REPUBLIC OF KENYA

MINISTRY OF HEALTH

Malaria Epidemic Preparedness and Response Review and Planning Workshops

January–March 2019

USAID FROM THE AMERICAN PEOPLE

CDC

U.S. President's Malaria Initiative

NATIONAL MALARIA CONTROL PROGRAMME

MEASURE Evaluation

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September 2019

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MEASURE Evaluation

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ABBREVIATIONS

CHRIO	county health records information officer
DHIS2	District Health Information Software, version 2
EPR	epidemic preparedness and response
IDSR	integrated disease surveillance and response
MOH	Ministry of Health
NMCP	National Malaria Control Programme
PMI	U.S. President's Malaria Initiative
SCHRIO	sub-county health records information officer
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

Epidemic preparedness and response (EPR) is one of the key strategic approaches to controlling malaria in Kenya. Malaria epidemics are defined as sharp increases in the incidence of malaria in populations in whom the disease is rare, or a seasonal increase in areas of low-to-moderate transmission over and above the normal pattern (Gilles and Warrell, 1993). Malaria epidemics usually occur in the western highlands and in the arid and semi-arid lowlands of northern, north eastern, and south eastern Kenya. The epidemics are caused by changes in weather conditions, mainly flooding resulting from increased rainfall, and other factors that may favour efficient breeding of malaria vectors (Ministry of Public Health and Sanitation, Division of Malaria Control, 2011). Malaria EPR is geared to the reduction of malaria morbidity and mortality during epidemics. Continuous monitoring, early detection, and prompt response with recommended treatment and timely vector control methods help minimize the impact of epidemics and upsurges (normal seasonal increases in malaria incidence).

Malaria EPR is one of the strategies under the surveillance objective of the Kenya Malaria Strategy (2019–2023) (Ministry of Health, 2019). The Surveillance, Monitoring, Evaluation and Operational Research Unit in the National Malaria Control Programme (NMCP) is responsible for EPR monitoring in Kenya. Before 2013, the NMCP supported annual EPR data review and planning workshops in the highland epidemic areas and in seasonal transmission zones. Following the devolution of health services in 2013, the annual review workshops were conducted for county-level health management officers only, with the expectation that they would cascade the training to the sub-counties. However, the officers trained at the county level faced challenges with cascading the training they had received to the sub-counties. Reporting and monitoring of weekly malaria thresholds consequently decreased. In September and October 2017, malaria upsurges were reported in nine counties, namely: Baringo, Isiolo, Mandera, Marsabit, Samburu, Tana River, Turkana, Wajir, and West Pokot. The upsurges caused over 50 fatalities, 400 hospitalization cases, and more than 2,000 adults and children diagnosed with the disease. Marsabit was the worst hit county, with 1,300 adults and children diagnosed with malaria and 26 malaria deaths reported (Mulambalah, 2018). The NMCP therefore prioritized the annual review of and threshold-setting workshops for both county and sub-county officers in the areas prone to epidemics. In 2019, support for EPR review workshops was provided by the U.S. President's Malaria Initiative (PMI) through MEASURE Evaluation.

Outputs of the Workshops

In collaboration with MEASURE Evaluation, the NMCP organised seven EPR workshops targeting county and sub-county malaria control and disease surveillance coordinators. The workshops were conducted for 127 sub-counties in 26 counties that fell in the epidemic-prone areas of the western highland and seasonal transmission zones. A total of 320 health managers from the 26 counties and 127 sub-counties were trained. The managers trained at both levels included 126 malaria control coordinators, 120 disease surveillance coordinators, 54 health records and information officers, and 20 other county and sub-county-level personnel.

Evaluation of the Workshops

Workshop participants completed a daily evaluation form to give feedback on the topics covered during each day of the workshop and on the general workshop organisation. The facilitators reviewed the feedback and provided support in areas identified by the participants. A pre-and post-workshop evaluation was administered to the participants to assess knowledge gained during the training.

- The post-workshop assessment showed remarkable improvements in the participants' knowledge of EPR planning and review after the training, with the participants scoring an overall mean of 3.7 (moderately knowledgeable or skilled), up from a baseline score of 2.2 (slightly knowledgeable or skilled) before the workshop.
- The majority of the participants (95.1%) reported that the workshop had met their objectives. However, 44 percent said that the workshop was too intensive and that more time was needed. The participants recommended increasing the number of workshop days from four to five to allow sufficient time for the development of accurate epidemic monitoring thresholds and to complete the EPR plans.

Key Recommendations

The workshop evaluations recommended the following:

- Inclusion of sub-county health records and information officers (SCHRIOs) in future EPR planning and review workshops. SCHRIOs were not included among the officers invited to attend the workshops. Only a few SCHRIOs (who doubled up as the disease surveillance coordinators) had the opportunity to attend the workshops. These personnel are the custodians of routine health data and their involvement in EPR planning and review workshops was key.
- Most sub-county malaria control and disease surveillance coordinators trained had difficulty accessing and extracting weekly data on confirmed malaria cases from the national District Health Information Software, version 2 (DHIS2) platform and using Microsoft Excel to set epidemic monitoring thresholds. The participants recommended the addition of basic training in the use of Excel and data mining from the DHIS2 platform in future EPR workshops.
- The development of the EPR plans was challenging for most participants. The participants recommended simplifying the templates provided to include some explanations of the sections, more support from the facilitators during the group work sessions, and more time to present and complete the EPR plans.
- Follow-up support by the national level to the sub-counties to enhance the skills learned should be provided.
- An EPR threshold reporting tool and dashboard in the national DHIS2 platform to facilitate weekly monitoring of malaria cases and epidemic thresholds by managers at sub-county, county, and national levels should be developed.

