Module 6: EBS Monitoring and Evaluation

Introduction

The implementation of a monitoring and evaluation (M&E) plan for event-based surveillance (EBS) systems provides timely information on whether a system is functioning properly and meeting targets, while providing data to guide continuous performance improvement. An EBS M&E plan should ideally describe why, how, and when changes towards a desired public health surveillance goal.

Module content:

This module consists of following sessions:

Session 1: Monitoring and Evaluation Framework in EBS
Session 2: Indicators used in EBS
Session 3: Conduction of EBS Monitoring and Evaluation

Module Duration: This module will take xxx minutes to complete

Learning Objectives

By the end of this module you will be able to:

- Explain Logical Monitoring and Evaluation Framework in EBS
- Describe indicators used in EBS Monitoring and Evaluation
- Explain how EBS Monitoring, and Evaluation can be conducted

Definition of terms

EBS Monitoring is the continuous tracking of planned surveillance activities. Monitoring the performance of the surveillance system involves identifying areas that require strengthening, acting for improvement and monitoring progress

Evaluation is a periodic assessment of whether the objectives have been achieved. Perform evaluation of event-based surveillance system annually, to measure progress against selected program targets

Indicators: An indicator is a specific, observable and measurable characteristic that can be used to show changes or progress a programme is making toward achieving a specific outcome.

Session 1: Logical Monitoring and Evaluation Framework in EBS

There are different models that can be used to assess different programmes.

It is suggested to the use a logical framework termed the results chain, or pipeline, model (figure 1) to track inputs, activities, outputs, outcomes, and impacts of a system. EBS programmes can be assessed routinely on how they are conducted

(inputs & activities); their level of performance (outputs); and their achievements (outcomes & impact).

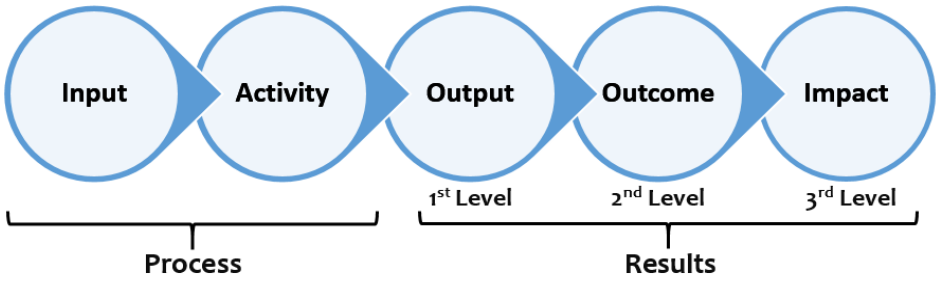


Figure 1: The five basic levels of results chain model

A results chain logic is a diagrammatic framework that hierarchically illustrates how a project or program actions taken at one level will lead to desired results at a higher level, over a defined period of time. It is a diagrammatic framework of the cause-and-effect logic for achieving a project/program objective over a defined period. The model uses a hierarchical causal logic that if lower-level desired results are achieved, then the next higher-level desired results can be achieved, if the critical assumptions hold. The logic is that specific resources (inputs) are required to undertake program tasks (activities) whose accomplishments (outputs) bring about system changes (outcomes) that eventually lead to an overall public health (impact).

This causal logic explains the relationships between actions and results through a series of "if-then" statements that describe the theory of project and program developments underlying those relationships. The linkage design is that results at the same lower level are considered necessary individually and jointly sufficient to achieve the level above them. It explains the links between what was done and what was achieved by demonstrating which actions will contribute to, or influence which results. The overarching questions are: Will the resources allocated deliver the desired results? Has there been measurable progress in the agreed results? The inputs, activities, outputs, outcomes, and impacts presented in a hierarchical conceptual diagram constitute the five basic levels of results chain logic (Figure 1). Each of these levels has a set of actions (or results of a lower level) together with the critical assumptions yields the desired results.

a. Inputs: These are all the resources required for the implementation of the EBS program. The inputs include implementation documents (legal frameworks, policies, guidelines); curriculum and tools; human resource, time, finance, materials, infrastructure, stakeholders (communities, public health and healthcare workers, national and sub-national leadership, multi-sectoral partners) and other resources.

b. Activities: Activities involve any tasks, actions, processes, or procedures undertaken in the course of the EBS program implementation through the utilisation of the inputs. Activities rely on a well thought out strategy for the successful EBS implementation. They include tasks such as planning meetings, procurement of supplies, training and sensitizations, and the rollout such as the

