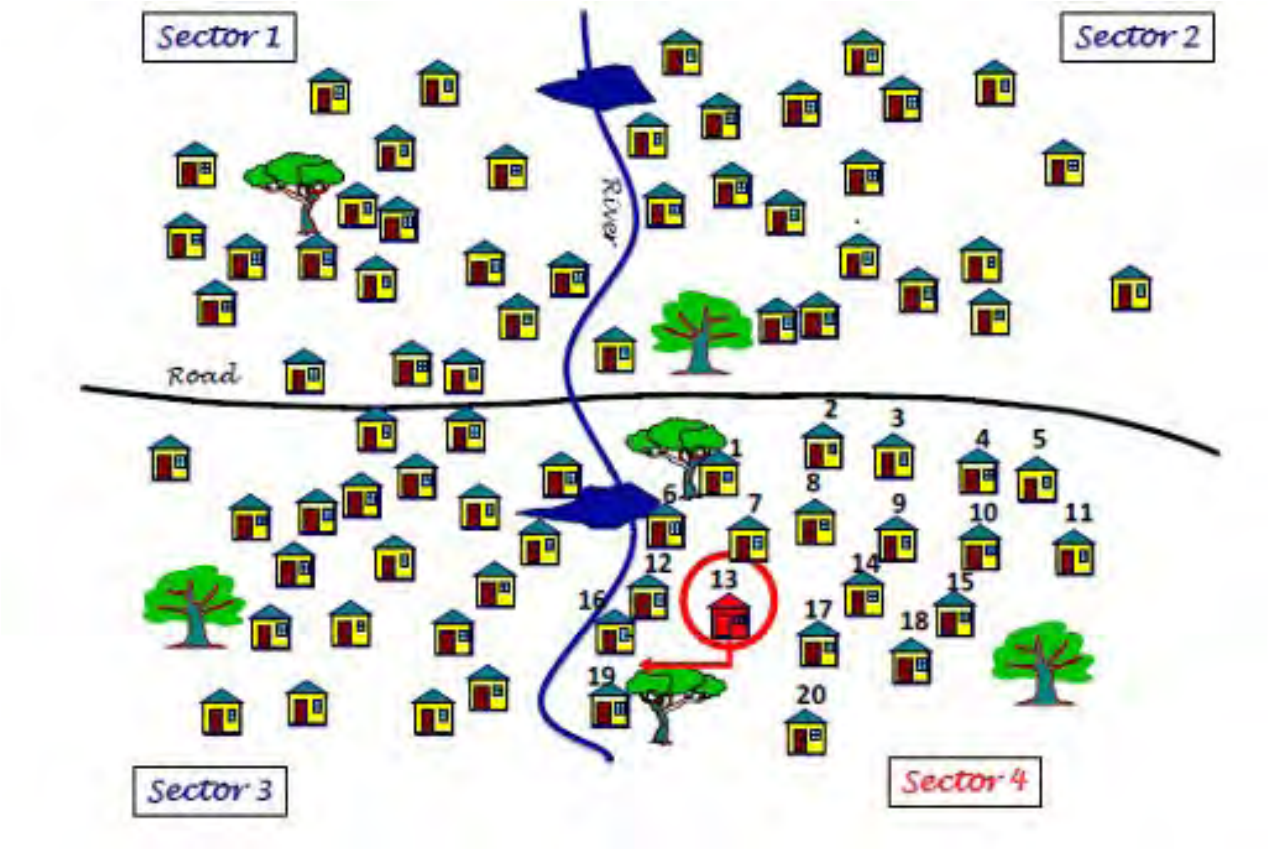
An example of segmentation and random HH selection is shown in Figure 3

- The figure below illustrates the last segmentation round with some 20 HHs in each segment.
- Using available landmarks, such as rivers and roads, surveyors divide the segment or cluster into "sectors" of approximately 20 HH in each sector.
- Next, surveyors randomly select one sector (in this example, sector 4), and number each HH in that sector.
- One of the 20 HHs will be randomly selected to use as the starting point and the first HH to be visited for interview (in this example, HH 13).
- Once surveyors have finished visiting the first HH, they exit the HH, turn to the right, and continue the survey by visiting every other HH.

Note that if the sector had exceeded approximately 20 HHs, surveyors would need to repeat the first steps described above and further divide the sector into sub-sectors, repeating this until there are approximately 20 HHs in each sub-sector.

18. GPEI (2012). Assessing Vaccination Coverage Levels Using Lot Quality Assurance Sampling. Field Manual.
19. Ibid.
20. Ibid.

Figure 3: Example of segmentation and random HH selection. Image adapted from WHO. Assessing Vaccination Coverage Levels Using Lot Quality Assurance Sampling: Field Manual. GPEI, 2012.



Sample size

Minimum standard: The selection of six clusters per lot and ten HH per cluster provides the minimum 6x10 sample size of 60 HH. This approach is based on the polio eradication assessment model and represents a trade-off between workload and precision.

Many national polio eradication programmes have been able to conduct hundreds of LQAS in campaign districts in the last 10 years because of the relatively low workload of the 6x10 design. However, the misclassification errors associated with the 6x10 decision rules from polio eradication may be different for malaria indicators. Misclassification errors include: the alpha error which is the probability of classification of a lot as "passed" when it should not have been passed; the beta error which is the probability of classification of a lot as "not passed" when it should have been.

Therefore, it is reasonable for malaria programmes to start with six clusters per lot and then look at the alpha and beta errors for the LQAS classification system during the analysis phase. If the alpha and beta errors are too high, then the number of clusters per lot can be increased from six to eight or 10 during the next campaign.

Other sample size options include: The selection of eight or ten clusters per lot and ten HH per cluster, for a sample size of 8x10 or 80 to 10x10 or 100, may reduce the miscalculation errors; however, the addition of clusters makes the operational approach heavier, which leads to increased workload for teams (more days) and increased budget costs.

Sampling and segmentation for in-process cLQAS: Sampling during in-process cLQAS is more complicated than for an end-process assessment. The M&E sub-committee, assessment coordinator and stakeholders need to decide on the number of days for the cLQAS process, then decide how the PSUs will be sampled. In general, it is difficult to sample PSUs and HHs on the same day as HHR teams are doing registration; therefore, PSUs and HHs are usually sampled the following day. For example, cLQAS PSUs and HHs are sampled on day two from the area where HHs were registered by teams on day one. Then, cLQAS PSUs and HHs are sampled on day three from the area where HHs were registered by teams on day two. cLQAS personnel will use maps to identify the areas covered by HHR teams on day one and will divide that area into four to ten segments with approximately equal population. The number of clusters for that day (one to three clusters) would be selected from the four to ten clusters using simple random sampling. If the cLQAS process lasts six days, then one cluster/PSU could be selected from four segments every day for six days. The objective would be to select a total of six clusters/PSUs per lot and interview 10 households in each cluster/PSU over two to six days or longer.

4.3. Select geographic area(s) based on risk and/or resources

National malaria programmes may decide to prioritize certain geographic areas for assessment, due to higher malaria burden, lower ITN coverage, problems experienced during previous campaigns and/or to make best use of limited resources in the case of budget constraints.

To identify areas for prioritization, one approach is to perform a risk assessment and select lots in areas with the most disease burden and other areas defined as high-risk for any other reason by local MOH authorities. The additional lots in high-risk areas can be in addition to the national frame of lots.

The campaign strategy will ultimately guide the selection of assessment objectives, including selection of geographical areas. Decisions should be validated by the national malaria programme director and shared in updates to the National Coordinating Committee.

4.4. Define assessment approaches for household data collection

As part of the protocol, it is important to define approaches to be used during HH data collection. These include:

- **Mobile device data collection application**. Once the questionnaires have been finalized (Step seven), the mobile device data entry form should be prepared and tested. Special attention should be paid to the drop-down menu or "pick list" which will include the names of the clusters or PSUs and strata (lots). It will be important to confirm that they match the spelling in the list of clusters or PSUs used in the PPS selection of clusters/PSUs.

- **Length of data collection.** As noted in Step two, for in-process assessments it is recommended to conduct data collection during approximately one-third to one-half of the number of days planned for the HHR and/or ITN distribution activities— for example two to four days for a seven-day campaign activity or five to seven days for a fifteen-day campaign activity— and at the start of or just after the start of the activities. This allows sufficient time to collect data and identify trends while also optimizing budget and staff resources focused during the timeframe when most issues will be identified. For end-process assessments, it is recommended to start data collection just after activities have been completed. From an operational perspective, assessment data collection for six to ten clusters may generally be completed within as few as two days, using three to five teams of one to two surveyors for each team, equipped with vehicles.

- **Identifying eligible interviewees.** Surveyors should be given guidance to speak with the HH members who most directly participated in the HHR and/or ITN distribution activities. For assessments of ITN distribution from a distribution point it will be important to understand which member(s) of the HH participated in the retrieval of ITNs. Generally, interviewees should be over the age of 18 years as they will likely have the most accurate information about the HH participation in the registration or distribution activities.

- **Determining HH consent standards.** Assessment protocols should include clear written standards for surveyors to introduce themselves to HH heads and members and to confirm informed consent from the selected interviewee before proceeding with the interview. For cLQAS, if a household refuses to be interviewed, then another HH is selected for interview until ten households have been interviewed in each selected cluster.

- **Determining approach for HH dwellers not at home.** For cLQAS approaches, the survey teams can record "not at home" on a row in the data collection form, then randomly select another HH until a total of 10 HHs with successful interviews in the cluster have been completed.

4.5. Conduct real-time analysis of data

If surveyors use mobile technology, interview data can be entered and uploaded to a web database during or at the end of the day during the cLQAS process. The data should be sent to the data analyst by the late afternoon of each day. The data analyst should then share the analysis with the M&E sub-committee and assessment coordinator by the evening of each day or the next morning for review and coordination with the national malaria programme and key partners to determine corrective actions. The M&E sub-committee and/or the assessment coordinator should then share results with regional and district campaign staff daily to support the planning and implementation of corrective actions.

Paper-based data collection systems may also be used, where mobile technology and networks are not available or where resources and other contextual factors do not allow for its use. Assessment supervisors will generally compile paper-based data from surveyors' questionnaires using summary sheets. The supervisor will then transmit the data to district data manager(s) who conduct the data entry and transmit to the data analyst. Daily transmission of the results may still be possible, where surveyors and/or supervisors are able to travel to collect completed questionnaires, or where surveyors are able to transmit photographed images of completed questionnaires to data managers via email or text messages. Depending on network access, availability of devices and/or vehicles to facilitate the data transfer, there may be a delay in daily data transmission and thus data analysis and corrective action planning. The M&E sub-committee and assessment coordinator can include these potential delays in assessment and corrective action planning with the national malaria programme and key partners to develop alternative approaches and timelines.

For in-process cLQAS, where a main objective is to identify issues and problems during the two to four or five to seven days of the HHR or ITN distribution assessment, real-time data analysis each day and evening is essential to alert ITN campaign supervisors of issues so that they can investigate and take action to improve campaign quality from the next morning. The process of real-time analysis of data is described more completely in Annex 8. For end-process cLQAS, real-time analysis of data can also provide draft analysis products (tables, graphs and maps) within five days of the end of data collection for campaign stakeholders to consider and discuss.

4.6. Analyse and classify lots (primarily for end-process assessments)

Part of the efficiency of the cLQAS methodology involves assessing HHR quality and ITN access and use in broad categories, rather than as precise estimates. AMP has adapted the LQAS lot classification system with three levels following the GPEI model of "Pass", "Uncertain", or "Fail" to use slightly different terminology: "Good", "Uncertain" or "Inadequate".