Conclusions

For the first time, the 2019 EPR planning and review workshops included sub-county malaria control and disease surveillance coordinators. The evaluations conducted during the workshops revealed important gaps in overall EPR training and monitoring. The workshops resulted in several recommendations to improve future EPR planning and review workshops and epidemic monitoring across all levels.

INTRODUCTION

Background

Epidemic preparedness and response (EPR) is one of the key strategic approaches to controlling malaria in Kenya. Malaria epidemics can be triggered by natural or man-made factors, such as flooding because of irrigation or mining activities, extreme weather conditions, global climate change, migration of non-immune populations to malaria endemic zones, a breakdown in malaria interventions, and complex emergencies, such as war. These factors modify the environment and increase the capacity of vectors to transmit the malaria parasite. Malaria EPR is geared to the reduction of excess morbidity and mortality during epidemics. This is done through continuous monitoring, early detection, and prompt response with recommended appropriate treatment and timely vector control methods to minimize the impact of upsurges and epidemics (Ministry of Public Health and Sanitation, 2011). The Surveillance, Monitoring, Evaluation and Operational Research Unit in the National Malaria Control Programme (NMCP) is responsible for EPR monitoring in Kenya.

A total of 127 sub-counties spread across 26 counties in the western highlands and seasonal transmission zones are classified as malaria epidemic-prone areas, according to the Kenya malaria profile (Ministry of Health [MOH], 2016). Figure 1 shows the 26 counties included in the EPR workshops. Each of the 127 epidemic-prone sub-counties has five sentinel health facilities strategically selected to represent malaria transmission in the entire sub-county. Data on confirmed malaria cases and malaria-related deaths are collected daily at the sentinel health facilities and reported weekly through the integrated disease surveillance and response (IDSR) system.

The NMCP has been conducting annual EPR review and planning workshops in the malaria epidemic-prone areas, with support from partners. These workshops are geared to preparing the counties to detect, manage, and respond to malaria epidemics in a timely and effective manner. Following the devolution of health services in 2013 in Kenya, the annual review workshops were conducted for county-level staff only, with the expectation that they would cascade the training to their sub-counties. However, the staff trained at the county level faced challenges in cascading the training to sub-counties. Reporting and monitoring of weekly malaria thresholds consequently decreased and malaria upsurges were reported in several counties.

In September and October 2017, malaria upsurges were reported in nine counties, namely: Baringo, Isiolo, Mandera, Marsabit, Samburu, Tana River, Turkana, Wajir, and West Pokot. More than 2,000 adults and children were diagnosed with the disease. Over 50 fatalities occurred from these upsurges and more than 400 people were hospitalized. Marsabit was the worst hit county, with 26 reported deaths and 1,300 adults and children diagnosed with malaria (Mulambalah, 2018). With support from the U.S. President's Malaria Initiative (PMI) and the United States Agency for International Development (USAID), the NMCP prioritized the annual review and threshold setting workshops for both county and sub-county officers in the areas prone to epidemics. The workshops were conducted between January and March 2019.

Objectives of the EPR Planning and Review Workshops

The objectives of the EPR planning and review workshops were:

1. To build the capacity of county and sub-county officers to set thresholds to detect malaria epidemics and upsurges.
2. To develop EPR plans to take appropriate actions to avert epidemics.

The following section describes the preparations for and the organisation of the EPR workshops.

Figure 1: Map of Kenya showing the 26 epidemic-prone counties

METHODS

Pre-Workshop Communication and Organisation

A letter was sent to the county executive committee members for health through the council of governors detailing the purpose of the EPR workshops. The letter requested that the county executive committees of the 26 specified counties send the following county and sub-county officers to participate in the workshops: malaria control coordinators, disease surveillance coordinators, and health records and information officers.

Telephone contact information for these officers was obtained from the county departments of health and the malaria control coordinators. Information about workshop logistics and data requirements was communicated to the officers required to attend the workshops. Data required for the workshops included:

- A list of five established sentinel health facilities representative of malaria transmission in each sub-county. (Criteria for selecting sentinel sites were shared with those sub-counties that had not yet established sentinel sites.)
- Weekly data on confirmed malaria cases from each of the selected sentinel health facilities for the past five years (2014–2018) and the current year (2019).
- Existing county and sub-county malaria EPR plans.
- A brief report on ongoing malaria activities implemented in the county, including EPR.
- Updated county population data and a breakdown by sub-county.
- Any other relevant county/sub-county information to enable effective planning.

The workshops were conducted in four regional towns (Eldoret, Nakuru, Embu, and Isiolo), bringing together participants from surrounding counties.

Preparation of Workshop Training Materials

A two-day workshop was held for the NMCP programme officers who facilitated the workshops to prepare the training materials, including PowerPoint presentations, reference materials, and the pre- and post-workshop evaluations. The facilitators continued to modify the training materials throughout the workshops based on daily feedback provided by the participants.

Organisation of the Workshops

The four-day workshops covered the following topics:

- Introduction to EPR
- Malaria epidemiological surveillance in the context of epidemics
- Entomological surveillance
- Social behaviour change
- EPR planning

The facilitators covered the topics using a combination of training methods, including lecture, brainstorming sessions, demonstrations, group discussions, and participant presentations.

