

MODULE 4

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING MODULE



U.S. Centers for Disease Control and Prevention



MODULE 4.1

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING MODULE

FACILITATOR GUIDE



U.S. Centers for Disease Control and Prevention



▶ **TABLE OF CONTENTS**

Acronyms	004
Event-Based Surveillance Glossary of Terms	005
Introduction	008
Overview	009
Purpose	009
Audience	009
General Objectives	009
Specific Learning Objectives	010
Facilitator Training Guide	010
Health Facility Event-Based Surveillance Facilitators	010
Agenda	011
Materials	011
Logistics and Supplies	012
Training Location and Space Setup	012
Class Preparation Checklist	012
Assistance to the Principal Facilitator	013
Supplies for Participants	013
Supplies for Principal Facilitator	013
Health Facility Event-Based Surveillance Training Agenda	014
S1. Welcome and Introductions	016
S2. Overview of Surveillance	021
S3. Health Facility Event-Based Surveillance Overview	025
S4. Signal Detection	031
S5. Signal Reporting	038

► TABLE OF CONTENTS

S6. Engagement of Healthcare Workers	043
S7. Wrap-Up and Closing	046
Appendices	049
Appendix A: Introduction to Health Facility Event-Based Surveillance Training	049
Appendix B: Overview of Surveillance	051
Appendix C: Health Facility Event-Based Surveillance Overview	054
Appendix D: Small Group Exercise: Why is Health Facility Event-Based Surveillance Important?	058
Appendix E: Health Facility Event-Based Surveillance Signal Detection	059
Appendix F: Case Study Exercise for Facilitators	061
Appendix G: Health Facility Event-Based Surveillance Signal Reporting	066
Appendix H: Small Group Exercise: Signal Reporting	069

► **ACRONYMS**

US CDC	U.S. Centers for Disease Control and Prevention
EBS	Event-Based Surveillance
EI	Epidemic Intelligence
EWAR	Early Warning and Response
HEBS	Health Facility Event-Based Surveillance
IBS	Indicator-Based Surveillance
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations (2005)
MOH	Ministry of Health
MS	Member States
NGO	Non-Governmental Organization
WHO	World Health Organization

► EVENT-BASED SURVEILLANCE GLOSSARY OF TERMS

Event:	The International Health Regulations (IHR) define an event as “[...] a manifestation of disease or an occurrence that creates a potential for disease [...]” (which can include events that are infectious, zoonotic, food safety, chemical, radiological or nuclear in origin and whether transmitted by persons, vectors, animals, goods/food, or through the environment).
Event-based surveillance (EBS):	Defined by the World Health Organization (WHO) as the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks, which may represent an acute risk to health. Such information can come from diverse sectors and may include animal, environment and other sectors.
Health facility:	Defined by WHO as any establishment that is engaged in direct on-site patient care.
Health facility event-based surveillance (HEBS):	EBS that is conducted in health facilities. Healthcare workers are involved as primary reporting sources, such as during patient consultations, or as secondary sources reporting unusual health events or health risks picked up through patient consultations.
Indicator-based surveillance (IBS):	Defined by WHO as the systematic (regular) collection, monitoring, analysis, and interpretation of structured data, i.e., of indicators produced by a number of well-identified, mostly health-based, formal sources.
One Health:	An approach to address a shared health threat at the human-animal-environment interface based on collaboration, communication, and coordination across all relevant sectors and disciplines, with the ultimate goal of achieving optimal health outcomes for both people and animals. A One Health approach applies to the local, regional, national, and global levels.
Outbreak:	A disease outbreak is the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season. An outbreak may occur in a restricted geographical area or may extend over several countries. It may last for a few days or weeks, or for several years. Other situations that may constitute an outbreak include a single case of a communicable disease long absent from a population, or caused by an agent (e.g. bacterium or

virus) not previously recognized in that community or area, or the emergence of a previously unknown disease.

Reporting:	The process by which health events and health risks are brought to the knowledge of the health authorities.
Response:	Any public health action triggered by the detection of a public health risk (e.g., monitoring of the event, information of the public, triggering field investigation and/or implementation of any control or mitigation measures). The nature of the response will be adapted according to the nature of the public health risk.
Risk:	The likelihood of an event resulting in negative consequences for public health.
Risk assessment:	A systematic process for gathering, assessing and documenting information to assign a level of risk to human health to an event. Risk assessment is conducted as part of an investigation of an event.
Signals:	Patterns of disease or other information considered by the EWAR System as representing potential acute risk to human health, such as an outbreak. All signals may not become events and as such need to be triaged and verified before a response is initiated. Signals may consist of reports of cases or deaths (individual or aggregated), potential exposure of human beings to biological, chemical or radiological and nuclear hazards, or occurrence of natural or man-made disasters.
Surveillance:	The IHR define surveillance as “[...] the systematic on-going collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary”.
Triage:	The process of screening out the data and information that are relevant for early detection purposes (i.e., the screening out of mild/irrelevant events from potential acute public health events and the cleaning to eliminate duplicates and correct obvious mistakes).