As noted in Step two, five **main end-process indicators** are used to classify lots (e.g. districts, sub-districts).

These are:

1. HHs with any campaign ITN
2. HHs that received the correct number of campaign ITNs according to ITN allocation rules
3. ITN use in all ages
4. ITN use in pregnant women
5. ITN use in children under five years old

Note that the first two indicators have HHs as the denominator and the last three have "persons" as the denominator. Therefore, the approach uses proportions or percentages of the indicators to classify each lot for each main indicator.

The **main indicators for in-process assessments** may vary slightly by the number of campaign phases:

- In a *single-phase campaign,* not all HHR indicators are needed in addition to a separate distribution indicator. For example, the assessment questionnaire for a single-phase campaign may include a question asking if the HH was registered and then asking the number of people in the HH and the number of nets received by the HH.
- In a *double-phase campaign*, the assessment questionnaire may include questions asking if the HH was registered and if a(ny) voucher(s) was/were received as part of the HHR assessment and then may ask the number of ITNs received by the HH during the ITN distribution assessment.

In campaigns where one voucher is provided in exchange for each ITN, the questionnaire can be simplified to ask for the number of vouchers or the number of ITNs.

Note:

It is critically important that HHR teams continue to register all HHs irrespective of the number of ITNs available for distribution to ensure that the HHR includes all HHs and people eligible to receive ITNs. Campaign assessments therefore need to identify any zones missed during HHR activities.

During the in-process assessment, classification of lots is not the major analysis task. The major tasks are to quickly identify all households that were not registered or identified (both single- and double-phase campaigns), that did not receive the correct number of vouchers or campaign nets, and reasons for the incorrect numbers of vouchers or campaign nets.

Two-steps to finalize the classification system: During the pre-campaign M&E planning process, the M&E sub-committee and national malaria programme need to decide on the **classification system breakpoints** for each main indicator and the **decision rules**.

As an example, campaign leaders can decide on classification breakpoints of 90—100 per cent for the "good" level, 80—90 per cent for the "uncertain" level, and under 80 per cent for "inadequate level" for the "at least one ITN" main indicator (because that indicator is easier to reach high levels) and 90—100 per cent, 70—90 per cent, and under 70 per cent for the other four indicators that are more difficult to achieve with higher percentages.

In addition to the classification breakpoints, the M&E sub-committee needs to decide on "decision rules" for classification. Because of the wide confidence intervals of main indicators for each lot due to the small sample size, M&E leaders need to set the levels of percentages to be classified in the "good" and "uncertain" levels to reduce misclassification errors. For example, to be classified in the "good" category, a lot would need to achieve 95 per cent or greater for main indicator no. 2 ("correct" indicator). Those lots with 90—94 per cent would be classified as "uncertain". By choosing 95 per cent as the decision rule cut-off for the "good" category instead of 90 per cent, the level of alpha misclassification error (misclassified as "good" when the true percentage is in the "uncertain" range) is reduced to reasonable levels. These procedures for HHR and ITN distribution assessment follow the GPEI practice of setting the decision rule five per cent higher than the lowest level of the classification system interval (95 per cent for the "good" 90—100 per cent level and 85 per cent for the "uncertain" 80—90 per cent level). This topic is discussed in more detail in Annex 9.

Summary table for the classification of lots: To help the M&E sub-committee, national malaria programme and stakeholders, the data analyst should prepare a single summary table of the main indicators showing estimates for all indicators, colour-coded classification for each main indicator, and analysis of the lots which qualify for investigation. In addition, the table should rank districts or sub-districts according to the average of the main indicators using a final index indicator (additional details can be found in Annex 10.) The data analyst then shares the summary table with the M&E sub-committee and assessment coordinator who collaborate with the national malaria programme to identify who should lead the investigation of lots with low indicators (4.7).

Data cleaning and analysis: These procedures include a program file (Stata .do file), Annex 11, that national programmes can use to clean and analyse their data. This program file has several sections including data cleaning, main indicator preparation, weighting and analysis, taking the complex survey design into account. The program file calculates three weight components—base weights, weight adjustments due to unit and item non-response, and calibration/post-stratification weight adjustments. The program file also calculates the main indicators by lot—which is used to create the summary table of classification of lots as mentioned above. Real-time analysis principles should be applied to end-process and in-process analysis.

Analysis of main and other indicators at higher levels (district, region, national): In most cases and for most indicators, a sample size of 300 HH yields a 95 per cent confidence interval of plus or minus 10 per cent or less, which is narrow enough for programme usefulness. Since the lot sample size is 60—100 HH, data from six or more lots can be combined to yield point estimates and reasonable-width confidence intervals, for example, at the district, region or national level. The analysis is similar (with weighting and accounting for complex design) as that in an MIS or DHS. Some indicators may not be suitable for LQAS. For example, as LQAS in its current application is limited by its shorter questionnaire, a register of persons and nets (ITNs) is not currently collected, so questions about individual nets cannot be captured. However, national programmes can modify the questionnaire to capture the data needed.

4.7. Following classification of lots—conduct investigation, identify potential actions and lessons learned

For end-process cLQAS, after lots have been classified (which should be done within three to five days of the end of the last day of cLQAS data collection), the M&E sub-committee and assessment coordinator should meet with the national malaria programme and national monitors and review cLQAS results. For lots that have most indicators in the "inadequate" range (and where data quality is not a likely issue), some investigation should be done. To prepare the investigation, the data analyst can meet with the M&E sub-committee, assessment coordinator, and other key campaign stakeholders to review hypotheses regarding why indicator levels were so low compared to other units. This may include comparing cLQAS and administrative data from logistics and distribution teams and conferring with supervisors and key staff regarding possible contextual factors. These factors may include, for example, operational challenges of reaching HHs in dense urban, remote rural or insecure areas, or availability of vouchers and ITNs to complete HHR and ITN distribution. A list of steps to consider for the investigation is shown in Annex 7.

After low-performing lots have been investigated, then the national malaria programme and stakeholders should consider potential corrective actions and identify lessons learned for the next campaign. During both in- and end-process assessments, decisions regarding corrective actions should first be determined at the national level with the national malaria programme and key campaign stakeholders during the design of the assessment protocol. These decisions should be clearly communicated to each affected regional and district campaign team by the data analyst or assessment coordinator as determined by the M&E sub-committee and corrective actions applied uniformly across geographic areas with inadequate lots. Feedback from district and regional campaign staff should be discussed and shared to support harmonized approaches for corrective actions to address issues identified and to overcome any operational challenges to implementing them.

During and following in- and end-process assessments, **lots classified as inadequate require corrective actions.**

Below are **examples of issues identified and corrective actions** which have been taken to address lots classified as inadequate.

- Vouchers for some HHs indicate the correct number of ITNs per campaign guidance, but several others receive vouchers that indicate an incorrect number of ITNs (fewer or more than planned in relation to the campaign ITN allocation rules). Corrective actions in this context should aim to quickly contact HHR teams to reiterate the allocation rules, re-share key messages from HHR training materials, and review and clarify any questions or points of concern with HHR teams to correct this moving forward. The number of supervision visits should also be increased in lots and for HHR teams where inadequate results are identified.

- Certain communities or zones have not received any HHR visits. HHR teams should be deployed to return and conduct registration of those areas which were missed.

- The number of ITNs planned during microplanning is insufficient to cover registered needs. During door-to-door single-phase campaigns, some national malaria programmes make a contingency stock of ITNs available at pre-positioning sites or distribution sites in advance of the campaign. In fixed-point distribution during double-phase campaigns, campaign staff should review the data early during HHR to make decisions for managing distribution with available ITNs. This may include adapting the maximum number of ITNs available per household or, though not ideal, temporarily borrowing ITNs from other channels (such as routine) and replacing them after the campaign.

- The indicator "information correctly communicated" shows inadequate results. SBC should be re-enforced and re-

emphasized, for example to re-disseminate messages through existing communication channels, such as through health district meetings, community outreach, radio and television spots. SBC teams should be included in daily campaign planning meetings at the regional and district levels so that they can hear the assessment updates directly and discuss the critical SBC actions needed to overcome the challenges identified in lots classified as inadequate.

- Security concerns exist at fixed-point distribution sites. District and regional health authorities should be engaged to speak with administrative authorities to reinforce expectations with populations and ensure the presence of sufficient numbers of appropriate security personnel. ITN distribution teams should also receive a briefing at the end of the day to reinforce security protocols for crowd control, limiting the number of people with access to ITN distribution personnel and the ITN distribution table, and protocols for temporarily closing ITN distribution sites as needed should be established.

4.8. Develop, review, and finalize the assessment protocol

The **assessment protocol** serves as a workplan and description of the decisions made in developing the sampling design, operational and dissemination plans. It will be a key reference document for the national malaria programme to clarify roles and responsibilities of all partners supporting the assessment, for harmonizing implementation roles and responsibilities across multiple areas and for ensuring standardized approaches in the case of uncertain or failed lots. Annex 12 provides a **cLQAS ITN campaign assessment protocol overview**. The template can be used as a starting point in developing each new assessment protocol.

Key components of an assessment protocol include:

- Country/region context and malaria situation, ITN campaign strategy and summary of decisions leading to undertaking the assessment
- Assessment goal, objectives and priority indicators (Step two)
- Assessment design, including sampling design, selection of geographic area(s), data collection instructions and timeline, setting targets for each priority indicator, and classifying results (Step four and Annex 12)
- Plans for carrying out corrective action if required (Step four)
- Financial plan (Step five)
- Recruitment and training of assessment staff (Steps six, eight)
- Fieldwork (Step nine)
- Plan for data management and analysis (Steps three, six, and ten)
- Data collection, analysis, validation, use and reporting (Step ten)

The draft protocol should be prepared by the M&E sub-committee and submitted to national malaria programme leadership for **review and finalization**. The national malaria programme may also request a review from M&E partners and/or independent experts. While routine programme monitoring, such as LQAS, and disease surveillance are generally excluded from ethical review by institutional review boards, the national malaria programme may need to submit the protocol for review. It is always safest to discuss with national or local institutional review boards to see if they think that the LQAS protocol and questionnaire need a formal review by the board. After stakeholder inputs are compiled and the assessment protocol is updated, it should be shared with the national malaria programme director for final edits and comments before final review and validation by the National Coordinating Committee.

STEP 5

Develop assessment financial plan

To ensure availability of funding to cover all assessment costs, it is important to develop a budget and secure funding.

5.1. Develop a budget

A set of **ITN campaign assessment budget considerations** is available in Annex 13 and provides a starting point for budget development. Because unit costs vary significantly across countries, the process of costing an assessment can draw from budget templates and plans used in other countries but will in the end be very specific to each country. The budget considerations in Annex 13 include a notes column which provides key questions and parameters for planning activity details to inform each of the cost categories listed below. For example, for budgeting assessment surveyors, the template notes that "typically, assessment data collection for six to ten clusters may be completed within as few as two days, using three to five teams of one to two surveyors for each team, equipped with vehicles." Assessment costs of other recent surveys conducted nationally or in the same geographic location can be helpful in verifying unit costs.

A standard **budget template** should include:

- All necessary cost categories
- Descriptions of each costed item
- Number of units needed of each costed item
- Cost per unit
- Subtotals of total costs per cost category
- Sub-totals of all costs
- Overheads or fees depending on donor and assessment lead partner budget procedures
- Notes describing the costed item or cost assumptions
- One overall budget total

Budgets should be prepared in Excel or similar spreadsheet software for ease of budget review, updates and tracking.

