MALARIA COMMODITY ACCOUNTABILITY INITIATIVE GUIDEBOOK

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USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM
Procurement and Supply Management

PMI U.S. PRESIDENT'S MALARIA INITIATIVE
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The USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project is funded under USAID Contract No. AID-OAA-I-15-0004. GHSC-PSM connects technical solutions and proven commercial processes to promote efficient and cost-effective health supply chains worldwide. Our goal is to ensure uninterrupted supplies of health commodities to save lives and create a healthier future for all. The project purchases and delivers health commodities, offers comprehensive technical assistance to strengthen national supply chain systems, and provides global supply chain leadership.

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Acronyms

ACT	artemisinin-based combination therapy
AL	**artemether–lumefantrine**
ADR	acceptable discrepancy ratio
ASAQ	artesunate + amodiaquine
DR	discrepancy ratio
GHSC-PSM	Global Health Supply Chain Program-Procurement and Supply Management Project
HMIS	health management information system
LLIN	long-lasting insecticide-treated net
LMIS	logistics management information system
M&E	monitoring and evaluation
MCAI	Malaria Commodity Accountability Initiative
mRDT	malaria rapid diagnostic test
PMI	U.S. President's Malaria Initiative
SDP	service delivery point
SP	sulfadoxine-pyrimethamine
SPAQ	sulfadoxine-pyrimethamine amodiaquine
UOM	unit of measurement
USAID	United States Agency for International Development

Terminology

Term	Description	Examples
service data	Refers broadly to quantitative data on service provided.	While validating the service data, it was confirmed that the site had provided the service to 1,100 patients in the previous month.
consumption data	Refers broadly to any commodity utilization through dispensing, issuance, or distribution. In the Malaria Commodity Accountability Initiative (MCAI) tool, "consumption" is used as a proxy for the quantities of commodities dispensed, issued, or distributed. Users may specify the type of consumption data (dispensing, issuance, or distribution) they collected based on the actual data sources.	During the site visit, it was confirmed that the site had consumed 1,000 treatments of artemether-lumefantrine (AL) 6x2 during the previous month. This was based on its "issuance" data from the pharmacy store to the dispensary, as the dispensing data were unavailable.
dispensing	The act of a health care worker giving the prescribed medicine to a patient. Dispensing typically occurs at health facility service delivery points such as dispensaries, pharmacies, consultation rooms, or health posts for community-level services.	Based on last month's register, the healthcare workers dispensed 10,000 treatments of AL 6x4.
issuance	A supply chain actor transferring commodities to another, typically accompanied by some form of documentation. Issuance can be a subset of a distribution activity. Note that issuance often refers	The pharmacy store issued 2,000 malaria rapid diagnostic tests (mRDTs) to the dispensaries during the past three months.

	to the issuing of commodities from a "higher" level (e.g., a store/warehouse) to another (lower) level (e.g., SDP) of the supply chain and can also occur within the same facility (e.g., issuance of commodities from the pharmacy store to the dispensaries and wards or affiliated parties, such as community health workers).	
distribution	A system-wide activity that entails the planned allocation and movement of commodities, usually from a higher level to lower levels throughout the supply chain through distribution mechanisms within the system. The scope of a distribution can be the entire country's supply chain or a subset of the supply chain. The defining characteristic of a distribution is that it is planned and carried out according to an order and/or a distribution plan.	The central warehouse distributed 5,000 vials of injectable artesunate to the district warehouse in the last three months.
prescription	The clinician's order or script to a patient for treatments/medication.	A total of 500 patients were given prescriptions for AL 6x3 during the previous week at the SDP.
acceptable discrepancy ratio (ADR)	A predefined country and/or product-specific ratio representing consumption (in standard units as agreed on by the country stakeholders, e.g., AL treatments) versus service data (e.g., number of cases treated) within a stipulated period. This is a value agreed upon by the country's stakeholders before	The national malaria control program established an ADR of 1.15 (i.e., 1.15 treatments to one case) as the threshold for artemisinin-based combination therapies (ACTs). Site visit teams used this performance threshold during their desk evaluations and subsequent

	implementation of the accountability initiative exercise and is used as a standard of performance. It may be subject to periodic review by the country's stakeholders. Discrepancy ratios below 1 (e.g., 0.9) should also be investigated, as they can indicate possible challenges in data quality, program service, and/or commodity availability.	site visits to evaluate site performance.
discrepancy ratio (DR)	Compares the site's consumption versus service data for a particular commodity. This ratio is then compared to the ADR. The DR is used to help guide discussions on making improvements.	In a country where the ADR for AL is 1.2 at the SDP level, the site visit team reviewed all presentations consumed against service data and generated the DR, which is 1.6, i.e., higher than the ADR. This was then used in root-cause analysis discussions, agreed actions for improvement, and timelines for completion.
sites	Primarily **service delivery points** (SDPs) or locations where consumption and services are provided or recorded. This definition would, in most cases, refer to health facilities and community health worker outposts.	Site personnel (facility staff) worked with the site visit team to collect and validate data and support the discussion for improvement actions and timelines.

Introduction

The U.S. President's Malaria Initiative (PMI) provides lifesaving goods and services that benefit more than 700 million people every year. In fiscal year 2023 alone, PMI supported the procurement of $188 million worth of malaria-related commodities.[1]

Transparency and accountability are required at every stage in the supply chain to promote countries' rational use of these life saving commodities and ensure optimal use of available funding resources.

Reviews of data in multiple PMI-partner countries over several past years disclosed commodity accountability challenges at health facilities providing services, for instance, discrepancies between consumption and service data. Stakeholders in these countries have sought to understand the root causes of these discrepancies and develop and implement solutions. The maturity and overall health of the supply chain, along with donor and political landscapes, have been critical factors contributing to the success of the implemented interventions.

The discrepancies observed between consumption and service data have raised accountability and quality of care concerns for in-country stakeholders and international donors, prompting the questions: Are commodity funding resources being accounted for and used efficiently, and are commodities managed and used according to best practices and countries' treatment guidelines? To help PMI-partner countries answer these questions, PMI worked with the USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project to develop an accountability process, including a data collection and analysis tool, described in this guidebook. This accountability process is intended for use at the country level. The guidebook provides a general process outline that countries can adapt to suit the in-country context.

Section A of this guidebook describes a process that allows country partners to identify and address areas of concern. An easy-to-use Malaria Commodity Accountability Initiative (MCAI) tool, which calculates a **discrepancy ratio (DR)** for specific commodities and sites/service delivery points (SDPs), is at the center of the process. The DR is benchmarked against the **acceptable discrepancy ratio (ADR)**, which is a country-specific predetermined acceptable ratio between consumption and service data as reported in a targeted program (country, region, district, facility, or community). In addition to other factors, the extent of deviation between the DR and the ADR in addition to other factors will help identify facilities/regions requiring improvement actions and follow-ups. This tool builds on methodologies already implemented by some GHSC-PSM country offices.

Section B describes how to use the MCAI tool and how to collect data and enter this information into the tool for analysis. Depending on local capacity, the data can be collected from electronic systems or in paper form. The methodology is designed to be generic and easily

[1] GHSC-PSM Task Order 2 (Malaria) Annual Report Fiscal Year 2023, October 1, 2022–September 30, 2023. https://pdf.usaid.gov/pdf_docs/PA021RS9.pdf.

adaptable by countries to identify and address commodity accountability challenges. It does this by comparing consumption and service data within product categories.[2]

This effort to improve stakeholder accountability in the management of malaria commodities will contribute to progress toward the PMI 2021–2026 Strategy focus areas to "Innovate and lead" and to "Keep malaria services resilient" as follows:

Innovate and lead: This innovative accountability process and accompanying tool build on previous stakeholder efforts to increase accountability in managing malaria commodities and offer a clear, step-by-step approach that can be adapted to any country's context. Countries will be able to identify areas of their supply chain with accountability issues and then develop targeted interventions to address them. By using this tool and then implementing interventions to address the issues identified, countries can lead in addressing supply chain accountability challenges.

Keep malaria services resilient: Commodity accountability challenges can undermine effective malaria service by contributing to stockouts and poor utilization of scarce resources. Enabling country programs to identify and address these challenges keeps their services resilient and promotes efficiencies, which is particularly important in resource-limited environments.

Objectives

The MCAI process has the following primary objectives:

1. Develop a standardized commodity accountability process (or methodology), tool, and guidance that focuses on consumption and service data.
2. Ensure the process can be easily adopted and adapted across all PMI-partner countries.
3. Provide enhanced opportunities for country-led supply chain risk management for malaria commodities. Enable environments for improved accountability and data use.

