

A Guide for Developing Data Dictionaries to Streamline Data Analysis, Use, and Interpretation

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PMI Measure Malaria

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ABBREVIATIONS

DHIS2	District Health Information Software, version 2
DRC	Democratic Republic of the Congo
HMIS	health management information system
IDSR	integrated disease surveillance and response
NHIS	national health information system
NMCP	national malaria control program
PMI	President's Malaria Initiative
PMM	PMI Measure Malaria
RDT	rapid diagnostic test

SME surveillance, monitoring, and evaluation

BACKGROUND

Appropriate analysis and interpretation of malaria indicators from routine health information systems require an understanding of how these indicators are generated. Although the District Health Information Software, version 2 (DHIS2) platform includes, as backend information, a dictionary of data elements, indicators, and formulas, this information is not always accessible to the end user. There is a need to better document how reported indicators are derived, including sources of data elements (e.g., which routine systems are involved, if the source includes both inpatient and outpatient data, etc.) and the number of facilities reporting each indicator. Moreover, some countries' DHIS2 includes historic data elements and indicators that are obsolete, rarely used, or erroneous, contributing to confusion and errors in data analysis and use of information for decision making. Furthermore, the World Health Organization/Global Malaria Programme established a process for installing the World Health Organization/Global Malaria Programme malaria module (standard dashboards to facilitate data analysis) in countries, which includes malaria data mapping. However, no specific detailed guidance exists on how countries can extract or develop and regularly update a malaria data dictionary.

PURPOSE AND OBJECTIVES

The guide will support the U.S. President's Malaria Initiative (PMI) Measure Malaria (PMM) countries to create, own, and implement a standardized process of developing, maintaining, and updating a country-specific data dictionary. The process will include defining, reviewing, revising, and updating (as needed) the routine health information system data structure, indicators, data elements, and points of disaggregation. This guide will clarify the processes and protocols for creating a new data dictionary or updating an existing one and supporting its accessibility to a broad spectrum of users at national, subnational, and facility levels. The data dictionary will have the following objectives:

- 1. Serve as a reference resource for PMM countries to ensure consistency in what is measured, harmonization of calculation approaches, and operationalization of indicators.
- 2. Enable all data users to have a shared and precise understanding of the following:
 - Data elements: their definitions, frequency of collection, and source of information
 - Disaggregation of data elements and ability to compare them across datasets and over time
 - Indicators: their definitions and method of calculation, including numerators and denominators
- 3. Provide guidance for treating and referencing historical data.
- 4. Provide guidance on naming conventions for metadata revisions.

METHODOLOGY

Implementing this guide will enable PMM countries to revise and update their health management information systems (HMIS), including routine systems/DHIS2 and surveillance systems, among others, and to ensure that the right¹ data are captured and comprehensively defined. It will take stakeholders through a process of:

- Identifying indicators and data elements that are most appropriate for use, standardization, and synchronization across systems and datasets
- Treating and referencing historical data elements and indicators

Engagement Process

Applying this guide to the development or update of a data dictionary is meant to be a collaborative process with key stakeholders.

Identify and Engage Key Stakeholders

The entity that initiates the process (e.g., national malaria control program [NMCP] or HMIS data manager) should follow these steps to engage key stakeholders.

First, identify and engage key stakeholders. These parties must include departments that report data to and use data from routine health information systems such as the HMIS department, the NMCP, the integrated disease surveillance and response (IDSR) program, the vital statistics team from the Civil Registration and Vital Statistics office or bureau, the Maternal and Child Health department (or antenatal care department if separate), and the HIV/AIDS program.

Next, schedule an initial kickoff meeting with key stakeholders to discuss the need to develop a data dictionary (or to update an existing one) and agree on a process for implementing this guide. Consider making this a half-day meeting to ensure adequate discussion and to gain buy-in from all parties involved. The following are suggested points to cover in this meeting:

- Review the objectives of the guide.
- Discuss collective needs from the data dictionary.
- Agree on the approach (creating a data dictionary or updating an existing one).
- Nominate the working group that will lead the development (or revision) of the data dictionary (as outlined in the Technical Process section). For efficiency, we advise keeping this group to three to five people.

¹ Data elements and indicators agreed upon by national stakeholders as those needed to align with global indicators and make appropriate policy and programmatic decisions.