Cost categories for a standard ITN campaign HHR or distribution assessment budget may include[21,22]:

- Administrative costs
- Equipment
- Communication
- Human resources, including costs associated with the recruitment process and the data analyst
- Training
- Supervision
- Travel
- Printing
- Meeting costs for presentation of results and validation of report
- Overheads (depending on assessment partner(s) requirements)

21. GPEI (2012). Assessing Vaccination Coverage Levels Using Lot Quality Assurance Sampling. Field Manual.
22. Tropical Health (2020). HHR Evaluation budget comparison.

A **budget review** is a key step in finalizing the ITN campaign HHR or ITN distribution assessment budget. Once a budget draft has been developed, it is important to share it with the national malaria programme for discussion with financial and/or implementing partners for inputs and approval. Budgeting is an inherently detailed process and bringing in others to review a draft budget helps to provide a comprehensive perspective, fill gaps in cost items and update costing assumptions. Additionally, national malaria programme leadership should validate and approve the budget.

5.2. Identify and secure financial resources to cover assessment costs

Ideally, the HHR and/or ITN distribution assessment(s) will be included as part of ITN campaign macroplanning and budgeting in Global Fund applications, the PMI Malaria Operational Plan development process, national and other resource mobilization. As these funding decisions are often made months and even years in advance, the decision to include an assessment of the HHR or ITN distribution should also be made well in advance of the campaign. Where advance planning has not been possible, it will be important to find cost savings, gap funding from campaign financial or implementing partners, or other sources to cover all costs prior to commencing assessment planning and implementation. If resources are limited, consider focusing the assessment on areas known to be at high risk or that have demonstrated previous problems with achievement of campaign targets.

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STEP 6

Identify and plan recruitment of assessment teams

6.1. Select assessment teams – composition and roles

The *GPEI Field Manual for Assessing Vaccination Coverage Levels Using Clustered LQAS* provides a comprehensive description of the composition and roles of successful survey teams, which is adapted below for ITN campaign assessments[23].

Personnel for successful assessments include:

- Data analyst
- Coordinator
- Supervisors
- Surveyors
- Local guides

To maintain objectivity of the assessment process and results, all personnel should be selected among qualified health system staff or applicants who are not directly involved in the ITN campaign itself. In the case of in-process assessments, it would not be feasible for HHR and/or ITN distribution staff to participate in the assessment given other roles and responsibilities. For this reason, if a national malaria programme does not have funds for external monitoring to be implemented and will conduct the assessment(s) internally, staff selected should be different from those already identified for campaign supervision and monitoring roles.

Data analyst. The data analyst will work closely with the M&E sub-committee to finalize the mobile device application questionnaire, working from the model questionnaires in Annex 14. The data analyst will also support several critical steps early in the assessment planning process, including the development and testing of skip and calculation logic embedded in the questionnaires and pre-testing of the questionnaires; the selection of a survey data analysis application (e.g. Stata, R, SPSS); and the development and running of the coding in preparation for data cleaning and analysis prior to the start of the cLQAS. She/he will develop the summary indicator and dummy data tables and analyse and share results from data collected as quickly as possible with members of the M&E sub-committee, assessment coordinator and other stakeholders and decision-makers.

Important criteria for selecting the data analyst include skills and experience in data analysis, mobile device applications and mapping. National malaria programmes will need to consider internal capacity, expertise within other MOH departments or campaign partner organizations, or alternatively to engage an external consultant for this important role.

Assessment coordinator. Ideally, the assessment will be coordinated by the M&E sub-committee chair, or her/his designated national malaria programme or partner staff member if, for example, an independent organization is contracted to implement the assessment or support data compilation, cleaning and analysis. The coordinator ensures that the assessment planning and implementation proceeds according to the protocol, budget and timeline established. The tasks include recruiting personnel, securing equipment and resources, overseeing training and supervision, and interpreting and sharing results. The coordinator and data analyst will also need to establish and maintain close communication with national malaria programme leadership at central and sub-national levels to review assessment data and determine actions needed in the case of uncertain or failed cluster results.

23. GPEI (2012). Assessing Vaccination Coverage Levels Using Lot Quality Assurance Sampling. Field Manual.

Assessment supervisors may be hired or nominated for this role of ensuring assessment quality. Supervisors may be selected from independent partners who are not involved in the campaign, such as non-governmental organizations (NGOs) or universities, WHO, UNICEF or other technical partners. Supervisors guide overall effective organization of the data collection activities. Throughout the process, supervisors review the data from surveyors, conduct preliminary analysis of data results daily, and transmit the paper-based or electronically collected data which has been entered into mobile devices or spreadsheet applications to a web database accessed by the data analyst, as noted in Step 10.2. The M&E sub-committee and/or assessment TWG should establish a mechanism for assessment supervisors to share results as part of daily debriefings with health facility and district ITN campaign staff.

Surveyors conduct HH visits and administer the questionnaire. They need to be familiar with and understand the local geography and culture to ensure a successful assessment. As described in the Training Field Staff for DHS Surveys manual[24], criteria for selecting surveyors are presented in Table 5.

Table 5: Criteria for selecting surveyors

Gender	Consider gender equity in hiring, to allow for assessment respondents to be interviewed by someone who is of the same sex when feasible or requested
Language	Ensure that candidates are fluent in the language(s) used for training as well as at least one of those used in the questionnaire
Educational level	For example, a secondary education
Previous assessment experience	If feasible. Stakeholders may be able to recommend research staff or consultant surveyors who have already supported other studies
Availability	Available for the whole length of the assessment. Potentially, they will need to work evenings and weekends and may not return home during the activity
Personal attributes	Maturity, integrity, approachability, respectful attitude, attention to detail, a commitment to assessment results and ability to achieve objectives within established deadline
Physical fitness	Surveyors may need to travel long distances in varying conditions

A standard recruitment process should be applied in considering field staff for the ITN campaign assessment team, including careful review to ensure that no real, potential or perceived conflict of interest is present in terms of any other personal, familial or professional interest in the outcome of the ITN campaign.

24. ICF Macro (2009). Training Field Staff for DHS Surveys. Calverton, Maryland, U.S.A.: ICF Macro.

Local guides. In some cases, where qualified surveyors are less familiar with the geographical area, local guides may be recruited to support surveyors. In areas experiencing insecurity, local guides can help to facilitate access for assessment teams as well as raise awareness of any changes in the security situation that may affect the safety and ability of assessment teams to circulate. Local guides may also be important in areas where the cultural context may make it difficult for surveyors from outside the area to gain the trust of HHs to allow entry into homes and to respond openly to survey questions.

6.2. Identify number of surveyors and number of days needed to conduct assessments

The number of surveyors needed depends on the geographic size of the lots, length of the questionnaire, the conditions in the field, and the availability of vehicles for ease of movement. As noted in section 4.4, typically, assessment data collection for six to ten clusters may be completed within as few as two days, using three to five teams of one to two surveyors for each team, equipped with vehicles. Where feasible, it is useful to recruit 10—15 per cent more than the number of surveyors needed, to cover needs in case of illness or attrition.

6.3. Establish recruitment processes

To support the unbiased selection of field staff candidates with the strongest qualifications, it is important to establish a standard documented process for the review of all applications and selection of final candidates for the assessment. As described in Training Field Staff for DHS Surveys manual[25], the components of this process may include:

- **Recruiting at sub-national level(s)** so that respondents can clearly understand the language spoken and identify surveyor(s) as "local". Surveyors who are familiar with the local area can also support assessment planning and logistics and advise on specific customs or practices to support the smooth functioning of the assessment. Disadvantages with sub-national recruitment may include higher costs for training where it is centralized.

- **Equitable recruitment,** including outreach to vulnerable groups and hard-to-reach populations will reinforce the ITN campaign vision to reach all who need ITNs and will allow flexibility in deploying assessment staff to conduct interviews according to gender, cultural and contextual needs to reassure assessment participants.

- **Objective criteria,** as captured in standard application forms and applicant tests, including for example educational level, length of previous experience, language ability, knowledge of local context in assessment zones, attention to detail, handwriting legibility, ability to undertake the necessary walking for field work, as well as availability.

- **Talents** needed to perform interviews well, including sound judgement and troubleshooting skills, maturity to handle challenges as they arise in the field, approachability and ability to speak clearly and respectfully with respondents across many HHs and communities, as well as integrity and commitment to the quality and viability of assessment results.

- **A personal interview with the candidate** to confirm written application inputs, language skills, availability and other criteria. A standard set of interview questions should be developed and notes captured during each interview retained.

- **Documentation of the process,** including notes taken by hiring manager(s), candidate archives, and any scoring of CVs and criteria used for the scoring.

25. ICF Macro (2009). Training Field Staff for DHS Surveys. Calverton, Maryland, U.S.A.: ICF Macro.

STEP 7

Develop assessment questionnaires

The main aim of a good survey instrument is to minimize the number of errors that are made when obtaining the desired information. Surveyors can obtain answers that are both valid and reliable only if they are using well-designed questionnaires. **ITN campaign assessment questionnaire templates** are available in Annex 14.

7.1. Draft the questionnaires

After reviewing the ITN campaign assessment questionnaire template, the M&E sub-committee and/or assessment TWG should develop draft questionnaires. Questionnaires should include sections that capture:

- Geographic information, for example the region, district, health area, name of the village or neighbourhood
- Name(s) of surveyor(s) and assessment supervisor(s), contact information, signatures
- Instructions for the surveyor(s)
- Introductory text regarding the assessment, informed consent and confidentiality, voluntary nature of the survey, and other key information which each surveyor should share with the HH
- Numbered questions with clear coding for responses, for example Y or 1=Yes; N or 0=No; numbers of vouchers received, number of people or sleeping spaces counted
- Columns or other clearly indicated space to mark responses for each HH responding to the questionnaires
- Skip patterns where relevant for responses to questions which may render other questions unnecessary (e.g. if a HH did not participate in the distribution, the respondent would not need to reply to questions regarding the number of ITNs received during the distribution)
- A place for surveyors to include additional notes or observations
- Summary calculations and compiled responses, where information from more than one HH is collected on paper-based forms

These key elements of the questionnaires should be considered for both paper-based and digital data collection. It is also important to include a comments section in the questionnaires. This allows description of any issues with selecting HHs, which will be important for analysis of the results and evaluating the survey method for future applications.

The model questionnaire forms found in Annex 14 contain questions/variables about the campaign process and ITN use. The in-process questionnaire concentrates on receipt of the correct number of ITNs for each HH, reasons for not receiving the correct number of ITNs, and campaign media or messaging exposure. The in-process form does not have information about hanging and use. In contrast, the end-process questionnaire has questions about hanging and use and reasons for not using ITNs during the previous night. The questionnaires can be added to or modified based on the needs identified by national malaria programmes.

7.2. Prioritize questions to inform the assessment objective and indicators

In line with the recommendation in Step two to choose simple action-oriented indicators, it will be critical in developing the questionnaire to prioritize the questions which will best inform the assessment objective and key indicators selected. For example, for the recommended priority indicators noted in Step two, example questions are included in the table below.

