Sierra Leone Performance Management Phone Survey

Practitioner Guide

December 2024

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Glossary of Terms

CHIS: Community Health Information System

CHW: Community health worker

CHW AIM: Community health worker Assessment and Improvement Matrix

DHMT: District Health Management Team

DPHC: Department of Primary Health Care

DPPI: Department of Policy, Planning, and Information

ETR: Easy-to-reach *(CHW who is between 3km and 5km from nearest PHU, serves a population of 100-170 households, and provides all services excluding iCCM treatment)*

HTR: Hard-to-reach *(CHW who is over 5km from nearest PHU or between 3km and 5km with difficult terrain, serves a population of 50-60 households, and provides all services including iCCM treatment)*

iCCM: Integrated community case management

ICRP: In-country research partner

LMH: Last Mile Health

MERL: Monitoring, evaluation, research, and learning

M&E: Monitoring and evaluation

PHU: Peripheral health unit

Project BIRCH: Building Integrated Readiness for Community Health

TAG: Technical advisory group

Executive Summary

In 2012, Sierra Leone established its first national community health worker (CHW) program, with the goal of providing community-based preventative and curative care for the leading causes of death and disease in Sierra Leone. The first policy aimed to standardize CHWs' roles, training, supervision, and monitoring. After the Ebola outbreak of 2014-2016, the Ministry of Health updated the policy to expand CHWs' scope of work. In 2019, JSI Research and Training Institute conducted an assessment of the program to improve its performance. As a result, the Sierra Leone National Community Health Worker Policy of 2021-2025 was developed and implemented with the goal of leveraging past implementation lessons and improving the overall performance of the program.

Last Mile Health, with support from Exemplars in Global Health, assessed the implementation performance of the National Community Health Worker Program (NCHWP) across districts, with the goal of identifying areas for quality improvement and establishing a replicable process for future performance monitoring. It examined several key functional domains essential to improving service delivery, including CHW roles and responsibilities, access to equipment and supplies, supportive supervision, incentives (both financial and non-financial), and data flow between communities and the health system. These domains, aligned to the CHW Assessment and Improvement Matrix (AIM)[1], provided a framework for evaluating the program and ensuring alignment with its goals. Results from the research offered practical recommendations for enhancing the program's performance and advancing its objectives for improved community health outcomes.

Research leveraged a mixed-methods data approach, drawing on sources including primary data collection and a Global Fund maturity assessment. Data collection ranged from qualitative and quantitative methods, and included key informant interviews, conducted with peer supervisors, peripheral health unit (PHU) in-charges, and CHW district focal persons to gain deeper insights into district-level performance. Findings of this research will be summarized on the Exemplars in Global Health website (exemplars.health).

This document details lessons learned from the CHW rapid phone-based survey. It breaks down the core steps taken to develop and deploy the survey, describes challenges encountered, and presents recommendations for future implementation in Sierra Leone and beyond.

Key design choices faced in the implementation of the phone survey:

Design choice	Approach used	Considerations and lessons learned
1. **Sampling**	The phone survey in Sierra Leone used a stratified random sample at the district level. Samples were randomly drawn from each of the 16 districts, considering gender, CHW classification, and numbers	• For future surveys, it is important to balance simplicity and efficiency with the need for detailed comparisons. While the large survey sample produced a strong baseline measurement

[1] Community Health Worker Assessment and Improvement Matrix (CHW AIM): A Toolkit for Improving CHW Programs and Services

	per district using Cochran's formula. CHWs were randomized within strata, with replacements made until target numbers were met.	and allowed for district-level comparisons, there are additional techniques that could decrease the time and cost of implementing. • Ensure district officials review and validate the CHW list before sampling to confirm up-to-date contact and demographic information and activity status. • To reduce nonresponse, ensure quality enumerator training, establish formal protocols for support staff to track response rates, and implement the usage of platforms for managing the survey.
2. **Questionnaire**	The questionnaire was based on the CHW AIM matrix. Prioritization was done alongside a consultative process with the Ministry of Health and key partners, and final design was informed by pre-testing and deployment.	• Ensure a plan to fill gaps in data collection is aligned to government plans and resource availability. For instance, the validation tools, most district secondary data collection, and key informant interviews will not be included for recommendation in a long-term performance monitoring system given cost and time. Only the CHIS secondary data collection is still recommended to continue. A more targeted sampling approach (such as only selecting high/low performing districts for interviews specific to each domain) could be adopted for key informant interviews if budget allows.
3. **Implementation**	Survey implementation was guided by pre-testing, including thoughtful team structure and research management and the development of communication	• Pre-testing gleaned insights around clarity, participant experience, and response quality that informed future survey

	tools and call logs to ensure CHWs could be reached. Management tools were used to solve real-time issues, and payment to enumerators included a small honorarium. Data collection took two and a half weeks.	iteration. For instance, pre-testing pinpointed the most optimal time to reach CHWs by phone in Sierra Leone. • Teams are more efficient when the enumerators have the necessary research capacity and bandwidth to deliver on commitments. • Early communication to CHWs to prepare them for receiving a phone call so they had information on hand would make surveys more efficient. • Strengthening quality assurance and oversight allows for issues to be proactively managed. • Ensuring mobile money and top-ups for enumerator communication allows for smoother implementation.
4. **Data Quality, cleaning, and analysis**	The data quality and cleaning process was sequenced by follow-ups in person with key informants, validating secondary source information, randomly selecting CHWs for validation, using real-time data capture tools, completing quality assurance visits, completing quality assurance measures during analysis, and implementing a triangulation process. The analysis process was iterative and evolved with guidance from the Ministry of Health and developed a bespoke analysis plan and scoring approach.	• For data quality and cleaning, implementing a hands-on approach is necessary. Establishing clear rules with a consensus from stakeholders, leveraging digital tools, and triangulating responses were all necessary steps to ensure data were valid and usable. • For analysis, the overall approach can be made more efficient by having an agreed-upon scoring approach before the start of data collection and prioritizing the most critical questions in the survey.
5. **Dissemination**	Four regional subnational dissemination events were held followed by a national event. The events were well-received by	• Completing both subnational and national dissemination ensured holistic health system

	stakeholders, with strong interest from district and national staff in applying the lessons learned. The events concluded with clear next steps for integrating the presented data into district action plans and a quality improvement plan for the national CHW program.	involvement. For instance, recommendations from subnational discussions informed national action planning, culminating in a quality improvement plan that integrated actionable steps for the CHW program. • Principles guiding dissemination were to ensure the accessibility and contextual relevance of research, ensuring a participatory approach is taken, and taking steps to facilitate audience engagement.