EBS processes (detection, reporting, triaging, verification, risk assessment, and response), support supervision, coordination, and operation support.

c. Outputs: Outputs are the immediate gains of activities during the EBS program implementation activities.

d. Outcomes: These are short-term and medium-term direct changes resulting from the EBS implementation. These include EBS implementation outcomes are demonstrable changes in the promptness of detection of events, timeliness in notifications, and rapidity in response to acute threats to public health.

e. Impacts: The impacts are the overall long-term improvements in health outcomes attributed to the EBS program implementation. The impacts are aligned to the EBS program goals and may be due to the implementation outcomes only or in combination with the outcomes of other health programs. Impacts include reduction in public health emergencies and or reduction in mortalities, disabilities, and morbidities due to acute public health threats.

Session summary

In this session you have learned the use of Logical M & E Framework to track desired results in EBS implementation.

Quiz

1. EBS monitoring is the continuous tracking of planned surveillance activities to measure progress against selected program targets. (True/False)
2. Regarding Logical Framework conducting EBS stakeholders meeting is an activity. (True/False)
3. The logic is that specific inputs are required to undertake activities whose outputs brings about outcomes that leads to impacts (True/False)

Session 2: Sample EBS Indicators

Introduction

In this session you will learn various attributes with respective Indicators

Session Content

There are twelve attributes which are measured by indicators as shown in the table below:

Table: Attributes and EBS indicators:

Attribute	Indicators
Timeliness	Time from event start to detection
	Time from signal detection to reporting (within 24 hours)
	Time from signal detection to verification (within 24 hours)
	Time from signal detection to response
	Time from event verification to risk assessment (within 24 hours)
	Time from event verification to response
Data quality (accuracy and completeness)	Analysis and summaries of EBS data are completed and made available within specified timeframes and are free of errors
Sensitivity	Proportion of events detected through EBS of all reported events in a specific period of time
Specificity	Proportion of detected signals that are verified as genuine public health events/threats
Programmatic	Number of MS supported with training/adaptation (EBS, TOT, EMS)

Indicator Type	Sample indicators
Input indicators (measures resources needed for the implementation of EBS or an EBS-related activity)	• Number of staff and key stakeholders to implement EBS at each level • Amount of financing for event-based surveillance implementation • Number and type of resources provided
Process/activity indicators: (measure whether planned activities took place)	• Event-management system established • Existence of EBS signals for all sources/sites • Technical guidelines, SOPs, and training materials are available for use • Equipment and reporting tools for EBS are

	procured and available
Output indicators: (measures the immediate results of EBS-related activities)	• Availability of EBS implementation work plan and signal definitions • Personnel trained and equipped • Signals reported, triaged, and verified • Surveillance units, health facilities and communities that establish EBS • Monitoring indicators reported • Evaluation site visits conducted
Outcome indicators: (measure the quality of the surveillance system and the extent to which surveillance and early warning and response (EWAR) objectives were achieved)	• Utility of EBS for surveillance workforce, community and leadership stakeholders • Events assessed for risk and responded to • Surveillance staff capable of analyzing and interpreting EBS data for early warning surveillance • EBS data analyzed into timely and accurate summaries • Sensitivity • Positive predictive value (PPV)
Impact indicators: (measure the improvement of overall health that can be attributed to EBS)	• Timely event detection, reporting, and response • EBS data used to initiate and inform outbreak response & control efforts

Summary

In this session you have learned various attributes with respective Indicators used in EBS.

Quiz

Matching Items

Question	Attributes	Answer	Indicators
1	**Data quality (accuracy and completeness)**	C	**A**: Proportion of detected signals that are verified as genuine public health events/threats
2	**Sensitivity**	B	**B**: Proportion of events detected through EBS of all reported events in a specific period of time

3	**Specificity**	A	**C**: Analysis and summaries of EBS data are completed and made available within specified timeframes and are free of errors

Session 3: Conducting EBS Monitoring and Evaluation

In this session you will learn how EBS Monitoring and Evaluation are conducted

EBS Monitoring

EBS can be monitored through:

a) Supportive supervisions conducted regularly (Monthly and Quarterly) to the regions, districts, health facilities and Community Health Volunteers and other key informants depending on availability of resources and demands.
b) Quarterly IDSR Expert Group evaluation meetings
c) Monthly data analysis and interpretation done by the Health Care Workers
d) Quarterly meetings between Health Care Workers and Community Health Volunteers convened by the Health Care Workers' supervisor conducted to receive C-EBS data activity reports and discuss experiences, challenges, lessons learnt
e) Health information or feedback shared by Health Care Workers to the lower levels

EBS Standard data collection tools will include; Alert register, Hotline/Media Alert Logbook (Annex IV), Risk Assessment tool, outbreak investigation reports, Supervisory reports from councils and regions

EBS Evaluation

EBS Evaluation is a periodic assessment of whether the objectives have been achieved. This can be performed annually, to measure progress against selected program targets. At least two events per year should be evaluated from notification to confirmation, assessment, and response.