Hold Technical Workshop and Finalize the Data Dictionary

The members of the working group should hold a workshop to cover the technical process of the data dictionary. We suggest dedicating one working week for this workshop, although completing the process may take longer depending on the specific country context.

After the technical working group has developed a draft of the data dictionary, schedule a meeting with key stakeholders who participated in the kickoff to present the data dictionary and solicit their feedback.

The working group should then use this feedback to finalize the data dictionary. It is important to note that the data dictionary is ultimately a working document that countries should plan to review and update periodically. More information about periodic review and updates is provided in the next section.

Technical Process

The following are proposed steps for developing a data dictionary, which are also applicable to countries updating an existing one. The technical process of developing or updating a data dictionary can be limited to malaria data or broadened to include additional intervention areas agreed upon by key stakeholders. If including data from other diseases, expand the steps in the technical process accordingly.

Throughout this section, we will use the Democratic Republic of the Congo's (DRC) DHIS2 data to showcase the different steps as illustrated in Tables 1, 2, and 3.

How to Develop a Data Dictionary

- 1. Identify routine data reporting systems.
- 2. Identify data elements that are reported in multiple systems and map those that are not.
- 3. Identify, map, and define data elements used to define each indicator.
- 4. Define what information should be displayed in the data dictionary.
- 5. Indicate how to store and treat historical data.
- 6. Indicate how to review and interpret historical data.
- 7. Provide guidance on how to document changes to the system.
- 8. Repeat for each system.

The DRC is one of the PMM countries that, in the last quarter of 2022, created a data dictionary and implemented this guide. We provide more information about their engagement and technical process in the Appendix.

Step 1: Identify routine data reporting systems.

Identify which routine data reporting systems capture malaria data. These may include but are not limited to the monthly routine reporting system, parallel or malaria-specific surveillance system, and the weekly IDSR reports.

After the team has identified the reporting systems, identify the electronic data storage and transmission platforms and gather the data collection tools (e.g., registers), reporting tools (e.g., monthly reports), and supporting documentation (e.g., manuals) for each system.

As applicable, identify the key datasets for each of these routine reporting systems (e.g., program management).

Finally, review the indicators that are reported in each platform. Table 1 shows a suggested method of recording the reporting systems, platforms, and indicators. It can also be used for Steps 2 and 3.

Reporting System	DHIS2				
Transmission Platform	Archive: Aggregated data (2014–2016)				
	Production: Aggregated data (2016–Present)				
	Tracker: Individual level data (malaria entomological data, death data)				
Data Reporting Tool	Weekly epidemiological report				
	Sentinel sites				
	Monthly national health information system (NHIS) report				
Data Collection Tool	Curative registers, antenatal care registers, monthly NHIS forms				
Indicator Name/ID	Completion rate basic services report				
	Completeness of malaria data in reports				
	Rapid diagnostic test (RDT) positivity rate				
	Proportional mortality due to malaria				
	Malaria incidence: cases of malaria per 1,000 people				

Table 1. Reporting system mapping

Step 2: Identify data elements that are reported by multiple routine systems, and map those that are not.

Next, identify which malaria data elements are reported from multiple routine systems (e.g., monthly routine reporting such as the DHIS2 and weekly IDSR reports), if any. Do this by simply listing the data elements and note which systems they are reported across.

In addition to defining which data elements, to ensure consistency and comparability, the working group should indicate each data element's parameters; which may include the following:

- Identifier (ID or code)
- Name/definition
- Disaggregation group (e.g., sex, age)
- Data collection source (e.g., forms, registers)
- Frequency of collection (e.g., monthly, weekly)
- Used to calculate what indicators
- Year of last use
- Whether reported in inpatient or outpatient register

Table 2 provides a potential method for this. It can also be performed in a separate spreadsheet with each reporting platform as a column, under which each malaria data element captured is listed. Note that the focus of this step is to understand which data are reported from each system into the DHIS2 platform. The next step defines the data elements needed for each indicator. It is possible that different data elements will be identified in Steps 2 and 3, and this will be important in informing decisions made in Step 4.