Participants were introduced to the essential components of EPR on the first day of the workshop, including basic statistics, to enable them to set thresholds for epidemic monitoring. The second day focused on threshold setting. The third and fourth days covered EPR planning. Threshold setting and EPR planning

were preceded by demonstrations by the facilitators, followed by guided group work sessions. Each group was assigned a facilitator to lead them through the practical exercises of threshold setting and EPR planning. The groups presented their thresholds during plenary sessions and received feedback from their peers. The groups reconvened to make corrections based on the feedback received and submitted their final EPR plans by the end of the workshop.

ASSESSMENT OF WORKSHOP ATTENDANCE AND OUTPUTS

Workshop Attendance

A total of 320 out of 332 (96.4%) participants invited attended the EPR workshops. Three counties (Uasin Gishu, Wajir, and Mandera) did not send the required number of participants to the workshops. Two participants did not complete the workshops because they were called back to their workstations to address other ongoing outbreaks (Kalazar fever in Samburu and cholera in Kajiado counties). Table 1 shows the cadres of health management officers who participated in the workshops.

Table 1. Composition of county and sub-county workshop participants

Health Management Team Members	Number of Participants	%
County Malaria Control Coordinators	25	7.8
County Disease Surveillance Coordinators	22	6.9
County Health Records and Information Officers	21	6.6
Sub-County Malaria Control Coordinators	101	31.6
Sub-County Disease Surveillance Coordinators	98	30.6
Sub-County Health Records and Information Officers	33	10.3
Other *	20	6.2
Total	**320**	**100**

*Sub-county public health nurses (4); county/sub-county public health officers (3); sub-county pharmacists (3); health promotion officers (2); county/sub-county laboratory coordinators (2); sub-county medical officers for health (2); clinical officer (1); nurse (1); sub-county AIDs and sexually transmitted infection coordinator (1); and sub-county tuberculosis and leprosy coordinator (1).

Workshop Outputs

The EPR workshops had two key outputs: updated epidemic monitoring thresholds and EPR plans. The epidemic monitoring thresholds and EPR plans prepared and submitted were assessed on a 10-point scoring system based on the course content and guidance given on how to develop the two outputs.

Malaria Thresholds

Overall, 103 of the 127 (81.1%) sub-counties who sent participants submitted their thresholds to the NMCP facilitators by the end of the workshop. Of the remaining 24 sub-counties that did not submit the thresholds, 21 did not have the required five-year retrospective data on confirmed malaria cases, whereas the other three lost all their data when their laptops were stolen from their hotel.

Assessment of the Submitted Thresholds

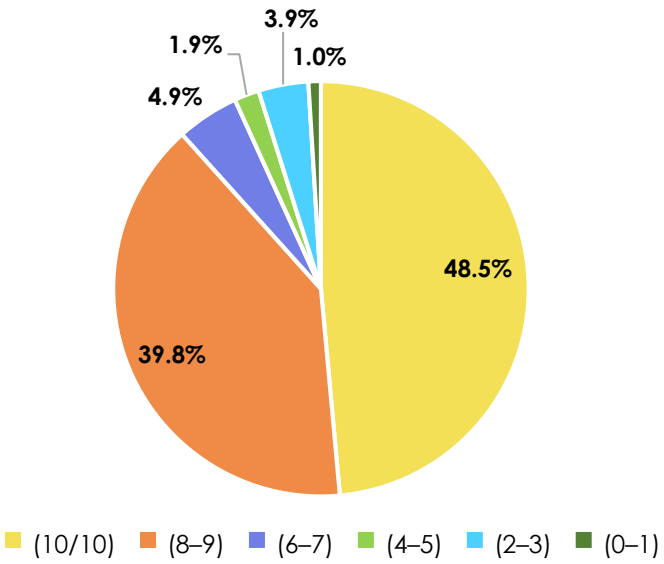
The thresholds submitted by the 103 sub-counties were assessed based on a 10-point scoring system, as shown in Table 2.

Table 2. Assessment criteria for thresholds set by the sub-counties

Assessment Criteria	Score
Five sentinel health facilities available	1
Data available for all years	1
Data properly arranged and labelled (years, alert, & action columns)	1
Alert threshold formulae correctly stated	1
Action threshold formulae correctly stated	1
Alert graph correctly plotted	1
Action graph correctly plotted	1
Bar graph for current year correctly plotted	1
General presentation of chart (title, axis labels, legend)	1
Threshold completed and submitted on time	1
Total	**10**

Of the 103 sub-counties that met the threshold output, 48.5 percent submitted accurate thresholds with a score of 10 out of 10. Another 39.8 percent of the sub-counties submitted acceptable thresholds, scoring eight to nine points. Twelve sub-counties (11.7%) scored seven points or fewer and required more support to set accurate thresholds (Figure 2).