Introduction

a. Rationale

The phone survey aimed to evaluate the success of the National Community Health Worker Program policy, understand factors affecting implementation, and establish a replicable process for future improvements, while aligning with the CHW AIM[2] framework to optimize program quality and promote data-driven decision-making. It was selected as a cost-effective method to assess the program's implementation by gathering direct feedback from CHWs. Unlike the 2019 JSI assessment, which conducted in-person interviews with a smaller sample (594 CHWs across 6 districts and 173 caregivers across 2 districts), the phone surveys allowed for a broader reach across all 16 districts, enabling the identification of district-level variations in program implementation and ultimately surveying over 1,600 CHWs. Although stakeholders had concerns about conducting phone surveys in Sierra Leone, these were addressed in the research design, described below.

b. Vision

Currently, the phone survey is a standalone measurement tool and fills an identified gap in measuring how the CHW program performed in its initial rollout. However, it is envisioned that the phone survey be complementary to other measurement efforts within the community health system, including CHIS, existing World Bank health facility surveys, and the CHW M&E framework being developed under the BIRCH investment. Together, these systems should complement and build upon one another to provide reliable and actionable information to support continuous programmatic improvement.

[2] Community Health Worker Assessment and Improvement Matrix (CHW AIM): A Toolkit for Improving CHW Programs and Services

Specifically, the phone survey is envisioned – if implemented correctly with strong data quality checks – to help the Ministry of Health in Sierra Leone assess the effectiveness of the CHW program and healthcare access for rural populations. This would enhance ongoing initiatives like the Community Score Card assessments and Health Management Information System meetings, providing a comprehensive view of community-based primary care. The insights gained could guide resource allocation and priority-setting for the government and partners. Additionally, the phone survey approach could serve as a model for ongoing performance monitoring, featuring an interactive dashboard for real-time updates while also testing the sustainability of phone surveys for data collection, offering broader geographic reach at a lower cost compared to in-person methods.

c. Government engagement model

The government of Sierra Leone was deeply involved in every step to develop and deploy the survey. A technical advisory group (TAG) – which included 10 members across the Ministry of Health, research partners, and academic institutions – provided input and direction during study design and implementation. The TAG and CHW Hub (implementing unit) coalesced review around key milestones in the survey. Key Ministry officials were trained to lead all facilitation for key research and dissemination moments, and to ensure sustainability and skills transfer for replicability, one deputy district M&E officer per district was recruited and trained to administer the survey. Finally, Ministry of Health leaders were co-investigators on the work, which provided the opportunity to review and advise on research (and especially the overall methodology).

1. Sampling

a. Design

Overview: The phone survey in Sierra Leone used a stratified random sample at the district level. Samples were randomly drawn from each of the 16 districts, considering gender, CHW classification, and numbers per district using Cochran's formula. CHWs were randomized within strata, with replacements made until target numbers were met.

Sampling frame: CHWs who participated in recruitment and training by the Ministry of Health were included in the sampling frame. All 7,282 trained CHWs were eligible for sampling, identified by the Ministry after their 2022 pre-service training. Sampling calculations identified that 23% (1,675) of CHWs should be surveyed based on our study design, and this target was met with 1,680 completed surveys. Although CHW attrition occurred during the nearly two years between their professional deployment and the time when surveys were conducted, CHW contact lists were not updated before the surveys; instead, replacement CHWs were contacted as needed to achieve sampling targets by district, gender, and classification.

The sampling approach aimed to balance simplicity and efficiency while enabling detailed comparisons. Cochran's sample size formula (modified for finite populations) was used to determine a sufficient sample size for district-level comparisons with a 90% confidence level, 7% margin of error, and 50% estimated population proportion. This method led to

overrepresentation of smaller districts and underrepresentation of larger ones, though the overall impact on analysis was minimal. There was variation in the percentage of CHWs from each district who were included in the sample, ranging from 18% to 44%.

Sample calculation

- Determined using Cochran's adjusted formula for finite populations with the inputs of 90% confidence level (corresponding z-score = 1.645), a sample proportion of 0.5, 7% margin of error and total population size of 7,282.
- Population size of 7,282 is based on the list of CHWs participating in the national training program examined in Part 1 of this project (in 2022).
- The sample represented 23% of the total pool of CHWs trained as part of the 2022 pre-service training.

The sampling design aimed to facilitate comparisons of survey responses across districts while capturing additional demographics like gender, age, and classification (ETR/HTR) for national analysis, albeit without district-level breakdowns due to high sample size requirements. This approach improved feasibility, as stratifying samples for all districts would have led to impractically large sizes given the 16 districts in Sierra Leone.

Stratified random sampling was employed to ensure samples within each district accurately reflected the CHW population regarding gender and ETR/HTR status. CHWs were categorized into four lists based on these factors, and enumerators were tasked with contacting them multiple times before replacing unresponsive individuals with matched replacements.

While this method ensured representation in terms of gender and ETR/HTR status, the need for a large minimum sample size led to oversampling in smaller districts. The final sample closely matched national CHW demographics, with 36% female (compared to 34% nationally) and both groups recording 40% as HTR.

However, discrepancies were noted between registration records and self-reported data on ETR/HTR status and gender. As a result, survey responses might be less representative in districts with greater disagreement; for instance, while 40% of sampled CHWs were identified as HTR according to records, 49% self-reported as HTR.

To ensure a representative sample of CHWs, if a phone interview could not be completed after sufficient attempts, the enumerator replaced the unreachable CHW with an alternate from the same district, gender, and ETR/HTR classification. For example, if a female HTR CHW from Kambia district was unreachable, a different female HTR CHW from Kambia was contacted. The CHW population was stratified by district, gender, and ETR/HTR classification.