[2] The product sets in ACTs, mRDTs, SP, SPAQ, long-lasting insecticide-treated nets (LLINs), chloroquine, primaquine, and injectable artesunate

This section describes the process of using the Microsoft Excel-based MCAI tool and includes guidance on involving stakeholders, collecting data using a paper-based form (if necessary), analyzing data using the tool, visiting selected health care sites, and addressing issues identified.

The methodology of this MCAI tool centers on consumption and service data.

The process focuses on collecting and analyzing data to determine discrepancy ratios (DRs) using the tool described in Section B below.

Use of the generic logistics term "consumption" in this guidebook will refer broadly to any form of commodity utilization (whether dispensed, issued, or, in some cases, distribution data when used as a proxy for commodities issued or dispensed). The term "service data" will be used in this guidebook to refer broadly to quantitative service data; hence, for the purposes of this process, consumption data are to be compared with service data when using this guidebook and associated tools.

PMI-partner countries typically collect consumption data in their logistics management information system (LMIS), while service data are typically collected in their health management information system (HMIS). These two data streams can be combined in the tool to generate DRs for each site and each month. The DRs can then be compared to the ADR to identify discrepancies at facilities. Based on these discrepancies, site teams can work with the supervisors to develop action plans, identify responsible parties, and establish timelines for improvement.

If the country's data are available centrally in the electronic LMIS and HMIS systems and are complete and of high quality, all data can be entered at the central level. If the central data are incomplete, site visits should be conducted to collect data, which will then be entered into the tool.

However, even if all the data are available at the central level, site visits remain an important part of the process to provide feedback and oversight to SDPs, local-level distributors, and others. By reviewing the facility DR between the two datasets (consumption versus service data), country teams can select and visit facilities that have DRs above or below predetermined

thresholds (the ADR). Those implementing the tool can work with the onsite team to develop continuous improvement actions for the site to implement.

DRs can also be generated for extended periods (quarters or years instead of months) or for larger geographies (regions or districts as opposed to SDPs).

The 10 Steps of the Accountability Exercise

1. Define the scope of the accountability exercise, including focus commodities and types of service data.
2. Identify and involve stakeholders.
3. Identify data sources.
4. Determine the acceptable discrepancy ratio threshold.
5. Enter centrally available data into the MCAI tool and conduct a preliminary analysis.
6. Identify sites and/or geographies of most concern (using available data).
7. Orient and train site visit teams.
8. Conduct site visits, collect data, and engage with local stakeholders.
9. Analyze data and create a report.
10. Address accountability challenges.

The order of the steps may change somewhat; for instance, stakeholders may be engaged and contribute to defining the scope of the accountability exercise (combining Steps 1 and 2). The steps relating to conducting site visits, analyzing data, and addressing challenges may happen repeatedly for different geographies or may be repeated over time as the program develops.

Step 1: Define the Scope of Accountability Exercise, Including Focus Commodities and Types of Service Data

Country teams should begin by defining the scope of the overall exercise (see Exhibit 1). The time frame, geography, team member roles, and responsibilities should be determined in advance. Based on local input and in alignment with the country's national malaria commodity guidelines, teams should select the commodities they would like to monitor for accountability. Commodities for uncomplicated and severe malaria and malaria testing are the first recommended products to be used.

At this point, the team can also consider anecdotal evidence of higher-than-normal commodity dispensing or other similar supply chain indicators that suggest discrepancy concerns. Any site's

or district's consistently measured inability to meet patient demand indicates possible accountability issues.

Exhibit 1. Possible Focus Commodities for the Accountability Exercise

Tracer Commodity Category	Tracer Commodity Example	Tracer Commodity Unit of Measure	Acceptable DR Calculation
Uncomplicated malaria	ACTs, such as artemether-lumefantrine (AL) or artesunate + amodiaquine (ASAQ) Pyronaridine-artesunate Piperaquine/ dihydroartemisinin	Blister packs	Consumption/service data (number of cases)
Diagnosis	mRDTs	Tests	Consumption/service data
Sulfadoxine-pyrimethamine (SP)	SP	Tablets	Consumption/service data
Sulfadoxine-pyrimethamine amodiaquine (SPAQ)	SPAQ	Tablets, doses, or tablets	Consumption/service data
Physical prevention	LLINs	Nets	Consumption/service data
Severe malaria	Injectable and rectal artesunate	Vials and suppositories	Consumption/service data
Primaquine	Primaquine	Tablets	Consumption/service data

Countries can use the approach presented in this handbook and adapt it for other health commodities. For example, accountability for antiretrovirals would look at HIV consumption versus the service related to HIV. The ADR and DR will still exist in this scenario, with some adjustments. To use the tool for other health commodities, these adjustments need to be made in the dataset, the bulk upload feature, and the analysis tab.

Step 2: Identify and Involve Stakeholders

The step of identifying and establishing relationships with relevant stakeholders is critical to the success of the overall accountability initiative. Some stakeholders may be involved in activities at all levels of the malaria supply chain, while others may interact only at one level.

Stakeholder involvement should be carefully considered based on the scope of the overall exercise. In most countries, six types of stakeholders act within the supply chain, each with specific roles as outlined in Exhibit 2.

Exhibit 2. Stakeholders and Examples of Roles and Activities

Types of Actors	Examples of Actors	Examples of Roles/ Activities
Extranational	The Global Fund to Fight AIDS, Tuberculosis and Malaria, World Health Organization, U.S. government, United Nations Children's Emergency Fund, Global Alliance for Vaccines and Immunization	Provides funding, support, tools, technical assistance, and commodities to commodity-related accountability activities such as those outlined in this guidebook.
Implementing partners	Both USAID- and non-USAID-funded projects or organizations (Clinton Health Access Initiative, Impact Malaria, etc.)	Implements supply chain, case management or information systems, or monitoring and evaluation (M&E) activities.
National	National Malaria Control/Elimination Program, Ministry of Health, central medical store, Pharmaceutical Services Department, HMIS/M&E Department, Community Health Department, Audit Department	Creates policies, tools, and guidelines for the accountability activities to function and also provides oversight, funding, logistics, personnel, and other material support.
Regional/district/provincial	Medical officers, pharmacists, logistics staff, regional technical advisors, M&E officers	Provides oversight (monitoring, technical assistance, supervision, coordination) to SDPs, which are responsible for direct implementation of activities.

SDP	The site in charge, pharmacy staff, data officer, nurses, and clinical staff	Provides oversight, service delivery, data collection management and reporting, commodity management.
Community	Community health workers	Provides service delivery, data collection management and reporting, commodity management.

Step 3: Identify Data Sources

Depending on the scope of the activity and the availability and quality of LMIS and HMIS data in each country, different data sources may be used to obtain the necessary consumption and service data. Exhibit 3 describes the data sources a country may choose to use depending on whether its data are completely electronic, hybrid-electronic, or paper-based.

In the first scenario, the necessary data are available entirely electronically. Required data are pulled directly from the country's central reporting systems (HMIS/LMIS or similar management information system) and manually entered into the Excel-based MCAI tool. The second scenario, hybrid-electronic, applies when data are only partially available through electronic systems. In the hybrid model, both the Excel-based tool and paper-based data collection forms will be used in the data collection phase to ensure that complete data are fed into the Excel-based MCAI tool. In the paper-based model, where there are no options for electronic data collection, it is suggested that paper-based data collection be conducted, or the bulk upload Excel template (described in Step 9 below) be used at each site. The complete data should thereafter be entered into the MCAI tool upon return to the central location. The bulk input Excel file is available to ease bulk data upload.

Exhibit 3 lists HMIS and LMIS systems as data sources; while these are preferable, they may not be available or appropriate in all countries or situations. These can be substituted with the types of systems or data available in-country that most closely match the three categories outlined below.

Exhibit 3: Data Sources

Completely Electronic	Hybrid-Electronic	Paper-Based
• Use HMIS or service data as the primary mechanism to gather service data. • Use LMIS or an equivalent system as the primary source for consumption data. • Where gaps exist in the electronic systems, collect data through site visits as needed. • Manually enter data into the provided tool. • Countries with complete electronic systems will likely use the MCAI tool as their primary tool to gather, collate, and analyze their data. Countries can also use the data collection forms, laptops, or tablets to gather the data. A country can then use the bulk upload Excel template within the accountability tool to validate data.	• Use HMIS or service data for supply levels where data are present and reliable. • Use LMIS or an equivalent system as the primary source for consumption data. • For supply chain levels lacking current and reliable electronic data, conduct site visits to gather the data. • Where data sources allow, manually enter data into the MCAI tool. Where data sources do not allow for electronic collection, use the paper-based data collection form (Annex B) or the bulk upload Excel template. • Manually enter the data from the data collection form, tablet, or laptop, or the bulk upload sheet into the MCAI tool or template within the accountability tool for further collating and analysis.	• Paper-based reports (service and logistics) submitted by the health facilities or data collected during site visits will be the primary mode of data collection. • For the data collection exercise, manually enter all data into the data collection form (Annex B), the bulk upload Excel template within the accountability tool. A laptop or tablet may also be used during site visits. • After entering all the data, use the MCAI tool for data analysis.