Table 2. Data element mapping

			Reporting System Populate the columns with the platforms identified in Table 1, then mark with an "X" in which reporting platform each data element is captured. This will show what is integrated or synced.			Disaggregation	
Data Element ID/Code and Name	Data Element Definition	Data Collection Source	Monthly National Health Information System Report	Weekly Epidemiological Report	Sentinel Sites	Group (e.g., sex, age, pregnancy status)	Year of Last Use
A1.4. Suspected Case	Person with a fever or a history of fever (≥99.5° F) in the last 48 hours, with or without signs of severity	Consultation form and curative consultation register	X			By age (<5 and 5+)	2022
A1.4. Rapid diagnostic test (RDT) Realized	Suspect cases tested with rapid diagnostic test for malaria	Consultation form, curative consultation register, and laboratory register	Х			By age (<5 and 5+)	2022
A1.4. Positive RDT	Suspected cases confirmed by rapid diagnostic test for malaria	Consultation form, curative consultation register, and laboratory register	Х			By age (<5 and 5+)	2022
A2.2. Antenatal Consultation 1 ANC 1)	A pregnant woman's first visit to a health care facility, ideally during the first trimester of the pregnancy	ANC form and register	X			N/A	2022
C1.12.1. Artesunate g50mg, 200mg and 400mg) Suppository (available stock)	The amount of artesunate (50mg, 200mg, and 400mg) suppository physically in stock and which can be used	Stock sheets, inventory, and delivery note	X			N/A	2022

Step 3: Identify, map, and define data elements that are used to calculate each indicator.

From the list of indicators identified in Step 1 (those reported in each platform and dataset), identify which data elements are used to calculate each indicator and how each data element is derived. For example, the number of confirmed malaria cases may be reported in weekly IDSR reports and in monthly DHIS2 routine reports, may be collected in both the outpatient register and inpatient register, and may be disaggregated by pregnancy status or age.

Specify the numerator and denominator for each indicator. If the denominator is not a data element collected in a register, specify the source. This is especially important for fever cases, suspected malaria cases, and severe malaria cases.

If possible, identify when each indicator and potentially each data element was last used for decision making by subnational or national malaria program managers or reported at the national level to estimate malaria burden. We suggest indicating the year of last use. This will inform Step 5.

Table 3 illustrates how indicators can be mapped. In the DRC's country example, to facilitate all end users' comprehension of reported indicators, stakeholders decided not to include data element information and additional parameters in the final list (in greyed columns).

Table 3. Indicator mapping

	Indiactor				Period (weekly, monthly	Zoro Significant	Disaggregation Group	Voor of Loot
Indicator Name	Definition	Numerator	Denominator	Data Elements	yearly, other)	Y/N	status)	Use
Completion rate basic services report	Basic services module reports versus expected basic services module reports	A-Basic services— actual reports	A-Basic services— expected reports					
Completeness of malaria data in reports	Reports with all malaria data elements completed versus all expected malaria data elements	Reports submitted with complete values (which are not missing data element values)	Expected malaria data elements					
Rapid diagnostic test (RDT) positivity rate	RDT positive cases versus all cases tested	A1.4. RDT positive + B10.2. Of which positive— fever cases	A1.4. RDT performed + B10.2. RDT performed— fever cases					
Proportional mortality due to malaria	Deaths attributed to malaria among all reported deaths	B7.2. Severe malaria–death + D9.6 Malaria deaths	Sum of deaths from all causes, including malaria					
Malaria incidence: cases of malaria per 1,000 people	Confirmed malaria cases as a proportion of the total population	A1.4. Confirmed simple malaria + B10.2. Of which positive -fever cases	Population of the health zone					

Step 4: Define what information should be displayed in the data dictionary.

After the working group has identified indicators, data elements, and sources of malaria data that are currently in the routine reporting system (e.g., DHIS2), they can determine which data elements and indicators should be displayed in the country data dictionary.

Step 5: Indicate how to store and treat historical data.

You now have a record of all data elements collected from routine reporting systems and the indicators calculated and reported from these data elements over time. Those that the working group decided not to display in the data dictionary are likely those that should be archived as historical. Review these and indicate which indicators are no longer used by recording the following:

- Indicator ID or code
- Indicator name
- Definition
- Data elements
- Disaggregation group
- Datasets
- Date (year) it stopped being used
- Reasons for discontinuing use

The working group should next decide where and how these historical data should be archived. When making these decisions, consider future accessibility so users can refer to the archived data as needed to understand trends over time. We suggest archiving these data electronically (although this may require additional electronic data entry) and ensuring that these electronic records are backed up and maintained. If data are archived because new data elements or indicators have since replaced them, this should be noted in the data dictionary for the "new" data element or indicator so users can refer to the corresponding historical data as needed (see Step 6).

