The malaria surveillance system assessment toolkit; a standardized approach for supporting surveillance system strengthening

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Global **Malaria** Programme

World Health Organization

Objectives

- To provide an overview of the scope of work for the malaria surveillance assessment toolkit
- To provide a status update on development of the toolkit
- To outline next steps and timelines for the toolkit

What	**A systematic approach to measuring the performance of malaria surveillance systems, and identifying and evaluating the determinants of that performance.**
Where	All malaria endemic countries should carry out a surveillance system assessment.
Who	Implemented by national malaria programmes and partners interested in malaria surveillance strengthening.
When	Undertaken at any time but recommended as part of key NMP planning milestones such as a Malaria Programme Review (MPR) and National Strategic Plan (NSP) development.
Why	**To provide actionable and prioritized recommendations on how to strengthen surveillance systems for malaria control and elimination**

The malaria surveillance assessment toolkit was developed to expand on surveillance guidance and respond to gaps in need for comparable assessments

GAP:

Lack of standardization between tools and approaches used in the past - **difficult to compare over time/ between countries**

METHOD:

Existing materials were compiled and reviewed to identify gaps for where new tool development was required

RESULT:

The Malaria Surveillance Assessment Toolkit *is single, standardized framework and set of tools which can be adapted to any context for malaria surveillance assessments aimed at the identification of key actionable gaps in malaria surveillance*

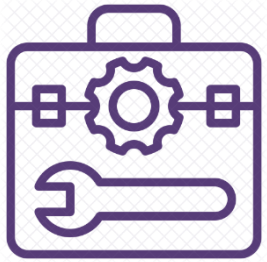
The toolkits has the following characteristics:

Adaptable assessment framework:

- User can define the **assessment scope**, by choosing the surveillance strategies and the indicators to be covered by the assessment.
- The **data collection tools within the Toolkit can be selected and filtered** accordingly.
- The assessment framework has been developed to assess surveillance in burden reduction and elimination settings

Standardized package of tools:

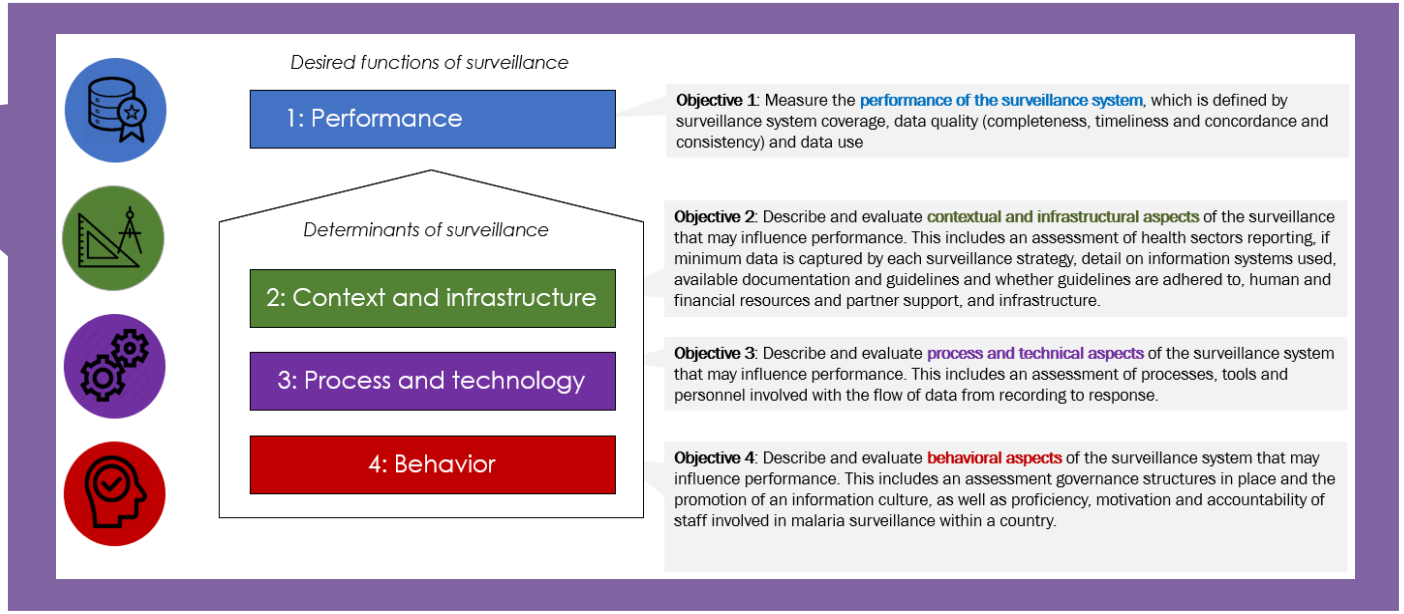
- Any malaria surveillance assessment conducted using the Toolkit will include a **minimum set of priority indicators** and **generate common and consistent expected outputs.**
- This ensures findings are comparable across countries and between assessments within a country over time



The Toolkit consists of nine tools (below) with different functions and a Reference manual and implementation guide