Verification:

In the context of the IHR (article 1): “[...] the provision of information by a State Party to WHO confirming the status of an event within the territory or territories of that State Party”. Under the IHR, all States Parties are required to provide verification upon request by WHO within a limited time period. In the current document, verification is also the pro-active crosschecking of the validity (veracity) of the signals collected by EWAR, by contacting the original source and additional sources, or by performing field investigation verification that ensures that hoaxes, false rumors, and artifacts are eliminated from further consideration.

► INTRODUCTION

EBS is defined by the WHO as the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks which may represent an acute risk to health. EBS may allow for the recognition of emerging or re-emerging public health threats because it is not disease-specific, requires immediate reporting, and is highly sensitive and broad. For EBS, information can come from any source, including community, media, healthcare workers, pharmacies and non-governmental organizations. This information, termed a signal, needs to be triaged and verified before the signal becomes an event. An event is an occurrence that could be a public health threat.

Health facility event-based surveillance (HEBS) requires trained physicians, nurses, and other relevant healthcare workers to recognize and report signals, i.e., observations that may represent an event. Additionally, since reporting does not require laboratory results and relies on physicians' experiences, HEBS may be practical and simple to establish and sustain. This type of surveillance can be readily extended to private practices or health facilities that may not participate in routine reporting through traditional surveillance.

► OVERVIEW



Purpose

This Health Facility Event-Based Surveillance Training Module provides healthcare workers with the knowledge, skills, and tools necessary to effectively implement EBS in health facilities.



Audience

Healthcare workers (physicians, nurses, and other relevant healthcare workers) and surveillance focal points in health facilities.



General Objectives

This training module has two general objectives:

- To build and strengthen the capacity of healthcare workers in health facilities to conduct EBS, and
- To improve the flow of surveillance information between health facilities and their respective local/intermediate public health administrative levels.



Specific Learning Objectives

By the end of this training module, participants will have the skills, knowledge, and resources to complete the following tasks:

- ▶ Describe the importance of HEBS,
- ▶ Identify signals for HEBS,
- ▶ Understand reporting to public health authorities, and
- ▶ Develop strategies needed to continuously engage existing and additional healthcare workers in EBS implementation.



Facilitator Guide

The Health Facility Event-Based Surveillance Training Module is comprised of a Participant Guide and a Facilitator Guide. This component, the Facilitator Guide, is to be used by facilitators from the national- and intermediate-levels to effectively provide training to healthcare workers on EBS in health facilities. This guide contains the following sections:

- ▶ **Healthcare worker training** – This section provides facilitators with step-by-step guidance to effectively facilitate and teach relevant HEBS activities to surveillance focal points and to local/intermediate-level public health authorities.
- ▶ **Appendices** – Handouts of presentations, small case exercises, and case study exercises.

This detailed Health Facility Event-Based Surveillance Training Module Facilitator Guide is intended to provide facilitators with materials to conduct training using adult learning theories and principles. The guide includes the session overview, learning objectives, content overview, teaching methodology, materials, and suggested timeline for each session and activity. The guide also includes step-by-step instructions, facilitator notes, and key takeaway messages to effectively guide facilitators through the module.



Health Facility Event-Based Surveillance Training Facilitators

It is suggested that training for healthcare workers be conducted by at least two EBS-trained facilitators. Facilitators should have experience with both IBS and EBS implementation in their respective countries. They should have knowledge and expertise on group facilitation methods using adult learning theories and principles and be familiar with the training materials in advance.

Before starting each session, it is recommended that facilitators ask participants to read the objectives of the session out loud. At the end of the session, and before moving to the next session, facilitators should ask the participants to go back to these objectives and confirm that they have been met.



Agenda

The suggested length for this HEBS training is four hours. The proposed agenda may be revised as needed based on country-specific needs for HEBS implementation. The curriculum is formatted so that lessons that are applicable to the health facility can be chosen.



Materials

Training participants should receive a packet containing materials for use during and after training, including the Health Facility Event-Based Surveillance Training Module Participant Guide. If this is not available, the handouts in the Appendices of the Health Facility Event-Based Surveillance Training Module Facilitator Guide may be distributed in the appropriate sessions or at the beginning of the workshop.