There is no single correct way to archive and store historical data, and this process may need to be reviewed and refined over time based on your country-specific context and experience interpreting data trends.

Step 6: Indicate how to review and interpret historical data.

Each time datasets, indicators, or data elements—and consequently the data dictionary—are updated, corresponding guidance is needed for comparing data over time. Any change should be documented, as outlined in Step 5.

When data elements or indicators that have recently changed or are being used to examine trends over a period of time in which indicator definitions (data elements, calculation) have varied, it is critical to note these changes or differences—such as new numerators or denominators—when reporting the indicator values and trends. Assumptions that are made about comparability should also be specified when reporting and they should be documented with any program or policy decisions that are made based on changes in indicator values or trends over time. For example, the definition of malaria case incidence rate has likely changed over time in many countries. This indicator is typically defined as the number of malaria cases per 1,000 population at risk. In the first World Malaria Report, published in 2005, few African countries were collecting and reporting laboratory confirmation of malaria cases. The number of malaria cases used to calculate malaria case incidence was consequently based on the number of suspected malaria cases (or number of fever cases) from multiple countries. Most countries now report the number of confirmed malaria cases (by RDT or microscopy) to inform the measure of malaria case incidence. Furthermore, the denominator has shifted over time as malaria transmission has become more heterogeneous globally. It is important to understand the change from using number of fever cases to the number of confirmed malaria, so that incidence rate is likely overestimated, and this information is important for programmatic decisionmakers.

Step 7: Provide guidance on how to document changes to the system.

Add a logbook to the data dictionary to continuously document any changes to the reporting systems over time. Changes should be recorded by reporting system and may include the following:

- Updates to definitions
- Renaming of data elements
- Disaggregation of indicators (e.g., subnational levels, sex)
- Updates to appropriate annotation

Step 8: Repeat for each system.

If the reporting systems are not integrated, repeat Steps 2–5 for each reporting system. Steps 6 and 7 should be applied consistently across all systems.

Using and Updating the Guide

All stakeholders who generate and use this guide should be oriented to the data dictionary when it is finalized and ready for use. We suggest doing this in two concurrent ways:

- Hold regional or district orientation sessions for key surveillance, monitoring, and evaluation (SME) staff. This is important for broadening the accessibility and use of the data dictionary. The sessions should orient staff to what the data dictionary is, how it aligns with the data they collect, and how it can be used to calculate and interpret malaria data.
- 2. Integrate the data dictionary into the DHIS2 training module as well as routine SME staff training. SME staff, including those at points of care delivery, can be supported in using the data dictionary through ongoing training and supervision.

The data dictionary should be reviewed and updated on a regular basis. A clear process should be put in place for doing this at regular intervals. This process is a technical review of what is in the data dictionary and any updates that might need to be made and an abbreviated application of Steps 2–6, to ensure that data elements and indicators in the data dictionary remain relevant for use.

We suggest that the working group initiate and convene regular review meetings with key stakeholders to gather feedback, review proposed revisions, and implement updates as needed. These meetings might take place biannually, every five years, or as needed to reflect technical updates, changes in global-level indicators, or revisions to national data collection tools. During a review that follows changes to global indicators or revision to data collection tools, the working group should determine the following:

- What does this change for data elements or indicators?
- How does this impact what is measured and thus displayed in the data dictionary?
- Should anything be archived from the data dictionary? If so, ensure this is done with a standardized record keeping as noted in Steps 5–7.

In addition to the formal review process, feedback should be collected from SME staff at facility, subnational, and national levels about their use of the data dictionary. This might be integrated into regular supervision or training schedules. Such input can help identify potential challenges in using the dictionary as well as highlight positive contributions to data use and decision making at these levels. The comments should be collated and discussed for consideration by the working group during regular review and update meetings.

Limitations

The data dictionary guide will help identify bottlenecks and potential pitfalls in malaria data interpretation and analysis but may not generate immediate solutions for either.

It is possible that updating existing data dictionaries will not improve all end users' understanding of malaria data sources and structure. However, this guide suggests making revisions that may enable a broader spectrum of users, at national and subnational levels, to access data dictionaries.