Function	Tools		Description
Define the scope	1	**Assessment framework tool**	A table of key objectives, sub-objectives, and indicators that can be used to quantify and/ or qualify strengths and weaknesses in the surveillance system. This tool should be used as the starting point in an assessment to define the scope and the approach.
	2	**Concept note and protocol**	A template for the outline of a short concept note for refining the scope, methods, expected outputs and outcomes of an assessment and a more detailed protocol outline required for comprehensive assessments
Collect & analyse data	3	**Desk review template**	A set of template tables and diagrams used to summarize what is known about malaria surveillance through document and data review, and optional interviews with surveillance programme staff and other relevant partners
	4	**Data Quality Assessment tools**	Tools and guidance for collecting and analysing data to specifically assess data quality at desk and service delivery levels
	5	**Question Bank**	A library of questions to develop survey questionnaires for data collection at service delivery levels
	6	**Analysis tools** To be developed 2021	Excel tools and code (in statistical software e.g., STATA) that can be adapted for data analysis for all data collected during a surveillance assessment
Develop and prioritize recommendations	7	**Technical brief and Report outline and Presentation**	A presentation and report template for organizing, visualizing, and interpreting results from the assessment. A technical brief is used to highlight a subset of priority results, where the complete report includes all assessment results.
	8	**Assessment evaluation plan**	An evaluation plan for evaluating the quality of a surveillance assessment implementation itself, which includes an indicator list, sample questionnaire, and expenditure tracker
	9	**Implementation log**	A log for tracking surveillance assessments that have been implemented using the toolkit

- The Toolkit builds on the PRISM (Performance of Routine Information System Management) model by having a framework based on four **objectives** that a surveillance assessment can address

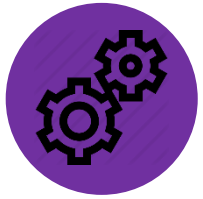


- Under each objective is a set of defined **sub-objectives** that further detail what malaria surveillance performance is and what drives that performance

- Under each sub-objective is a set of qualitative and quantitative **indicators** that are used to assess each sub-objective and can be measured by one or more of the data collection tools within the Toolkit.
- A subset of indicators have been flagged as '**priority indicators**', representing the minimum set of metrics to be included in any malaria surveillance assessment conducted using the Toolkit. This allows the resulting standardised expected outputs to be comparable between countries and within the same country over time.

Four key objectives

Framework:



Desired functions of surveillance

1: Performance

Determinants of surveillance

2: Context and infrastructure

3: Process and technology

4: Behavior

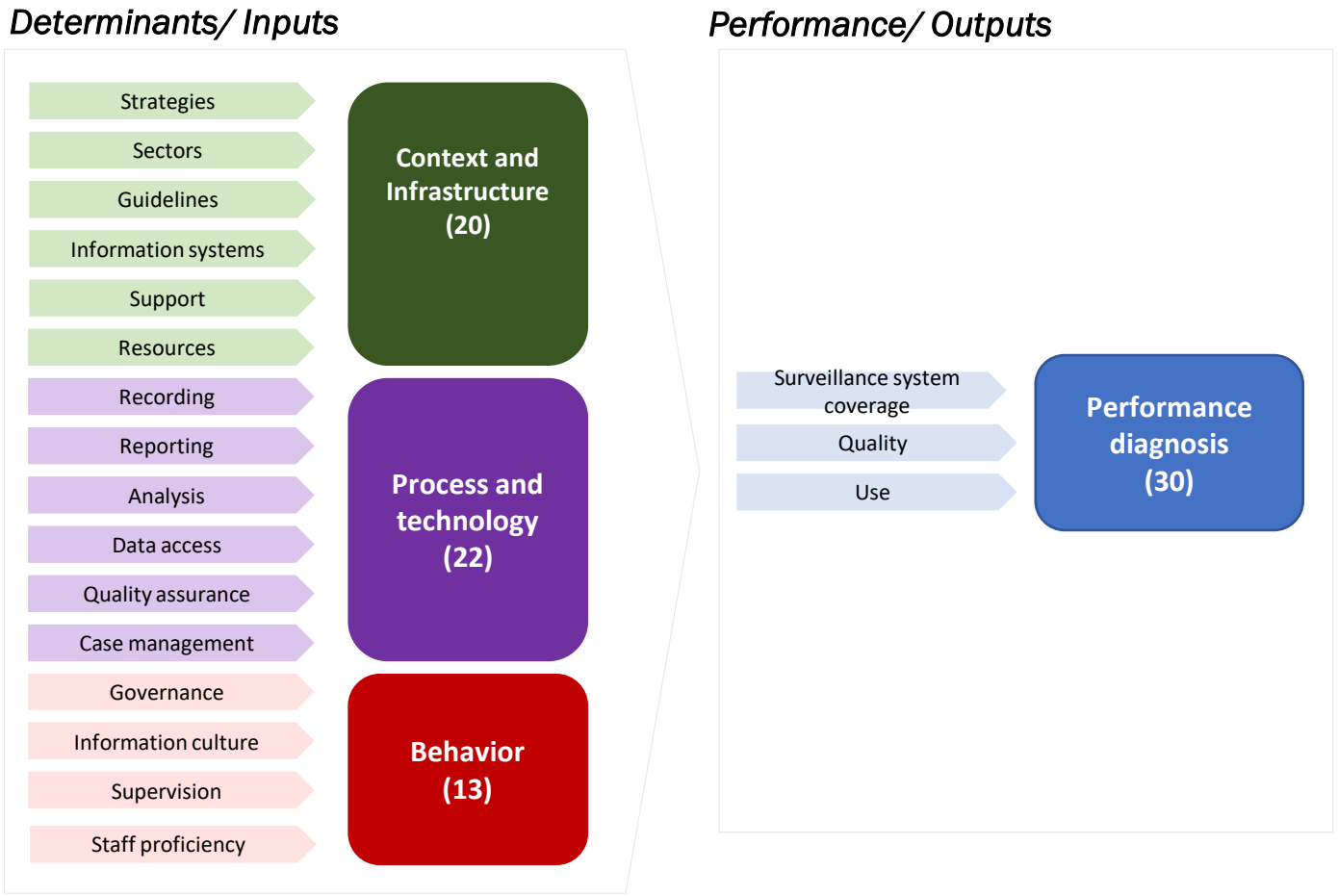
Objective 1: Measure the performance of the surveillance system, which is defined by surveillance system coverage, data quality (completeness, timeliness and concordance and consistency) and data use