► LOGISTICS AND SUPPLIES

Training Location and Space Setup

Training locations may vary, and training can be conducted in community health facility compounds, health centers, hospitals, on the premises of places of worship, in classroom spaces, or in other locations. Five to six tables with a seating capacity of five to six participants per table is recommended (the maximum recommended number of participants is 25 to 30). This will facilitate group work and discussions in the plenary sessions. The facilitator(s) will also be able to move around the tables easily to get close to trainees. Arrange the seats so that everybody can see the screen and set up one flipchart and markers beside the screen for the speaker.

Class Preparation Checklist

HEBS training planners and facilitators should review the materials section in each lesson to identify required materials in advance of the training. Once facilitators are familiar with the content, they should make sure it is adapted to the context/country.

TASK	
Verify that LCD projector and computer are functioning properly	
Obtain adequate number of flipchart packages, including stands, paper, and markers (one for every team of participants)	
Obtain adequate supply of sticky notes, pens, and paper	
Verify that training room is set-up with circular tables with 5-8 chairs at each table	
Customize the Workshop Agenda (p.14 of this guide) with location and workshop dates	
Make sufficient copies of this Facilitator Guide for co-facilitators	
Make one copy per participant of the Health Facility Event-Based Surveillance Training Module Participant Guide	
Make one copy per participant of the Event-Based Surveillance Post-Training Evaluation survey	

Assistance to the Principal Facilitator

It is strongly recommended that this training be facilitated by at least two persons: a primary facilitator and a secondary facilitator to assist with small group activities and discussions. The secondary facilitator can serve as the recorder and take notes during the sessions.

If the primary facilitator is alone, he/she should identify at least four volunteer participants to play the role of team (i.e., small group) leads. Each volunteer will be responsible for leading the small group exercises, role-plays, case studies, and selecting others in their group to report back during participation presentation and feedback activities. In addition to assisting the primary facilitator with the training, incorporating “participant team leads” into the training develops leadership and facilitation skills among healthcare workers.

Supplies for Participants

- ▶ Name tags and holders
- ▶ Agenda
- ▶ Writing pens and journals
- ▶ Copies of Health Facility Event-Based Surveillance Training Module Participant Guide

Supplies for Principal Facilitator

- ▶ PowerPoint presentations and projector
- ▶ Flipcharts, markers, pens, tape
- ▶ Health Facility Event-Based Surveillance Training Module Facilitator Guide
- ▶ Appendices: Basic templates for a training agenda, handouts of presentations, exercises, and case studies

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING AGENDA

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Group activity	
▶ Welcome and introductory icebreaker ▶ Training overview and agenda	Introductions Lecture	20 minutes
2. Overview of Surveillance		
▶ EWAR, IBS, and EBS	Group discussion and lecture	30 minutes
3. Health Facility Event-Based Surveillance Overview		
▶ HEBS overview ▶ Why is HEBS important?	Lecture Small group exercise	40 minutes
4. Signal Detection		
▶ What is signal detection? ▶ Signal detection for HEBS	Lecture Interactive case study exercise	75 minutes

Morning Break (15 minutes)

Opportunity to interact with colleagues and mentors

SESSION	ACTIVITIES	TIME
5. Signal Reporting	Lecture	35 minutes
▶ Signal reporting ▶ Signal reporting for HEBS	Small group exercise	
6. Engagement of Healthcare Workers	Brainstorming group exercise	20 minutes
▶ Engaging healthcare workers and other facility staff		
7. Wrap-Up and Closing	Group discussion	20 minutes
▶ Takeaways from the training ▶ Participant feedback and closing	Group activity	
HEBS Training	Total 4 hours	

▶ **SESSION 1**

WELCOME AND INTRODUCTIONS

This session introduces the training and reviews the objectives, content, and agenda for the day. Any necessary logistics announcements should be made in this session. In addition, an icebreaker is conducted to allow participants to introduce themselves and get to know each other.



Purpose

- ▶ Help participants get to know each other and share their expectations of the HEBS training,
- ▶ Get participants to interact with each other and the facilitators in a fun way,
- ▶ Familiarize participants with the objectives and content of the training, and
- ▶ Give participants a roadmap for the workshop via the agenda.