PRACTICAL USE OF THE GUIDE—DRC CASE

Malaria Data Dictionary—DRC Development Process

Stakeholder Engagement

The DRC PMM team hired a national health information system (NHIS) consultant to assess the country's malaria data reported and available in the DHIS2 system. PMM, the NHIS consultant, and the NMCP were among the key stakeholders who participated in the development of the data dictionary.

Technical Workshop and Finalization of the Data Dictionary

Preliminary Assessment

The consultant gathered and organized in an Excel spreadsheet the list of indicators and data elements (including their respective parameters) reported in the DRC's DHIS2.

Technical Workshop

On December 22, 2022, during a half-day meeting, the NHIS consultant and the DRC SME advisor presented the first findings on data elements and indicators to key stakeholders to gather their feedback. The list of data was discussed in detail by all parties to reach a common understanding of what information to include in the data dictionary.

Based on the feedback received during the workshop and with additional input from the Ministry of Health, Hygiene, and Prevention, between December 22–28, 2022, the NHIS consultant revised the data dictionary to its present and final version.

Step 1: Identify routine data reporting systems.

The NHIS consultant identified three platforms in the DHIS2 that reported malaria data:

- Archive (Snisrdc.com)–Aggregated data (2014–2016)
- Production (Snisrdc.com)—Aggregated data (2017–Present)
- Tracker (Tracker.snis.com)—Individual-level data (e.g., malaria entomological data, death records)

For a comprehensive assessment of the malaria data collected and reported, the NHIS consultant also consulted additional resources, such as manuals and national documents; which included the following:

- Malaria in Africa—A Brief Overview (NMCP 2017)
- National Malaria Management Guidelines (NMCP)
- A Guide for Developing Data Dictionaries (Hellen_Data Dictionary Protocol_Final 2022)

- Glossary of Data Elements (NMCP 2018)
- National Malaria Strategic Plan 2020–2023 (NMCP)
- Malaria Dashboard Elements (NMCP)
- Integrated Disease Surveillance and Response, Third Edition

Finally, data collection and reporting tools were identified. These are the curative, antenatal, inpatient, and laboratory registers, as well as the NHIS monthly reporting form.

Table 1. Reporting	system	mappi	ng

Reporting System	DHIS2		
Transmission Platform	Archive: Aggregated data (2014–2016) Production: Aggregated data (2016–Present)		
	Tracker: Individual level data (malaria entomological data, death data)		
Data Reporting Tool	Weekly epidemiological report		
	Sentinel sites		
	Monthly national health information system report		
Data Collection Tool	Curative registers, antenatal care registers, monthly national health information system forms		
Indicator Name/ID	Completion rate basic services report		
	Completeness of malaria data in reports		
	Rapid diagnostic test positivity rate		
	Proportional mortality due to malaria		
	Malaria incidence: cases of malaria per 1,000 people		

Step 2. Identify data elements that are reported by multiple routine systems, and map those that are not.

In the DHIS2, malaria data are reported in the following:

- Weekly epidemiological report
- Sentinel sites report
- NHIS monthly reports (health center, central bureau of the health zone, general reference hospital)

Data are disaggregated by gender, age, and pregnancy status. The year of last use is 2022.

Overall, 143 malaria data elements and 43 indicators were initially identified in the DHIS2 system. In the final version of the data dictionary, stakeholders retained 144 data elements and 48 indicators.

Table 2. Data element mapping

			Reporting System Populate the columns with the platforms identified in Table 1, then mark with an 'X' in which reporting platform each data element is captured. This will show what is integrated or synced.			Disaggregation	
Data Element ID/Code and Name	Data Element Definition	Data Collection Source	Monthly National Health Information System Report	Weekly Epidemiological Report	Sentinel Sites	Group (e.g., sex, age, pregnancy status)	Year of Last Use
A1.4. Suspected Case	Person with a fever or a history of fever (≥99.5° F) in the last 48 hours, with or without signs of severity	Consultation form and curative consultation register	X			By age (<5 and 5+)	2022
A1.4. Rapid diagnostic test (RDT) Realized	Suspect cases tested with rapid diagnostic test for malaria	Consultation form, curative consultation register, and laboratory register	x			By age (<5 and 5+)	2022
A1.4. Positive RDT	Suspected cases confirmed by rapid diagnostic test for malaria	Consultation form, curative consultation register, and laboratory register	x			By age (<5 and 5+)	2022
A2.2. Antenatal Consultation 1 (ANC 1)	A pregnant woman's first visit to a health care facility, ideally during the first trimester of the pregnancy	ANC form and register	X			N/A	2022
C1.12.1. Artesunate (50mg, 200mg and 400mg) Suppository (available stock)	The amount of artesunate (50mg, 200mg, and 400mg) suppository physically in stock and which can be used	Stock sheets, inventory, and delivery note	X			N/A	2022

Step 3: Identify, map, and define data elements that are used to calculate each indicator.

