

## REQUEST FOR PROPOSALS:

# DESIGN AND ROLLOUT OF REGIONAL MALARIA SURVEILLANCE PLATFORM

### Background

The Elimination 8 (E8) is a regional partnership of the eight southernmost countries in Africa, collaborating on an ambitious regional strategy to eliminate the transmission of malaria from the region. Malaria transmission across the E8 is inextricably linked; it is thus not only a national problem, but a regional problem requiring an understanding of the transmission dynamics that define the region. Both national and regional responses must be based on a regional picture, enabling the use of regional data to inform the more effective targeting of interventions at the local level. For example, continued investment in prevention in a community which serves as a recipient or a sink of malaria importation from another highly endemic source provides limited value; rather, it may be more effective to target the more highly endemic “source,” which is often located outside the country, and which is connected through human population movement. Such an approach therefore requires “regional intelligence” and the development of a regional picture of malaria transmission patterns. Poor data quality and variation of surveillance information across the region also limits the ability to track regional trends, which is critical for designing appropriate programming, both at the country level as well as the regional level.

The E8 has therefore prioritized the implementation of a regional surveillance database that aggregates malaria data from the eight countries, supporting robust analysis and feedback of regional transmission patterns and intervention coverage, thus informing more effective strategic planning and response by the national malaria programmes. Development of the regional surveillance database will require harmonizing reporting and data collection by the E8 countries and developing a functional mechanism to allow integration and joint analysis and mapping of the region’s surveillance data.

The main objective of the regional surveillance database is to integrate data from each country and to facilitate feedback of high spatial and temporal resolution, regional analytic outputs and maps to the respective countries (thus improving local data systems). This will allow better planning and will result in programming that is informed by regional patterns. *(It is important to note that the proposed system is not a parallel system, but simply uses and builds on existing surveillance systems in the countries). The E8 regional malaria surveillance system will not collect any new data, but rather integrate data from the various countries.*

## Long-term vision for regional surveillance in the E8

The long-term vision of the E8 is to have a regional platform capable of delivering the features outlined Table 1 below.

Table 1: Features of the E8 Regional Surveillance Platform

Platform feature	Description
<b>Harmonized indicators</b>	Harmonize definitions (case classification, numerator, and denominator) for a minimum set of core indicators, to allow comparability. (Although new indicators may be defined, these will all be based on existing data so they will not require additional data collection)
<b>High resolution data reporting</b>	Support progressive high temporal and spatial resolution reporting, including weekly district-level reporting from frontline countries. Second line countries will report monthly, at the district level initially. Eventual aim is to have the database pulling weekly health facility data from all front line countries.
<b>Central database with automated extraction</b>	Automated extraction of data from existing health management information systems into a central consolidated database. A protocol for consolidating the various data formats will be developed, allowing integration and joint analysis for the region. Central database will have full time staff managing data quality and feedback on behalf of the E8.
<b>Integrated, robust analysis and visualizations</b>	Automated analysis to provide alerts and early warning as per pre-set thresholds, including for outbreak conditions. Dashboard allows quantitative analysis and summaries, as well as spatial views of mapped data. Full time data analyst to manage the regional surveillance system, monitor data completeness, troubleshoot, and conduct robust trend analysis.
<b>Country feedback mechanism</b>	Mechanism for feedback to the country program; experienced M&E and program expert communicating data directly with countries and supporting design of response by the country. Monthly data bulletin will also be circulated to the E8 countries and partners; Reports and feedback will be customized to specific needs of users at each level.
<b>Customizable use cases</b>	End users will include NMCP managers and M&E and surveillance officers at central, provincial, and district levels. Conforms with national data security guidelines, and provides password protected access to web-portal for NMCPs and their designated users.
<b>Outputs (Phase 1)</b>	<p><b>Data Aggregation and Simple Trend Analysis</b></p> <ul style="list-style-type: none"> <li>• Collate weekly health facility data from all frontline countries, and from border districts of second line, as well as monthly district data from the rest of the second line countries (See Annex 1 for table of basic malaria indicators to be reported in the database; additional intervention data will also be added).</li> <li>• Trend analysis of standard malaria morbidity and mortality data from the countries, at different administrative levels – district to regional (E8), and disaggregated according to age, travel history and other basic classifications used in national health management information systems</li> <li>• Develop visualization tools for analysis of spatial and temporal trends; these include comparative analysis of disease information for multiple units (i.e. health facilities, districts, countries, region)</li> <li>• High spatial resolution mapping of intervention coverage</li> </ul>