Table 6: Example cLQAS questionnaire questions

Registration indicators	Example questions
• Percentage of HHs registered • Percentage of HHs that received vouchers • Percentage of HHs that know the correct location of their ITN distribution point	• Did you receive a visit from a HHR team in your HH? (yes/no) ↘ If you did not receive a visit from a HHR team, why not? (e.g. absent when the team visited; team did not visit; other) • If a HHR team visited, did you receive a voucher? (no/yes, available to view/not available to view) ↘ If yes, what is the number of ITNs written on the voucher for your HH to receive/how many vouchers did you receive? Write the number. Yes, available to view, yes, not available to view ↘ If no, why not? (absent; refused to receive a voucher; not informed; stock-out; did not register; other reason) • How many people slept in your HH last night? Write the number. • How many people or sleeping places were included in the HHR process? Write the number.
Distribution and use indicators	**Example questions**
• Percentage of HHs that received any ITN during the distribution • Percentage of HHs that received the correct number of ITNs according to ITN campaign allocation rules • Percentage of ITN use, by children, pregnant women, and total population • Percentage of HHs that received information about how to hang and use the ITNs	• Did the distribution team have adequate ITNs to cover the needs for your HH? (yes/no, if no, why not?) • How many people are in your HH? Write the number. • How many people or sleeping spaces were written on the ITN campaign voucher or how many vouchers did you receive (depending on voucher allocation decisions)? Write the number. • How many ITNs did the distribution team provide to your HH during distribution? • Did you encounter any challenges in collecting your ITNs from the distribution point? ↘ If yes, indicate the challenge (e.g. did not receive ITNs; incorrect number of ITNs provided relative to number indicated on voucher; distribution agents not clearly identified; security or crowd control issues during distribution; unclear information from distribution team members; culturally inappropriate actions of distribution team members [list]) • Where are the ITNs you received currently? (In the home? Hanging? If not hanging, where are they?) • Did you encounter any challenges in hanging your new campaign ITN? (storing new campaign ITN and not using right away; still airing out; ITNs too few for sleeping space; lack of nails or rope; do not know how to hang; sleeping space is small for ITN) • Did you encounter any challenges in using your campaign ITN last night? (too hot; dislike fabric; caused itchiness or other discomfort [list]; other family member used)

Distribution and use indicators	Example questions
• Percentage of HHs that received any information about the ITN campaign	• Did the HHR and distribution teams provide HH members messages about ITN use? (yes/no) ↘ If no, why not? ↘ If yes, what messages did they provide? (e.g. date, time, location, and other details for the ITN distribution at the distribution point; air, hang, care for the ITNs received)? ↘ Were the messages understandable? ↘ If HH received information, percentage who heard about the campaign by source (volunteer, town crier, religious leader, health facility worker, CHW, neighbour, friend, radio, other media, and/or other)

7.3. Share the draft questionnaires with key ITN campaign partners for inputs

Once a draft questionnaire has been developed, reviewed and refined by the M&E sub-committee and/or assessment TWG, it should be shared for feedback. The national malaria programme leadership can identify a list of stakeholders that should receive a copy of the draft questionnaires. The draft questionnaires can be shared via email, with instructions to guide reviewers and a deadline for receipt of comments and tracked edits in the text. Additionally, or alternatively, a questionnaire review meeting may be organized to capture inputs, update and finalize the questionnaires.

After stakeholder inputs are compiled and the questionnaires are updated, they should be shared with the director of the national malaria programme for final edits and validation, before proceeding with the pre-testing.

7.4. Translate final validated questionnaires

For validity and reliability, assessment questionnaires should be translated into all major languages in which interviews will take place. "As translation is not an easy task and requires both strong linguistic skills as well as an understanding of terms and expressions used in the questionnaires, the recommended approach is that someone who understands both the technical terms as well as the appropriate language(s) translates the questions into the required local language(s)"[26]. Following translation by qualified translator(s) the translated questionnaires should be further reviewed and updated for technical quality and comprehension by malaria partners fluent in the language of the translation.

7.5. Pre-test and finalize the questionnaires

Pre-testing and finalizing the assessment questionnaires is a critical means of testing survey processes. Pre-testing can be conducted prior to and in tandem with the training of surveyors, provided there is a system in place to capture and share findings of the pre-test to guide the finalization of questionnaires and assessment manuals. Sufficient time should be allowed after the pre-test to update questionnaires, translations and manuals prior to photocopying of paper-based or programming of digital data collection tools. Further testing of digital questionnaires should be completed to ensure that coded responses are accurately captured and skip patterns are working correctly.

26. ICF International (2012). Survey Organization Manual for Demographic and Health Surveys (DHS).

STEP 8

Train assessment personnel

8.1. Develop the field survey manual

To prepare for data collection, surveyors will need to participate in a training of approximately three days for household selection, data collection, reporting and decision-making in the field. As a first step to organizing the training and developing the manual, it will be important to develop a **detailed agenda for the training session** to be implemented. The training workshop agenda, adapted from the *GPEI Field Manual for Assessing Vaccination Coverage Levels Using LQAS* should include a(n):

- Overview of the ITN campaign
- Overview of the assessment, its purpose, and key questions of interest, how the assessment will be carried out and how the results will be used
- Review of the instructions for each step of implementing the assessment, including hands-on exercises to practise each of the steps with hypothetical case studies and data, allowing participants to ask questions and refine their approach
- Review of the content and purpose for data collection forms, applications and technology (for digital data collection), including practice in completing the forms with hypothetical data
- Practice session in a community close to the training venue which allows each surveyor the opportunity to draw and use segmentation mapping, select the random starting point HH(s) in the cluster and conduct the HH sampling. This should be scheduled for at least half a day and should include ample time for surveyors to ask questions, discuss any problems encountered, adapt the field manual as needed for the logistics and planning of the fieldwork (being careful not to edit any components of the manual that would alter the assessment itself and cause a misalignment with the assessment being conducted in other areas)
- Written pre- and post-test to understand surveyor strengths and weaknesses, track progress after the training, and identify any surveyors not performing to a minimum threshold of capacity needed for a quality assessment
- Plan for reinforcement, if necessary, if post-test results show weaknesses or misunderstanding

Based on the training agenda, a **cLQAS field survey manual** should be developed, incorporating the assessment design (Step four) and instructions for field teams. The manual will include instructions[27] for:

- Introducing the assessment and its objectives
- How to select the clusters in each lot, with the help of local public health officials (if it is not possible at central level to pre-select the clusters)
- How to choose HHs based on random sampling presented in Step four
- How to choose an individual in the HH who should be interviewed
- How to administer the questionnaires
- How supervision and monitoring will be organized
- How to report results, when and to whom while in the field
- Troubleshooting problems

8.2. Organize training sessions

Training sessions should be organized well in advance, including selection of venues and catering services and invitations to participants with information about timing for arrival, transport and location and duration of stay. It will be important for facilitators to ensure that they have identified areas where the community-level practice session will take place and ensure that community leaders are informed in advance of the training. Equipment and materials for the training should be available in advance of starting the session.

To ensure that surveyors understand and retain the key information presented, trainers should incorporate key aspects of effective training, as described in the **AMP Considerations for training for implementation of ITN mass distribution campaigns**[28]. For example, effective training requires including the use of practical and interactive sessions, and preparation and delivery of materials based on adult learning principles.

27. GPEI (2012).
28. https://allianceformalariaprevention.com/wp-content/uploads/2022/06/Training_ITN_Campaign_Considerations_for_Training_032021_EN.pdf

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Prepare and conduct data collection fieldwork

9.1. Coordinate with health and administrative authorities

Involvement of health and administrative authorities at regional, district, other sub-national and community levels in ITN campaign activities, including the assessment, is vital to the quality and success of the campaign. Given the many competing demands on the time and attention of authorities at all levels, it is important for the M&E sub-committee to include information regarding the campaign assessment as part of overall ITN campaign updates, taking care not to share details of the assessment logistics which could introduce bias. For national assessments, this information-sharing will need to align with regular ITN campaign updates to authorities.

It is critical to communicate assessment findings to district and regional health authorities and the national malaria programme daily, including corrective actions that have been identified for HHR and/or ITN distribution activities. The data analyst should submit both a written and verbal summary of results to the M&E sub-committee and assessment coordinator at the end of each day or the following morning if additional time is needed to analyse results. Results should be submitted to health personnel at the level of the lot being assessed (e.g. district or sub-district), the levels above including other sub-national levels (e.g. region) and to the national malaria programme and M&E sub-committee. Ideally, assessment supervisors for in-process assessments should attend the daily ITN campaign debrief meetings at the lot and/or sub-national level to discuss assessment findings and any corrective action(s).

9.2. Prepare data collection tools

Once the questionnaires and any additional data collection and supervision tools are finalized, it is important to ensure that all assessment teams have the data collection tools that they need.

Paper-based data collection tools. Printing, collating, stapling and preparation of boxes for storing and transporting printed questionnaire copies should be organized well in advance of the assessment. A detailed plan is required for the preparation of a sufficient number of questionnaire copies for surveyors and supervisors. If sub-national printing facilities are available and reliable, they may reduce transport time and costs. When the printed questionnaires are delivered, it will be critical to carefully check several boxes to ensure that copies are complete, legible and stapled in the correct order.

Electronic data collection tools. After the tool is selected (Step four and Annexes 4 and 5), it will be important to identify the specific types of equipment needed for data collection. Tasks may include procurement of dedicated smartphones or tablets for the assessment, though this option is very costly and may not be feasible. In many cases, the MOH and partners may have smartphones or tablets which can be used for the purposes of the assessment. If a research agency or independent organization will be contracted to support the assessment, the request for applications for interested organizations can specify digital data collection as part of the requirements. Alternatively, surveyors may be selected in part based on their ownership of a smartphone which can be used for the assessment. As this approach is used in more studies, lessons learned are emerging on the use of personal mobile phones for data collection[29].

29. See the experience of Togo using personal mobile phones for an ITN distribution campaign. https://allianceformalariaprevention.com/wp-content/uploads/2022/05/AMP_digitalisation_mass_campaign_Togo_EN.pdf

9.3. Plan for data processing

The M&E sub-committee should support the identification of available desktops and laptops for data processing and analysis (Step ten).

9.4. Organize data collection fieldwork administration and logistics

Well-organized administration and logistics for each component of the HHR or ITN distribution assessment will reinforce the quality of the training, data collection, data processing and analysis. To achieve this, detailed plans should be developed for:

- Logistics for secure transport of field staff and supervisors to and from training and data collection sites. Generally, each data collection team has one dedicated vehicle with a driver so vehicles must be large enough to carry a full team and their equipment. In some cases, vehicles may not be able to reach selected clusters and alternative transport options (motorcycles, boats, etc.) may need to be planned and budgeted for.
- Procurement, transport and provision of assessment materials for each supervisor and/or surveyor. Materials may include:
  - Pens, folder, notebook, flipchart, markers, maps for training
  - Pens, pencils, clipboards, job aids for data collection
  - Identification badge or other identifier for surveyors, supervisors
  - Chalk or markers to mark houses
- Administration of accommodation fees and per diem for field staff

The *GPEI Field Manual for Assessing Vaccination Coverage Levels Using LQAS* includes a useful checklist pre field deployment, which recommends that everyone going to the field bring the following items:

1. ***Personal identification:*** to always be able to demonstrate who you are and why you are there to the interviewees.
2. ***Survey manual:*** for reference in the field.
3. ***List of the localities (clusters) in the lot to survey:*** if it is not possible at central level to pre-select the clusters where the survey will take place, then the survey teams will need to select the clusters once they are in the lot with the help of local public health officials.
4. ***Maps of the localities to survey:*** if maps of the localities (clusters) of the lots are available in advance, it may be helpful to provide electronic or paper copies of them or links to online maps to the survey teams during training; if they are not available survey teams will have to draft them on site.
5. ***Table of random numbers or random number generation application:*** to allow random selection of sectors in a village (or settlement) with more than 20 HHs, individuals, etc.
6. ***Notepad and pen:*** to take notes, draft the map of the locality if needed, complete the questionnaires.
7. ***Questionnaires:*** carry spare copies in case the questionnaires get lost or damaged during travel.
8. ***Summary sheet:*** also carry spare copies in case of loss or damage during travel.
9. ***Survey contact sheet:*** to know who to contact during the survey, especially if a decision needs to be taken in their lot.