Step 4: Determine the Acceptable Discrepancy Ratio (ADR) Threshold

The ADR is the acceptable ratio between consumption and service data in a targeted program (in a country, region, district, facility, or community). This acceptable ratio should be predetermined by country stakeholders on a country-specific/program-specific basis (and possibly commodity category-specific basis). This ensures that the program stakeholders and all relevant parties measure and review the accountability of commodities using a standard

benchmark. This ratio can be commodity and supply-chain level-specific (see Exhibit 1 above). For instance, the consumption (for example, of ACTs) should be compared to the service data, while the number of diagnostic test kits issued should be compared to the service rendered, and the number of nets distributed should be compared to the services reached through expanded programs on immunization or antenatal care visits, or during mass distribution campaigns. Relevant country stakeholders will jointly determine and adopt this ratio, specific to their in-country contexts.

Country program context and factors that could affect the accountability of commodities within the country should be considered when determining the ADR. Major factors to be considered are the maturity of the country's data reporting or logistics system design and the availability of consumption data. For example, countries with access to consumption data may want to adopt a DR that is closer to 1:1, as a close alignment between consumption and service is expected. As the process is meant to address any form of discrepancy from the acceptable ratio, it is important to review any ratio below or above the country's ADR. Hence, discrepancy ratios below 1 (e.g., 0.9) should not be ignored but investigated, as they can indicate possible data quality, program service, and/or commodity availability challenges.

Though the ADR is an absolute fixed figure (subject to a yearly review for continued applicability), the measurement of a reporting unit's (site, district, region, state, etc.) accountability can be presented as a spectrum, where the discrepancy between the DR of the reporting unit and the ADR is used to determine an accountability profile. This will facilitate comparison across reporting units within a country and form a basis for future measurement of progress. For example, for a country whose ADR is 1.1, a DR between 1 and 1.1 might be considered acceptable. The country may then determine that a range of 1.1–1.3 is satisfactory but requires further improvement, a range of 1.31–1.5 may require closer supervision, and a DR of 1.51 and above is unacceptable and will require possible investigation. Countries may adopt a color code, such as a traffic light rating, or similar measures to categorize the spectrum ranges.

Step 5: Enter Centrally Available Data into the MCAI Tool and Conduct Preliminary Analysis

All centrally available data on consumption and service at each site for a time period should be gathered and entered into the MCAI tool (as described in Section B). The tool allows data to be ingested through a bulk upload function or manually entered for each single reporting site (usually an SDP). For a bulk upload, using the provided bulk upload template is recommended, and any conversion from tablets to treatments must be done before the upload. Once the data have been assembled, their entry should be relatively straightforward, with adequate time allocated to the upload task.

Step 6: Identify Sites and/or Geographies of Most Concern

Site selection principles follow the logic of continuous improvement of the overall site management and supply chain. An initial desk review of the available data of all sites helps to identify those that do not align with the defined ADR. Overages of this ratio represent the first warning signs of an accountability challenge at sites.

Once the data have been entered into the MCAI tool, the analysis should be run (as per Section B) to highlight the sites with the highest discrepancy between DRs and ADRs. These sites should be prioritized for site visits. The criteria for selecting the sites for visits are subject to the countries' resources and progress in performance accountability. The following criteria could be used for consideration. National programs may use additional country-specific criteria to select sites. (See below for examples.)

1. Set up a DR-related parameter for site selection (or number of sites) depending on available resources (budget, human resources, number of days for site visits, etc.). For example:

    - Select the sites with DR higher than 1:3 against an ADR of 1:1.5.
    - Select the sites with the highest discrepancies (such as the top 20 percent) from the ADR.
    - Select a fixed number of sites with the highest discrepancies from the ADR.

2. Further examples below can help to determine which sites to visit:

    - Sites with inadequate data availability through central data sources (LMIS, HMIS, or their equivalents).
    - Sites with DRs significantly above or below the ADR (pre-established threshold) for two or more (or other pre-established number) consecutive reporting periods.
    - Sites with significant fluctuations in DR in three or more past reporting periods.
    - Sites above the ratio threshold at least once in the three last reporting months: If a site has been above the acceptable ratio threshold for one month during the previous three months at the time of the initial desk review activity, then that site should be within the second prioritized target facilities pool for visits.

In addition to selecting sites with clear "discrepancy problems," as evidenced by having a DR above the ADR on the preliminary analysis, a good practice would be to include some "good" sites to the list to be visited (a percentage such as 10 percent of the number of sites to be visited may suffice). This refers to sites where preliminary data analysis shows minimal or no discrepancy from the ADR, appearing to be well-performing. Their inclusion would serve the dual purpose of identifying good practices responsible for their good performances on the accountability index, to be shared with other sites, and also potentially unveiling poor practices or challenges that their "good" results may have masked, and hence provide an opportunity to correct these practices or address the challenges.

Step 7: Orient and Train Site Visit Teams

As detailed above, the availability of data in a country will determine the scope of work for the site visit teams. If high-quality electronic data are available, the teams may visit only sites with DRs of concern, while in other settings, they will have a data collection role.

No matter what their scope of work is, properly orienting the site visit team is critical to the success of the overall malaria commodity accountability initiative. These trained site visit teams are on the front line of data collection, collation, and analysis and key to identifying abnormal commodity accountability trends, data, and practices. They help onsite staff develop practical solutions to any commodity accountability challenges identified using the form in Annex A, or within the Excel tool itself.

An outline of critical subjects for trainees to understand is provided below. Countries may decide which additional topics are needed to prepare the site visit teams. Each country's training will be based on the level of electronic data availability within the country's supply chain. Below are some skills to consider when developing site visit training protocols, including how to:

- Extract and use data from data systems (HMIS, LMIS, and others).
- Enter existing data into the MCAI tool and use the bulk input feature.
- Use laptops or tablets to collect the data.
- Conduct analyses using the MCAI tool.
- Conduct site visits for data collection using the data collection tool (Annex B) or the bulk upload form to combine all files and enter them at once.
- Conduct site visits for data review purposes.
- Work with site staff to identify root causes and develop continuous improvement plans using the form in the MCAI tool or using the paper-based form (see Annex B).
- Work with site staff to develop appropriate timelines for accomplishing targets.
- Select and train supervisors.

An example of training for supervisors:

Supervisors should receive training on how to 1) use the data collection form at the site level, 2) enter data into the MCAI tool from the data collection form and the bulk upload feature, 3) analyze data in the tool, and 4) fill out and discuss the malaria accountability action plan template (Annex A) as part of a continuous improvement strategy. The training should include practical exercises for supervisors to understand their responsibilities, identify challenges, discuss root causes and interventions, and discuss desired outcomes. Countries can explore the possibility of including a practicum visit session in facilities proximal to the

training venues. Supervisors should be trained on using the data collection form and accountability analysis tool to collect and analyze data, as well as on result interpretation for reporting and communication. Detailed instructions on using the form for data collection and the tool for analysis can be found in Section B.

When site visit teams understand these tasks, they can accomplish what is being asked for in this guidebook. Conducting a practice exercise or a pilot visit to a health facility is also recommended, where trainees can be observed conducting the various field visit requirements within the framework of the guidebook.

Step 8: Conduct Site Visits, Collect Data, and Engage With Local Stakeholders

Site visit teams should visit targeted health facilities to verify data onsite and identify factors contributing to data discrepancies. For supply chains with hybrid or paper-based data collection systems, greater emphasis should be placed on data collected during site visits. In contrast, a fully electronic data collection system will use site visits more for continuous improvement and collecting additional or missing data as needed. These activities should be carried out by trained supervisors.

Site visits: Each site visit team should be assigned a specific number of facilities. For site teams using the visit as a data-gathering exercise, the initial focus should be on gathering, but not analyzing, data for the period under review. The team can thereafter continue the activity by analyzing the data and developing agreed-upon interventions. In such cases, the team should plan to spend more time at the site. For teams visiting sites with complete data obtained at the central level, the focus will be verifying data and identifying any discrepancies.

Supervisors: A team of supervisors comprising pharmacy/supply chain, clinical/case management, and M&E/HMIS personnel should be selected from the district/regional/provincial/state and central levels. The exact constitution of the supervision team for each round of visits will depend on availability and the structure of the country's health system, recognizing that country health system workers may be supporting multiple health programs within the health system structure.