At each stage people involved should be interviewed and performance of the EBS system assessed and the recommendations made. A team consisting of relevant from Ministry of Health, relevant stakeholders and partners should be formed to conduct evaluation. Surveillance attributes such as usefulness, positive predictive value, representativeness, and flexibility should be used to evaluate EBS performance. Use the results of the evaluation as an input for planning for the following year's activities. Analyse the monitoring and evaluation data after collection (person, place, and time).

- What do the results tell you?
- How has the performance of each village/street (community)/facility changed across time? How do communities/facilities compare to each other?
- Are there other ways to look at the data

Summary

In this session you have learnt how EBS monitoring and evaluation are conducted

Quiz

1. EBS Evaluation is the continuous tracking of planned surveillance activities to measure progress against selected program targets. (True/False)
2. Signal Register are sources of data Monitoring and Evaluation (True/False).

End of Module Questions

1. Timeliness can be measure by the time from event verification to risk assessment within 24 hours (T/F)

Matching item

	Sample indicator	answers	Indicator type
2.	Utility of EBS for surveillance workforce, community, and leadership stakeholders	B	A: Output indicators
3.	EBS data used to initiate and inform outbreak response & control efforts	E	B: Outcome indicators:
4.	Signals reported, triaged, and verified	A	C: Process/activity indicators
5.	Existence of EBS signals for all sources/sites	C	D: Input indicators
6.	Amount of financing for event-based surveillance implementation	D	E: Impact indicators

7. Arrange the following basic level of result chain model in chronological order
   a. Inputs 1
   b. Output 3
   c. Activity 2
   d. Impact 5
   e. Outcome 4

8. The following are the indicator used to measure EBS sensitivity.
    a. Proportion of detected signals that are verified as genuine public health events/threats
    b. Proportion of events detected through EBS of all reported events in a specific period
    c. Time from signal detection to response
    d. Number of MS supported with training/adaptation (EBS, TOT, EMS)

9. Write True or False against each of the following regarding EBS Monitoring and evaluation.
    a. Monitoring and evaluation are carried out concurrently. False
    b. Monitoring the performance of the surveillance system involves identifying areas that require strengthening, taking action for improvement and monitoring progress. False
    c. Evaluation is a periodic assessment of whether planned activities have been implemented. False
    d. Evaluation of EBS cab be performed on daily basis. False

10. Write True or False against each of the following regarding Logical framework in EBS.
    a. Conducting EBS stakeholders meeting is an activity. True
    b. Increased promptness of alert response is an output. False
    c. Decreased number of deaths due to epidemic prone disease is an outcome False
    d. Procurements of supplies in one of the inputs. False
    e. Increased timeliness of disease notification is an impact. False

11. A team consisting of relevant from Ministry of Health, relevant stakeholders and partners should be formed to conduct evaluation. (**True**/False).

12. The impacts are the overall Short -term improvements in health outcomes attributed to the EBS program implementation (True/False)

7.1. Annex 1: Signal Log and/or Register Book

Variables	Response
Source of Information	
(a) Source: CBS, HEBS, Media Scanning, Hotline	
(b) Reporter Info: Employee at national team, community health volunteer, health-care worker etc.	
(c) Date and Time: of detection/receiving signal (DD/MM/YYYY and HH:MM)	
(d) Reference/Contact: Link, Contact name and Phone number	
Signal Information	
(a) Signal Type: Human, Animal, Environment	
(b) Signal: From the country's list of signals	
(c) Location: Details about the location that can follow the administrative levels	
(d) Date of start: When did this start	
(e) Cases: Number of cases	
(f) Deaths: number of deaths	
(g) Description: narrative text for any further information, including any response activities (by community or health	
Follow-up activities	
(a) Follow-up: Discard, Monitor, Verify Date-Time: DD/MM/YYYY HH:MM	DISCARD / MONITOR / VERIFY D D M M Y Y Y Y H H M M
(b) Sent for verification: Yes/No Date-Time: DD/MM/YYYY HH:MM	YES / NO D D M M Y Y Y Y H H M M
(c) Risk Assessment: Low/Moderate/High/Very High	Low / Moderate / High / Very High
(d) Sent to Response: Yes/No Date-Time: DD/MM/YYYY HH:MM	YES / NO D D M M Y Y Y Y H H M M
(e) Response Status: Not Started, Ongoing, Completed Date-Time: DD/MM/YYYY HH:MM	NOT STARTED / ONGOING / COMPLETED D D M M Y Y Y Y H H M M