9.5. Ensure data quality control and assessment supervision

The most important component of ensuring **data quality** is to supervise the data collection adequately. Assessment supervisors observe a person or activity to make sure that everything included in the assessment protocol and/or field survey manual is done correctly and safely. Assessment supervisors should observe surveyors on the job and provide any feedback to help the surveyors improve their approach for subsequent HH visits and interviews. Supervisors should return to a few of the HHs where interviews were conducted to do a short interview and compare the results of the survey team with the supervisor's notes.

Assessment supervisors should provide feedback directly to surveyors and a summary of any significant issues to the assessment coordinator and should keep notes of their observations to include in daily and final assessment supervision reports. To reinforce supervision observations leading to actionable improvements during the assessment, the assessment coordinator should also participate in daily data summary and daily review meetings with HHR or ITN distribution teams and their immediate supervisors.

Data quality may also depend on motivation and morale of the surveyors, both of which are important to the overall effectiveness of the assessment, and so it is important during planning and budgeting to ensure security, administrative and logistics support for data collection teams and supervisors.

Data collection

- In each selected cluster, the data collection team should prepare a sketch map, locate the boundaries of the cluster and undertake HH selection in line with the sample design
- If the HH members in selected HHs are not present, the interview team should apply the approach for HHs not at home identified in the survey design (Step four)
- For each interview, the surveyor should present her/himself as well as the objective of the assessment and secure informed consent from the head of HH and interviewee(s) (if different) to conduct the survey, hold the interview and mark the HH
- Surveyors must ensure that they collect data from exactly 10 HHs in each cluster

STEP 10

Compile, analyse, report and use data

Depending on the data collection tool selected (Annexes 4 and 5), processing the data collected is important to ensure a clean consistent data set.

10.1. Recruit data processing and analysis support

As noted in Steps two and six, the data analyst should be identified early, as part of the process for determining whether to undertake the assessment.

10.2. Enter data electronically

As described in Step four, all HH-level data should eventually end up in a spreadsheet format (one row or one record per HH) as shown in the Summary table (Annex 10). Paper-based and electronic data entry are most likely to occur directly into mobile devices or into spreadsheet applications on laptops or desktop computers at the end of the day's work (or a mixture of the two methods). Direct data entry using mobile devices, where feasible, has some advantages over data entry from paper forms into laptops or desktop computers. Mobile device data entry can be completed at the household or settlement level or at the town level at the end of the day and can be done offline to preserve battery or in the absence of a connection to a cellular network.

10.3. Transmit data to a web database

Data transmission is a separate step from data entry. At the end of the day, the assessment supervisors generally return to a more populated settlement, such as a town. Most towns will have at least 2G cellular service that can be used for the supervisors to transmit the paper-based or electronically collected data which have been entered into mobile devices or spreadsheet applications to a web database, as noted in Step 10.2. If the town(s) do(es) not have at least 2G cellular service, then at least one member of the team, identified by the supervisor or the supervisor her/himself will need to travel to a town or place with 2G cellular service at least once every two to three days during the field work to transmit data.

10.4. Reinforce data security

As the names of the heads of HH may be directly recorded, or may be traceable through field maps, HH level data collection tools and field maps should be collected by the assessment coordinator from assessment supervisors and should be destroyed within one to two weeks after data collection (when the data analyst has had a chance to fully examine and clean the data). Likewise, paper records of HH data should be destroyed within one to two weeks. This can be accomplished if data cleaning and examination by a data analyst start on day one of the fieldwork.

10.5. Analyse the data

The analyst should prepare for data cleaning and analysis prior to the start of the cLQAS. Indicators and dummy data tables should be listed and reviewed by members of the M&E sub-committee and/or assessment TWG and other stakeholders and decision-makers. A survey data analysis application (e.g. Stata, R, SPSS) should be selected and example coding for data cleaning and analysis should be written prior to the assessment beginning.

Use of real-time electronic data in managing the cLQAS process depends on the number of cLQAS lots being conducted at the same time. If only one lot is being conducted at a time, then the analyst can provide detailed, specific information based on the data, including issues to be addressed the following day. If five to 20 lots are being conducted at the same time, then the analyst might only provide general feedback about data cleaning and management issues (e.g. incomplete data). In general, data cleaning analysis should start on the evening of day one of the first lot. Complete data are very important for the data analyst to receive, especially on the first day. Many of the potential "errors" or issues with the assessment questionnaire can be uncovered on the first day. Many mobile device applications can update questionnaires or send new questionnaires to each device in near real time to help correct issues which arise. If the analyst examines the data on the evening of each day of the assessment, then supervisors can make procedural adjustments on the morning of the next day before the teams leave for their fieldwork. Data cleaning and analysis should continue during each day and evening of the field work and feedback should be provided to assessment supervisors as quickly as possible. Establishing a WhatsApp chat group of supervisors can be useful for quickly sharing feedback.

10.6. Include maps to visualize the results

With either paper-based or digital data collection, it is important to include maps to visualize the results of the data analysis for HHR and ITN distribution assessments. These maps will help sub-national and national ITN campaign personnel, as well as national malaria programme staff, to identify trends and take corrective action as needed in areas of low coverage or excess distribution (and possible wastage) of ITNs, including after the campaign has been completed.

10.7. Develop and disseminate reports

Assessment reporting

- Assessment results should be shared daily during HHR and ITN distribution as well as compiled into a final report highlighting key findings from the start to the end of the assessment timeframe. All corrective actions taken and updated results should be highlighted. Final reports should note if HHR or ITN distribution activities were stopped to undertake corrective action, or if HHR or distribution activities were conducted for a second time in any campaign areas.

- Results need to be clear and actionable to allow ITN campaign staff to determine key indicators which are not being achieved or are at risk of leading to sub-optimal campaign results. Where data collection and analysis are leading to unclear or contradictory results, the national malaria programme and M&E sub-committee should together determine actions to resolve any issues leading to lack of clarity.

- The timing for the reporting of daily results will depend on the time required for data entry, processing and quality checks. In some cases, reporting of the assessment results will be shared the day after data collection.

- Reporting the results of in-process assessments should follow the overall campaign reporting lines. In general, daily meetings are held at health facility and sub-national (district, region, province) levels to

gather feedback from supervisors and ITN campaign teams and to inform decision-making and ongoing campaign process improvements. During these meetings, the assessment coordinator may provide reports directly to sub-national supervision teams in the geographic areas of the data collection.

- Final ITN campaign assessment reports should include a summary of the assessment protocol and process, as well as highlights and/or summary data from the assessment and recommendations for future campaigns and assessment activities.

Final report format

The outline below was made to guide the assessment data analyst in writing a final technical assessment report. The outline follows the usual sections of a published article: background, methods, results, and discussion.

- **Background:** Including the general overview of ITN mass campaign and main assessment indicators
- **Methods:** Precisely describing the sampling and including a description of the sampling frame (area), unit of strata and lots (e.g. region, district, sub-district), selection of primary sampling and lower units, approach to segmentation and the method and number of households selected, as well as handling of households that were not at home or refused interviews
- **Results:** Including tables, graphs, maps, and text of main and other indicators, using a data analysis program (e.g. Stata) to calculate weights, point estimates and confidence intervals for units above the lot level (district, region, national, for example) to calculate unweighted point estimates and confidence intervals above the lot level
- **Discussion:** Including the main findings in the first paragraph, other findings in subsequent paragraphs, a "limitations" paragraph, for example, the text, "our analysis did not include a calculation of the alpha and beta errors associated with the classifications" as a limitation

Report validation

- Daily in-process reports should be validated by the health facility and sub-national health authorities in charge of the geographic areas where the assessments have been conducted.
- Final reports should be validated by the M&E sub-committee before being submitted to the National Coordinating Committee.

Report dissemination

- It will be important to share validated assessment results, lessons learned and case studies with relevant MOH departments, national malaria and ITN distribution stakeholders, as well as global technical, financial and operational partners within one month of the end of implementation.
- Key findings highlighted in PowerPoint presentations or similar formats can also be shared by e-mail and through presentations to health, malaria and ITN campaign stakeholders, including through the National Coordinating Committee. National malaria programme teams may also choose to coordinate with global partners including the RBM Partnership to End Malaria and AMP to present key findings at global meetings. Through regional and global malaria partnerships, national malaria programmes may also choose to share findings with programmes in other countries, which can provide a foundation for cross-country and regional sharing and learning from the results and lessons of other countries, as well as from the assessment approaches and tools used to collect and analyse the results.

Using the data from assessments

Key data users and decision-makers identified in the data use plan developed in Step four for the assessment protocol should be consulted to confirm their priority information needs when preparing HHR and/or ITN distribution assessment results and reports.

- As draft reports are developed, preliminary results should be shared with key data users. This can be through electronic sharing and requests for inputs.

- Key data users and decision-makers may wish to organize a data review and decision-making meeting. The meeting should be led by the national malaria programme and the agenda can include time to provide feedback on preliminary results, to analyse and discuss the implications of the results on the recent campaign, and to document lessons learned and associated changes for planning and implementation for the next ITN campaign.

- Outcomes of data review meetings should be documented and shared with all participants for finalization and validation of action items to inform the planning and implementation of future campaigns (and assessments).

- Final documented action items should then be shared alongside the final validated HHR and/or ITN assessment reports with the National Coordinating Committee.

For further information, please consult these example reports, located in *AMP ITN Campaign HHR and ITN Distribution Global and Country Resources*[30]

- **Mozambique:** Use of rapid monitoring data for improvement of quality HH registration data collection: Lessons learned and recommendations, PowerPoint slide deck
- **Benin:** Use of rapid monitoring data for improvement of quality HH registration during Benin's 2017 insecticide-treated bed net distribution campaign; lessons learned and recommendations, Poster presentation for the American Society of Tropical Medicine and Hygiene
- **Benin:** Distribution gratuite de MILD dans le département du Centre et du Sud du Benin, Monitoring externe du dénombrement (MED), Rapport Provisoire, Leadership et Développement (LEADD)

30. https://drive.google.com/drive/folders/1YGoCbxCPLszLGjOcCv6utbYeEFb5M396?usp=sharing