Step 9: Analyze Data and Create a Report

Outputs of the field visit and data collection will include three separate entities: data, findings, and analysis. Various stakeholders will receive varying configurations of these entities depending on their need to evaluate and use the results. During implementation of the accountability initiative, individuals will be assigned to work with different data collection and analysis processes. For example, one team member may only collect data while another team member will work with the data collected, the DR findings, and the reports during development of accountability actions. Once the full data analysis is complete, the team will be ready to present the findings and the analysis.

Data storage: All the data collected from country electronic systems or paper-based forms should be entered into the MCAI tool and then stored together in an accessible and secured location.

Findings: After the data are saved, this information is then collated and analyzed at the site. Site visit teams are to identify findings during their initial analysis. Findings are the facts as presented in the data gathered, ideally within the tool.

Examples of findings are that the DR is:

- Significantly higher than the ADR during the three previous months.
- Significantly below the ADR during the three previous months.
- Marginally above or lower than the ADR during the three previous months.

Analysis: The analyses are derived from the data and findings and are the most critical part of the reporting piece as they enable continuous improvement processes. The analyses are developed jointly between site staff and the team that visits the site. After jointly reviewing the findings, they should develop an action plan (see Annex A for a template) on what needs to be done at the site, including an appropriate timeline for accomplishing targets. The team should notify the site that this accountability initiative is a routine activity and that they should expect possible follow-up visits to ensure that the steps noted in the action plan are implemented. These visits will include reviews that mirror the original visit and provide supervision and training on accountability practices as needed.

Step 10: Address Accountability Challenges

Teams should use the data and analysis to engage with local stakeholders to develop accountability plans. The MCAI action plan template below (Exhibit 4, and also available as Annex A) can be used to record problems and solutions, along with a timeframe and a list of personnel responsible for taking action. This kind of document has been widely used for continuous improvement efforts in various sectors. For example, an analysis could reveal that the site staff are not following the prescribing guidelines for patients under 5 and are prescribing higher or lower than prescribed dosages, leading to a higher or lower DR. Based on this analysis, the team will brainstorm action steps that can be implemented, such as re-training staff on prescribing guidelines and/or introducing job aids or other guidance.

Exhibit 4. Malaria Commodity Accountability Initiative Action Plan Template

Date	Action Number	Site Name	Site Area	Problem Identified	Proposed Solution	Proposed Timeline	Responsible Party

The MCAI tool (available in Annex C) is comprised of two parts:

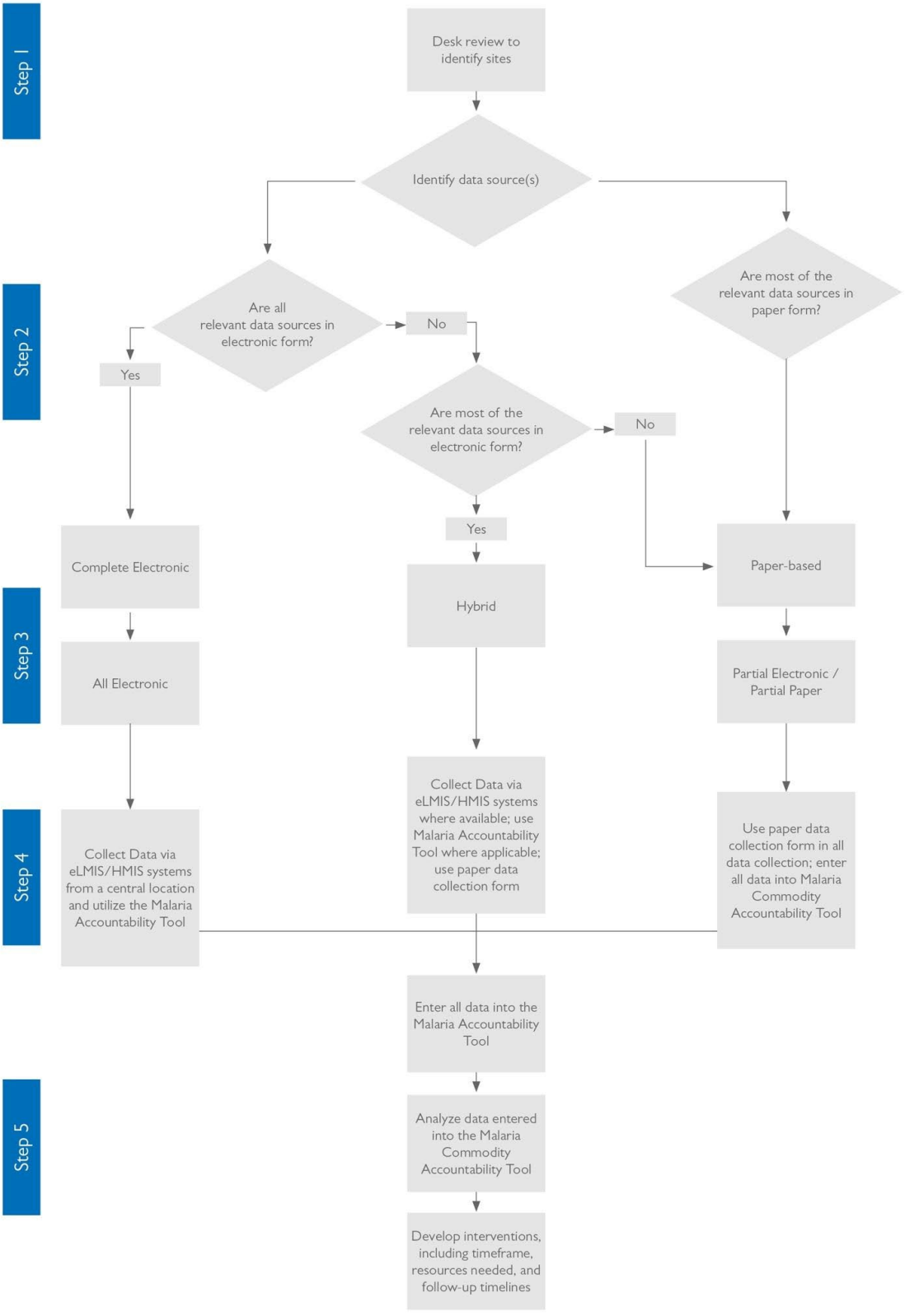
1. An Excel-based self-contained data capturing and analysis tool, which allows the entry of commodity and service data for analysis
2. An optional standalone data collection form that can be used to collect data from sites and manually transfer the data into the Excel-based tool. The bulk upload template can also be used to gather data systematically.

The Excel-based tool will be used in all settings, while the data collection form will be used only in countries where the relevant data—both commodity and service data—are not available centrally and must be collected at the site level. Each country team will assess the data availability in their setting and decide how to implement data collection and analysis (using the guidance provided in Section A above). The decision tree below (Exhibit 5) outlines the different scenarios in which each part of the tool is most effectively used.

See below a few notes about using the MCAI tool:

1. When **opening the tool, you will need to enable macros** to run on your computer to allow the tool to function.
2. The tool will work best if you follow the steps outlined below (Exhibit 5).
3. Each tab has a Return to Home Page button on the far right of the page. You can use this to navigate back to the home screen.

Exhibit 5. Malaria Accountability Tool Decision Tree (Scenarios for Using the MCAI Tool)



Central Use of the MCAI Tool Using Centrally Available Data

If a country has high-quality and complete SDP-level HMIS and LMIS data, all site data can be entered into the tool at the central level and analyzed. Use of the bulk upload template is recommended to upload all data at once. If data from sites are not readily available at the central level, then the site visit teams should gather this information when visiting the sites. Once the data have been entered, the analysis will be conducted through the internal analysis module within the MCAI tool. The option to use the bulk upload feature may save time in this scenario. Depending on findings, the analysis may lead to subsequent site visits to develop accountability plans using the malaria accountability initiative action plan template (Annex A). Site visits may also be planned to check and validate centrally available data.

Central Use of the MCAI Tool Using Data Gathered From Sites

In this scenario, the MCAI tool will be used after all the sites have been visited, data have been collected through the data collection form, and MCAI action plan templates have been filled out. Once the data collection forms or the bulk upload template have been filled out, the data collection teams at the specific site should use the MCAI action plan template to identify problems, solutions, and responsibilities.

Once all data are gathered at the designated place (SDP, district, or central level), the overall analysis will be conducted through the internal analysis module within the MCAI tool. This analysis will function as a high-level analysis of what has been collected through the site visits. All data collection forms and completed MCAI action plan templates should be stored for reference within the MCAI tool if desired.

As mentioned above, countries could also collect data at sites to validate their own electronic data collection.

Individual Site Use of the MCAI Tool

In this scenario, data are available at the central level but incomplete, and data collection and analysis occur during site visits. This means that each site will have their data in files separate from the central-level data, or they can place their data in the bulk upload template to save time for aggregation and analysis. The site visit teams will follow the steps below to collect the site's data and conduct the analysis. Once the analysis has been conducted, the site visit team should work with the site team to develop the action plan as described above in Step 10. The site visit team should include SDP staff when possible, to develop the skills laid out in this guidebook so that they can participate in the regular cadence of this exercise.