Measures were implemented to combat non-response. These included working through district-level officials and "fixers[3]" to make early contact with participants and their families to ensure an understanding of the purpose of the study and reason for the call, as well as making appointments to ensure availability, network coverage, and adequate phone credit.

Final sample: 1,680 CHWs (23% of total CHWs)

b. Alternatives considered

i. **Master CHW list:** Research teams attempted to obtain current lists of deployed CHWs verified by district officials, but were unable to acquire usable records. The CHW lists provided were not in the requested format, were missing requested information, and were not up to date for most districts. Given these persistent challenges, the teams opted to use the original CHW master list from the CHW pre-service training.

- **Mitigation strategies:** To account for CHW attrition and potentially inaccurate information on the master list, enumerators provided lists of replacement CHWs matched to the ETR/HTR status and gender of the sampled CHWs. A call log was utilized to give instruction on making phone calls and when to proceed to the replacement list. See instructions here.

ii. **Lot quality assurance sampling**[4] was considered as a potential approach, given the smaller sample size would be easy to replicate at low cost. The decision was made to use a representative sample at the district level for a survey, guided by the CHW Hub's recommendation for a larger sample size to boost precision and confidence in the results. This approach enhanced representativeness, allowed for more detailed questions, and was more acceptable to the Ministry of Health. However, it also required a larger sample size, resulting in higher costs and extended timelines.

c. Future recommendations

i. Balance simplicity and efficiency with the need for detailed comparisons. While the large survey sample produced a strong baseline measurement and allowed for district-level comparisons, there are additional techniques that could decrease the time and cost of implementing. For instance:

1. Only contact CHWs in a subset of districts, and repeat surveys on a rotating basis with other districts at a later date.
2. Collect responses that are nationally representative and voice district-level comparisons. For example, estimates suggest that only 139 CHWs would need to be sampled to allow for a nationally representative survey, compared to the >1,600 needed for district-level comparison.

ii. Ensure district officials review and validate the CHW list before sampling to confirm up-to-date contact and demographic information and activity status. If

[3] Note: 'fixers' were mostly active peer supervisors hired to support the enumerators to ensure targeted CHWs are reached on phone

[4] Azizi H. Lot Quality Assurance Sampling (LQAS), an Efficient and Rapid Assessment Technique in Quality Assurance and Public Health Studies. J Prev Med Hyg. 2022 Jan 31;62(4):E793-E794. doi: 10.15167/2421-4248/jpmh2021.62.4.1578. PMID: 35603248; PMCID: PMC9104662.

this is not possible, develop a guide to match missing CHWs with similar demographic replacements.

iii. To reduce non-response:
   1. Enhance enumerator training on documenting contact attempts and improve monitoring processes. While call logs provided real-time insights, variations in their use, especially near the end of implementation, limited our understanding of non-response rates. For future efforts, consider fewer enumerators conducting a smaller number of interviews for consistency in documentation.
   2. Establish a formal protocol for engaging fixers and tracking their impact on survey response rates.
   3. Explore existing platforms for managing phone surveys and replacements to reduce documentation burdens on enumerators and improve adherence to the replacement protocol. This is contingent on whether there is a budget and resources to account for this addition and whether the system is user-friendly enough for researchers and enumerators.

iv. To reduce high replacement: By the end of survey implementation, there were high rates of survey participant replacement due to challenges with the accuracy and usability of the master list. The cell phone numbers of CHWs were extracted from a mobile money listserv. However, many CHWs may not have been actively using the SIM cards associated with the list, or their phones would not be on. In the future, it is recommended that implementers develop an approach to ensure CHWs are using SIM cards associated with master lists or leverage alternative phone number methods.

2. Questionnaire

a. Design

Questionnaire framework: The questionnaire was based on the CHW AIM[5] tool commonly used in CHW program performance research and featured close-ended questions organized by domains including roles and responsibilities, equipment and supplies, supervision, incentives, and data. These domains covered a range of topics – from service provided by CHWs to equipment and supply availability and reporting practices.

Question prioritization: Prioritization of questions for each of the domains was done alongside a consultative process with the Ministry of Health and key partners. Questions were identified to assess adherence to the national CHW policy and prioritized for inclusion if there was not an existing reliable source for the information.

Questionnaire design: Initial deployment of the survey produced lessons on the future design and implementation of the survey, including the necessary training and supervision required to ensure consistency in survey administration by enumerators. Prioritization and framing of questions may need to change as the CHW program matures. Future revisions of the tool should be made in close consultation with the Ministry of Health.

[5] CHW-AIM-Updated-Program-Functionality-Matrix_Dec-2018.pdf

For a full list of learnings on question format, please see here.

b. **Domains not included:** Given time and cost, the survey was unable to ask about community access to, perception of, and experience with CHW services; CHW motivation and job satisfaction; and CHW knowledge, competency, and quality of service provision. In the future, there are low-cost community-based data collection methods that can be considered to assess these areas. No mitigation strategies were developed for CHW motivation, as it was decided that the importance of this question required a deeper understanding that the phone survey could not provide.
    i. **Prioritization of questions to assess CHW AIM domains:** The survey could not ask everything and had to prioritize questions for inclusion along the key domains. Prioritization strategies were as follows:
        1. **Roles and responsibilities**: In Sierra Leone, CHWs provide essential health services across various disease areas. The survey focused on high-priority services identified by the Ministry rather than detailed questions about their entire scope of work.
        2. **Equipment and supplies**: The survey assessed all equipment and supplies CHWs should receive, focusing on whether the equipment or supply had ever been received, whether it was currently in stock, and duration of stock-outs. Given the supply challenges in Sierra Leone, the questionnaire opted for a three-month assessment period for stock-outs and included questions on stock-out reporting and resupply protocols.
        3. **Supervision:** This section measured adherence to CHW supervision policies, ensuring the appropriate supervisors were overseeing CHWs at the correct intervals and on relevant content.
        4. **Incentives**: To address known challenges with CHW incentive disbursement, the survey collected data to supplement anecdotal reports from program managers. Inquiries were included about receipt of payments, satisfaction with incentive amount, and access for mobile money incentives.
        5. **Data**: This section included questions on timely submission of CHW registers and self-reported knowledge on correct completion of registers. Due to the phone survey format, it was not possible to review CHW registers and reporting tools in person, so this section's questions may be subject to self-report bias. To mitigate this and to factor in the subsequent steps for digital entry of CHW reports, secondary data from CHIS was used to capture actual CHW report submission rates.

c. **Future recommendations**
    i. Ensure a plan to fill gaps in data collection is aligned with government plans and resource availability. For instance, the validation tools, most district secondary data collection, and key informant interviews will not be included for recommendation in a long-term performance monitoring system given cost and time. Only CHIS secondary data collection is still recommended to continue. A more targeted sampling approach (such as only selecting high/low performing districts for

interviews specific to each domain) could be adopted for key informant interviews if budget allows.