Figure 2. Performance of 103 sub-counties in setting thresholds for monitoring malaria epidemics



Key Challenges Encountered in Setting Epidemic Monitoring Thresholds

1. Lack of historical IDSR data: Twenty-one sub-counties could not submit their thresholds because they lacked the five-year retrospective data needed for the exercise. The missing data were mainly from 2014 and 2015. Weekly data on confirmed malaria cases are submitted through the IDSR system, which was integrated in the District Health Information System, version 2 (DHIS2) in 2016. IDSR data before 2016 were therefore not available in the DHIS2. The affected sub-counties were advised to prepare the threshold template with available data, including all formulae. Participants from the affected sub-counties were required to obtain the missing 2014 and 2015 data from their sentinel health facilities and enter them in the template to complete and submit the thresholds.
2. Lack of knowledge on how to obtain weekly malaria data from the DHIS2: Some participants were challenged accessing and extracting IDSR data from the DHIS2 platform. Experienced participants demonstrated how to access weekly malaria cases from the DHIS2 platform and provided further support to their peers in extracting the data.
3. Use of Microsoft Excel: Some participants were not proficient in using Excel. The facilitators provided small group tutorials on how to use the software. Participants who were experienced in using Excel provided further support to their peers during the threshold setting exercise.
4. Updating thresholds: Most participants experienced challenges updating their thresholds for a new year. Some participants deleted data for the previous years to update the thresholds, leading to the loss of data. The facilitators demonstrated and guided the participants on how to update the thresholds without deleting data for the previous years.
5. Poor communication from the county to the sub-county level officers: Some participants received the pre-workshop communication with very short notice and had no time to obtain the required weekly data that were not available in the DHIS2 platform. In subsequent workshops, the facilitators ensured that the pre-workshop communication was sent to each participant, emphasizing the importance of obtaining correct data before coming to the workshop. The data were checked during the registration of participants on the first day of the workshop. Participants who had not brought the necessary data were asked to contact their colleagues to send them the required data. Despite these measures, 21 sub-counties were still not able to obtain the required data before coming to the workshop.

EPR Plans

All 26 counties and 127 sub-counties were required to submit their EPR plans by the end of the workshop. Overall, 144 of 153 (94.1%) counties and sub-counties submitted their EPR plans.

Assessment of EPR Plans

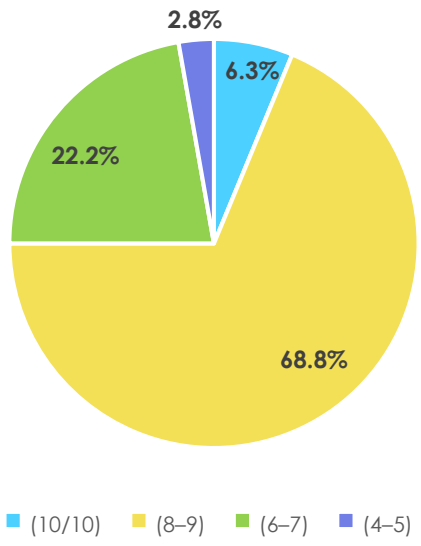
The EPR plans were assessed using a 10-point scoring system based on guidance given during the workshop and a template provided to the participants for this output (Table 3).

Table 3. Criteria for the assessment of EPR plans

Assessment Criteria	Score
Title	0.5
Period of the plan	0.5
Introduction and health profile of the county/sub-county	0.5
Overview of malaria in the county/sub-county	0.5
Strengths, weaknesses, opportunities, and threats analysis	1
Statement of the problem	1
Goals and objectives	1
EPR strategies (≥2 strategies = 1, only 1 strategy = 0.5)	1
EPR implementation plan (3 activities=1, only 2 activities = 0.5)	1
Log frame/budget summary	1
Monitoring and evaluation plan (indicators and data sources)	1
Annexes	1
Total	**10**

Only nine (6.3%) counties/sub-counties obtained the full score of 10 out of 10 on the EPR plan output. The majority of the counties/sub-counties (99/144; 68.8%) scored eight to nine points, showing an overall acceptable performance. Thirty-six (25%) of the counties/sub-counties scored seven or fewer points and required more support to develop their EPR plans (Figure 3).

Figure 3. Performance of 144 counties and sub-counties in developing EPR plans



Challenges Encountered in Developing EPR Plans

1. Definition of indicators and data sources: Participants experienced challenges with defining indicators and data sources for monitoring EPR in their respective counties/sub-counties. The facilitators responded by including PowerPoint slides on EPR monitoring and evaluation indicators and their definitions. The facilitators engaged the participants to identify data sources for the indicators based on their work environment and experience.

2. Budgeting: Most participants had difficulties budgeting for the various activities. The facilitators provided the participants with some standard costing assumptions used across Kenyan MOH programmes.
3. Limited time for EPR planning: Forty-four percent of the participants said that the time allocated for developing the EPR plans was not sufficient. To maximize the time allocated, EPR planning was introduced on the first day of the workshop and the participants were guided to work on specific sections of the plan each day. The facilitators checked participants' progress each day and continued to provide guidance to the work groups.

In summary, the assessment of workshop outputs showed that 88.3 percent of the sub-counties submitted acceptable epidemic monitoring thresholds and 75.1 percent of the counties and sub-counties developed acceptable EPR plans. The counties and sub-counties that did not perform well on these two outputs were identified for continued follow-up and support by the NMCP.