Units of Measure Used in the MCAI Tool

In this guidebook, consumption versus service data generally represent what is described in Exhibit 1. However, if a country would like to extend the use of the tool to other commodity types, the unit of measure and data sources can be adjusted as suggested in Exhibit 2 and would be interpreted accordingly. For example, when reviewing LLINs, the column titled Service Data

in the spreadsheet may instead represent clients, and the consumption would represent utilization (quantities distributed to clients) data for LLINs.

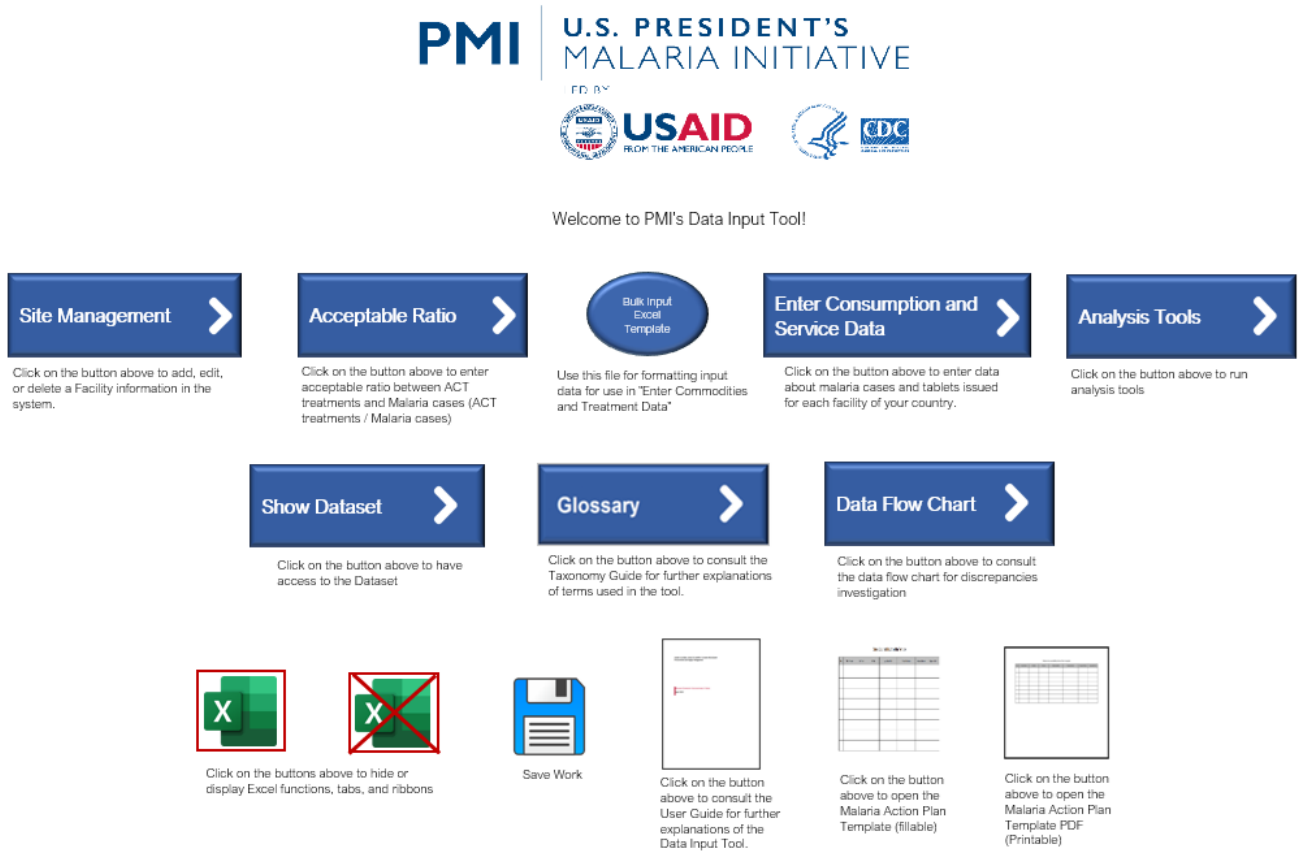
For commonly used commodities (such as AL and ASAQ), a conversion will occur within the tool for countries whose unit of measurement (UOM) is not the number of treatments. For other commodities, countries should provide their commodities-to-treatments conversion. This will enable the tool to work with the treatment conversion. Again, this is for countries and products whose UOMs are not measured in treatment conversion.

This approach can also be applied to using the tool for analyzing regional (district/state/province)-level or national-level data.

Instructions for Using the MCAI Tool

These instructions are a step-by-step guide to using the MCAI tool. Open the MCAI tool and save it with a specific file name (SDP name and date). The following screen (Exhibit 6) will then show all the modules described below.

Exhibit 6. MCAI Tool Home screen



1. **Site Management:** Record a new site and the data collector responsible for capturing consumption and service data.
2. **Acceptable Ratio:** Enter an acceptable ratio between the consumption and service data. The most likely product group will be consumption/service, although other commodity groups can also apply.
3. **Bulk Input Excel Template:** Upload all data at once without having to enter each piece individually. Note that this is not mandatory but could be helpful to facilitate quick data uploads.
4. **Enter Consumption and Services Data:** Enter data about consumption and service data for each site identified as needing a site visit. This can be an SDP, district, or central-level site. As described above and in Exhibit 2, for some items (AL, ASAQ) the tool will do the conversions during the upload process, and countries can decide to use these columns for different commodities. For other commodities, countries should provide their conversion in the tool.
5. **Analysis Tools:** Run analysis tools.
6. **Show Dataset:** Access the dataset.
7. **Glossary:** Consult for further explanation of terms.
8. **Data Flow Chart:** Consult to investigate discrepancies.
9. **User Guide:** Access the MCAI guidebook.
10. **Accountability Action Plan Template:** Site teams and supervisors, use to ensure sites are within the ADR threshold. This can also be done within the tool by clicking the MCAI Action Plan Template button in the MCAI Excel tool.
11. **Save Button:** Save your work as you go.

A more detailed description of each module is provided below.

Module 1: Site Management (Adding/Editing/Deleting)

When a site needs to be edited, added, or deleted from the network, use the Site Management button. This will ensure the site is found correctly in the dropdown boxes when the data are entered using the Enter Commodities and Treatment Data command.

After you click the Site Management button, the following window will appear:

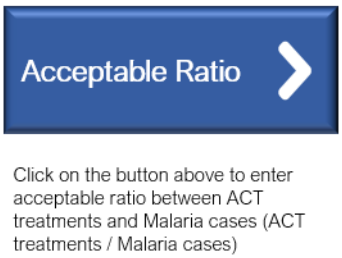
Exhibit 7. Site Management Home Screen

COUNTRY	REGION/PROVINCE/STATE	DISTRICT	FACILITY	DATA COLLECTOR 1	DATA COLLECTOR 2	DATA COLLECTOR 3
NIUE **	WEST	NEW	PHARMACY	GELF		
NIUE **	WEST	NEW	OTHER PHARMACY	JOSE		
NIUE **	CENTRAL	NEW	THIRD PHARMACY	HERMES		
NIUE **	WEST	NEW	PHARMACY	STEVE		
NIUE **	WEST	NEW	OTHER PHARMACY	JOHN		
NIUE **	CENTRAL	NEW	THIRD PHARMACY	ISRAEL	AA	BB
NIUE **	SOUTH	NEW	PHARMACY	ELIZABETH	CC	DD
NIUE **	SOUTH	NEW	OTHER PHARMACY	TIM		

In this module, you can record a new site, edit existing information, or delete it altogether.

1. To add a new site, fill in each column with the necessary information. First, select the country from a dropdown list in the Country column. Then, type in the district and site. Finally, indicate the data collector responsible for collecting the data for the site. Since each site may have multiple data collectors, multiple fields are provided for including data collector names.
2. If you need to edit existing site information, you can re-type the information in each column field (e.g., country, site, district, data collector name).
3. If you need to delete a site, you can select the relevant row and then delete it entirely.

Module 2: Acceptable Discrepancy Ratio



This section allows you to enter the ADRs that stakeholders have selected, as shown in Exhibit 8.

Exhibit 8. Established Country-level ADR

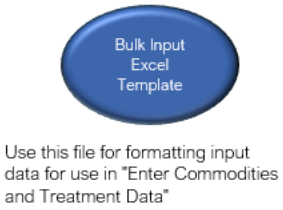
Commodity	ActAcceptableRatio
ACT	1.15
mRDT	1.15
LLIN	1.15
Severe Malaria	1.15
Other	1.2

Return to Home Page

Note: Acceptable ratio should be defined by authorized personnel of each country

See Determine the ADR Threshold section (Step 4, p. 13).