Objective 2: Describe and evaluate contextual and infrastructural aspects of the surveillance that may influence performance. This includes an assessment of health sectors reporting, if minimum data is captured by each surveillance strategy, detail on information systems used, available documentation and guidelines and whether guidelines are adhered to, human and financial resources and partner support, and infrastructure.

Objective 3: Describe and evaluate process and technical aspects of the surveillance system that may influence performance. This includes an assessment of processes, tools and personnel involved with the flow of data from recording to response.

Objective 4: Describe and evaluate behavioral aspects of the surveillance system that may influence performance. This includes an assessment governance structures in place and the promotion of an information culture, as well as proficiency, motivation and accountability of staff involved in malaria surveillance within a country.

Sub-objectives and indicators (n)



Total indicators= 85

Total priority=55

Priority burden reduction= 41

Priority elimination=50

Priority other strategies= 23

Malaria surveillance strategies

Case surveillance
Burden reduction and/or elimination settings

Intervention implementation surveillance
Chemoprevention: IPTp, IPTi, SMC, MDA
Vector control: ITNs distributed through routine channels and/or mass campaigns, IRS and larval control

Other surveillance
Commodity tracking
Entomological surveillance
Drug resistance surveillance
Other genomic surveillance (pfhrp 2/3 gene deletions)

Assessment Framework

Select indicators based on case surveillance setting
Review and select indicators based on interest/country context or priority/optional

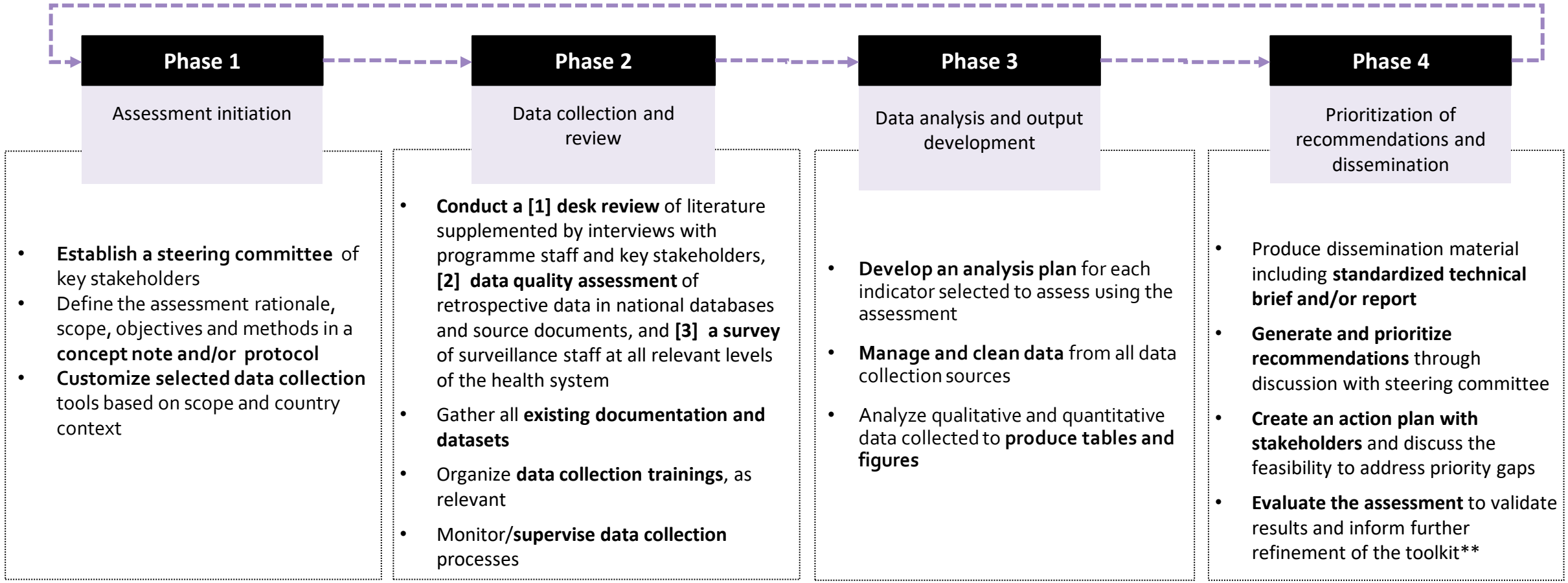
Priority indicators for other strategies automatically selected. The goal of an assessment of these strategies is to understand what information is collected and how, and if it is integrated and used along with case surveillance data. The toolkit does not include data quality assessments for these surveillance strategies.