Materials

Facilitator

- ▶ Colorful postcards/index cards cut into four even pieces (depending on the number of participants required in each group)
- ▶ Flipchart paper for each group
- ▶ List of icebreaker questions
- ▶ Markers
- ▶ Laptop, LCD projector, and screen
- ▶ PowerPoint presentation

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide page 10



Total time: 20 minutes

► **ACTIVITY 1.1**

WELCOME AND INTRODUCTORY ICEBREAKER



Help participants get to know each other and share their expectations of the HEBS training

Get participants to interact with each other and the facilitators in a fun way



Group activity



15 minutes

Step 1: Introduce yourself

Facilitators should begin every training module with a warm welcome and an interactive introductory icebreaker. Start by introducing yourself and providing some background on your experience working in surveillance, and interest in facilitating the training. This should provide a fun start to the workshop and help to build trust between you and the participants. It is also a way of modelling the introductions exercise ahead.

Step 2: Form groups using the postcards

After introducing yourself, move on to the icebreaker activity. The icebreaker should involve all participants, including the facilitators themselves, and the activity should motivate the participants to interact with each other for the remainder of the training. The purpose of the icebreaker is to create an environment where participants feel a common sense of purpose and find the training appropriate and worthwhile.

Distribute the cut-up postcards randomly to participants and explain that they need to form a whole picture by finding the other pieces of their postcard. They will need to describe what they have on their piece of postcard rather than just showing it to other participants. This is a way of generating conversation and a sense of fun.

If materials are not available, randomly divide participants into groups of four. Ask the team lead to read the questions to the small group and record the group's answers.

Once everyone has found their group, give each group a piece of flipchart paper, list of questions, and markers (if available).

If materials are not available, randomly divide participants into groups of four. Ask team leads to refer to the Welcome and Introductory Icebreaker section in the Participant Guide for the questions to this activity and to record the answers in their journals.

Step 3: Facilitate small group introductions

Ask participants to introduce themselves by answering the following questions on the flipchart paper (if available) or in their Participant Guide:

1. What is your name and what health facility do you work in?
2. What two things do you enjoy most about the work you do?
3. What is one expectation you have for this training?
4. What two core values or ground rules should the group have during this training?
5. What are two words that best describe the people who frequent your health facility?

Ask each group to choose someone who will write the answers, and another person who will be responsible for introducing each group member and sharing the group's answers with all participants.

If materials are not available, facilitators should ask team leads from each group to introduce each of their group members, and to share some of the answers discussed in their group.

Each group should be given two minutes to share with the larger group. Ask participants to be mindful of time and show respect towards each reporter by refraining from side conversations.



As a training facilitator, remember your role is to not only provide information and give answers to questions, but also to create a positive and productive environment that encourages learning and allows participants to feel comfortable interacting and contributing to the training.

► **ACTIVITY 1.2**

TRAINING OVERVIEW AND AGENDA



Familiarize participants with the objectives and content of the training

Give participants a roadmap for the workshop via the agenda



Lecture



5 minutes

Step 1: Review the training goals and agenda

Open the PowerPoint file titled Introduction to HEBS Training (also in Appendix A of this guide) and ask participants to locate the introduction questions in their Participant Guide.

Go over the purpose of the training and agenda by reading the script below:

The purpose of this training is to provide you with the knowledge, skills, and tools necessary to effectively implement EBS in health facilities. Our training today has two general objectives:

- *To build and strengthen healthcare workers' capacity to conduct surveillance*
- *To improve communication between health facilities' personnel and public health system personnel*

Let's now review the training agenda. As you can see from the agenda, we will be covering the following topics today:

- *Overview of surveillance*
 - *HEBS overview*
 - *Signal detection*
 - *Signal reporting*
 - *Engagement of healthcare workers*
-

Step 2: Go over expectations for the workshop and ground rules

Finish the activity by establishing the expectations for group participation and respect for the ground rules that have been established in the icebreaker activity. Before moving on to the next session, ask participants if everything was clear and answer any questions they may have.

▶ **SESSION 2**

OVERVIEW OF SURVEILLANCE

This session focuses on the importance of healthcare workers in surveillance and includes key theoretical aspects about surveillance.



Learning Objectives

By the end of this session, participants will be able to:

- ▶ Explain the importance of EWAR and public health surveillance, and
- ▶ Describe surveillance systems, including the major surveillance systems, IBS and EBS.



Materials

Facilitator

- ▶ Laptop, LCD projector, and screen
- ▶ PowerPoint presentation

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide pages 11-13



Total time: 30 minutes

► **ACTIVITY 2.1**

OVERVIEW OF SURVEILLANCE



Explain the importance of
EWAR and public health
surveillance

Describe surveillance
systems, including
the major surveillance
systems, IBS and EBS



Group discussion and
lecture



30 minutes

Note: Review the PowerPoint file titled Overview of Surveillance (also in Appendix B of this guide) prior to facilitating this activity and lecture.