Module 3: Bulk Input Excel Template



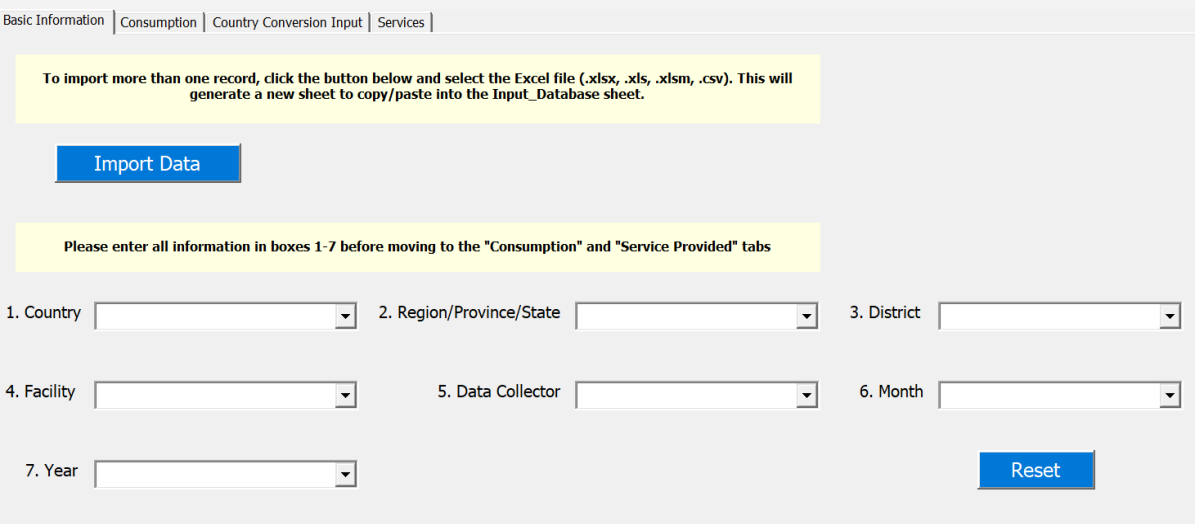
This button brings you to the bulk input Excel template. Using this file will save time in data entry. As a recommendation, ensure the columns are in the same structure as in the dataset in the MCAI tool. To use this bulk input feature, click on the bulk input Excel template button. With the input file, you can enter data exactly as presented in the tool. When all data have been entered, the file can be saved to the local machine. Next, use the Import Data button in Module 4 to use the data from the bulk input Excel template. Once this input is processed, the tool will produce a Temp file from which the data can be extracted for final input. Although using the bulk upload form when using the bulk input function is not mandatory, it has proved to be more efficient in uploading data into the MCAI tool. Note that, if the UOM is in terms of tablets, it needs to be translated into treatments before entering into the bulk upload file.

Module 4: Enter Consumption and Services Data

The data collector is responsible for gathering data on the appropriate commodity and service. These data points are entered into the MCAI tool by clicking the Enter Commodities and Treatment Data button:

The button will open up the data entry form shown in Exhibit 9.

Exhibit 9. The Data Entry Form to Enter Commodities and Treatment Data

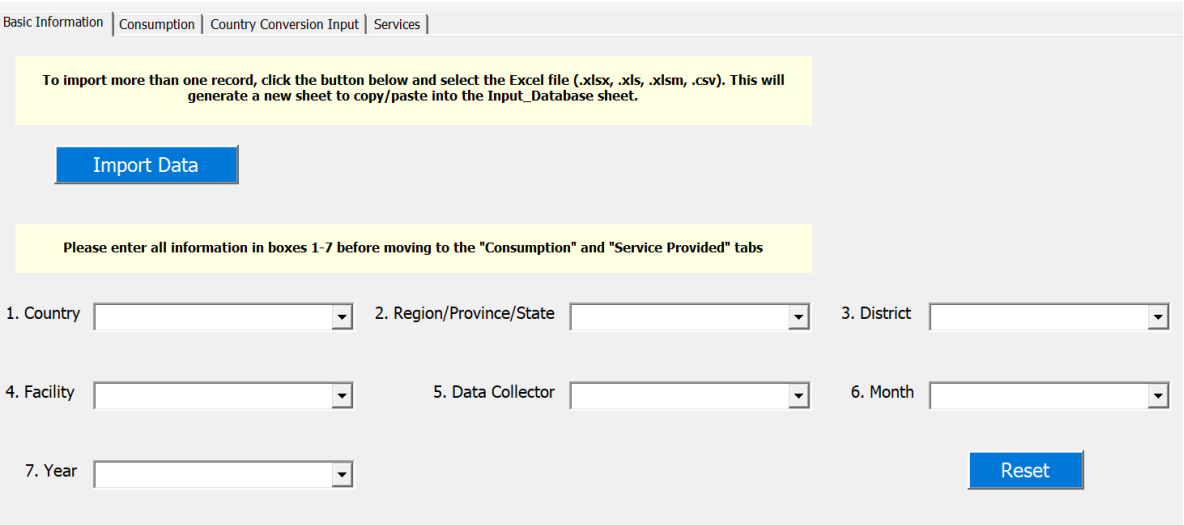


As shown in Exhibit 9, the data entry form has four tabs:

- Basic Information
- Consumption
- Country Conversion Input
- Service

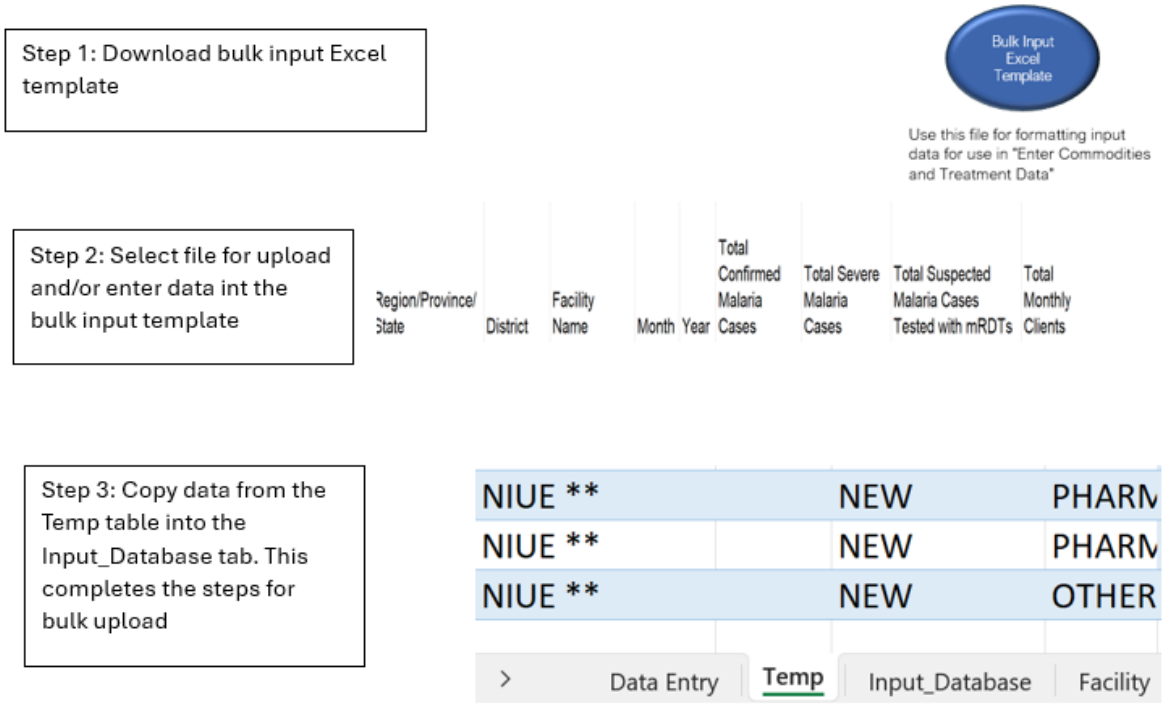
In the Basic Information tab, you can input several pieces of information by selecting from a dropdown menu for Country, Region/Province/State, District, Facility, and Data Collector. Finally, in data entry boxes numbered 6 and 7, you can type the month and year of the timeframe under review, respectively. This screen also includes the Import Data button (Exhibit 10). Alongside the bulk Excel input template, this tab will provide the opportunity to bulk input data.