The scope will determine the assessment approach, which can be summarized in to 3 potential approaches:

	Rapid	Tailored	Comprehensive
Scope	Only *priority indicators* from all four objectives for case surveillance and all other surveillance strategies implemented in country	*Priority indicators + user selected optional indicators of interest* from the four objectives for case surveillance and *priority indicators* from other *selected* surveillance strategies	*All* indicators from all four objectives for case surveillance and *priority indicators* for *all* surveillance strategies implemented in country
Methods	Primarily limited to desk review only with few essential site visits	Desk review and surveys at different levels of the health systems (i.e., national, subnational, a sample of facilities and community healthcare workers)	Desk review and surveys at different levels of the health systems (i.e., national, subnational, a sample of facilities and community healthcare workers)
Access	Ready-to-use tool within the Toolkit that can be downloaded*	Data collection tools are customized then downloaded**	Ready-to-use data collection tools can be downloaded
Estimated resource requirement	Low; 2-4 weeks	Medium/High; up to 12 months depending on data collection methods appropriate for the selected indicators and strategies to be assessed	High: a minimum of 3 months up to 12 months depending on context
Suggested frequency	Once every 3-5 years in line with the MPR and NSP development or if necessary, once a year as part of the annual programme review	Once every 3-5 years in line with the MPR and NSP development to assess the system comprehensively	Once every 3-5 years in line with the MPR and NSP development to assess the system comprehensively

**A separate workbook with all content for rapid assessments has been made available for ease of use*

*** customization within the web-app will be available in 2021. The current version can be manually filtered once downloaded*



*the desk review may begin in phase 1 to inform the protocol or concept note
** the expenditure tracking component of the evaluation plan should begin as soon as assessment activities start

The **Assessment Framework Tool** will indicate the most appropriate data collection method(s) required to assess each indicator. A surveillance assessment conducted using the toolkit has three methods of data collection: Desk review, Data Quality Assessment and a Survey.

User customizes tool based on surveillance strategy and indicator selection (scope)

User customizes tool based on surveillance strategy and indicator selection (scope)

User gets a set of standardized outputs informed by methods/tools used

Data collection method	Desk level	Service-delivery level
Desk Review	**Compile documents and data at the national level** to review and describe surveillance system(s) using the Desk Review Guide. Supplement with **key informant interviews** at national and subnational levels where appropriate.	
Data Quality Assessment	**Extract retrospective data** from national surveillance system (s) and perform a DQA using the Data Quality Assessment desk level tool	**Gather data from register books and reporting forms at facilities** using the Data Quality Assessment service delivery tool
Survey		Customize the Question Bank to create questionnaires for each unit/level to be surveyed.

1. Choose indicator from assessment framework tool

1.3			DATA USE	Number of indicators=7 Data use is defined in the context of this toolkit as: "instances where data are reviewed to inform programmatic action."	Desk review and survey
1.3	Priority	1.3.1	**Data used for strategic, policy and operational processes**	Data was used to inform strategic, policy and operational processes* within the last 36 months **Question format:** What decision-making or strategic and policy processes have been informed by surveillance data in the previous 36 months? **strategic planning process may be:* *-develop or revise NSP or other health program strategy or work plan* *-develop subnational operational plans* *-stratification for targeting and prioritising of interventions* *-develop or revise a malaria policy* *-advocate for a policy or programme* *- monitor program performance/progress towards achieving national targets* *-allocation or reallocation resources from national level* *- distribution of commodities* *-subnational or national elimination certification (elimination settings)* *-routine review of data from proactive and reactive case detection to determine whether the approach is efficient and useful (elimination settings)*	Desk review + survey

2. Indicator is selected in the Desk review guide and data is collected in a standardized Table

Table 1.3.1. Evidence of data use for strategic, policy and operational planning			
Data use	**Evidence found at national level**	**Details**	**Add links or screenshots as relevant**
National strategic planning	√ or ×		
Sub-national strategic planning	√ or ×		
Stratification and prioritization of interventions	√ or ×		
Malaria policy	√ or ×		
Advocate for policy or programme	√ or ×		
Monitor program performance	√ or ×		
Allocation of resources	√ or ×		
Distribution of commodities	√ or ×		
Subnational or national elimination cer	√ or ×		
Proactive and reactive case detection	√ or ×		

If survey is carried out at servuce delivery level duplicate table to capture results. Table can be modified to capture results by geographical area.