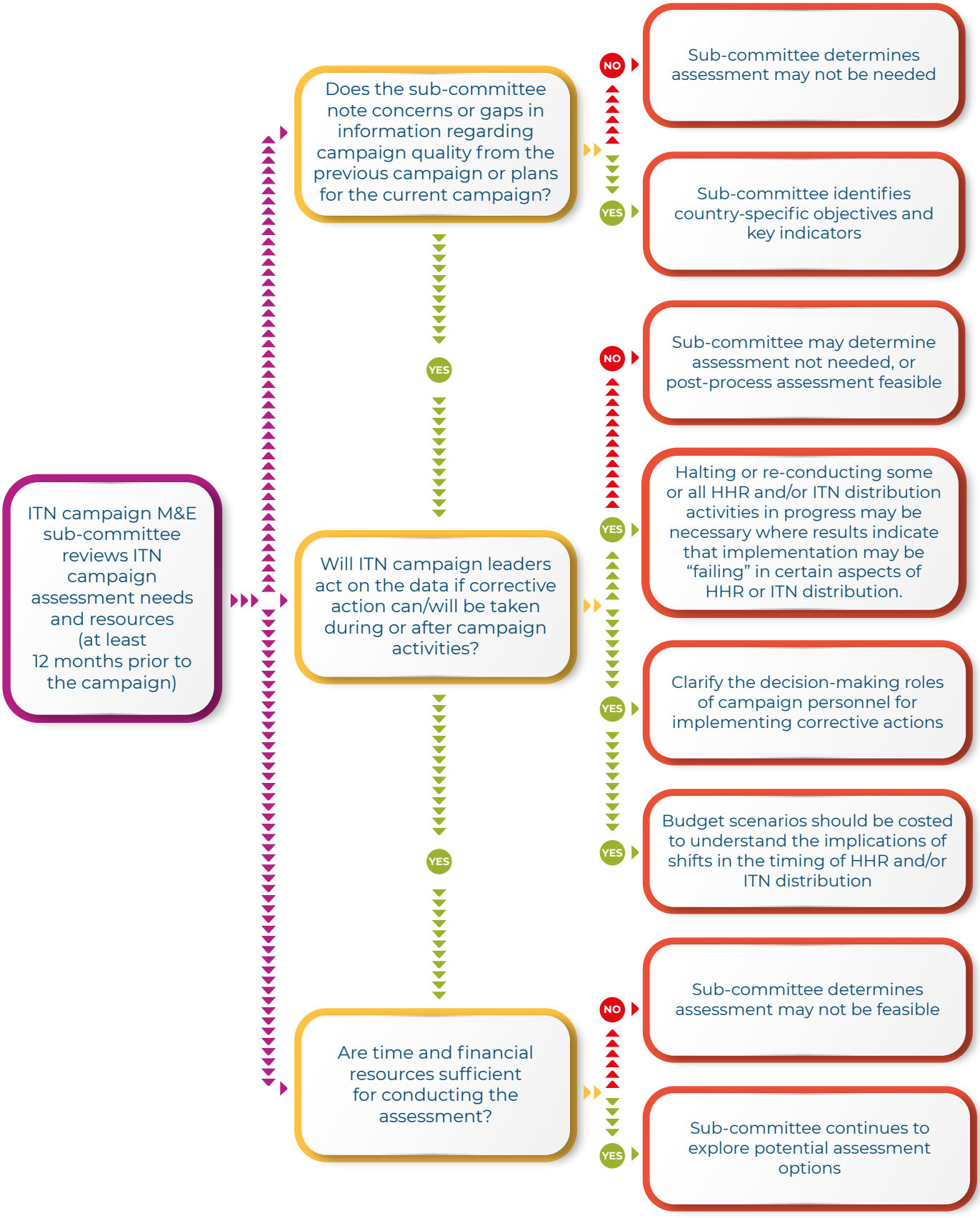
ANNEXES

Annex 1: Glossary of terms

The descriptions below aim to provide a common understanding of how AMP defines specific terms used throughout these procedures.

Assessment	The collection of data to track the quality and coverage of the HHR/ITN distribution to inform corrective actions, either immediately or in the future.
Clustered LQAS (cLQAS)	cLQAS divides the sample (N) into smaller clusters (k) of n individuals, where N=k*n. For example, if a sample of N=60 is needed in a district or lot, six villages would be selected first and then 10 individuals in each village, rather than randomly selecting 60 individuals throughout the district or lot. The cLQAS approach increases the rapidity and efficiency for conducting the survey, but it reduces precision somewhat. Results are relevant at the lot level for the selected sample.
End-process assessment	Provides a means to validate achievement of key campaign activities and is conducted at the end of the implementation of a campaign phase or all campaign activities. Daily feedback is not provided, and immediate corrective action will not be taken on a day-to-day basis. Results and lessons learned can be used to inform future plans. End-process data for each phase (HHR or ITN distribution) of the ITN campaign assessed should be summarized into a report as quickly as possible (within 48 hours of the end of the activity).
Independent assessments	Ideally, assessment activities should be conducted by independent personnel not involved in the ITN campaign. If this is not possible due to budget or personnel constraints, then teams that have implemented activities in one area could be deployed to assess another area.
In-process assessment	Conducted during activity implementation and is designed to flag potential programmatic issues for further investigation and action during the HHR and/or ITN distribution process. Daily monitoring of progress and provision of feedback to ITN campaign staff can inform day-to-day decision-making during ITN campaign activity implementation, support troubleshooting of problems identified, re-orient resources where needed and pause activities to allow the time and resources necessary to recalibrate and implement corrective action.
LQAS	A rapid survey method to assess the quality of coverage following a health intervention in pre-defined areas such as health districts or sub-districts (known as lots) using a small sample size. Traditionally, LQAS has been used with a simple random sample design.
Qualitative approach	Collects and analyses non-numerical data, e.g. population perceptions of the quality of HHR and/or ITN distribution processes
Quantitative approach	Collects and analyses numerical data, e.g. percentage of HHs having received an ITN, percentage using an ITN

Annex 2: ITN campaign assessment decision tree



Annex 3: ITN campaign assessment planning checklist

Annex 4: Choosing tools and methods for assessment of the quality of household registration for ITN distribution campaigns

Choosing tools and methods for assessment of the quality of household registration for ITN distribution campaigns

Decision matrix for HHR quality evaluation sampling method choice

Annex 5: Choosing tools and methods for post-campaign assessment of ITN coverage, access and use

Choosing tools and methods for post-campaign assessment of ITN coverage, access and use

Decision matrix for post-campaign evaluation sampling/modelling method choice

Annex 6: List of paper and digital data collection tools

The tables below provide further information and updates for the paper-based and electronic data collection tools listed in the AMP guidance: *Choosing tools and methods for assessment of the quality of household registration for ITN distribution campaigns and Choosing tools* and *methods for post-campaign assessment of ITN coverage, access and use*.

Data are often collected using both methods—record data on a paper form, then enter data into the digital device at one of three opportunities: in real-time (using the paper form only as a backup in case of problems with data transmission), when data collection is finished before leaving the lot, or during the evening after the day's work is finished. Once the data are transmitted from the digital devices to the database, the usual methods for processing electronic data are used.

An advantage of real-time or same-day electronic transmission is that data can be analysed every evening and results submitted to supervisors before the daily morning review session or when coordinating activity start up the next day.

© NMCP, Togo

Table 1: Paper data collection

Paper data collection – In this traditional approach to data collection, paper-based tools are provided to surveyors collecting field data at household level.	
Centralized data entry	
Tools	Description
Excel spreadsheet, Access database or District Health Information Software 2 (DHIS2) https://dhis2.org/	Data summaries are calculated manually and reviewed by data collection supervisors. Data from individual data forms and data summary forms are then compiled and sent to data managers (based on the existing data collection and transmission circuit) who manually enter data. In some cases, scanners can be used to upload data from paper forms. In line with the operational guidance for conducting DHS[31], it is important to monitor and oversee data processing, including the establishment of controls for secure storage of questionnaires in a separate room with a lockable door.
Decentralized mobile device data entry	
Tools	Description
Short message service (SMS), MeasureSMS	Mobile health (mHealth) tools including SMS can be used to allow supervisors or surveyors to directly enter and send data for each HH visited and/or summary data via SMS to a centralized data collection and analysis repository. For example, the SMS tool, MeasureSMS, an Android-based application, developed in collaboration with Tripod Software Ltd. allows SMS data transfer using basic mobile phones as opposed to a smartphone application. This method offers lower cost, greater availability of handsets, greater network availability for sending SMS messages and the superior battery life of basic mobile phones. In many countries, health workers in peripheral areas are more likely to own a basic mobile phone as opposed to a smartphone and would be able to adopt an SMS reporting tool more readily. The Android application enables individual records to be sent via SMS to a local smartphone to be validated (i.e. checked for formatting errors) and uploaded to a cloud server and then accessed via a web browser[32].
RapidPro https://community.rapidpro.io/	Guided by "innovation principles of open source, open standards, and collaboration", UNICEF partnered with Rwandan software engineering firm Nyaruka to develop RapidPro. RapidPro has become "UNICEF's common platform for developing and sharing mobile services that can be adapted for different contexts and sectors".

31. ICF International (2012) Survey Organization Manual for Demographic and Health Surveys (DHS).
32. Stanton, M., Molineux, A., Mackenzie, C/, Kelly-Hope, L. (2016). Mobile Technology for Empowering Health Workers in Underserved Communities: New Approaches to Facilitate the Elimination of Neglected Tropical Diseases. *JMIR Public Health and Surveillance*. DOI:10.2196/publichealth.5064

Table 2: Digital data collection

Digital data collection – These tools allow direct data collection across a range of digital options. Some options are free and open-source, some are fee-based, and some offer both free and fee-based choices, depending on functionality. DHS operational guidance includes checks for inconsistent and missing values built into digital data processes, training data collection and processing teams to conduct daily backups of data and ensuring data processing supervisors produce field check tables to identify problems which may not have been identified during data collection in the field.		
Tools	**Free, open-source smartphone/ tablet data collection**	**Fee-based smartphone/ tablet data collection**
Census and Survey Processing System (CSPro) https://www.csprousers.org/help/CSPro/what_is_cspro.html	CSPro is a "software package for entering, editing, tabulating and disseminating data from censuses and surveys". Using CSEntry, the data collection component, it is possible to run a data entry operation in both Windows and Android environments.	
KoBo Toolbox https://www.kobotoolbox.org/	KoBo Toolbox is a suite of tools for field data collection.	
Telephone Audio Computer-Assisted Self-Interview (T-ACASI)	Using T-ACASI, "respondents answer voice-digitalized survey questions by pressing the appropriate keys on a telephone"[33].	
Akvo Foundation https://akvo.org/capture-and-understand-data-that-matters/	Akvo Flow was released as an open-source option in June 2012 as a user-friendly data platform to capture, clean and monitor data offline or online.	Akvo Lumen is an add-on, used to build interactive maps, graphs and charts; filter, aggregate, combine and enrich the datasets; and display visualizations with context.
doForms https://www.doforms.com	doForms has a free trial but does not have a free or open-source option.	doForms paid is a data collection app which can be used on smartphone, tablet, laptop and is desktop friendly.

33. Mingay, D. Is Telephone Audio Computer-Assisted Self-Interviewing (T-ACASI) a method whose time has come? http://www.asasrms.org/Proceedings/papers/2000_182.pdf

Tools	Free, open-source smartphone/ tablet data collection	Fee-based smartphone/ tablet data collection
Magpi https://www.magpi.com/		Magpi paid. Web-based interface which can be deployed on multiple Android and iOS apps to collect and sync data from anywhere in the world.
SurveyCTO https://www.surveycto.com/		A "mobile data collection platform for researchers and professionals working in offline settings".
Organizational Network Analysis (ONA) https://revealprecision.com/	ONA is an open-source mobile data collection solution and application that is Open Data Kit based. ONA Reveal provides mobile survey software that works offline. Developed by Akros, ONA Reveal "uses spatial intelligence to drive delivery of life-saving interventions".	ONA paid provides mobile survey software that works offline.
Open Data Kit (ODK) https://getodk.org	ODK basic is a suite of tools that allows data collection using Android mobile devices and data submission to an online server, even without an Internet connection or mobile carrier service at the time of data collection.	ODK cloud provides a fast, reliable, secure cloud platform.

Annex 7: Steps for investigation of low-performing lots

In Annex 10, a summary table ranks lots by main indicators, using classification systems described in Annex 9. The completed summary table and completed assessment results will usually indicate lots with lower indicators and lots with higher indicators. After the summary table is examined by the assessment coordinator and M&E sub-committee, an investigation should be undertaken to understand why some lots had low indicators compared to the lots with higher indicators. The M&E sub-committee and national malaria programme should be prepared to investigate the lowest 5—10 lots (sub-districts or districts) and potentially compare them with several lots that had high indicators (those with positive or upward deviance, for example, >90% or >=95%) which indicated that high indicators were possible. Below are some suggested actions:

- Establish criteria for investigation after looking at the point estimates and ranking of the five main and summary indicators by lot. For example, where :
  - One or more of the five main indicators are less than 70%

- Carefully consider reasons why those lots were likely to have low indicators and generate working hypotheses. For example:
  - Are most of those lots urban or in insecure areas?
  - Were they the last lots to have the distribution or registration/distribution where nets may have been in short supply?