WORKSHOP EVALUATION

Evaluations Conducted

A pre-and post-workshop assessment was done with the participants to assess knowledge gained during the workshop (Appendix A). Participants also completed an evaluation form at the end of each day (Appendix B). The purpose of the daily evaluations was to get participant feedback on the topics covered during the day, identify what was not well understood, and obtain feedback on general workshop organisation. The facilitators reviewed the forms on a daily basis, identified topics that needed further clarification, and modified the training materials and training methods to foster better understanding by the participants. The participants completed an overall evaluation at the end of the workshop (Appendix C). The end of workshop evaluation form was adapted from the regional workshops on Surveillance, Monitoring and Evaluation of Malaria Programs supported by MEASURE Evaluation in collaboration with the School of Public health, University of Ghana. The end of workshop evaluation collected the following information from the participants:

- Achievement of workshop objectives
- Quality of instruction, including delivery and understanding of workshop concepts
- Ability to apply knowledge and skills learned during the workshop
- Motivation to apply and share knowledge gained with colleagues at their workstations
- Topics found to be most useful
- Workshop logistics and general organisation
- What needed to be improved in future workshops

Responses from the end of workshop evaluation were analysed quantitatively and qualitatively.

Pre and Post-Workshop Assessment

Participants were asked to assess their level of knowledge/skills on each topic covered before and after the EPR workshop based on a scale of one to four, as follows:

1 = Not knowledgeable/skilled

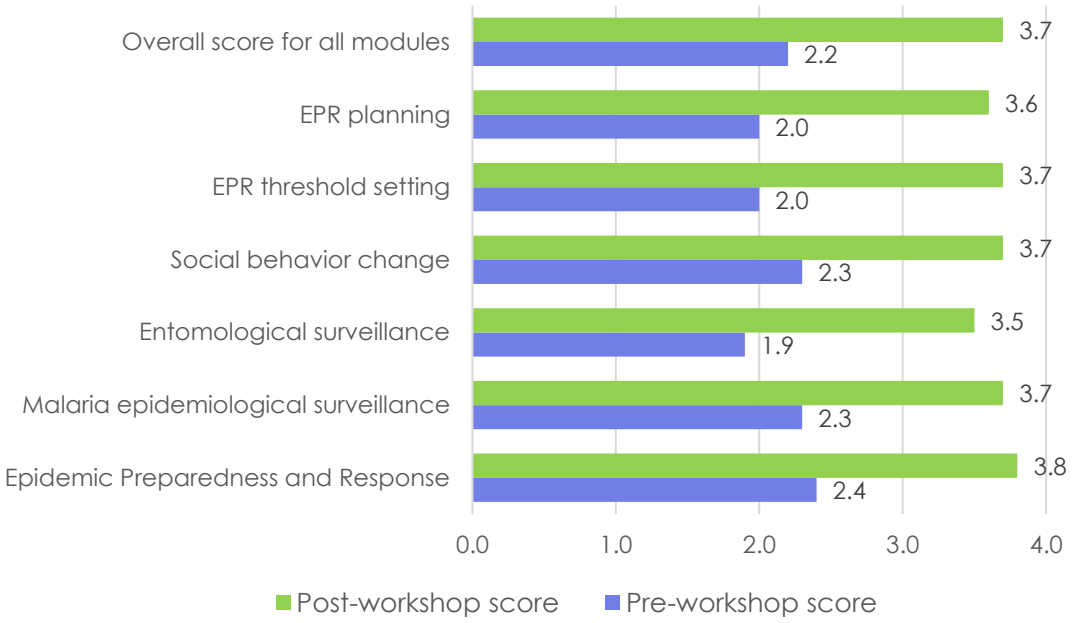
2 = Slightly knowledgeable/skilled

3 = Moderately knowledgeable

4=Very knowledgeable/skilled

Overall, the participants' self-rating of EPR knowledge/skills increased from an average of 2.2 in the pre-workshop assessment to 3.7 in the post-workshop assessment, representing a 68.2 percent improvement (Figure 4).

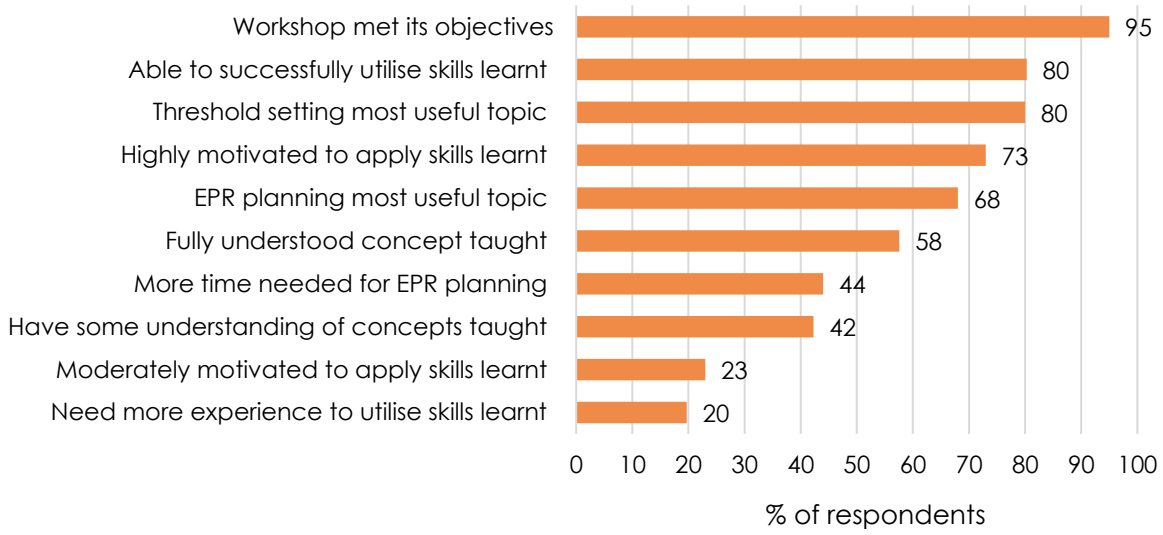
Figure 4. Pre and post-workshop scores, by module