Step 1: Introduce the brainstorming exercise

Introduce the activity to the group by explaining they are going to go over some key words used in surveillance that will be used throughout the training. Present questions (Q1-5 below) individually and consecutively, and explain that participants should spend 2-3 minutes brainstorming the answer to each question.

Step 2: Consolidate with the accepted definition or answer

Provide feedback and encouragement when groups are close to the accepted definition of each term. Consolidate by presenting the relevant slide and reviewing the accepted definition of each term before moving to the next term and definition. Encourage participants to review the slides in their Participant Guide after the activity is complete and to make notes as needed. For the second part of the lecture (Lecture – Part 2), simply present the slides noted in red.

Definitions and Lecture – Part 1

Q1: What is surveillance? (Slide 4)

Surveillance is a primary function of public health. It is the ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice. It is closely integrated with the timely dissemination of these data to those who need to know.

Q2. What are the objectives of public health surveillance? (Slide 5)

The objectives of public health surveillance are:

- ▶ Monitor the burden of a disease over time,
- ▶ Detect outbreaks in a timely manner,
- ▶ Determine risk factors for the disease and populations at greatest risk,
- ▶ Guide immediate public health actions for individual patients or the community,
- ▶ Guide programs to prevent and control disease and evaluate those programs, and
- ▶ In some cases, to estimate the population-based burden of disease.

Q3. What is early warning and response? (Slide 6)

Early warning and response (EWAR) is the organized mechanism to detect, as early as possible, any abnormal occurrence or divergence from the normally observed frequency of phenomena. The general objective of EWAR is to rapidly detect and control acute public health events of any origin, with particular attention to nationally-prioritized health risks (“detect earlier to better protect”).

It is embedded in overall surveillance. To ensure efficiency, the EWAR data collection and analysis processes need to be systematized and formalized. In this respect, EWAR relies on a process: epidemic intelligence and two main channels of information, IBS, and EBS.

Q4. What is indicator-based surveillance? (Slide 7)

IBS is defined as the systematic collection, monitoring, analysis, and interpretation of structured data. The collection of IBS data is a routine, regular process, which is primarily passive. Data are collected according to established case definitions, which are either disease-specific or syndromic. They may be collected as individual or aggregated data and originate from either exhaustive or sentinel systems.

The primary function of IBS is to monitor disease and pathogen circulation trends, and not to function as an early warning system. However, it can be a useful supplement to early warning systems as data are analyzed in comparison to baseline values and thresholds to determine unusual disease patterns. The Integrated Disease Surveillance and Response (IDSR) is an example of a primarily IBS-driven system.

Q5. What is event-based surveillance? (Slide 8)

EBS is defined as the organized collection, monitoring, assessment and interpretation of unstructured ad hoc information regarding health events or risks, which may represent an acute risk to health. Data for EBS systems can originate from a variety of sources, including community residents, health facilities, news reports of deaths causing public anxiety, schools, and animal and environmental sectors, among others. As such, EBS can be implemented in communities, schools, pharmacies, health facilities, the animal health sector, or at the national level through hotlines and media scanning.

A key feature of EBS is the emphasis on immediate detection and rapid reporting of signals. When implemented correctly, EBS provides a simple and adaptable form of surveillance, that can be tailored to different settings according to the needs of the country or context.

Step 3: Deliver the second part of the lecture

Lecture – Part 2

Integration of indicator-based surveillance and event-based surveillance (Slide 9)

IBS and EBS are complementary sources of information, and both contribute to the early warning function critical for a prompt and proportioned response. The two are not necessarily separate surveillance systems; both are processed through a single activity (epidemic intelligence), and some of the surveillance functions might be common to both types.

Epidemic intelligence is defined as the systematic collection, analysis and communication of any information to detect, verify, assess, and investigate events and health risks with an early warning objective (as opposed to monitoring of disease trends or burdens). Epidemic intelligence should integrate both IBS and EBS to efficiently detect acute public health events and/or risks.

Comparing indicator-based surveillance and event-based surveillance processes (Slide 10, 11)

Both IBS and EBS present intrinsic characteristics in terms of processes and type of data or information collected. The IBS process is defined by public health professionals for their own specific programmatic use; data/indicators are developed accordingly and are collected and transmitted in routine (i.e., passive) reporting. Conversely, in EBS, both content and format of information collected is not defined (i.e., unstructured information). Data sources for EBS are diverse and intended for different audiences, including some with non-human health objectives (e.g., environmental health, wildlife and fisheries, animal health).