- Conduct a careful desk review of the data from low- and high-indicator lots.
  - Review where indicator results might be low due to data issues, or programmatic or contextual factors.
  - Examine the data for evidence that low data quality might have caused the low indicators.
    - Look for internal inconsistencies, for example if the number that slept under a net was greater than the number of persons in the HH, or the number of nets received by households had an unusual pattern.
  - Examine the data by cluster/PSU and note if the low indicators were present across all clusters/PSUs or whether one or two clusters/PSUs were responsible for the low indicators for the lot. In both cases, the data analyst needs to be prepared to support the investigators with additional analyses for indicators by cluster/PSU for those lots with very low indicators.

- Review administrative data
  - Check and triangulate administrative data at the most peripheral level in lots with low indicators.
  - Triangulate the data from the distribution teams with the logistical distribution point data (ITNs received, distributed, remaining in stock).

- Interview supervisors or other campaign personnel in lots with low and high indicators.

- If the reasons for low indicators are unclear in most low indicator lots after preliminary investigation, investigators may randomly sample six settlements or villages for investigation of five households (quantitative, qualitative) and interview settlement or village leaders and key informants (qualitative).

- Investigators should write a report indicating likely hypotheses for low indicators, corrective actions taken and planned, lessons learned, and recommendations.

Annex 8: Real-time analysis of data

In-process assessment

Data cleaning and analysis of in-process data are very different activities from those of end-process data. The objective of in-process analysis is to examine, clean and analyse each record in real-time to see if the campaign is being conducted as planned based on the strategy adopted (e.g. that each household is being registered; that each voucher is indicating the correct number of ITNs per HH according to campaign allocation rules; that each household receives the correct number of ITNs). Households that did not receive the correct information or the correct number of ITNs on their voucher are flagged and reasons for incorrect information or service are investigated. During in-process assessment, the first several days of data collection are most important since campaign errors should be identified as early in the process as possible to allow time to plan and implement corrective actions. Therefore, real-time analysis during the late afternoon or early evening during the initial two to four days of HHR and/or ITN distribution activities planned for up to seven days, or five to seven days for activities planned for up to fifteen days, is recommended.

Real-time analysis planning and preparation. The assessment coordinator should have planned the expected number of lots and clusters/PSUs to be sampled in the first days of the cLQAS. Therefore, the data analyst should know the names of the expected lots and PSUs for each day and can produce an on-going update on "missing reports" or missing records.

The data analyst should prepare a program file (for example, Stata .do file) in advance that searches for missing data or missing records, and flags household records with incorrect information or services (e.g., number of ITNs). AMP has prepared a model Stata .do file for this purpose (Annex 11)[34].

Using the program file, the data analyst will flag all household records that were not 100% correct on the key variables—voucher received (yes/no), correct number of vouchers received (yes/no), household registered (yes/no), correct number of ITNs received (single-phase campaigns). The data analyst should share this list of flagged records electronically each hour with the campaign and cLQAS leadership (e.g. via WhatsApp, email, text). The hourly update should start as soon as cLQAS sampling teams start transmitting data.

The data analyst should begin monitoring the completeness and timeliness of expected reports and records in the late afternoon of the first days of activity implementation. For example, if several cLQAS teams have not sent any data or are missing lots, PSUs or households, then the data analyst should send messages to cLQAS supervisors about the late or missing data.

The data analyst should send a report at the end of each day to the M&E sub-committee and assessment coordinator, as well as assessment supervisors, so that discussions can be conducted during the next morning's supervision/monitoring meeting with the campaign and cLQAS surveyors to adjust the campaign, cLQAS approach, or both.

34. https://drive.google.com/drive/folders/1YGoCbxCPLszLGjOcCv6utbYeEFb5M396?usp=sharing

End-process data, including model program file (Stata .do file)

AMP has prepared a model Stata program file for data cleaning and analysis of end-process data. The analysis file uses Stata's complex survey commands and weighting to calculate results by lot and for higher level (district, region, national) strata.

The sections of the Stata .do file include:

- Background
- Set Defaulter Folder
- Import Excel data; rename variables
- Exploratory analysis
- Cleaning section (extreme value sub-section not completed)
- Preparation and creation of variables for main indicators
- Weighting section
  - Preparation (population data by PSU or lot)
  - Base weight
  - Item non-response
- Analysis
  - Main indicators by higher level strata (district, region, national)
  - Main indicators by lot
  - Analysis of secondary and other indicators, and more in-depth analysis

LQAS is known as a quota sampling method, where an exact number of elements in each lot or PSU have data. This assessment approach has adjusted that concept. It is recommended that households without interviews or data have a record completed in the data collection form indicating households that were not at home or refused interview.

The model .do file will produce point estimates, confidence intervals and design effects for indicators for all lots and higher-level stratum or strata. The confidence intervals for lots are generally too wide for management interpretation. This is the reason that LQAS uses two- or three-level classification as its primary analysis function, but the confidence interval for higher-level stratum indicators is usually less than plus or minus five per cent.

To combine data from each lot to provide point estimates and confidence intervals at higher-level strata (district, region or national), weighting of each lot by population is necessary. It is ideal if the population by lot comes from the population by PSU from the PPS procedure of selecting PSUs. Therefore, as part of the cLQAS procedure, the list of PSUs should be collected from each lot and put into a multi-lot database, with their population as used during the PPS process. Adjustment of base weights for non-response requires population by PSU and not only population by lot.

A sample cLQAS database is available that can be used for training linked to the program .do file. The .do file can be run against the sample cLQAS database to produce illustrative results. A few variables in the model questionnaire/ mobile application file are not in the sample cLQAS database.

Annex 9: Classification of lots

As described in Annex 8, the model Stata .do file produces point estimates for each of five main end-process indicators. Classically, LQAS uses counts (e.g. 1 "defect part", or 2, 3, ...) to "reject" or "fail" the lot. Polio eradication uses the same principle—if 0—3 out of 60 children did not receive the polio drops (vaccine), then the lot is classified as "good". However, in essence, the count (for example, zero to three out of 60) is also a proportion or percentage. The lot must achieve a percentage coverage of 95% or better to be classified in the "good" (90—100%) category. Therefore, although the "good" class is 90—100%, a "decision rule" is applied (must reach 95—100%) to reduce the alpha misclassification error (misclassification as "good" when the lot should be classified in the "uncertain" or "inadequate" class in reality).

Furthermore, classically, LQAS classifies based on one indicator and the indicator is one type (individual person—child, person of any age). However, it is recommended to adapt this principle for malaria because there are five main indicators for end-process assessments and the indicators include two types—with individual and household denominators. Therefore, the five main indicators are classified based on percentage (not counts). However, the polio eradication group practice of requiring a percentage at least 5% above the lower limit of the classification range for the decision rule to reduce the misclassification error is maintained. For example, the measured percentage for an indicator must reach at least 95% to be classified in the "good"/90—100% class and reach at least 85% to be classified in the "uncertain"/80—90% class.

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Annex 10: Summary table for the classification of lots based on five main indicators

Below are two model tables of lots (districts/ sub-districts) classified and colour coded according to a three-level classification system. Different classification ranges can be used for each indicator. In the model table, two sets of classification cut-off ranges are shown. These include cut-offs of 90/80 for 90—100%, 80—90%, <80% and cut-offs of 90/70 for 90—100%, 70—90%, <70%. The M&E sub-committee and the data analyst can decide on the classification ranges during production of the summary table.

In both summary tables, the first indicator has the 90/80 classification cut-offs because the first main indicator (at least one ITN) is easier to achieve with >=95%. In the first summary table (Area 1), the 90/80 classification cut-offs were used for all the remaining indicators because the estimates were high for most lots for most indicators. The first main indicator classifies using the cut-offs of the four summary tables. In Area 1, 13 of 27 lots were classified as "inadequate" using the "average" indication in the last column. Therefore, the M&E sub-committee and stakeholders might investigate why these 13 lots were <85% compared to four lots where almost all indicators were >=95%.

In the second summary table (Area 2), 90/70 classification cut-offs were used for main indicators 2—5 and the average because the estimates were lower. If 90/80 classification cut-offs are used in areas with lower indicators, then most or all the lots will be classified as "inadequate" thereby reducing the discriminating function of the classification system.

The last (sixth) column is an average of the five indicators. The lots are ranked based on the last column. The classification of each indicator is also important. Note in both summary tables (Areas 1 and 2), there are patterns among the indicators. The first indicator is the highest and population access is next. The "correct" and ITN use indicators are the lowest. Since the "correct" indicator is the primary outcome of the mass campaign, it is important to pay attention to the results and ranking of that indicator.

The colour coding was automated using the Excel "Conditional Formatting" function. Lots are classified based on the point estimate to the first decimal, yet the displayed estimate is rounded to the nearest whole number. Therefore, some lots may have different classification colours but have the same displayed estimate.

Summary table, Area 1

Classification of Lots, Five Main Indicators, End-Process cLQAS, ITN Mass campaign, late 2021, Area 1								
Name of Lots	**At least 1 ITN**	**Correct**	**Pop. Access**	**Use, total**	**Use < 5yo**		**Average**	
	90/80	90/80	90/80	90/80	90/80		90/80	
Lot 1	100%	97%	98%	100%	100%		99%	GOOD
Lot 2	100%	87%	100%	100%	100%		97%	
Lot 3	100%	90%	98%	98%	99%		97%	
Lot 4	99%	91%	96%	96%	95%		95%	
Lot 5	100%	79%	91%	99%	100%		94%	UNCERTAIN
Lot 6	100%	90%	98%	87%	82%		91%	
Lot 7	99%	92%	96%	81%	86%		91%	
Lot 8	99%	75%	93%	88%	98%		91%	
Lot 9	100%	71%	95%	96%	90%		90%	
Lot 10	95%	71%	95%	95%	89%		89%	
Lot 11	100%	66%	90%	85%	97%		88%	
Lot 12	96%	71%	87%	89%	91%		87%	
Lot 13	99%	60%	81%	93%	99%		86%	
Lot 14	96%	70%	83%	85%	93%		85%	
Lot 15	96%	77%	93%	74%	69%		82%	INADEQUATE
Lot 16	100%	68%	88%	67%	74%		80%	
Lot 17	100%	78%	95%	60%	64%		79%	
Lot 18	90%	62%	83%	79%	79%		79%	
Lot 19	98%	55%	93%	72%	72%		78%	
Lot 20	100%	44%	78%	83%	84%		78%	
Lot 21	95%	57%	89%	71%	73%		77%	
Lot 22	93%	57%	83%	65%	81%		76%	
Lot 23	88%	56%	71%	79%	81%		75%	
Lot 24	92%	25%	78%	83%	84%		72%	
Lot 25	100%	68%	84%	50%	52%		71%	
Lot 26	92%	55%	87%	63%	47%		69%	
Lot 27	87%	31%	77%	58%	61%		63%	