3. A set of associated questions are selected in the question bank to be asked at different levels of the health system as part of a questionnaire

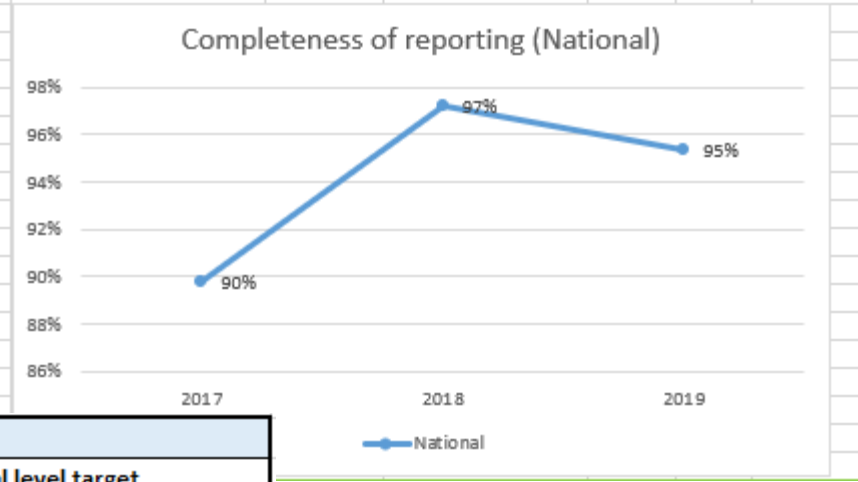
Indicator Number	Indicator	Burden reduction settings	Elimination settings	Subnational level surveillance office/unit	Service delivery level	Community level
1.3.1	**Data used for strategic, policy and operational processes**	Burden reduction	Elimination	yes	no	no
1.3.1	**Data used for strategic, policy and operational processes**	Burden reduction	Elimination	no	yes	no
1.3.1	**Data used for strategic, policy and operational processes**	-	Elimination	yes	yes	no

Name	Question	Response Options
datause_1	What strategic and operational processes have been informed by surveillance data in the previous 12 months?	a. Develop work plan b. Develop subnational operational plans c. Stratification for targeting and prioritising of intervention d. Advocate for a policy or program e. Monitor program performance/progress towards achieving national targets f. Distribute commodities g. None h. Don't know i. Other, specify:-
datause_2	What operational processes have been informed by surveillance data in the previous 12 months?	a. Advocate for a policy or program b. Monitor program performance/progress towards achieving national targets c. Distribute commodities d. None e. Don't know f. Other, specify:-
datause_3	Is there routine review of data from proactive and reactive case detection to determine whether the approach is efficient and useful?	a.Yes b.No c.Don't know

A. Database - Health Facility (HF) data from HMIS or MIS

									Variables – priority											
Province	District	Health Facility	Public / Private	year	month	Report On Tim	Report receiv	Expect Report	Total malaria cases (confirm + presumed)	Confirmed malaria cases	Microscopy tested	RDT tested	Microscopy positive	RDT positive	All cause outpatients	All cause inpatients	All cause deat	Malaria inpatients	Malaria inpatient deat	Confirmed malaria cases treated with 1st line treatment courses (ie, ACT)
Province A	District 1	Health Facility 1	Public	2017	1	1	1	1	1450	1237	408		242	995	2389	1283	63		1	1135
Province A	District 1	Health Facility 1	Public	2017	2	0	1	1	1099	1049	577	119	259	730	2177	1977	160		24	963
Province A	District 1	Health Facility 1	Public	2017	3	0	1	1	1052	1052	275	202	152	900	2390	889	117		7	1027
Province A	District 1	Health Facility 1	Public	2017	4	1	1	1	1022	793	636	167	191	602	2820	1091	203		4	684
Province A	District 1	Health Facility 1	Public	2017	5	1	1	1	1102	829	815	279	289	540	1324	673	154		15	659
Province A	District 1	Health Facility 1	Public	2017	6	1	1	1	1036	894	523	242	233	661	1113	660	128		12	798
Province A	District 1	Health Facility 1	Public	2017	7	1	1	1	908	671	372		93	578	1791	647	175		24	536
Province A	District 1	Health Facility 1	Public	2017	8	1	1	1	1015	935	885	143	121	814	1180	680	140		11	858
Province A	District 1	Health Facility 1	Public	2017	9	1	1	1	977	685	439	93	229	456	1344	1054	132		23	672
Province A	District 1	Health Facility 1	Public	2017	10	0	1	1	1038	797	772	171	120	677	1451	1330	226		11	698
Province A	District 1	Health Facility 1	Public	2017	11	1	1	1	1110	902	356	237	250	652	1814	1396	166		21	737
Province A	District 1	Health Facility 1	Public	2017	12	1	1	1	519	331	869	292	120	211	1930	909	294	86	1	257
Province A	District 1	Health Facility 1	Public	2018	1	1	1	1	265	150	987	964	74	76	1616	1241	109	159	9	97
Province A	District 1	Health Facility 1	Public	2018	2	1	1	1	424	362	449	298	101	261	2253	1052	168	231	15	347
Province A	District 1	Health Facility 1	Public	2018	3	1	1	1	381	222	635	354	154	68	2554	792	62	124	9	168
Province A	District 1	Health Facility 1	Public	2018	4	1	1	1	514	253	300	813	78	175	1789	620	151	257	10	94
Province A	District 1	Health Facility 1	Public	2018	5	1	1	1	577	369	238	795	145	224	2684	1221	237	185	12	194
Province A	District 1	Health Facility 1	Public	2018	6	1	1	1	546	409	304	908	184	225	2118	743	278	145	28	296
Province A	District 1	Health Facility 1	Public	2018	7	1	1	1	362	362	661	577	119	243	2058	1026	50	155	3	190
Province A	District 1	Health Facility 1	Public	2018	8	1	1	1	684	416	510	323	189	227	1009	1051	143	261	4	390
Province A	District 1	Health Facility 1	Public	2018	9	1	1	1	725	518	845	793	276	242	1375	1981	281	133	7	329
Province A	District 1	Health Facility 1	Public	2018	10	1	1	1	448	236	73	537	55	241	1093	765	51	153	10	263
Province A	District 1	Health Facility 1	Public	2018	11	1	1	1	664	411	265	721	184	227	2308	1668	80	144	17	304
Province A	District 1	Health Facility 1	Public	2018	12	1	1	1	466	277	360	382	186	91	2776	1514	228	77	23	87
Province A	District 1	Health Facility 1	Public	2019	1	1	1	1	647	535	690	74	256	279		1459	235	144	11	442
Province A	District 1	Health Facility 1	Public	2019	2	1	1	1	514	360	611	505	248	112		1444	86	262	7	288
Province A	District 1	Health Facility 1	Public	2019	3	1	1	1	628	448	622	622	214	234		1142	192	275	4	309
Province A	District 1	Health Facility 1	Public	2019	4	1	1	1	503	371	530	355	82	289		1022	153	218	22	177
Province A	District 1	Health Facility 1	Public	2019	5	0	1	1	285	232	642	535	62	170		936	191	88	26	213
Province A	District 1	Health Facility 1	Public	2019	6	1	1	1	367	313	777	270	95	218		1276	255	245	19	200
Province A	District 1	Health Facility 1	Public	2019	7	1	1	1	459	373	292	296	185	188		1133	137	70	1	299
Province A	District 1	Health Facility 1	Public	2019	8	1	1	1	439	150	296	643	80	70		601		109	11	
Province A	District 1	Health Facility 1	Public	2019	9	1	1	1	576	391	439	912	120	271		768		145	2	329