End of Workshop Evaluation

A total of 309 of the 320 participants (96.6%) completed the overall end of workshop evaluation. Ninety-five percent (294/309) of the participants indicated that the workshop had met its objectives. Overall, 80.3 percent (248/309) of the participants said that they were able to put what they had learned during the workshop into practice, whereas the remaining 19.7 percent thought that they needed more experience to practice the skills learned. Only 58.6 percent (181/309) of the participants felt that they fully understood the concepts taught, whereas the remaining 41.4 percent felt that they had an understanding of the concepts. Seventy-three percent of the participants said that they were very motivated to use the skills learned and would make it a high priority in their work, and the remaining participants were moderately motivated. Threshold setting was identified as the most important topic by 80 percent of the participants. Forty-four percent of the participants felt that the time allocated for EPR planning was not sufficient (Figure 5).

Figure 5. Workshop evaluation



Qualitative Analysis of the End of Workshop Evaluation

The participants' responses to the open-ended questions in the final workshop evaluation were reviewed and grouped into themes to better understand what the participants thought about the workshop. Illustrative quotes were selected to highlight key ideas from the participants.

Achievement of Workshop Objectives

The EPR workshops had two objectives: to set thresholds for monitoring malaria epidemics and to prepare EPR plans to respond in case of an emerging epidemic. The majority of the participants felt that the workshop objectives had been met, as illustrated by the following quotes:

> *The workshop totally met its objectives because initially I didn't know how to set thresholds and update but now I can confidently do it comfortably* [Nakuru workshop].

> *The workshop met its objectives. It was very helpful to me since in my sub-county we have been getting upsurges* [Isiolo workshop].

> *The two objectives were well articulated and served its purpose. I do propose to have an annual review forum to deliberate on gaps. Awarding best performing counties* [Eldoret workshop].

However, there were gaps in the overall achievement of the workshop objectives, as identified by participants in the following quotes:

> *Objectives were 75% met. More time was needed for the workshop …the 2nd objective* [EPR planning] *was not completely met* [Embu workshop].

> *Yes, it did as am able now to deliver at least 3/4 of the objectives* [Embu workshop].

The workshop met its objectives because when we came, we didn't know how to calculate thresholds and make EPR plans & now we are above 70% in doing these [Eldoret workshop].

The workshop met its objectives, but the time was too short. Threshold setting requires adequate practice [Eldoret workshop].

The workshop met its objectives though for threshold it was partly met due to lack of adequate data [Embu workshop participant].

NO. next time invite the team record officers for easy use of computer [Eldoret workshop participant].

These quotes support the quantitative assessment results, which indicated that 44 percent of the participants felt that the time allocated for EPR planning was not adequate. The quotes also highlight the challenges experienced in setting the threshold because of the lack of the required data, inadequate computer literacy, and the lack of involvement of the sub-county health records information officers (SCHRIOs), who are the custodians of health data at the sub-county level. The county health records information officers (CHRIOs) were invited to the EPR workshops, but their counterparts at the sub-county level were not invited. SCHRIOs receive the routine health data collected monthly from the health facilities and are required to check and enter them in the national DHIS2 platform. The lack of involvement of these officers in the EPR workshops was a clear gap that needs to be addressed in the future.

Workshop Organisation

The daily evaluations not only assessed the course content but also general workshop organisation, including food, cleanliness, internet connectivity, and other workshop logistics. MEASURE Evaluation staff reviewed all feedback about the workshop venues and logistics and made the required changes. Feedback on the training venue was communicated to the hotel management for necessary improvement. MEASURE Evaluation staff addressed the feedback about other workshop logistics, such as pre-workshop communication. Participants were generally happy with the workshop organisation. The following quotes highlight some of the feedback provided:

The training was well organised, and participants were given a chance to express their feelings daily [Isiolo workshop].

This is one of the best workshops I have ever attended …the organisation was done well with the evaluation done after every topic [Eldoret workshop].

I thank the organisers, facilitators, and the entire teams for fully participating, it was a knowledgeable training that can improve the malaria surveillance in our working sites …I wish to acknowledge and appreciate all the facilitators and the partner for spending the time and all energies to us [Eldoret workshop].

There were challenges with pre-workshop communication, especially in first workshops, as highlighted in the following quotes:

> *Pre-workshop communication should be made to the participants because county coordinators may withhold part of what is required of the participants……communication not very clear since the county disease surveillance officers were not copied in the mail* [Eldoret workshop].

> *Workshop communication should be done early and if possible, copy to the relevant county officers not one but at least 2-3* [Nakuru workshop].

Pre-workshop communications were sent to the county health management teams through the council of governors. The county health directors and county malaria control coordinators were required to pass on the communications to the sub-county officers. However, some sub-county officers got the communications very late and had no time to mine the data required for the workshop. To address this problem, in subsequent workshops, MEASURE Evaluation staff made telephone calls to all required county and sub-county officers to inform them about the workshop logistics and the data requirements.