Summary table, Area 2

Classification of Lots, Five Main Indicators, End-Process cLQAS, ITN Mass campaign, early 2022, Area 2								
Name of Lots	**At least 1 ITN**	**Correct**	**Pop. Access**	**Use, total**	**Use < 5yo**		**Average**	
	90/80	90/70	90/70	90/70	90/70		90/70	
Lot 1	100%	63%	98%	91%	90%		88%	
Lot 2	95%	72%	91%	87%	90%		87%	
Lot 3	100%	72%	85%	85%	92%		87%	
Lot 4	100%	51%	92%	88%	91%		84%	
Lot 5	100%	68%	88%	85%	78%		84%	
Lot 6	100%	60%	90%	83%	83%		83%	
Lot 7	99%	83%	88%	69%	74%		82%	
Lot 8	100%	65%	82%	84%	79%		82%	
Lot 9	100%	54%	87%	81%	88%		82%	
Lot 10	89%	50%	90%	90%	87%		81%	UNCERTAIN
Lot 11	70%	49%	94%	97%	96%		81%	
Lot 12	99%	69%	92%	75%	71%		81%	
Lot 13	100%	63%	92%	76%	71%		80%	
Lot 14	100%	88%	96%	63%	53%		80%	
Lot 15	100%	78%	91%	62%	60%		78%	
Lot 16	99%	79%	90%	63%	58%		78%	
Lot 17	89%	69%	82%	67%	77%		77%	
Lot 18	100%	53%	79%	68%	75%		78%	
Lot 19	97%	38%	89%	77%	73%		75%	
Lot 20	89%	64%	93%	54%	68%		73%	
Lot 21	100%	60%	78%	65%	61%		73%	
Lot 22	95%	37%	95%	62%	71%		72%	
Lot 23	100%	62%	59%	68%	72%		72%	
Lot 24	100%	46%	86%	62%	62%		71%	
Lot 25	100%	73%	80%	54%	48%		71%	
Lot 26	100%	80%	87%	38%	47%		71%	INADEQUATE
Lot 27	76%	47%	92%	74%	60%		70%	
Lot 28	97%	34%	93%	50%	56%		66%	
Lot 29	92%	24%	85%	56%	61%		64%	
Lot 30	100%	38%	78%	44%	54%		63%	
Lot 31	94%	22%	93%	42%	50%		60%	
Lot 32	100%	54%	70%	39%	38%		60%	
Lot 33	99%	66%	66%	26%	26%		57%	
Lot 34	83%	28%	93%	46%	33%%		56%	

Annex 11: Program files (Stata .do file) for end- and in-process data cleaning and analysis

A Stata program file (.do file) for analysis of cLQAS is located in Annex 11. Data and variables from questions in the model questionnaires (Annex 14) are used in the program file for analysis. This program file was used for analysis of several cLQAS surveys in Nigeria with approximately 20—30 district/local government area lots in each implementation in 2021 and 2022. It was also used for capacity-building in workshops for analysts in Nigeria and DRC in 2022. Below are the sections in the program file:

- Background
- Set default folder for analysis
- Import Excel or spreadsheet data; rename variables
- Exploratory analysis (example how many admin 1, admin 2, health facility, settlements, etc.)
- Cleaning
- Preparation and creation of indicator variables
- Weighting (for estimates above the lot level)
- Calculate base weights
- Adjust weights for unit non-response
- Analysis section
- Main indicators
- Indicators by lot or strata (or higher)
- Other indicators

Note that users of the Stata .do file were encouraged to use the probability proportional to size method to choose both primary sampling and lower units (for example, settlements or villages). Users were also encouraged to collect the list of PSU names and population numbers and forward those lists electronically to the assessment data analyst to use for weighting to provide estimates above the lot level (e.g. district, region, national).

Annex 12: Example: Protocol for assessment of ITN mass campaign household registration and/or ITN distribution

This document provides an example of the content that would be expected in a protocol for assessing the quality and outcomes of household registration and/or ITN distribution during and/or after mass campaigns. It is intended for national malaria programmes or partners leading an assessment and, when complete, will serve as the guiding document for the planning, budgeting and implementation of the assessment, as well as the data collection, analysis and reporting against specified indicators. Contexts vary and the protocol should be adapted and modified to include any additional information needed. National malaria programmes should replace the suggested text with their own narrative.

ITN campaign assessment protocol
(example of table of contents)

Title page – logos, date of draft (**country specific**)

Acronyms and abbreviations
Describe all acronyms and abbreviations in table format.

Glossary of terms
Provide a glossary for key terms that are used throughout the protocol, with a description that aims to ensure a common understanding. Annex 1 of the procedures document has some key terminologies.

List of tables, etc.
Provide a list of all tables, figures, graphs, etc.

1. Protocol executive summary

Develop a brief (one-half to one page) summary of the assessment, including the:

- Planned assessment and reason(s) for conducting it
- Survey design and intended use of survey results
- Plans for dissemination of survey results

2. Background

- Malaria, ITN and campaign overview:
  - Describe the malaria situation in the country and the key interventions being deployed; use maps
  - Describe the current ITN situation including policy, channels for distribution and key indicators from population-based surveys and the itnuse.org site
  - Describe the ITN campaign strategy (for example door-to-door or fixed site distribution via a one- or two-phase process)
- Rationale for undertaking the assessment:
  - Provide general information regarding how and why it was decided that there was a need to assess HHR and/or ITN distribution activities
  - Provide the intended use of findings, including if and what corrective actions may be taken (see Step four of the procedures document)

3. Assessment objectives and key indicators (see Step two of the procedures document)

- Provide the overall objective and the specific objectives of the assessment
- Present the selected priority assessment indicators and targets in bullet-point or table format

4. Assessment design (see Step 4 of the procedures document)

- Describe the **assessment approach(es)** that will be used and if the assessment will include both HHR and ITN distribution:
  - In-process cLQAS provides information during campaign activity implementation and is designed to flag potential programmatic issues for further investigation and action during the HH registration and/or ITN distribution process
    - If in-process is planned, describe the number of days in relation to the campaign (Day 2 and 3 of campaign only, Days 2—5, etc.)
  - End-process cLQAS provides a means to validate achievement of key campaign activities and is conducted at the end of the implementation of a phase of or all activities, with results for registration, access and use and lessons learned used to inform future plans
    - If end-process is planned, describe the phases after which it will take place and the number of days it will be implemented
- Describe the geographical scope and population included in the assessment (see Steps three and four of the procedures document):
  - Describe whether the geographic scope has been defined according to specific parameters or reasons and what those are if so
  - Describe whether certain populations are being targeted specifically for the assessment and the reasons why if so
- Survey methodology:
  - Define the cLQAS (or other) methodology (see Step four in the procedures document) for both in-process and end-process
  - Describe the development of the survey instruments to be used including type of questionnaire(s), how it/they will be pretested, languages, finalization of the questionnaire(s) etc.

- Sample size: (see Step four of the procedures document)
  - Define the unit that will be the lot e.g. district or sub district, and the lots to be included in the sampling frame
  - Describe the procedures for selection of clusters and the expected number of clusters and households to be included
- Sampling procedure: (see Step four of the procedures document)
  - Describe the process of household random selection (how first and subsequent households are selected)
  - Describe the procedure to be followed if household dwellers are not at home or refuse to participate
  - Describe any additional sampling procedure details as relevant to the country context

5. Assessment staff, recruitment and training

- Overall staffing structure:
  - Describe how the assessment will be coordinated and the staff that will be involved at each level including field staff and team structure (surveyors, supervisors, local guides, etc. as relevant)
  - Describe the recruitment and selection process that will be followed where additional staff or technical support will be recruited; annex terms of reference for the positions, including required qualifications
  - Describe any technical or financial partners that will be engaged in the assessment(s)
- Training:
  - Describe the training that the field staff will receive including any post-training assessment as detailed in step eight of the procedures document

6. Fieldwork

Describe:

- Data collection tools (see Step four and Annexes 4—6 of the procedures document)
- Timing and duration of fieldwork (see Step two of the procedures document)
- Process for submitting data (see Step 10 of the procedures document)
- Describe how supervision and monitoring will be organized (see Step nine of the procedures document)

7. Data collection, management and analysis (see Step 9 of the procedures document)

- Describe the data collection, transmission and analysis including:
  - Whether data collection will be paper-based or digital or a hybrid and, if paper-based, at what level data will be inputted to an electronic platform
  - Management of data quality, privacy and security
  - Approach for conducting real-time analysis of data and the role of the data analyst
  - Approach for data cleaning, processing and analysis
  - Analysis plan including the interpretation framework for the in-process and/or end process assessment as applicable
  - Approach for the classification of lots
  - Timeline for reporting survey findings
- Describe process for performance review, lessons learned, and report writing including:
  - Outline of how results will be quickly reviewed by the assessment/M&E committee
  - How and why lots will be identified for further investigation
  - How results will be communicated (particularly for in-process) to ensure corrective action is implemented

8. Archiving and dissemination

- Describe process and timelines for disseminating results to national and sub-national programme offices, survey participants, implementing partners and other key stakeholders for validation
- Describe how the database will be made available for secondary data analyses

9. Ethical considerations

If ethical clearance is required in country, describe:

- Independent Review Board (IRB) process for providing ethical clearance
- Process of:
  - Obtaining consent
  - Maintaining participant privacy and removing identifiable information
- Official documentation required or to be included (e.g. letters of notification to local governments)

10. Collaborators and funding mechanisms

- Indicate primary implementing agency
- Provide names and affiliations of key roles and involvement in bullet format or table format. This will include the following:
  - Survey coordinator
  - Survey statistician
  - Data manager
  - External/independent experts
  - National and international stakeholders
  - Funding agencies
- Include information on ITN campaign M&E sub-committee, and assessment technical working group where relevant
- Detail other human resources needed to implement the assessment

11. Budget (see Step five and Annex 13 of the procedures documents)

- Provide the total cost of the assessment(s)
- Provide a summary of the budget by cost category
- Note the funding source(s) and/or funding mechanisms

12. Timeline

Provide a schedule and timeline of all assessment activities in table/Gantt Chart format.

13. Annexes

Include a list of all annexes (consider embedding the files) which may include but are not limited to:

- References
- Assessment questionnaires including translations
- Consent forms including translations
- Other supporting documents (e.g. sub-national notification letters, etc.)
- Additional documents as determined by the country IRB such as assessment team ethics certificates

Annex 13: ITN campaign assessment budget considerations

Annex 14: Model ITN campaign assessment questionnaire template, in- and end-process assessments

DOWNLOADS

To download the ten steps for assessing household registration and ITN distribution or related materials separately, click on the appropriate link.

Introduction
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_Introduction

Step 1: Review ITN campaign coordination structure and identify common understanding of campaign and assessment needs
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepOne

Step 2: Identify assessment goals and approach, objectives and primary ITN campaign indicators for a potential assessment
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepTwo

Step 3: Decide whether to undertake an assessment
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepThree

Step 4: Design the assessment and develop assessment protocol
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepFour

Step 5: Develop assessment financial plan
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepFive

Step 6: Identify and plan recruitment of assessment teams
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepSix

Step 7: Develop assessment questionnaires
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepSeven

Step 8: Train assessment personnel
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepEight

Step 9: Prepare and conduct data collection fieldwork
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepNine

Step 10: Compile, analyse, report and use data
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_StepTen

Annexes 1—14
https://allianceformalariaprevention.com/wp-content/uploads/2022/11/Assessment_Procedures_Annexes


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AMP CONTACTS

To join the weekly AMP conference call each Wednesday at 10:00 AM Eastern time (16.00 PM CET) use the following Zoom meeting line:
https://us06web.zoom.us/j/2367777867?pwd=a1lhZk9KQmcxMXNaWnRaN1JCUTQ3dz09

You can find your local number to join the weekly call:
https://zoom.us/u/acyOjklJj4

To be added to the AMP mailing list visit:
https://allianceformalariaprevention.com/weekly-conference-call/signup-for-our-mailing-list/

To contact AMP or join an AMP working group please e-mail:
allianceformalariaprevention@gmail.com

For further information please go to the AMP website:
https://allianceformalariaprevention.com

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