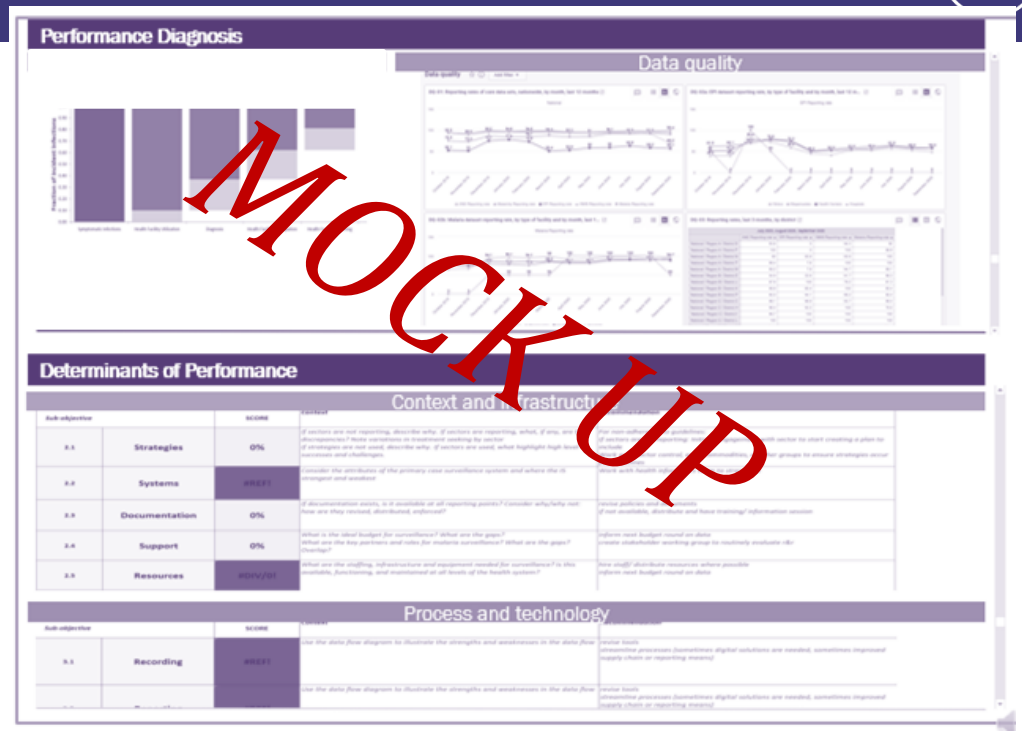
Country (Name)	Completeness of reporting 2017	2018	2019
National	90%	97%	95%