<b>Outputs (Phase 2)</b>	<ul style="list-style-type: none"> <li>• Integration of layers of geo-coded data - water bodies, health facilities, environmental factors combined with malaria metric data</li> <li>• Automated, rapid and real-time high resolution (1 kilometer x 1 kilometer) user-generated risk maps, generated from case data and relationship with contemporaneous high resolution environmental/climate data from remote sensing satellite repositories, visualizable at a 1km pixel level, and aggregatable to ward/village, health facility, and district level, allowing users to better visualize foci/hotspots at high resolution, prioritize operational units for response, and communicate with cross-border neighbors to coordinate prioritized regional response.</li> <li>• Ability to incorporate and overlay additional information, including patterns of vector distribution, human movement patterns, and commodity stockouts.</li> </ul>
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## DHIS2

DHIS2 is increasingly becoming a common platform for health systems reporting in the region, and will be leveraged by the regional platform to avoid duplication in reporting, and to provide programs and surveillance officers with familiar technology and reporting dashboards. In most countries, DHIS2 at the national level collates monthly data, disaggregated down to the health facility level. The regional surveillance database will therefore be designed to draw seamlessly from these national systems.

Following discussions among the E8 Surveillance, Monitoring and Evaluation Technical Working Group, it was agreed to consider DHIS2 as the platform through which the E8 could achieve the long term vision outlined above. DHIS2 could serve as the platform for the collection and consolidation of regional data. The reasons why DHIS2 offers a distinct advantage are outlined below.

- Five of the eight countries have adopted or plan to introduce the district health information reporting system (DHIS2) for reporting malaria<sup>1</sup>.
- Being familiar to programs, and by mirroring the existing health system reporting hierarchy<sup>2</sup>, the use of DHIS2 for the regional database minimizes the workload of national M&E and surveillance staff.
- Implementing a regional DHIS2 platform would essentially involve importing national data into a regional DHIS2 instance, facilitating the data collection and consolidation process, without designing and building a separate platform. This minimizes duplication in reporting and facilitates data extraction and sharing.
- The features offered by DHIS2 (mapping, figures, tables, etc.) align with the desired features of the regional system.
- Building the system on a DHIS2 platform will allow the E8 to take advantage of ongoing efforts to integrate automated risk mapping and other analyses into DHIS2 in the future.

For countries not using DHIS2, a process for merging and consolidating the various formats will be

<sup>1</sup> The five are Botswana, Mozambique, Namibia, South Africa, Zambia, and Zimbabwe. South Africa uses DHIS2 for other reporting within the MOH, but not for malaria.

<sup>2</sup> The system will be designed to report along the same hierarchy as the country health information systems, that is: national, province/region, district, health facility, and sub-health facility levels (health post or community health worker).

developed to facilitate ease of submission. The E8, through its technical partners, will also support countries to strengthen the implementation of their own health management information systems, improving the quality of data input into both national and regional surveillance systems.

## Scope of Work

The E8 requires support for the initial development of the regional DHIS2 platform. The E8 has designed a framework for the implementation of regional malaria surveillance, and now seeks a consultant team to lead the development of the regional database that will house and aggregate malaria data, and allow further analyses.

In order to conduct further analyses (Phase 1 in Table 1), the consultants will use DHIS2, or will propose alternative platforms for analysis, in consultation with the E8 Secretariat. The consultant team will also be required to support ongoing maintenance and capacity building as the system is rolled out to the countries.