For a mutual and precise understanding, data elements and indicators were mapped and reported exactly as they appeared in the DHIS2, keeping definitions, IDs, and codes the same. The team described the data collection source, reporting form, and disaggregation group for each data element and indicator. Additionally, the numerator and denominator of indicators were noted, as well as the year of last use.

Table 3. Indicator mapping

Indicator Name	Indicator Definition	Numerator	Denominator	Data Elements	Period (weekly, monthly, vearly, other)	Zero Significant Y/N	Disaggregation Group (sex, age, pregnancy status)	Year of Last Use
Completion rate basic services report	Basic services module reports versus expected basic services module reports	A-Basic services— actual reports	A-Basic services— expected reports					
Completeness of malaria data in reports	Reports with all malaria data elements completed versus all expected malaria data elements	Reports submitted with complete values (which are not missing data element values)	Expected malaria data elements					
Rapid diagnostic test (RDT) positivity rate	RDT positive cases versus all cases tested	A1.4. RDT positive + B10.2. Of which positive— fever cases	A1.4. RDT performed + B10.2. RDT performed— fever cases					
Proportional mortality due to malaria	Deaths attributed to malaria among all reported deaths	B7.2. Severe malaria–death + D9.6 Malaria deaths	Sum of deaths from all causes, including malaria					
Malaria incidence: cases of malaria per 1,000 people	Confirmed malaria cases as a proportion of the total population	A1.4. Confirmed simple malaria + B10.2. Of which positive -fever cases	Population of the health zone					

Step 4: Define what information should be displayed in the data dictionary.

The NHIS consultant, with key stakeholders and the DRC's PMM team, defined the parameters of the data elements and indicators to be included in the data dictionary.

Step 5: Indicate how to store and treat historical data.

In the DHIS2, all data except the "treated presumed cases" data element, which ceased to be used in 2017, are actively used. The system was last updated in 2016, and all data produced between 2014–2016 are archived in the DHIS2 and are easily accessible to users.

Step 6: Indicate how to review and interpret historical data.

Archived data can be used to make assumptions and compare trends for indicators that have been updated. The following platforms contain historical data:

- Archiving (Snisrdc.com)—Aggregated data (2014–2016)
- Production (Snisrdc.com)—Aggregated data (2017–Present)

Step 7: Provide guidance for how to document changes to the system.

Whenever the system is updated, the NHIS keeps track of the revisions and modifications. Definition updates were made in 2013, 2016, and 2020.

Step 8: Repeat for each system.

If the reporting systems are not integrated, repeat Steps 2–5 for each reporting system. Steps 6 and 7 should be applied consistently across all systems.

Next Steps

The DRC PMM team is planning to hold a two-day meeting with the NHIS consultant, NMCP stakeholders, and three information technology experts to set up the validated data dictionary in the DHIS2. Additionally, the team plans to make printed copies of the final version of the data dictionary available to health centers that do not have access to the DHIS2.

APPENDIX. DEMOCRATIC REPUBLIC OF THE CONGO MALARIA DATA DICTIONARY

The data dictionary examples provided in this appendix are based on the DRC's actual data dictionary (as of December 2022).