3. Implementation

a. **Design Pre-testing:** The ICRP pre-tested the phone survey with a small sample of CHWs in rural districts to identify potential challenges. The pre-testing involved 21 CHWs from three districts (Bonthe, Falaba, and Kailahun), oversampling HTR and female CHWs. CHWs were stratified by gender and HTR/ETR status, and if a phone interview was unsuccessful after sufficient attempts, enumerators replaced the unreachable CHW with an alternate of the same profile. A response tracking sheet was created to record call attempts and outcomes.

   The main goals of the pre-testing centered on assessing the clarity and comprehension of questions, enumerator and participant experience, assessment of CHW program performance, quality of responses, time required, and response rate and willingness to engage. For a full list of learnings from pre-testing, see here.

b. **Team structure:** The research implementation plan detailed the team structure and specific roles in overseeing the data collection process. The team structure for the research implementation included a primary investigator, ICRP research lead, LMH MERL staff (including a data analyst), ICRP regional coordinators, database managers, a chief field coordinator, district coordinators, quantitative and qualitative enumerators, and fixers (who were mostly active CHW peer supervisors). Various roles were assigned with specific responsibilities, such as oversight, problem solving, and data collection. Extensive time and effort was put into data collection quality assurance by the research management team in order to ensure the research was implemented in line with the research protocol.

c. **Communication:** Implementation included developing a call log to track attempts made before replacing CHWs and hiring fixers to support enumerators in reaching targeted CHWs. Each district had four fixers to support a team of two enumerators. The effectiveness of fixers varied by district due to delayed payments and unclear guidance on their role during training. To ensure effective communication during a survey, WhatsApp groups were created at district, regional, and national levels. These groups were used to provide updates, discuss challenges, and share real-time solutions. Prior to implementation, engagement meetings were held, involving key stakeholders and planning movement for quality assurance officers. Daily debrief meetings were organized at subnational and national levels, where participants discussed call rates, challenges, and support needed.

District spotlight: Communication
The survey initially leveraged CHW Focals in each district to get actual phone numbers of CHWs ahead of data collection, but this approach was unsuccessful. As a result, in one district, enumerators mentioned that they would ask CHWs they surveyed for support in getting ahold of other CHWs on their list (e.g., asking them to spread the message to other CHWs to turn on their phones, asking CHWs to provide updated phone numbers for fellow CHWs). Other enumerators were provided phone numbers of the PHU in-charges (from the CHW Focal) and reached out to them for support in getting in contact with the CHWs in their catchment area.

d. **Management tools:** Adaptive management tools, such as a phone survey trackers and issue logs, were used to monitor data collection and identify quality assurance issues. Quality assurance visits were conducted by LMH and Ministry officers in all 16 districts, with some districts receiving two visits to address performance issues. During these visits, officers observed enumerators, provided coaching, and resolved flagged issues to ensure data quality. Overall, these communication and quality assurance efforts helped improve the effectiveness of the survey.

e. **Payment:** Interviewees were not compensated, while CHW focals were provided with a small honorarium. The ICRP coordinated payment for all data collectors, giving partial payment up front and tying final payment to completing targets. Fixers were also paid by ICRP in the districts. Quality assurance officers received an honorarium to monitor data collection. Payments were processed through mobile money, causing some delays due to not collecting mobile money numbers ahead of time.

f. **Time horizon:** Data collection for CHW phone surveys took place from February 26 to March 14, 2024, lasting 2.5 weeks instead of the planned 12 days due to unmet targets; only two districts reached their goals by the original deadline. Quantitative data analysis and visualization (for the subnational dissemination) was conducted by Last Mile Health's Senior MERL Analyst over a period of approximately two months.

g. **Costs:** The cost of implementing the phone survey can be broken down into the following two categories:
    i. **One-time setup costs**, which includes personnel costs[6], indirect costs for implementing organizations, TAG meetings, and phone survey pretesting.
    ii. **Implementation costs**, which includes enumerator training, enumerator data collection fees, phone credit top-up, fuel, quality assurance, and research management.
    iii. **Cost per CHW interviewed:**
        1. All cost drivers included: $44
        2. Data collection and enumerator training only: $30
    iv. **Total costs:**

[6] Note that this should not be included in future surveys, as it is assumed the Ministry of Health would take on these responsibilities and their salaries would presumably be covered by alternative funding sources.

Cost category	*Sum of cost category (USD)*	*Percentage of total cost*
Data collection	41,661	56%
Enumerator training	9,112	12%
Institutional review board	477	1%
Pretesting	222	<1%
Quality assurance	21,010	28%
Stakeholder meetings	1,480	2%
Grand total	**73,962**	**100%**

h. **Future recommendations**

1. **Pre-testing**: For a full list of learnings from pre-testing, see here.
2. **Team structure:**
    a. Choose fixers based on the sampled CHWs, rather than delegating selection to district staff discretion. In some cases, fixers were effective at targeted communication to CHWs via WhatsApp communication and traveling directly to CHW communities to facilitate phone calls. In others, fixers were less effective due to being selected because of their relationship with the district, rather than their supervisory relationship with sampled CHWs.
    b. Ensure that ICRP has the necessary capacity and bandwidth to deliver on commitments:
        i. Implement a rigorous enumerator screening process to ensure only qualified individuals are selected.
        ii. Ensure full-time research coordinators are present during data collection, with clear supervision plans in place.
        iii. Implement adequate financial management processes including accurate budgeting, timely payment processing, and accurate financial reporting.
        iv. Create detailed implementation plans and translate them into documents, with robust training, mentorship, and coaching provided to all staff involved.
3. **Communication**: Improve early communication with districts to ensure CHWs and fixers are well-informed and prepared for their responsibilities. Proactively address potential challenges, such as conflicting commitments during data collection, by alerting CHWs in advance through the monthly meetings with PHU in-charges.