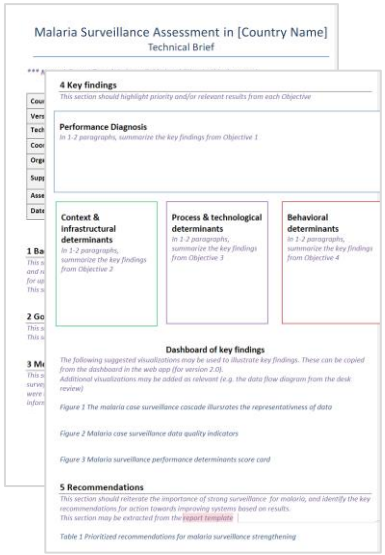


Summary national data quality estimates		
	National level results	National level target
Completeness of reports	95%	80%
Timeliness of reporting	86%	80%
Completeness of core variables within reports	84%	80%
Consistency between core variables	82%	80%
Concordance of key variables between two reporting systems	73%	80%
Consistency over time for core indicators	Consistent trend (Yes/No)	
1. Proportion of malaria outpatients	Yes	
2. Proportion of malaria inpatients	No	
3. Proportion of malaria inpatient deaths	Yes	
4. Test positivity rate	Yes	
5. Slide positivity rate	Yes	
6. RDT positivity rate	No	
7. Proportion of suspects tested	Yes	

World Health Organization

- To facilitate comparability between assessments over time and across geographies, a set of **results expected from all assessments** conducted using the Toolkit can be visualized in a dashboard including:
  - Data quality plots
  - A scorecard for each sub-objective (e.g. data use)
  - A scorecard for each priority indicator
- These outputs provide a high-level understanding of or first glance at the context, infrastructure, process, and technical and behavioural aspects that may be driving the surveillance system's poor or good performance.





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- The **in-depth findings** from the malaria surveillance assessment can be presented in a **Technical Brief** ("2-pager)of key findings or a comprehensive **Report,** which includes a summary of the methods, a more in-depth description of the assessment results, and recommendations for surveillance strengthening actions based on key findings.

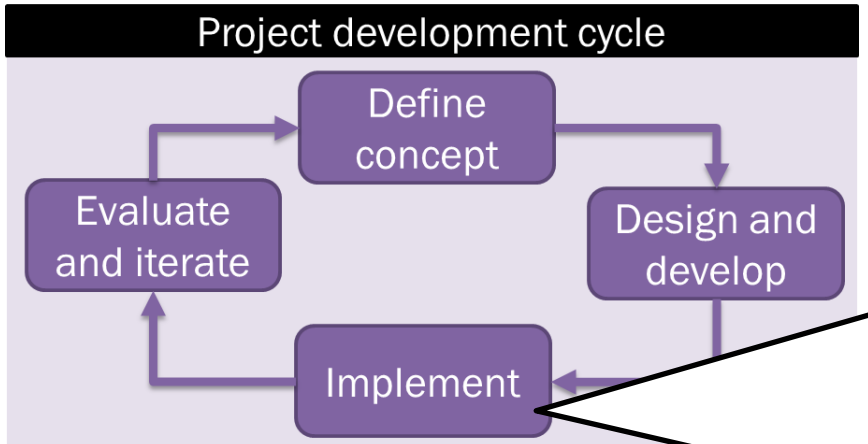
Upon completion of an assessment, recommendations should be developed based on the assessment results and prioritized in consultation with the NMP and other stakeholders based on their impact and feasibility for strengthening the surveillance system.

Recommendation	Impact		Feasibility			Funding avail.
	Public Health	Cost Saving	Timelines	Difficulties	Cost	
1 • implement surveillance staff training in Region x once every quarter to improve reporting rates	🟡	🔴	🟢	🟡	🟢	🟢
2 • Implement supervision for surveillance staff in Region x and y once a month to improve data use	🟡	🟢	🟡	🔴	🟢	🟢
3 • Shorten data collection forms to ensure completeness of forms reported by community healthcare worker	🟢	🔴	🟡	🟡	🔴	🟡

Prioritized results from assessments should be disseminated to stakeholders and used to inform action planning during key strategic planning opportunities. Examples include:

- Delegating and costing activities to roll out a new information systems or revise surveillance guidelines during NSP formulation
- Using assessment recommendations to advocate for additional funding or resources (e.g. Global Fund grants)
- Track progress in malaria surveillance outputs and outcomes over time

The toolkit is currently being implemented in 5 countries



All comprehensive assessments

Need to identify countries to carry out the rapid assessment

Burkina Faso: primary data collection (survey) completed, analysis ongoing

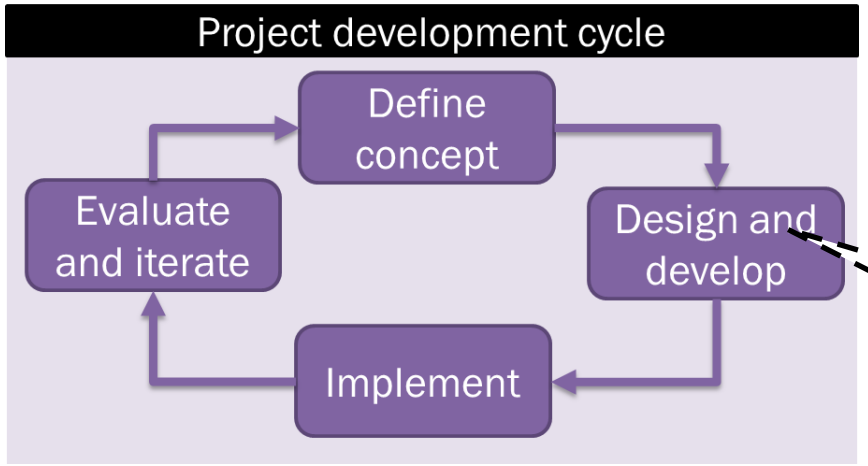
Ghana: primary data collection (survey) to begin March 2021