7.2. Annex 2: Verification Tool

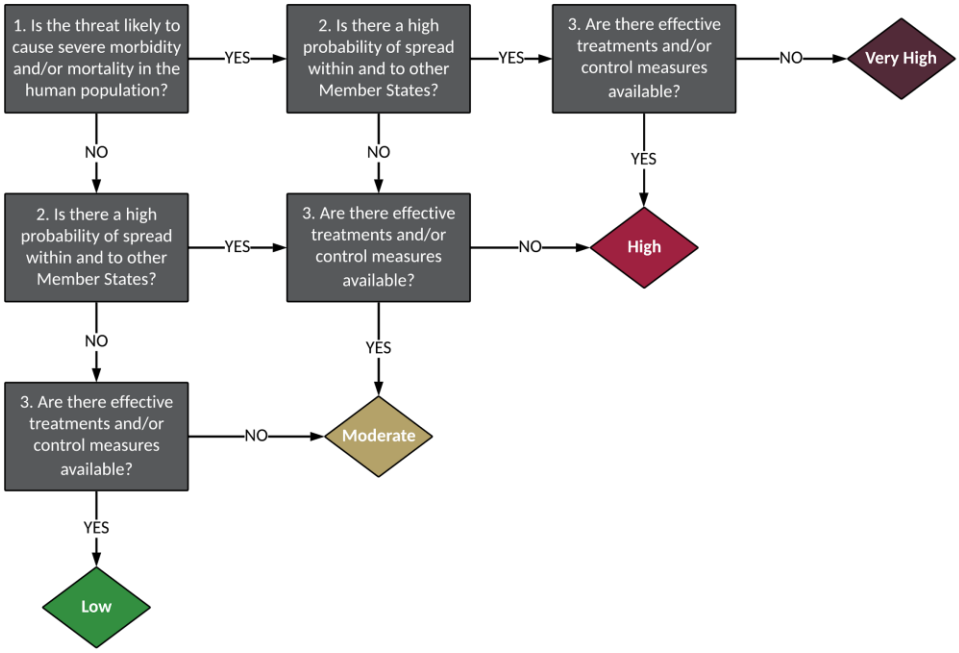
Discard	Confirm as Event
Report is a hoax or a false rumor Report does not meet pre-defined signals	Information is accurate and true, and the signal meets one or more pre-defined signals Information has been reported by an official source or sources

Discard, if	Confirm as an event if
Signal: Two or more persons presenting with similar severe illnesses in the same setting (e.g., household, workplace, school, street) within one week	
There is only one person presenting with illness The persons present with dissimilar signs and symptoms There is no temporal association, and >1 week separates the patients' illness The persons presenting with similar symptoms reside in different settings that are physically well-separated	There are two or more persons presenting with similar signs and symptoms who live or work in the same setting The ill persons had an opportunity for exposure or close contact with one another The persons' illness requires hospitalization One or more persons has died There is a common source of exposure
Signal: Unexpected large number of deaths of poultry, livestock, other domestic animals or wildlife	
The number of animal deaths is what is normally expected There is a reasonable explanation for the animal deaths	The number of animal deaths is not what is usually expected There are multiple clusters/groups of animal deaths There is no explanation for the animal deaths
Signal: Severe illness of a healthcare worker after exposure to patients with similar symptoms	
The ill healthcare worker did not have exposure to patients with similar symptoms The healthcare worker's illness does not require hospitalization The healthcare worker did not have exposure to patients	The ill healthcare worker had exposure to patients with similar symptoms There are multiple clusters/groups of severely ill healthcare workers with exposure to patients with similar symptoms The healthcare workers' illness requires hospitalization One or more patients have died One or more healthcare workers have died
Signal: One or more hospitalized patients with unexplained severe illness, including failure to respond to standard treatment	
The patient is not severely ill (i.e., does not require hospitalization) There is a reasonable explanation for the patient's illness The patient is responding to standard treatment	The patient is severely ill (i.e., requires hospitalization) There are multiple clusters/groups of severely ill patients and/or deaths with similar symptoms There is no explanation for the patient's illness The patient is not responding to standard treatment One or more patients have died