4. **Management tools:**
    a. Strengthen quality assurance and oversight by reinforcing the observer and quality assurance role within the team and ensure robust plans for quality assurance visits to address implementation challenges proactively.
    b. Emphasize adherence to the phone survey protocol and ensure quality assurance officers have access to real-time reporting dashboards for informed decision-making.
    c. Orient regional supervisors on navigating quality assurance tools and dashboard to enhance overall quality control and data accuracy.
5. **Payment:**
    a. Provide additional mobile money top-up for communication and ensure fixers are well-oriented to their roles to enhance overall coordination and efficiency.
    b. Have a baseline of which CHWs have phones and what number they are reachable on.
6. **Time horizon:** Two weeks is standard for full data collection, though it is important to ensure time horizon is based on multiple factors, including the number of surveys to be completed, the number of available enumerators, and the length of the survey.

4. Data Quality, Cleaning, and Analysis

a. Data quality and cleaning process:

i. **Follow up in person with key informants**: Following the full implementation of the phone survey, key informant interviews were conducted with peer supervisors, PHU in-charges, CHW focal persons, and district representatives to validate CHW reports against secondary data sources. This included using demographic data and training history from earlier research on training and recruitment, along with examining supply distribution logs, payment records, supervision forms, and CHIS records (Hf4 forms) to confirm CHW responses and contextual understanding.

ii. **Validate secondary source information:** Secondary sources for validation included:
    1. District supply distribution logs for drug supply assessment.
    2. Incentive payment records for district-level payment assessments.
    3. CHIS records for evaluating service delivery data.
    4. Cross-checking CHW phone survey responses for selected supply, supervision, and data reporting questions with direct supervisors and/or district staff

iii. **Randomly select CHWs for validation:** Twelve CHWs per district who participated in the phone survey were randomly selected for district-level validation of incentive payments, CHIS records, and supervision.

iv. **Use real-time data capture tools**: Data from phone surveys was captured using KoboToolbox and Google Sheets, allowing for real-time monitoring. Enumerators were trained on these digital tools, and a tracking dashboard was updated daily to monitor progress and address technical issues swiftly.

v. **Complete quality assurance visits:** Two rounds of quality assurance visits were conducted to evaluate enumerators' performance, with poor-performing districts prioritized for follow-up visits. The quality assurance team (which included LMH and the Ministry of Health's DPHC and DPPI) monitored enumerator calls, ensuring adherence to data collection procedures and providing feedback to enhance data accuracy. They additionally supervised data collectors to ensure proper sampling methods and delivery of tools was accurate.

vi. **Complete quality assurance measures during analysis:** Standard data cleaning techniques were applied to ensure quality, including removing duplicates and invalid entries and checking for completeness. Surveys were only included in analysis if they had documented consent and confirmed data source availability. Interrelated survey questions were cross-validated for consistency.

vii. **Implement a triangulation workshop:** After data collection and initial analysis, a triangulation workshop was held to compare quantitative and qualitative data, identifying recurring themes and insights across sources.

b. **Effectiveness of process:** The two rounds of quality assurance visits were highly effective, allowing the team to identify poorly performing districts for additional support during the second round. By directly observing enumerators, the quality assurance team improved question framing, response recording, and adherence to documentation protocols, enhancing data accuracy and reliability. Timely feedback addressed issues quickly, leading to improvements in data quality.

   Using Kobo forms for data collection and Google Sheets for documenting survey attempts required extensive training and monitoring, but the investment was worthwhile, as it enabled broader team involvement and rapid quality assessment.

   Collecting secondary data helped compare CHW responses and revealed upstream challenges, such as missing or inaccurately tallied supply logs.

   Data cleaning techniques effectively prepared the dataset for analysis, reducing initial submissions from 1,746 to 1,680 valid records.

c. **Challenges:** A comparison of self-reported data from CHWs and reports from PHU in-charges and district CHW focal persons revealed varying reliability. CHWs' ETR/HTR status and individual medicines received were found to be more reliable, while the reported number of months worked and paid were less reliable. Reliability varied significantly by question and district, highlighting localized documentation effectiveness. Additionally, some CHWs reported invalid catchment data (population and households served), leading to the exclusion of these values from 14% of phone surveys. This issue may stem from incomplete community profiling, often linked to delayed payments that hinder transportation to assigned communities.

   i. **Mitigation:** Validation data was used to inform what was presented during dissemination as well as overall recommendations for improving record keeping. For example, where CHWs and supervisory staff had a different assessment of how many months the CHW had been paid for, this can be resolved by making

more on time to reduce confusion, as well as by better documenting payment methods.

d. **Analysis process:** Analysis was iterative, evolving with guidance from the Ministry of Health. Quantitative data analysis and visualization for subnational dissemination took about two months, led by Last Mile Health's Senior MERL Analyst, while qualitative analysis was conducted concurrently by ICRP and LMH staff. Descriptive analyses were generated to characterize study participants. Bivariate analyses were utilized to compare survey responses by geographic district and by key variables of interest. Multivariable regression analyses were used to further examine the relationship between geographic district and National Community Health Worker Program policy fidelity and program performance in terms of individual phone survey questions, by domain, and as a composite overall score. Qualitative data from key informant interviews provided context and enhanced understanding of potential causes of variation in district-level program performance.

In collaboration with Ministry of Health colleagues, we developed an analysis plan and scoring approach. The highest level of analysis was a composite score by domain for each district. For each domain, critical questions were scored to provide an assessment of performance based on policy standards. In addition to the highest level score by domain across districts, we also looked at detailed responses to each question (including questions that do not contribute to the scores) to provide additional context to increase understanding of scores and overall performance. The five domains contributed equally to the overall score, with a maximum of 20 points each. Scores were classified based on a scale typically used by the Ministry to measure performance: high (80-100%), medium (50-79%) or low (0-49%).