Why is early warning and response important? (Slide 12)

EWAR can ensure the timely detection of public health threats. This can lead to an early response and increases the potential for outbreak prevention.

Step 4: Wrap up session with key message

Prior to moving to the next session, reinforce the key takeaway message below.



EWAR, through IBS and EBS, enables countries to rapidly detect and control acute public health events of any origin.

▶ **SESSION 3**

HEALTH FACILITY EVENT-BASED SURVEILLANCE OVERVIEW

This session focuses on the key role that health care workers play in conducting HEBS, including key theoretical aspects.



Learning Objectives

By the end of this session, participants will be able to:

- ▶ Define HEBS,
- ▶ Explain the importance of HEBS,
- ▶ Describe how HEBS is conducted.



Materials

Facilitator

- ▶ Laptop, LCD projector, and screen
- ▶ PowerPoint presentation
- ▶ Prepared flipchart paper for each group with 4 separate quadrants, if available
- ▶ Markers

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide pages 14-17



Total time: 40 minutes

► ACTIVITY 3.1

HEALTH FACILITY EVENT-BASED SURVEILLANCE OVERVIEW



Define HEBS

Explain the importance of HEBS

Describe how HEBS is conducted



Lecture



20 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled HEBS Overview (also in Appendix C of this guide) and ask participants to review the slides in their Participant Guide and to make notes as needed.

Step 2: Deliver lecture on surveillance

What is health facility event-based surveillance? (Slide 3)

When EBS is conducted in health facilities, including hospitals, it is called health facility event-based surveillance (HEBS). A health facility is defined as any establishment that is engaged in direct on-site patient care. HEBS is not disease-specific; it relies upon detecting unusual occurrences and patterns of disease—also known as signals, which are primarily reported by healthcare workers.

What is a signal? (Slide 4)

A signal is an observation that may represent an event occurring in a population. Signals can be patterns of diseases, such as a cluster of cases with a similar illness, or something that is unusual, such as a treatment failure for infectious diseases on a standard drug regimen or unexpected deaths. A signal is determined to be of public health significance when it is triaged and verified to be an event.

What is an event? (Slide 5)

An event is an occurrence that can threaten public health. It can be a single case of a disease in some settings (a notifiable disease like measles or diseases under elimination like polio), clusters/outbreaks, or unusual events such as someone presenting with drug-resistant tuberculosis.

How is health facility event-based surveillance conducted? (Slide 6)

EBS can be organized in five main steps:

- ▶ Detection of signals
- ▶ Reporting of signals
- ▶ Triage of signals
- ▶ Verification of signals
- ▶ Risk assessment of events

Signal detection (Slide 7)

The process of EBS starts with the identification of a signal, which is an observation that might represent an event occurring in a population. Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designated by national public health authorities. At health facilities, signals are most likely to be detected by healthcare professionals, including physicians and nurses, because of their close contact with patients.

Signal reporting (Slide 8)

Reporting signals means communicating this information to a public health authority. Healthcare workers who detect a signal should report it immediately. Modes of signal reporting may differ depending on available resources and existing surveillance structures, and may include telephone, SMS, or verbal notification.

Triage (Slide 9)

Because of the often-informal nature of signal sources, once detected, signals must be evaluated to determine the likelihood that they truly represent events through the process of triage and verification. The process of triage comprises the review of information in order to discard duplicates, misinformation, irrelevant information, and false information to allow the identification of real events.

Verification (Slide 10-11)

Once a signal has been triaged and verified, it becomes an event. Verification is an essential step to confirm the validity and authenticity of the reported signals (i.e., is the information truly occurring?). This step must be conducted within 24 hours of the signal being detected. Additional information may be required. It is important to note that not all signals become events.

Risk assessment (Slide 12)

An event needs to be assessed to determine the level of risk to human health and to determine the appropriate level of investigation and control measures. Once a signal is verified as an event, risk assessment begins. Risk assessment is a systematic and continuous process for gathering, assessing, and documenting information to provide the basis for actions required to manage and reduce the negative consequences of an acute public health event. Every assessment is a process by which the available information about a real event is analyzed and a judgment is made as to whether it poses an immediate risk to public health. In this case, a full risk assessment is done. Intermediate and/or national-level public health authorities should lead risk assessment efforts. Initial risk assessments must be conducted within 48 hours of signal detection.

Events may manifest as occurrences of patterns of disease, such as clusters of similar illnesses or cases of non-laboratory confirmed illnesses with high-risk exposures (e.g., severe pneumonia in a poultry slaughterer). Alternatively, single cases of diseases in some settings can constitute an event because that illness/disease may be of high priority (e.g., a child with acute flaccid paralysis or the isolation of an Ebola virus in a laboratory).