7.3. Annex 3: Event Register

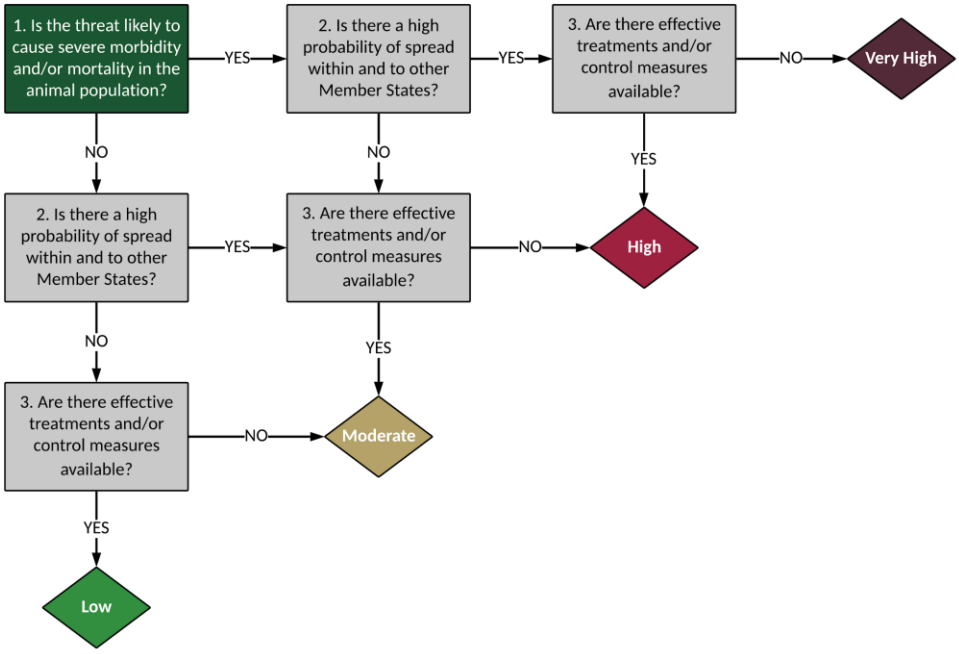
Outbreak/Event Report and Assessment Form		
Information about source of report		
What is your **name**?	What is your **phone number**?	
What is your **position**?		
If report is second-hand information, what is the original source of **information**? (Name, contact information)		
Location of event		
What is the **name of the village** (specific location where the event took place)?		
What is the **district**?		
What is the **province**?		
Description of the event		
What do you want to report (what happened/who is affected/what are the symptoms)?		
Number of cases among **children**:	Number of deaths among **children**:	
Number of cases among **adults**:	Number of deaths among **adults**:	
When did the problem **begin**?		
Is the problem **ongoing**? YES/NO		
What do you think is the cause of this event?		
What are the **control measures** being implemented?		
What **support** do you need from us?		
Is there any **other information** you wish to share?		
Thank you.		
For office use only:		
ASSESSMENT – If **any** of this conditions are met, a response is **required**		
Is the disease unusual/unexpected in this community?		YES / NO
Could the disease have an impact on international travel or trade?		YES / NO
Could the suspected disease cause outbreaks with high potential for spread (e.g. cholera, measles)?		YES / NO
Is there a higher than expected mortality or morbidity from the suspected disease?		YES / NO
Is there a cluster of cases or deaths with similar symptoms (e.g. bloody diarrhoea, haemorrhagic signs and symptoms)?		YES / NO
Could the disease be caused by a contaminated, commercially available product (e.g. food item)?		YES / NO
Is there a suspected transmission within a health care setting (i.e. nosocomial transmission)?		YES / NO
If the event is a **non-human event** (e.g. animal disease or chemical spill), does the event have **known** or **potential** consequence for human health?		YES / NO
Name of person filling out this form: ***Date:***		

7.4. Annex 4: Human Risk Level Algorithm



NOTE: If there are specific groups at increased risk of infection, consider performing separate risk assessment for each group. If in doubt for any questions, select higher risk answer.