There was also feedback on the selection of the required officers for the EPR workshops. Although the invitation letter clearly stated that the malaria control coordinators, disease surveillance coordinators, and health records and information officers were required, some counties still sent other officers whose work did not focus on malaria, as illustrated in the following quote:

> *Some counties however brought friends as participants so be strict and specific and verify at the beginning* [Eldoret workshop].

Participants expressed concerns about the lack of inclusion of SCHRIOs in the workshops, as highlighted by the following:

> *Increase time of training to five days. Health records officers should be included in the training for work to flow …. add one participant from each sub-county—the SCHRIO…please involve record officers (computer experts)* [Eldoret workshop].

Participants felt that the time allocated for EPR planning was inadequate, as illustrated by the following quotes:

> *Since the EPR development is hectic, please plan for it to take a whole week for the beginners* [Eldoret workshop].

> *Planning* [EPR] *…it needs a lot of time and very involving…increase the number of days for effective planning of EPR plans …* [Nakuru workshop].

> *Requires more time to complete plans. Facilitate sub-counties to obtain data for threshold setting and perform OJT* [on-the-job training] [Eldoret workshop].

Besides the time allocated for its preparation, the delivery of the EPR plan needed to be improved, as illustrated by the following quote:

> *Improve on EPR planning, the outline of the EPR plan (Word document) and Excel template* [Eldoret workshop].

Each section of the EPR plan outline needed to be explained more. The Excel template was complicated to use among those officers who were not proficient in Excel.

Quality of Presentations

Participants were generally happy with the NMCP facilitators, as shown in the following quotes:

> *Appreciation to the facilitators who worked tirelessly to ensure that we get the concept* [Nakuru workshop].
>
> *Thanks to all the facilitators for their friendly interactions with participants…Excellent preparation & delivering of materials intended for the meeting. Keep it up…The workshop was more practical and participatory in all its objectives and were all achieved* [Embu workshop].
>
> *Session presenters were up to the task. Congratulations …The training ran smoothly right from day one and the facilitators were just fantastic. They took us slowly by slowly through each presentation. This is a training in which I really understood what you were teaching us* [Eldoret workshop].

However, some participants identified a few gaps in the quality of facilitation, as highlighted in the following quotes:

> *Principles of adult learning should be taken into consideration* [Isiolo workshop].
>
> *For me, the workshop met the objectives. However, there is need for the facilitators to support the groups (sub-counties) more closely* [Eldoret workshop].

CONCLUSIONS

The objective of the EPR workshops was to build the capacity of county and sub-county health managers to set thresholds for monitoring upsurges in malaria cases to detect malaria epidemics. The second objective was to develop EPR plans to respond to epidemics if and when they occur. The end of workshop evaluations showed that 95 percent of the participants felt that the workshops met their objectives. Eighty percent of the participants felt that they were able to use the knowledge and skills learned in the workshop successfully and 73 percent were highly motivated to use their knowledge in their work. However, only 58 percent of the participants felt that they fully understood the concepts taught. Forty-four percent of the participants felt that the time allocated for EPR planning was inadequate.

Some gaps identified in the workshops included inadequate computer skills in the use of Microsoft Excel and some participants' ability to access and extract required data from the DHIS2 platform. The lack of involvement of SCHRIOs was another major gap because they are the custodians of routine data at this first level of implementation. The lack of five-year retrospective data on confirmed malaria cases to set the epidemic monitoring thresholds was another important gap that led to some sub-counties not being able to deliver one output of the workshop. Participants experienced challenges with defining indicators for EPR planning, identifying key response activities, and budgeting using the Excel template provided.

Recommendations made included increasing the duration of the EPR workshops from four to five days, and simplifying the EPR planning templates for better understanding and use by sub-county and county-level managers. The inclusion of SCHRIOs in future EPR workshops was highly recommended. The incorporation of basic skills in using Excel and the demonstration of data mining from the DHIS2 platform were also recommended. Follow-up support by the national level to the sub-counties and on-the-job-training to enhance skills learned were likewise recommended. Last, participants recommended that more time be allocated for group presentations and feedback and more support be provided by the facilitators during the group work sessions.

Implication for Malaria Programming

EPR is one of the eight strategies under the surveillance, monitoring, evaluation, and operational research objective of the Kenya Malaria Strategy 2019–2023 (MOH, 2019). The key outcome indicator for this strategy is the proportion of targeted sub-counties reporting malaria thresholds data weekly. There is currently no established system for monitoring this indicator. Participants at the EPR workshops were instructed to send the weekly thresholds as Excel attachments by email to the EPR focal persons at the NMCP. The Excel sheets sent to the focal persons are tedious and cumbersome for the focal persons to analyse, monitor, and feedback to the sub-counties to respond to any emerging or apparent epidemics. Kenya has consequently continued to experience malaria epidemics, despite the apparently successful EPR capacity building conducted.

A key recommendation for the EPR workshops to achieve the intended outcome is to establish an EPR threshold reporting tool in the DHIS2 platform. An EPR dashboard will monitor the weekly thresholds and to trigger actions from the sub-county, county, and national levels should be included in the development of the tool. This will facilitate early detection to avert malaria epidemics and the response to reduce morbidity and mortality.

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APPENDIX A: EPR WORKSHOP ASSESSMENT AND REVIEW FORMS (FOLLOWING PAGES)

EPR Planning and Review Workshop Pre-Workshop Assessment

The information collected in this form will be used for training improvement purposes. Please respond honestly. All information you provide is CONFIDENTIAL.