DRC: primary data collection (survey) to begin Jan 2021

Cameroon: primary data collection (survey) to begin Jan 2021

Benin: primary data collection (survey) to begin March 2021

A web-app will be developed to house the toolkit, as well as provide an interface for users to input assessment data and automate core outputs



- Early feedback on toolkit suggested **poor navigation and user interface** limited usability
- Need for **standardized, comparable, and automated display** of core outputs

e-Zest

Features

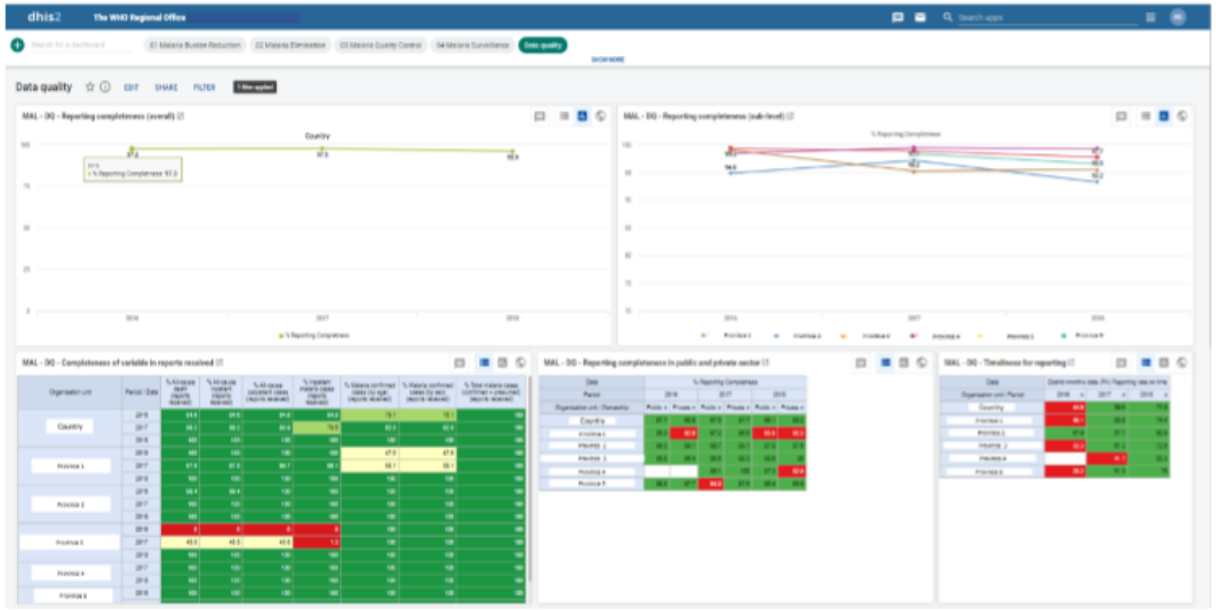
Interface in English and French
User permissions
Interactive web-app with automated tool content selection and outputs
Maps showing completed assessments
Dashboard with summary results

Approximate release dates

Malaria Surveillance Assessment Web-app Development - Scope of work	
Q2 2021	1. Digitalization of the assessment toolkit and ability to download tools in their current format
Q3 2021	2. Customization and download of data collection tools based on scope (indicators and strategies to be included)
Q4 2021	3. Assessment result input/upload and dashboard generation

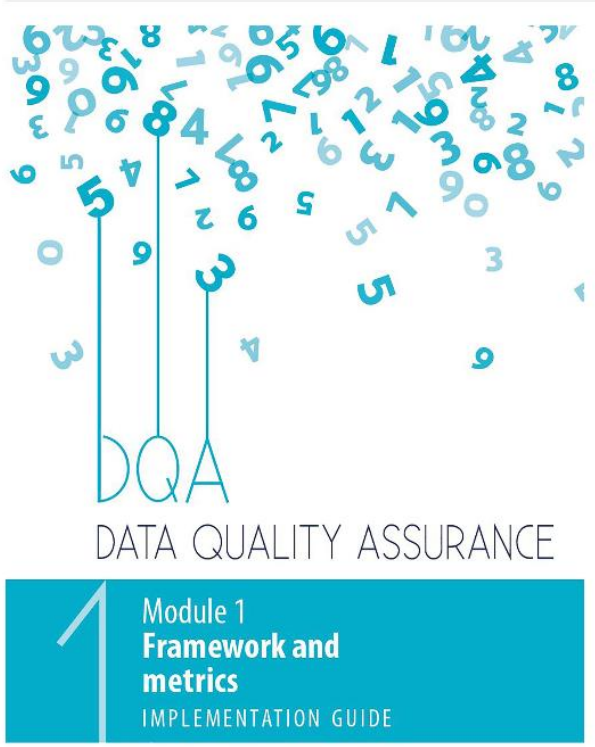
Other developments

DQA findings can be visualized using standardized dashboards, that can be programmed within WHO's Malaria Module on DHIS2



Standardized visualizations for each level of the health system are provided within the WHO Malaria Module

Align WHO DQ documents and tools and update DQ app in DHIS2



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