Probability weighting was considered to address the overrepresentation of smaller districts and underrepresentation of larger ones in our sample. However, it was found that the weighted results closely aligned with the unweighted results (within 1-2%), and the adjustments did not yield different insights.

For simplicity and efficiency, weighting was not applied during the production of analytic outputs for dissemination.

e. **Future recommendations**

i. **Data quality and cleaning process:**

1. Implement a hands-on approach when implementing data collection procedures, particularly for sampling and tool administration. Timely feedback ensures rapid addressing of any issues, leading to positive improvements in data quality.
2. Establish clearly documented data cleaning rules and reach an early consensus with the analysis team on which values to include. For instance, instances of CHWs reporting implausible figures – such as unusually high averages for households served or exceeding totals for population served –

should prompt a review of these values. The team should collaboratively determine which values to exclude to ensure valid results. In cases where reported data is deemed invalid, both the population and households served figures should be excluded from analysis, as they may arise from misunderstandings by CHWs, lack of information, or enumerator errors.

3. Leverage digital tools to capture data to limit open-ended responses and ensure entered data fits within allowed parameters (such as a feasible value for CHW age), which significantly limited the possibility of manual data entry errors during survey administration.
4. Collect secondary data to triangulate CHW responses and inform challenges faced by CHWs.

ii. **Analysis process:** Shorten analysis time by having an agreed-upon scoring approach and analysis plan with the Ministry of Health before the start of data collection. Prioritizing the most critical questions to include in the survey would also simplify and shorten the time needed for analysis.

5. Dissemination

a. **Outcomes:** Four regional subnational dissemination events occurred between June and July 2024, and national dissemination occurred on August 8-9, 2024. In all, the events were positively received by all stakeholders and both district and national staff demonstrated strong interest in taking lessons forward.

In all, the dissemination events culminated with clear next steps on ensuring integration of presented data into both district action plans and a quality improvement plan for the National Community Health Worker Program.

b. **Design**

i. The **subnational** dissemination events were structured around specific performance domains, and included:

1. **Overview**: Implementation standards from the 2021 CHW Policy
2. **Key findings**: Successes, challenges, and their drivers
   - **Performance scores:** Overall scores by district, categorized as low (0-49%), medium (50-79%), or high (80-100%).
   - **Data explanation:** Quantitative and qualitative insights behind domain scores.
3. **Recommendations**
4. **Group discussion and action planning**

Each district received a comprehensive fact sheet (prepared by LMH) detailing performance across five key domains, helping them identify strengths and areas for improvement. These reports highlighted specific findings across each of the five domains (such as supervisory activities and supply gaps), enabling targeted actions.

District action plans were developed with clear, actionable steps focused on areas for immediate improvement, empowering teams to enhance performance and allocate resources effectively.

ii. The **national** dissemination event was structured around presenting performance alongside key programmatic domains and drew from many different data sources including but not limited to the following: knowledge and training assessments, Project BIRCH stakeholder analysis on CHW program maturity, key informant interviews, CHW phone survey results, and CHW supervision. Recommendations from subnational discussions informed national action planning, culminating in a quality improvement plan that integrated actionable steps for the CHW program.

c. **Dissemination principles**

i. **Accessibility and contextual relevance:** Results were presented in an accessible format to facilitate informed decision-making, with ample time allocated for action planning, leading to written action plans from both subnational and national events.

ii. **Participatory approach:** Participants were carefully selected, including district health leaders, CHWs, and relevant stakeholders to ensure accurate data interpretation and action. National events involved a broader range of healthcare directorates, CHWs, and implementing partners.

iii. **Audience engagement:** Recognizing the developing data culture in Sierra Leone, efforts were made to balance positive recognition of achievements with realistic discussions on improvement areas, emphasizing the importance of skilled facilitation and clear event objectives.

Annex

a. **Learnings from question format:**

i. Population and households served: There were challenges with incomplete or illogical values in these fields. The looping format of the question (enter data on each community separately) may have been confusing. Can also include logic checks directly at time of capture (calculation to check for unrealistic value for number of people per household).

ii. It may be unnecessary to include population questions in future iterations of the phone survey because this information will be collected separately as part of upcoming development of the geomapped CHW master list in Sierra Leone. If these questions are retained for verification purposes (compared against the future master list), they should be modified and tested further with enumerators and CHWs to improve results.

iii. ETR/HTR status: Clarify the question further and ensure enumerators are trained to prompt CHWs for explanation of their designated status. Recommend separately asking what they believe their designation should be, based on the reality of their working situation. (This may be unnecessary if this classification is removed.)

iv. All demographic questions may either be removed or revised instead to verifying existing data (from the future master list). Microplanning data can also be leveraged if needed.

v. If amenable to the Ministry and acceptable within the supply chain context, the questions on malaria commodities (AL6, AL12, AL18, and AL24) could be combined into a single question (supply of different doses of artemether-lumefantrine).

vi. Recommend adding historical information on the number of referrals (by type) in survey areas to the secondary data collection. When evaluating referral information, it was difficult to set a target because the relevant burden of disease is unknown, so it was not possible to accurately assess if CHWs were performing as expected in this area.

vii. Questions that instruct the enumerator not to read the list of responses, but to ask an open-ended question and select the box(es) mentioned by the CHW: Responses to these questions were difficult to interpret due to implementation variation (e.g., some enumerators may not have followed instructions and hinted at possible answers or may not have been familiar enough with CHW duties to select the right box based on their response). If this type of question is kept, enumerators need additional training and supervision to ensure implementation consistency.

viii. Questions about past and current drug supplies: As the CHW program matures, this question series may be revised to ask the questions of greatest interest to the CHW Hub (e.g., could include questions about current stock levels).

ix. Questions about incentive payment: Similar to recommendation above. Our current question series asks about all payment since deployment. However, in the future, we would likely ask questions about payment over a more restricted timeframe (e.g., past year).

x. Question about services provided by CHWs: Enumerators may have influenced participants' responses. It was difficult for participants to recall all the services they provided over the targeted period.