In the latter case, the event can constitute a notifiable disease within the routine surveillance system or a novel infectious threat that requires further investigation. In both instances, after triage and verification, an event enters the public health surveillance structure where it will be integrated into the routine disease reporting system, such as the Integrated Disease Surveillance and Response (IDSR) programs common in African countries.

Why is health facility event-based surveillance important? (Slide 13)

Due to the heavy workload that healthcare workers have in patient care and clinical management, it is important that EBS in health facilities does not increase their burden of work, but rather is easily integrated into their daily roles and activities. Healthcare workers will use a list of signals to detect events. Once a signal is recognized, it should be reported immediately to surveillance focal points already identified in their health facilities. A signal will have to be triaged and verified to become an event, and this process is performed in collaboration with public health authorities.

Step 3: Wrap up session with key message

Prior to moving to the next session, reinforce the key takeaway message below.



Healthcare workers are frontline reporters who can rapidly detect an emerging public health threat within health facilities. They can use their intuition and experience to identify something unusual or unexpected. Within healthcare facilities, EBS can be practical and easy to implement. Health facility staff can engage in rapid detection and reporting when provided with clear guidance and a reporting mechanism in place.

► **ACTIVITY 3.2**

WHY IS HEALTH FACILITY EVENT-BASED SURVEILLANCE IMPORTANT?



Explain the importance of
HEBS



Small group exercise



20 minutes

Step 1: Set up the small group exercise

Introduce the small group exercise by referring to the prepared flipchart Small Group Exercise: Why is HEBS important? (Appendix D of this guide) and ask participants to locate the corresponding handout in their Participant Guide.

Inform participants that they will be divided into groups and will work to complete all four sections of the flipchart by answering a set of questions. Ask participants to go back to the same groups that were formed during the introductory icebreaker activity. Each group should be made up of at least four participants.

Give each group the prepared flipchart, instructions, and a marker. Each team shall select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter).

Step 2: Get students to discuss and record answers to the questions

Ask participants the following questions and capture the answers in a prepared flipchart with four equally divided spaces:

- How do you (physicians, nurses, and other healthcare workers) currently conduct surveillance in your health facility?
- Do you (physicians, nurses, and other healthcare workers) know the purpose and importance of EBS?
- What is the value of adding EBS to the current surveillance in your health facility?
- What is HEBS?

Explain that this is a brainstorming exercise and therefore active participation from every group member is very important.

Step 3: Facilitate group presentations and feedback

Monitor the timing of the exercise. After 10 minutes, ask the groups to direct their attention to the larger group for the group presentations. Inform the groups that they will have 2 minutes to present. Ask if there is a group that wants to present first. If no group volunteers, randomly select a group to present first. Ask participants to be mindful of the time and show respect towards each reporter by not engaging in side conversations. Summarize common points from the presentations by including input from each group.

Step 4: Wrap up session with key message

Prior to moving to the next session, reinforce the key takeaway message below.



The goal of HEBS is to detect and report signals at health facilities that may represent events that require a quick response.

Now that we have brainstormed and shared why HEBS is important, what it is, and how it should be conducted in our health facilities, we will start Session 4, which focuses on how to identify signals for detection at health facilities.

▶ **SESSION 4**

SIGNAL DETECTION

This session defines signals for HEBS and focuses on how to detect signals at health facilities. It incorporates a case study to explore signal detection in health facilities.



Learning Objectives

By the end of this session, participants will be able to:

- ▶ Define signals and events,
- ▶ List HEBS signals that are predefined for their country,
- ▶ Detect signals within health facilities, and
- ▶ Determine if a signal should be reported.



Materials

Facilitator

- ▶ Laptop, LCD projector, and screen
- ▶ PowerPoint presentation
- ▶ Handout of case study
- ▶ Flipchart paper and markers for each group

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide pages 18-24

Effective Case Study Facilitation Tips

To prepare for and facilitate the case study:

- ▶ Review the training sources for each case study that fit the session's objectives. Adapt the details of the case study according to the participants' country and community.
- ▶ Prior to dividing the participants into groups, explain the purpose of using case studies, read directions out loud, and provide a timeframe for completion of the activity.
- ▶ Be available to answer questions or provide clarification, if needed.
- ▶ Reconvene the participants for larger group discussion and ask each group to present their case study and responses.
- ▶ Before moving on to the next activity, ask participants if everything was clear and answer any questions they may have.



Total time: 75 minutes

► **ACTIVITY 4.1**

WHAT IS SIGNAL DETECTION?