1. Develop a detailed roadmap for development of the E8 DHIS2 instance. This includes:
  - Travel to each of the countries to identify the malaria data elements and indicators currently being collected/reported on or planned for implementation in each national database and assess the programming requirements for collection of data from the national systems
  - Identify end-users at regional, national, and sub-national (provincial/district/facility) level and how regional DHIS2 instance will be available and used by each
  - Identify the timeframe from collection, aggregation, availability at the district and national levels, possible timeframe for pushing up to E8.
  - For countries not using DHIS-2, identify the structure of the existing database (e.g., excel, Access), indicators collected, and plan to link these systems with the regional database
  - Establish data transfer between national and regional systems, and orient health information management staff
  
2. Design the prototype of the reporting portal, based on the specifications outlined above. With input from the client, develop mock malaria data scenarios using dummy data to serve as a demo-model or illustration of the proposed long-term design and functionalities of the database. The consultant team will be requested to develop a visualization of each scenario (e.g. time series of maps) as well as a slide deck that describes the outputs of each scenario, the data inputted and layers used, and what the resultant analysis that will be made available to the user.
  - Develop scenarios in the regional DHIS2 instance for demonstration to various audiences as a way to introduce the concept, its function and utility. Audiences will include E8 Technical Committee, E8 Ministerial Committee, and other technical partners. Data for building the scenarios will be provided by the E8 Secretariat.
  - Scenario 1: Trend analysis of incidence data (at all administrative tiers, from health facility to E8 regional) and other related variables such as intervention coverage.
  - Scenario 2: Mapping of incidence and other data

- Scenario 3: Regional thresholds and early warning system
3. Develop and launch the platform with the ability to receive data from the eight countries, ensuring interoperability with the respective electronic surveillance systems under operation in the E8 countries (See Annex 2 for intended features and functionalities). Pilot a phased implementation of full functionalities of the platform, starting with four of the E8 countries currently using DHIS2, and later integrating the remaining countries according to the roadmap developed in 1) above. The platform will include a dashboard, and will generate charts and other data visualizations, as per the mock-ups generated in 2).
  4. Train users in the E8 countries and E8 Secretariat, and other partners, and handover customized user manuals to facilitate implementation and system maintenance in each country. Conduct periodic follow-up visits to support trouble-shooting and maintenance.

## Eligibility

In order to be eligible, organizations must meet the following criteria:

- Demonstrated expertise among team members in software engineering, database development and maintenance, requirements analysis, and large geographic information systems.
- Experience working with Ministries of Health, government departments, and/or malaria programmes in the implementation of health information management systems
- Experience in the design and monitoring of health indicators, and working knowledge of regional frameworks for monitoring malaria indicators, preferably in sub-Saharan Africa
- Demonstrated expertise in health informatics, epidemiology and public health, disease surveillance and response
- Organizations and/or team members with demonstrated experience with setting up, implementing and managing DHIS2 instances at national and regional levels.
- Organizations with proven working relationships with some or all of the Ministries of Health of the E8 countries will have an advantage
- Organizations with the ability to provide ongoing support for training, and database maintenance to the Secretariat and to the users in the eight countries will have an advantage

## Timelines and Mode of Work

The workplan will follow a very aggressive schedule, as the rollout of the implementation of the project is a priority initiative, and is a critical for other project outcomes and deliverables. The proposed timelines below will be negotiated and finalized upon signing of the contract with the successful team.



*\*Duration for Activity 4 (ongoing support and maintenance) will be negotiated between the E8 and the selected team.*

The selected organization or team of consultants will report to the Director of the E8 Secretariat. The team will also work collaboratively with the E8 Surveillance, Monitoring and Evaluation Technical Working Group (ministries of health and technical partners), receiving and incorporating input on the design and functions of the system.