Please assess your level of knowledge or skills in each of the following course topic areas BEFORE the workshop.

1 = Not knowledgeable or skilled
2 = Slightly knowledgeable or skilled
3 = Moderately knowledgeable or skilled
4 = Very knowledgeable or skilled

BEFORE the course	**Topic**
1 2 3 4	Updates on Malaria Control in Kenya
1 2 3 4	Malaria Epidemic Preparedness and Response (EPR)
1 2 3 4	Malaria Epidemiological Surveillance in the context of epidemics
1 2 3 4	Entomological Surveillance in the context of epidemic monitoring
1 2 3 4	Social Behaviour Change (SBC) for malaria epidemic containment
1 2 3 4	EPR threshold setting
1 2 3 4	EPR planning

EPR Planning and Review Workshop Post-Workshop Assessment

The information collected in this form will be used for training improvement purposes. Please respond honestly. All information you provide is CONFIDENTIAL.

Please assess your level of knowledge or skills in each of the following course topic areas **AFTER** the workshop.

1 = Not knowledgeable or skilled
2 = Slightly knowledgeable or skilled
3 = Moderately knowledgeable or skilled
4 = Very knowledgeable or skilled

AFTER the course	**Course Topic**
1 2 3 4	Updates on Malaria Control in Kenya
1 2 3 4	Malaria Epidemic Preparedness and Response (EPR)
1 2 3 4	Malaria Epidemiological Surveillance in the context of epidemics
1 2 3 4	Entomological Surveillance in the context of epidemic monitoring
1 2 3 4	Social Behaviour Change (SBC) for malaria epidemic containment
1 2 3 4	EPR threshold setting
1 2 3 4	EPR planning

Daily Workshop Evaluation Form

End of day evaluation

1. Did you learn anything new from today's sessions?

Yes [__] No [__]

If Yes, write down any new thing you learnt from today's sessions

(i)_____

(ii)_____

(iii)_____

2. Is there anything in today's sessions that was not clear to you?

Yes [__] No [__]

If Yes, please write down the topics/ areas you would like clarified or explained further.

i)_____

(ii)_____

(iii)_____

3. What did you like most from today's sessions?

_____

_____

_____

4. Please suggest/comment on anything else that needs to be improved from today's sessions.

_____

_____

_____

End of Workshop Evaluation Form

The information collected in this form will be used for training improvement purposes. Please respond honestly. All information you provide is **CONFIDENTIAL.**

Workshop Venue: _____

Workshop dates: _____

1. How able are you to put what you've learned from the training into practice?
    a. I am still unclear about what to do, and/or why to do it.
    b. I need more guidance before I know how to use what I learned.
    c. I need more experience to be good at using what I learned.
    d. I can be successful now in using what I learned.

2. Now that you have completed the training, how well do you feel you understand the concepts taught?
    a. I am still confused about the concepts.
    b. I am now somewhat familiar with the concepts.
    c. I have an understanding of the concepts.
    d. I fully understand the concepts taught.

3. Regarding the skills taught during the training, how motivated are you to utilize these skills in your work?
    a. I am NOT motivated and will NOT make this a priority when I return to my worksite.
    b. I am slightly motivated, but will make this a low priority when I return to my worksite.
    c. I am motivated and will make this a moderate priority when I return to my worksite.
    d. I am VERY motivated and will make this a high priority when I return to my worksite.

4. Do you plan to share the information you have learned at this training with other colleagues?
    a. No
    b. Maybe
    c. Yes
        i. If yes or maybe, what topics do you plan to share?

        _____

        _____

        _____

5. What topics/aspects of the workshop did you find most useful to you

    (i) _____

(ii) _____

6. What topics/aspects of the training could be improved?

   (i) _____

   (ii) _____

7. The main objectives of this workshop were twofold; **1) to build capacity of county and sub-county officers to set thresh holds to detect malaria epidemics/upsurges 2) develop epidemic preparedness and response plans in order to take appropriate actions to avert epidemics**. Please explain if you think the workshop met its objectives. If you think it did not, please explain how it could be improved.

_____

_____

_____

8. Please rate the overall quality of instruction/facilitation in this workshop *(Please circle the number corresponding to your rating)*

Not satisfactory									Excellent
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

9. Which of the following are true about your course facilitators? Please circle **ALL** that apply.

   a. The facilitators were unclear or disorganised.
   b. The facilitators were inappropriate, which negatively impacted my learning.
   c. The facilitators gave us little time to practice skills we could use in our work.
   d. The facilitators generally did a good job facilitating the learning.
   e. The facilitators demonstrated deep subject-matter knowledge.
   f. The facilitators showed high levels of real-world experience relevant to the topic.
   g. The facilitators motivated me to engage deeply in the learning.

10. How was the overall workshop administration/Organisational logistics? (Please circle the number corresponding to your rating).

Not satisfactory Excellent

1 2 3 4 5 6 7 8 9 10

11. What recommendations would you make to improve the workshop Organisation (training venue, meals, lodging, pre-workshop communication, workshop administration?)

_____

_____

_____

_____

12. Is there anything else you want to tell us regarding the training?

_____

_____

_____

Thank you for your honest and detailed feedback. Congratulations on finishing the training!

MEASURE Evaluation
University of North Carolina at Chapel Hill
123 West Franklin Street, Suite 330
Chapel Hill, North Carolina 27516
Phone: +1-919-445-9350
measure@unc.edu
www.measureevaluation.org

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