Exhibit 10. Import Data Button



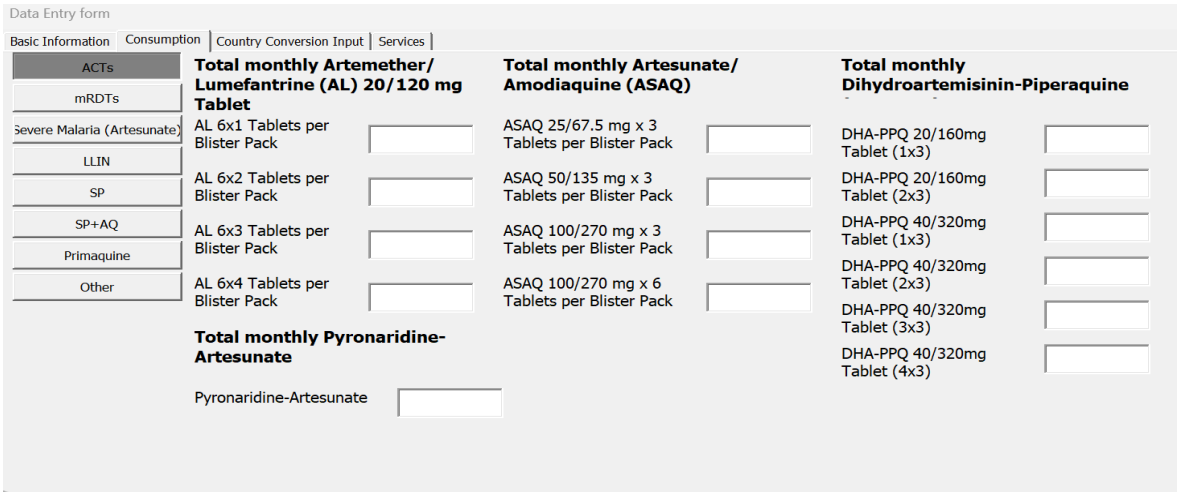
Once the import screen is selected, you will need to find the appropriate file to upload. Depending on the file size, the upload process may take several minutes. Uploaded data will then go to a Temp (2) tab. This is the bulk upload file that you can then upload directly into the dataset section. Steps of this process are outlined in Exhibit 11.

Exhibit 11. Temp (2) Tab with Instructions to Use Bulk Upload File



If you do not use the bulk input, you will need to use direct data entry to populate the information on the remaining screens. Once all the information in the Basic Information tab is filled in, you can proceed to the second tab, Monthly Commodity. See Exhibit 12 for an overview of this tab and a description of its main components. Each box is designed to enter the consumption, for example, the number of AL 6x1 or mRDT number (see Exhibit 1 for more examples) during the specific timeframe. Once all information is filled in and there is no need to fill out the Country Conversion piece of the tool, you can proceed with the fourth tab about malaria monthly cases.

Exhibit 12: Non-Bulk Upload Consumption Data Entry Screen



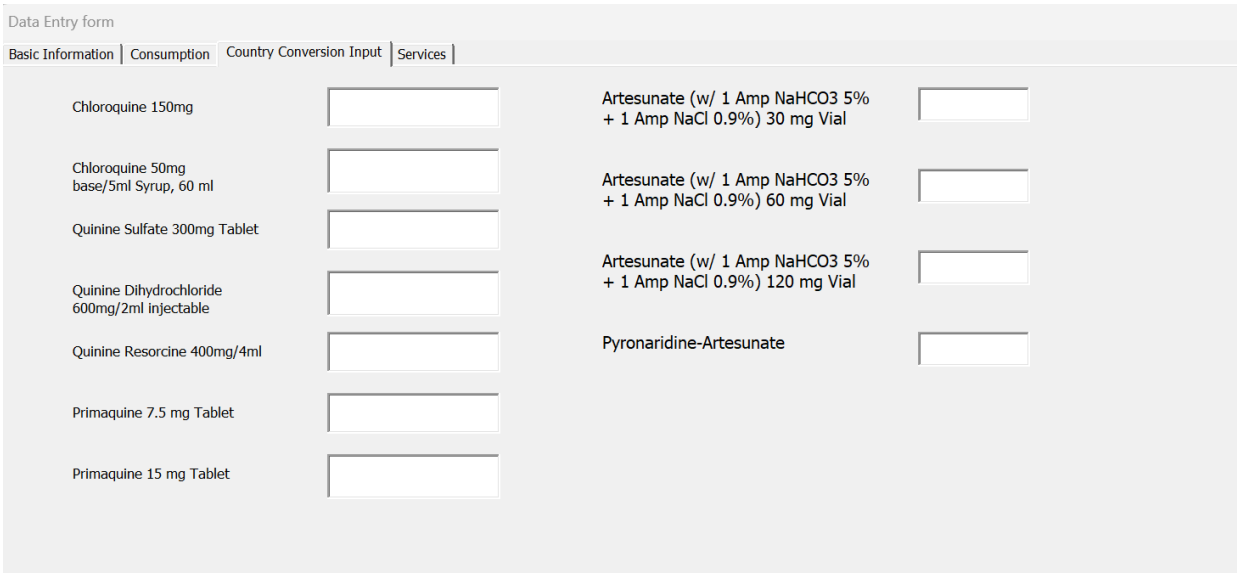
Use the paper-based commodity input forms (or entering directly into entry using a laptop interface) to enter the information related to commodity consumption according to product category (i.e., left menu listing the commodity in the above Exhibit 9). Alternatively, if the bulk upload feature is being used, all collected data can be migrated to the upload template.

Note that figures provided in this tab should be for monthly-based data (the month is selected in the first tab) and boxes can be left blank. Furthermore, users should enter commodity treatments. If the country's UOM is not presented in treatments for certain products (AL and ASAQ), the tool will make the conversion. Alternatively, you can do the conversion before data entry or use the Country Conversion Input tab (see below) for select commodities.

If you choose not to use the bulk input feature, you will need to use direct data entry to populate the information on the remaining screens. Once all information is filled in, you can proceed with the fourth tab on the provided service.

The country conversion table (Exhibit 13) is used for countries whose product UOM is not measured in treatments. If countries do not have a dataset built on treatments, they can use the bulk upload feature but with some modifications to the dataset that is generated. For example, the entered data needs to be equivalent to treatments as the UOM; otherwise, the bulk upload will not produce usable data.

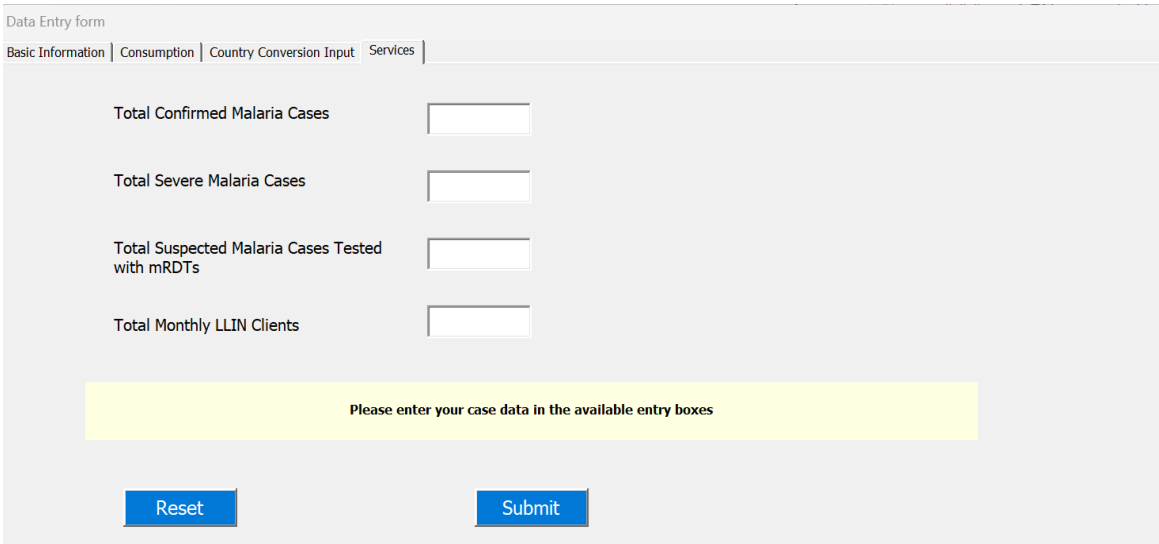
Exhibit 13: Conversion Table for Products with Different UOMs



If the bulk upload feature is not used, then each box should be populated with the appropriate conversion factor for each commodity. Each country will need to populate the respective fields according to their respective national guidelines, with the number of tables, vials, or other commodities that constitute a single dose/course within that country's context. For example, if a country chooses to assume three vials of artesunate injectable 30 mg per treatment, the country will manually enter three vials per treatment in the box. This means that the workbook will assume that for artesunate injectable 30 mg, one treatment equals three vials on any data from this product. As a reminder, conversion factors can differ between countries, so you need to ensure that the value entered is specific to the country.