Dictionary of Malaria Data Elements

No.	Data Element	Definition	Disaggregation (sex, age)	Previous Change to Data Element (Y/N)
CARE	AND SUPPORT	•		
1	A1.4. Suspected case	Person who is febrile or has had a history of fever** in the last 48 hours with or without signs of severity*	by age (<5 years and 5+ years)	N
2	A1.4. TDR completed	Suspected cases tested with a rapid diagnostic test	by age (<5 years and 5+ years)	N
3	A1.4. Positive TDR	Suspected cases confirmed with a rapid diagnostic test	by age (<5 years and 5+ years)	Ν
4	A1.4. Simple malaria confirmed	Suspected case with a positive diagnostic test (rapid diagnostic test or microscopy) without signs of severity*	by age (<5 years and 5+ years)	N
SIGL-	-MALARIA COMMODITY TR	ACKING		
5	C1.12.1. Artesunate+ amodiaquine (2-11 months) 25mg+67.5mg tablet - usable stock available	The amount of artesunate+amodiaquine (2-11 months) physically in stock and that can be used	Not applicable	N
6	C1.12.1. Artesunate (50 mg, 200mg, and 400mg) Suppository (usable available stock)	The amount of artesunate (50 mg, 200mg, and 400mg) suppository physically in stock and that can be used	Not applicable	N
MON	ITORING OF EPIDEMICS			
7	F6.3. Malaria—case investigated	Collection of information to classify a malaria case according to the origin of the infection	Not applicable	N
8	F6.3. Malaria— confirmed case	Samples examined in the laboratory and confirmed with a positive diagnostic test (microscopy: blood smear/thin smear) after investigation	Not applicable	N
9	F6.3. Malaria— declared epidemic	Report the outbreak if the presence of confirmed cases in symptomatic individuals by rapid diagnostic test or blood smear with evidence of locally occurring infection (excluding imported cases). The government can declare the outbreak after consultation with international agencies, local authorities, and non-governmental organizations.	Not applicable	N
10	F6.3. Malaria– outbreak response	The malaria epidemic benefited from measures taken in response to a real public health event.	Not applicable	Ν

			Disaggregation (sex,	Previous Change to
No.	Data Element	Definition	age)	Data Element (Y/N)
WEE	KLY EPIDEMIOLOGICAL SU	RVEY		
11	H1. Malaria–case	Onset of malaria infection in a person in	By age (<5 years	N
		whom the presence of plasmodia in the	and 5+ years) and	
		blood has been confirmed by a	pregnant women	
		diagnostic test (biological: rapid		
		diagnostic test or microscopy and which		
		has been reported weekly		
12	H1. Malaria–death	People who died from malaria and were	By age (<5 years	N
		reported weekly	and 5+ years) and	
			pregnant women	
COMI	MUNITY CARE SITES			
13	B10.2. Fever cases in	People who had a fever or a history of	By age (<5 years	N
	a malaria risk area	fever** within 48 hours and visited the	and 5+ years)	
		community care site		
14	B10.2. RDTs	Fever** cases tested with a rapid	By age (<5 years	N
	performed-cases of	diagnostic test at the community care	and 5+ years)	
	fever	site		
15	B10.2. Of which	Fever** confirmed with a rapid	By age (<5 years	N
	positive—fever cases	diagnostic test at community care site	and 5+ years)	
16	B10.2. Of which	Rapid diagnostic test-confirmed fever**	By age (<5 years	N
	treated according to	cases treated with	and 5+ years)	
	national policy—fever	artesunate+amodiaquine or artemether-		
	cases	lumefantrine or AP, dihydroartemisinin-		
		piperaquine, at the community care site		
SENT	INEL SITES			
17	J1.1. Admitted to	Patients received and kept in hospital for	By age (<5 years	N
	hospitalization	treatment	and 5+ years) and	
			pregnant women	
18	J1.1. Hospitalized with	Patients received and hospitalized for	By age (<5 years	N
	malaria diagnosis	malaria treatment	and 5+ years) and	
			pregnant women	
19	J1.1. Hospitalized	Patients who died from all causes during	By age (<5 years	N
	deaths	their stay in hospitalization	and 5+ years) and	
			pregnant women	
20	J1.2. Malaria deaths in	Patients who died of malaria while in	By age (<5 years	N
1	hospitalization	hospital	and 5+ years) and	
			pregnant women	

* Sign of severity: The criteria for severity or malfunction are as follows: **Altered consciousness**: Prostration: general fatigue (inability to get up, sit, walk without assistance); **Repeated seizures**: >2 episodes/24 hours respiratory distress (dyspnea, tachypnea, costal pull, etc.); **Hypoglycemia**: Blood glucose <2.2 mmol/L (<40 mg/dL); **Severe anemia**: Hb <5 g/dL (Hct <15%) <20% with parasitemia >10,000/µL; **Renal impairment**: serum creatinine >265 µmol/L (3 mg/dL), urea >20 mmol/L; **Jaundice**: bilirubin >50 µmol/L (3 mg/L) with parasitemia >100,000/µL; **Lung edema**: 92% <Rx or SaO2 image in the open air with FR >30 cycles/min, sibilance/crepitations; **Hemorrhagic diathesis**: recurrent or prolonged hemorrhage (epistaxis, bruises, hematemesis, melanena); **Hemoglobinuria**: dark urine; **Shock**: PAS <80 mmHg with evident decrease in peripheral perfusion; **Malaria retinopathy Hyperparasitemia**: P. falciparum parasitemia >10% of G