STEPS FOR MAKING PHONE CALLS *** Repeat these steps for each tab (List #1 - List #4) ***	
1)	On your tablet or mobile device, open a new Kobo form, "CHW Phone Survey."
2)	On a laptop, open your contact log: Google Sheets link shared with you during training.
3)	Call the first CHW on the list. - Make a phone call to the first CHW on the list. - Confirm that you are speaking to the correct person. - Introduce yourself and ask if it is a good time to speak (explain length of survey). - Follow the instructions in the Kobo form. Provide background on the purpose of the survey, and confirm that the CHW consents to participate. - When you have finished the survey, submit the Kobo form. - Reminder: you should conduct surveys with CHWs even if they are no longer working as an active CHW.
4)	**For all contact attempts,** whether or not you complete a survey, record the following information in the contact log (Google Sheets): - **Check box:** In the column with today's date, record the number of times you called each CHW today. - **Results column**: record result of the call by choosing an option from the drop down list. If you are working from a printed the form instead, you should write one of the following options: - Survey Done - No Answer - Appointment scheduled - Phone number incorrect -- contact fixer - Unwilling or unable to participate - CHW is deceased - Survey in progress, call back to complete - As needed, write any follow up notes (such as a requested call back time)
5)	Call each remaining CHW on the list, repeating the same steps.
6)	**Go in order, do not skip around** unless you scheduled an appointment to call a CHW back at a specific time.
7)	(As needed) For any CHWs you were not able to reach, call them again. Wait at least 3-4 hours before contacting the same person, and try calling at a different time of day.
8)	(As needed) Fixer: If you have not reached a CHW after two calls, engage the fixer to help make contact with the CHW.
9)	Call the CHWs more times until you complete the required number of phone surveys.
STOP: Speak with your supervisor for approval before proceeding. Each CHW on the sample list should be contacted at least 5 times contacting anyone on the replacement list.	
10)	Proceed to the **replacement list:** - After you have contacted all sampled CHWs at least 5 times, speak to your supervisor, then move on to the replacement CHW list. - Attempt contact with each replacement CHW in the same manner as for sampled CHWs: call #1; call #2; contact fixer; call #3; call more as needed.
11)	As needed, continue to contact sample and replacement CHWs until you have completed enough surveys to meet the target listed on each tab.

b. **Learnings from pre-testing:**

i. **Clarity and comprehension of questions:** The observers reported that questions were framed clearly by the enumerators with appropriate translation and probing, resulting in good comprehension by the respondents. There were a few reported challenges with translating a few domain names and acronyms into simple language that CHWs could understand, as the enumerators were not familiar with all the terms used in the survey. Additionally, findings during data analysis indicated areas of confusion on some questions that were not identified by the observers.

- On the incentive domain in the CHW phone survey, there should be a clarifying question to establish whether CHWs have ever been paid before continuing to ask questions on the incentives. This is because some CHWs have never been paid, resulting in confusion when they were asked the number of months they've been paid.
- On the roles and responsibilities domain, CHWs could not remember all their roles and responsibilities listed on the tool. It is preferable to give hints based on the different disease areas they could not measure (e.g.,"Are you doing anything on HIV, nutrition, or TB?"). This easily reminds them of their roles in each disease area. However, any decision on hints to be provided would need to be standardized across enumerators.
- Make the introduction to each domain more descriptive to ensure participants are clear on what they will be asked about. This is especially important in domains that confused participants (e.g., equipment and supplies; supervision).
- Develop a glossary for terms that enumerators and/or respondents did not understand or which were difficult to translate to Krio. This should not be simply listing out acronyms, but describing the meaning of the term in a way the respondent would understand.
- Improve training for enumerators and their supervisors, providing ample time to practice administering and translating the tool before the start of data collection.

ii. **Enumerator and participant experience:** Observers noted enumerators were confident in administering the tools, had good control over the interviews, and were able to easily transition between questions/domains. We found that more logistical support and guidance was needed for key informant interviews: recorders for the interviews and structured note taking templates were not provided. As well, one of the district secondary tools was not aligned with the district forms and needed to be restructured. Some participants also did not have all the information needed to answer the questions readily on hand, causing delays; this suggests improved communication is needed before beginning data collection. Although respondents found the surveys to be long, they were generally eager to share their work-related experiences as they have limited opportunities to share feedback.

- Revise secondary data collection form: district supply distribution log. The current form mirrors PHU supply logs, not the district supply log. The reviewed tool should use the district stock card information of the DHMT: supply received from/issued to, quantity received, quantity issued, losses/adjustments, and stock balance.

- Inform and share the district supply log tool with the district pharmacist before the interview date to accord them time to locate documents with the data needed for the interview.
- Inform and share the incentive payment records tool (district level) with the district CHW focals before the interview date so they can collate all records.
- Develop a structured note-taking document linking questions to responses provided by key informants.
- Provide standard project recorders to all qualitative enumerators.
- Train enumerators to replace unreachable CHWs with other CHWs from their corresponding list (matched on ETR/HTR status and gender)

iii. **Assessment of CHW program performance:** The enumerators and observers found the questions to be informative, eliciting answers on different issues or current implementation of all CHW program domains. No specific feedback was provided regarding the questions that were most or least informative. There are some questions enumerators were supposed to leave open-ended (not reading out the list of options to the CHWs), but these instructions were not followed. Enumerators deviated from the instructions, reporting that CHWs were unable to respond to the options except when prompted with options. Additionally, despite the expectation that CHWs would be located in their catchment area and easily able to access documents and registers to answer survey questions, this was not the case. Questions related to data for reporting on monthly activities were not properly answered because most CHWs were not with their registers at the time of the call, which made it difficult for CHWs to give correct figures during the survey.