The last tab (Exhibit 14) is used to enter the data for services provided.

Exhibit 14: Data Entry Screen for Services Provided



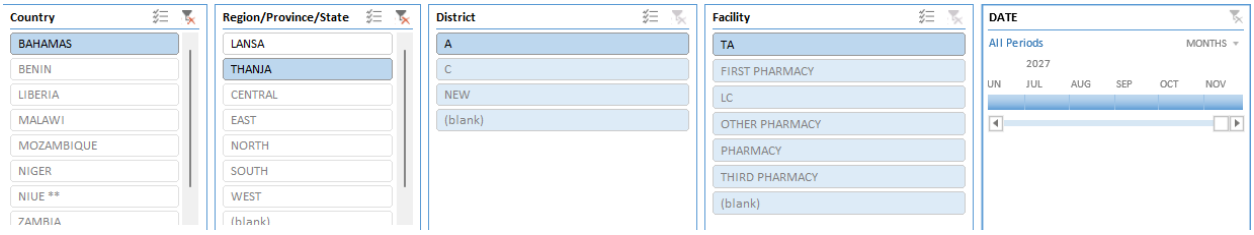
If manually entering data, once the data points are entered in all tabs, you can record the information by clicking on the Submit button. Otherwise, if you want to delete and clear the data entry form, you can click the Reset button.

Module 5: Analysis Tools

Click on the button above to run analysis tools

1. By clicking on the Analysis Tools button on the main screen, you can run seven built-in analyses (see #4 below) for malaria service, commodity, and consumption data. All seven analyses have five slicers enabled (as shown below in Exhibit 15), allowing you to customize data output. You can select multiple items within slicers by selecting boxes while pressing and holding the Ctrl key on the keyboard.

Exhibit 15. Analysis Options



2. Within each analysis, you can find a corresponding graph and data table under the graph (see Exhibit 16 and Exhibit 17 below).

Exhibit 16. Sample Analysis Chart

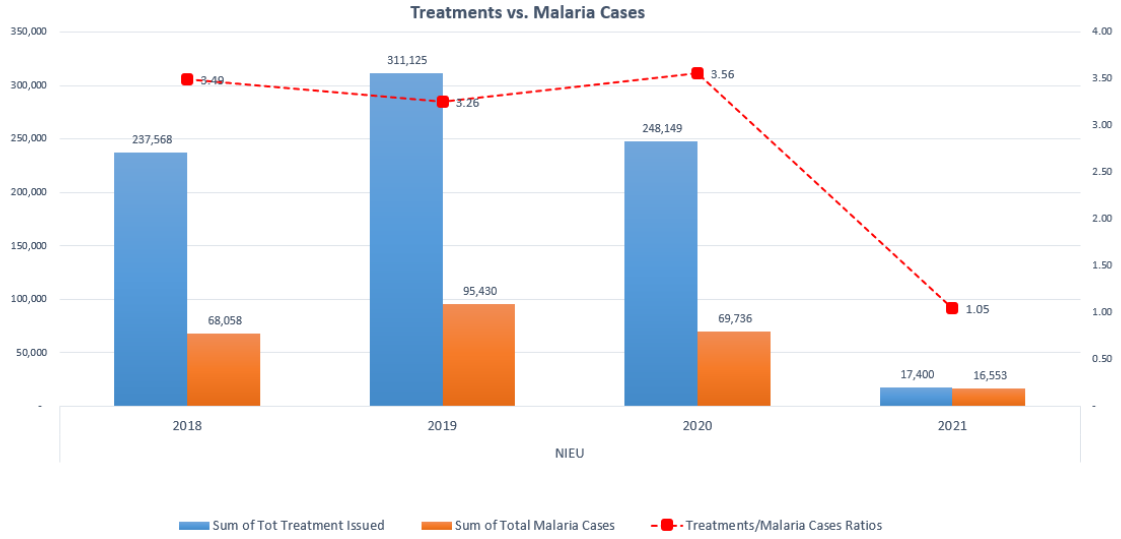


Exhibit 17. Sample Table of Analysis Results

Row Labels	Sum of Tot Treatment Issued	Sum of Total Malaria Cases	Treatments/Malaria Cases Ratios
⊟NIEU	814,242	249,777	3.26
⊞2018	237,568	68,058	3.49
⊞2019	311,125	95,430	3.26
⊞2020	248,149	69,736	3.56
⊞2021	17,400	16,553	1.05
Grand Total	814,242	249,777	3.26

3. Click the plus sign (⊞) in front of each year to view more details. The workbook graph within the Analysis tab of the MCAI tool will also reflect the expansion.

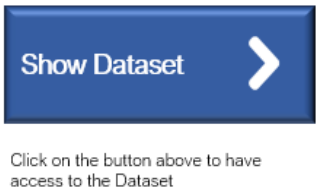
4. Commodities: With these analyses, you can analyze the total and breakdown of commodities. Seven analysis tables are provided in this tool:

    - Total malaria cases
    - Total monthly treatments issued
    - Total monthly ACTs consumed/total service data
    - Total monthly treatments/total malaria service data
    - Severe malaria products consumed/severe malaria service data
    - Total monthly malaria cases/total suspected malaria cases tested with mRDTs
    - Total monthly LLINs distributed/total monthly LLIN clients

5. Reset button: The analysis tables have a reset button that lets you quickly reset data analysis to the beginning when needed.

Attention: The overage between the DR between consumption and service data is a key indicator requiring further investigation.

Module 6: Show Dataset



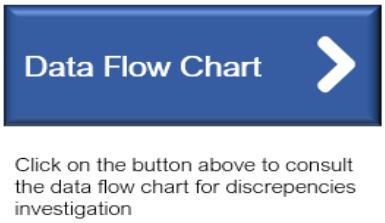
By clicking on the Show Dataset button, you can access the database and analyze consumption data alongside service data.

Module 7: Glossary

By clicking on the seventh button, Glossary, you can clarify terminology relating to commodities, data collection points, actions within the supply chain, etc. This module aims to provide a top-level vocabulary for the words and terms used in this application to ensure the MCAI tool is replicable across different countries. The Glossary includes four major columns.

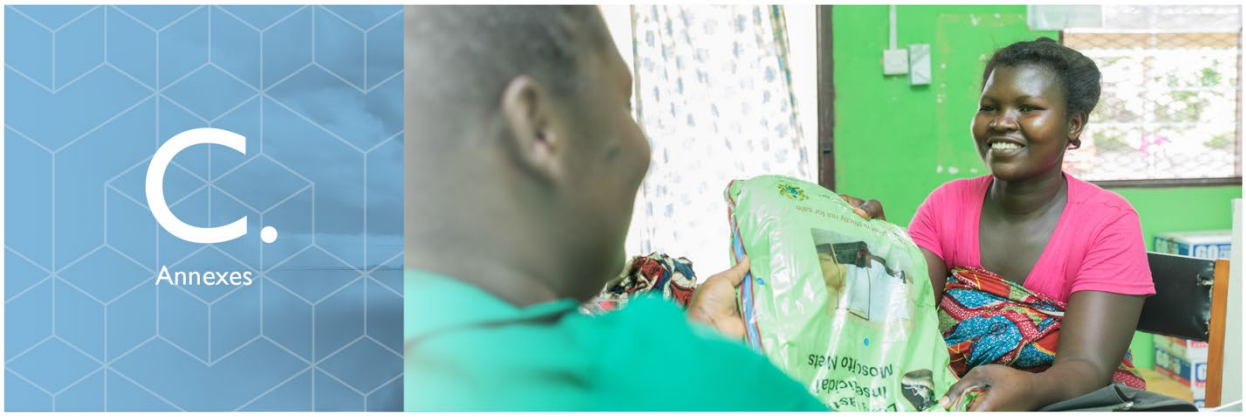
1. **Term:** The vocabulary within these modules that the governance body needs to define or clarify for users.
2. **Description:** Brief expressions that have a precise meaning when used for commodities and service data.
3. **Example:** Real-life examples of how the vocabulary should be used in particular contexts or countries.
4. **Common Mistakes:** Common vocabulary mistakes seen when undertaking the accountability exercise.

Module 8: Data Flow Chart



This feature is strongly recommended but optional to conduct the analysis or to fully use the tool. By clicking on the Data Flow Chart module, you can visualize how data flows through the in-country supply chain and how it is used to calculate the DR. Authorized users should copy and paste the data map/flow chart (e.g., a supply chain map) image under the red arrow in the Data Flow Chart tab (Exhibit 18). The chart allows you to easily identify the area of the supply chain from which you gathered data.

Exhibit 18. Data Flow Chart Map



Annex A: Malaria Accountability Initiative Action Plan Template

Annex B: Data Collection Form

Annex C: Malaria Commodity Accountability Initiative Tool