### **Proposal Format**

Interested teams or organizations are requested to organize their proposal as follows:

1. Summary profiles of proposed team members, including relevant experience on similar assignments, and in the E8 countries, and full-time equivalent on the project for each individual (Please do not provide full CVs, only summaries of experience and training relevant to this project).
2. Project narrative, providing a description of the proposed approach/methodology for each activity, identifying the key risks and proposing mitigation strategies, inputs on feasibility/challenges to the proposed database design above, and suggestions to improve on the design (NO MORE THAN 5 PAGES).
3. Detailed workplan, outlining critical pathway
4. Budget – fees only. Travel and related expenses will be covered by directly by the E8 Secretariat, or reimbursed to the team, on the basis of receipts

**The proposal submission deadline is February 29, 2016. Proposals should be sent to [operations@elimination8.org](mailto:operations@elimination8.org); any questions can also be directed to the same email address.**

## Annex 1: Sub-set of core malaria indicators to be aggregated in the database

Indicator		Frontline	Secondline	
			Border/Elimination	Rest of Country
Total Confirmed Malaria Cases	<i>Classified</i>	✓	✓	✗
	<i>Age</i>	✓	✓	✗
	<i>Frequency</i>	<i>Weekly</i>	<i>Weekly</i>	Monthly
	<i>Admin Unit</i>	<i>Health Facility</i>	<i>Health Facility</i>	District*
Deaths	<i>Frequency</i>	Monthly	Monthly	Monthly
	<i>Admin Unit</i>	District	District	District
Vector Control	<i>Frequency</i>	Annual	Annual	Annual
	<i>Admin Unit</i>	District	District	District
Proportion of HF Reporting	<i>Frequency</i>	Weekly	Weekly	Monthly
	<i>Admin Unit</i>	District	District	District

## Annex 2 – Design of the Surveillance Platform

The following is a detailed description of the features and functionalities to be integrated into the design.

### Database Design and System Architecture

- Operating on DHIS-2 platform to enhance interoperability with national health information systems of most E8 countries
- Ability to later intergrate additional software onto the regional DHIS2 database to support functionality not natively supported by DHIS2, such as more advanced dashboard functionality, database tools and scripts, advanced analyses, etc.
- Stable, simple, and scalable architecture, requiring few resources, enabling efficient transmission of data to facilitate timely surveillance and analysis of disease transmission patterns
- Supports a modular design and multiple users

### User Interface

- Browser-based user interface

- Modern, visually appealing interface that is accessible to lay users and allows them to navigate easily to access the information they need and to generate simple trend analysis
- Dynamic dashboard capability, with user-friendly extraction of information in different perspectives (both raw data and analyzed data/tables/graphs). This may be the native dashboard of DHIS2, or a custom dashboard for instances where DHIS2 functionality is not enough

#### Data Input and Integration:

- Enable data transfer from national systems to the E8 database by using APIs (application programming interfaces) where applicable.
- Provide an interface to allow manual uploading of datasets from systems/countries that do not yet have systems with an API. For more complex datasets this step may be done using SQL scripts as well
- Able to conduct validation checks for outliers and missing values as data are entered/uploaded to maintain data integrity
- On-premise hosting, with appropriate security protocols to ensure data protection

#### Data Analysis, Visualization, and Reporting

- Robust search logic capability, and allows users to select multiple variables for analysis
- Allow user to pre-set routine queries, and to create and customize charts, graphs, and GIS maps
- User forum, where users can exchange ideas, leave comments and recommendations based on their experience
- Provide for graphical alerts to highlight outbreaks or elevate disease activity as per pre-set algorithms
- Allows users to raise alerts and send to other users on the system or through sms or email
- No restrictions on the number of users (per intent basis licensing); role-based user access.
- Defined algorithms to analyse data, with reporting and graphics capabilities
- Exportable data, allowing it to be used and analysed outside of the framework of the database
- Incorporates rules for privacy and security

#### Feedback

- Built in protocol for generation of routine reports and periodically sending summary trends of regional malaria trends to stakeholders and users of the system via email