- The observers recommended no changes are required, as all questions were found to be important in assessing the performance of the National Community Health Worker Program. However, given the need to shorten the survey, we determined to have the questions reviewed and rated by members of the TAG to determine their level of importance and identify questions to be removed, revised, or simplified.
- Provide additional training and guidance to enumerators on how to probe for responses without directly providing the response options.
- During training, enumerators will be provided standard language to text to potential survey participants to make them aware of the upcoming call and survey. In this message, they should advise CHWs to have their registers available for the call.
- Review the instructions provided to participants before beginning the survey about the type of documents and registers that will be required. If participants do not have access to the necessary documents at the time of the call, they should reschedule. Enumerators should be well-trained to ensure the participants have the required documents before beginning the survey or interview.

iv. **Quality of responses:** Observers reported that the quality of responses provided by respondents in both the CHW survey and key informant interviews was high, as it elicited major issues related to CHW program performance. However, upon analyzing

the data, it was found that some of the CHWs' responses were inconsistent, contradictory, or not aligned with the expected responses given the national program policy. These issues may either be due to how the question was asked by the enumerator or misinterpretation by the CHW.

- Add a question that specifically asks the CHWs to indicate how many communities they work in. This will help the research team get the exact numbers of the communities they are covering to verify with the community listing they subsequently provide. Enumerators should be well-trained on how to enter data for multiple communities, instruct CHWs to provide data for each community separately, and practice this during the training.
- Provide extensive training for the contact/response sheets and entry of ID numbers from the sample listing, and undertake more supervision during the data collection to ensure all documents are completed correctly and questions are asked as instructed. This includes increasing emphasis on the importance of documentation during the training. Trainers can use mock exercises to validate data collectors' understanding of the documentation process.
- There is the need to ensure the question on the number of household visits is clear – that is, we are asking the number of households visited and not the rounds of household visits. Also, there is the need to clarify from the CHW Hub of the Ministry of Health whether antenatal, post-natal, and sick children are part of the household visits.
- Questions about whether CHWs have ever received drugs should be rephrased to say "drugs and commodities" (or "drugs or diagnostic tools").
- Check the skip logic in this section to understand whether the questions are for all CHWs or only HTR CHWs. Check whether skip logic works for 4a and 4b and whether response options for 3b match the tool in the institutional review board.
- Since drugs and supplies are a priority topic, the ICRP should train more to ensure enumerators are clearly asking CHWs about which drugs they have received.
- Train enumerators on how to prompt respondents when their responses are contradictory or inconsistent.
- Enumerators need more training to ensure they follow the protocols fully. The role of the supervisors should also be to ensure enumerators are following protocols and making corrections where this is not the case.

v. **Time required:** The average time recorded for the CHW phone survey was 49 minutes (range: 30-90 minutes). The average time required to administer each key informant interview was 55 minutes (range: 45-76 minutes) including the participant feedback questions, which added to the length. Most respondents said the survey and interviews were long (67% of CHWs) – yet, they had the patience and willingness to respond to all questions, as they were interested in sharing their experiences. Note that the experiences with these CHWs (which were among the easiest to reach by phone) may not be representative of all CHWs.

- Given that respondents felt the survey was too long, questions should be reviewed to identify possible areas to cut back. However, extensive reductions in the length

of the CHW survey and key informant interview guide may not be necessary, as participants maintained interest and willingness to participate for the full length.
    - Ensure the informed consent script provides a realistic range of the time required for participation in the survey or interview.

vi. **Response rate and willingness to engage**: Enumerators faced challenges reaching CHWs via the numbers indicated on the CHW database (numbers were switched off for long periods of time; some numbers were incorrect or only used by CHWs during the period they expect to receive their incentive). The contact tracking sheets were not correctly filled by the enumerators, which meant we did not have the expected data on which CHWs were contacted, how many calls were made, and why certain CHWs were not able to be reached. Although response tracking sheets were not completed correctly, we know which CHWs were surveyed and what number they were on the contact list. Assuming enumerators went down the list in order (which cannot be confirmed through the logs), the contact rate is estimated to be 12.6% (22 CHWs successfully interviewed among 174 CHWs contacted). Enumerators could not wait long for the sampled CHWs to turn on their phones and/or respond before moving to the replacement list given the short time for pre-testing. We expect contact rates to be higher with more detailed contact protocols and a longer timeframe for data collection for actual field implementation. Respondents who were successfully reached were willing to participate; no participants ended the survey or interview early. For key informant interviews, some DHMT staff were not in the district at the time of pre-testing, so their deputies were interviewed but were unable to provide some critical records needed as part of the interviews.
    - For the actual administration of the CHW survey, we need to verify or obtain an updated CHW database directly from the district CHW focals/M&E officers. This is key to accelerating the success of the data collection, especially concerning correct phone numbers of CHWs.
    - There should be enhanced district-level engagements to notify key actors needed for the study at the DHMTs and for them to ensure all CHWs are adequately informed about the upcoming study, including specific dates for field data collection. To ensure this is successful, all stakeholders to be engaged, including peer supervisors, should be motivated or incentivized to focus on their role in implementing the study. That is, we suggest providing incentives to peer supervisors to motivate them to focus on their fixing and coordination roles during the implementation of the study across the districts.
    - During the training of enumerators for the CHW phone survey, we need to emphasize the importance of the response tracking sheets and push data collectors to master the forms before field data collection commences in earnest. Better still, LMH can provide a sample of the filled-out form for all enumerators to see and ensure they have practical sessions to demonstrate their mastery of the tool.
    - During enumerator training, emphasize that interviews should be conducted even if the CHW is no longer active. For inactive CHWs, the survey will be much shorter but still have important questions.
    - Align data collection with expected incentive payment dates (end of the month).
    - Keep district staff informed about the data collection timelines so they are in their districts for the actual data collection.

vii. **Optimizing contact times with CHWs**: Pre-testing revealed the best time for reaching CHWs by phone, as many CHWs are involved in other daily activities, such as farming, which limits their availability and network access during the day. Morning and late evening emerged as the best times to call, allowing us to connect with CHWs before they head out to work or after they have returned from their farms. This insight allowed us to adjust our contact schedules to improve response rates.

viii. **Understanding gender dynamics in phone communications**: Pre-testing also highlighted the importance of gender dynamics in contacting CHWs. Female enumerators found it easier to communicate with female CHWs, especially in cases where married CHWs shared phones with their husbands. Male enumerators, in contrast, often encountered resistance or had to navigate additional questions when speaking with male spouses before being connected to the female CHW.