7.5. Annex 5: Animal Risk Level Algorithm



NOTE: If the threat is zoonotic or likely to cause severe morbidity and/or mortality in the human population, also complete the **Human Health Risk Assessment Algorithm**.

7.6. Annex 6: CHW Notebook

General Information	
Name	
Telephone	
Name of CBS Supervisor:	
Telephone	
Instructions **When you detect one or more signals in your community, please report immediately to your local-level supervisor. Use this notebook to record the following information and communicate it to the local-level supervisor:**	
Date the signal began	
Date the signal was detected	
Description of the signal, including number of people/animals affected	
Location of the signal	

Signal to be reported	Insert images
Two or more persons presenting with similar signs/symptoms from the same community, school, or workplace, within one week	
A cluster of unexplained deaths of animals within one week	
Any person presenting with new or rare signs/symptoms	
Any person with fever and rash	

7.7. Annex 7: CEBS Register for Local Supervisor

Date						Name of local-level supervisor								
Health Facility						Name of Administrative level								
#	Date identified	Date reported	Name of person reporting	Source of report	Tel #of reporting person	Location of signal	Code	# of people affected	Recent travel history Y/N	If travelled, where?	Verification		Date verified	Date reported
											True	False		

This Signal Register may be completed by community event-based surveillance (CEBS) supervisors upon receiving reports of signals detected at the community-level.

TABLE INFORMATION KEY

1. **'**Date identified' is the date that the person reporting became aware that a person (or persons) showed signs/symptoms of one or more of the signals. Please enter the date in the DD-MM-YYYY format.

2. 'Date reported' is the date that the reporter informed a local-level supervisor about the signal. Please enter the date in the DD-MM-YYYY format.
3. 'Source of report' is the individual reporting to the local-level supervisor. A source may be a community health worker (CHW), school teacher, traditional healer, community resident, healthcare professional, among others.
4. Please state the location of the patient's home, hospital, or place where the incident is occurring, as precisely and exactly as possible. If an address is available, please record it. If an address is not available, please describe the relationship between the patient's location and a landmark. If necessary, please describe the appearance of the setting. For example, a patient's home might be the brown house with a red door that is four buildings away from a specific church.
5. Please use the following codes to show the type of signal that is reported:

Code	Example signals
1	Two or more persons presenting with similar signs/symptoms from the same community, school, or workplace, within one week
2	A cluster of unexplained deaths of animals within one week
3	Any person presenting with new or rare signs/symptoms
4	Any person with fever and rash

6. 'Number of people affected' is the number of individuals who show signs of the signal being reported. Any deaths should be included in this value.

7. 'Reported by multiple sources?' asks the local-level supervisor to state whether the signal has been reported by other individuals at any level of the health system.
8. 'Any recent travel history?' asks the local-level supervisor to state whether or not the person(s) affected by the signal have travelled to another community, sub-national jurisdiction, or country in the 21 days preceding identification of the signal.
9. 'If travel history, where?' asks the local-level supervisor to state the location of travel of the person(s) affected by the reported signal. More than one location may be stated here.
10. 'Signal Verification' asks the local-level supervisor to authenticate the report and record the date of report authentication. If the information has been reported by a credible source in the community (e.g., CHW, village leader, etc.), and/or by multiple sources, and meets one or more pre-defined signals, it is an event. If the report does not meet these criteria, it is false. All events should be communicated immediately (within 24 hours) to the sub-national jurisdiction.
11. Date signal verified' is the date that the local-level supervisor verified the signal. Please enter the date in the DD-MM-YYYY format.
12. 'Date event reported' is the date that the local-level supervisor communicated events (i.e., signals verified as true) to the local-level. Please enter the date in the DD-MM-YYYY format.

7.8. Annex 8: CHW Monthly Signals Logbook

Instructions: This form is a line listing of all the diseases/events/signals identified during the month. It is completed by the CEBS focal person and submitted monthly to the nearest health facility/sub-district surveillance focal person every month.

Community Event-based surveillance Suspected Diseases and Public Health Events Monthly Log Sheet						
District			Sub-district			
Community			Date			
Serial Number	Signal	Date	Location	Number affected	Number died	Action Taken

NB: Countries should adopt this form such that it is used to capture and notify/report the country's priority diseases (indicator-based surveillance) and events/signals (event-based surveillance) occurring at the community level. This can be carbonated in the form of a notebook with a copy sent to the nearest health facility and copy kept at community with the CEBS focal person.