** Fever: Fever = Body temperature greater than or equal to 37.5°C, hot to the touch or history of fever within 48 hours

*** Population types at risk: **1. Age:** Children under 5 years of age in malaria-endemic areas are particularly susceptible (high-risk population); **2. Gender and pregnancy status:** Although gender is not a major factor, pregnant women are more susceptible to malaria (high-risk population); **3. Place of residence:** In epidemic-plagued regions, all age groups susceptible to malaria

Changes to DRC Malaria Data Elements over Time

	Change to:	What changed?	When did the change happen?
Data Element	(Definition/Name/Code)	(Record the change)	(Past 2 years, Past 5 years)
Not applicable			

1

Dictionary of Malaria Indicators

					Previous change to
No.	Indicator	Definition	Numerator	Denominator	Indicator (Y/N)
PREVENTION					
1	Proportion of pregnant women who received long-lasting insecticidal net (LLIN) at prenatal care (PNC)	Pregnant women who received LLIN at PNC1 for malaria prevention compared to pregnant women seen at PNC1	A2.1. LLINs distributed at PNC1	A2.1. Prenatal consultation 1 (PNC 1)	N
2	Proportion of children under one year of age who received the LLIN at pre- school health check-ups	Children under one year of age who received the LLIN at pre-school check-ups compared to children under one year of age who were seen at pre- school health check- ups	B8.1. LLINs distributed	B8.1. Children seen at pre- school health check-ups	Ν
CARE	E AND SUPPORT				
3	Proportion of suspected cases tested	Suspected cases tested versus all suspected cases	A1.4.RDT completed + 5.3 blood smear completed—Reviews completed + B10.2. RDTs performed— Cases of fever	A1.4. Suspected case + B10.2. Fever cases in a malaria risk area	N
4	RDT positivity rate	RDT positive case compared to all cases tested	A1.4. Positive RDT + B10.2. Of which positive—Fever cases	A1.4. RDT made + B10.2. RDTs performed—Cases of fever	Ν
SIGL	-MALARIA COMMOD	ITY TRACKING			
5	Proportion of health facilities with RDT rupture	Health facilities that have experienced the rupture in RDT compared to all health facilities	Health facilities with RDT out of stock	Declared health facilities	N
IMPA	CT				
6	Malaria incidence: malaria cases per 1,000 people	Confirmed malaria cases relative to total population	A1.4. Confirmed simple malaria + B10.2. Of which positive—Fever cases	Population of the health zone	N
7	Hospital case fatality rate	Deaths attributed to malaria among hospitalized patients compared to hospitalized patients for registered malaria	J1.1. Hospitalized deaths	J1.1. Hospitalized with malaria diagnosis	N
REPO	DRTING				
8	Completeness of malaria data in reports	Reports with all malaria data elements completed versus all expected malaria data elements	Reports submitted with complete values (which do not lack malaria data element values)	Expected malaria data elements	N

No.	Indicator	Definition	Numerator	Denominator	Previous change to Indicator (Y/N)
QUALITY CONTROL					
9	Proportion of health facilities	Health facilities that have benefited from	Health facilities that have benefited from	Health facilities selected for	Ν
	that have benefited from	quality control of antimalarial drugs	quality control of antimalarial drugs x	quality control	
	antimalarial drugs	controlled health facilities	100		
ENT	ENTOMOLOGY				
10	Entomological inoculation rate	Number of infectious bites received per person per unit of time, in a human population	Rate of aggressiveness x circumsporozoite index catch by CDC light trap	1	N

Changes to DRC Malaria Indicators over Time

Indicator	Change to:	What changed?	When did the change happen?
	(Definition/Name/Code)	(Record the change)	(Past 2 years, Past 5 years)
Not applicable			

PMI Measure Malaria

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