Define signals and events

List HEBS signals that are predefined for their country

Detect signals within health facilities



Lecture



15 minutes

Step 1: Review the content of this activity

Review the content of this activity prior to conducting the presentation. Open the PowerPoint file titled HEBS Signal Detection (also in Appendix E of this guide). Ask participants to review the slides in their Participant Guide and to make notes as needed.

Step 2: Deliver lecture on signal detection

What is a signal? (Slide 3)

A signal is an observation that may represent an event occurring in a population. Signals can be patterns of diseases, such as a cluster of cases with a similar illness, or an unusual health-related occurrence, for example, severe healthcare worker sickness after treating patients, unexpected deaths, etc.

All signals may not become events, so a reported signal needs to be triaged and verified before a response is initiated. Signals may consist of reports of cases or deaths (individual or aggregated); potential exposure of human beings to biological, chemical or radiological and nuclear hazards; or the occurrence of natural or man-made disasters.

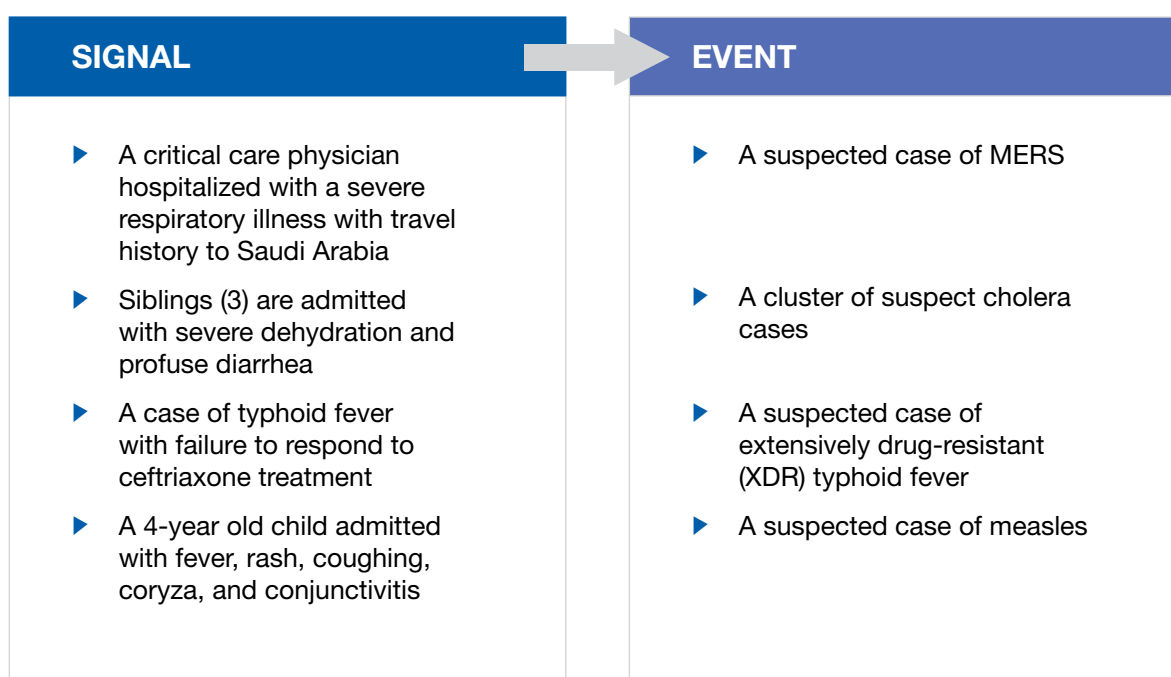
What is an event? (Slide 4)

An event is an occurrence that can threaten public health. It can be a single case of a disease in some settings (a notifiable disease like measles or diseases with ongoing elimination efforts like polio), or an occurrence that creates the potential for a disease, like clusters of people presenting with similar severe symptoms.

Examples of signals and events (Slide 5)

Some examples illustrating the difference between signals and events are:

- ▶ A critical care physician with a recent travel history to Saudi Arabia who has been hospitalized for a severe respiratory disease is considered a signal that requires reporting. After triage and verification of the signal, there may be more evidence to suspect the event as a case of MERS.
- ▶ A case of typhoid fever that has failed to respond to standard treatment is considered a signal. After triage and verification there may be sufficient evidence to suspect the event as a case of extensively drug-resistant typhoid fever.
- ▶ A 4-year-old child with fever, rash, cough, coryza, and conjunctivitis could be a signal. This could become an event, such as a case of measles, after triage and verification.



Examples of signals for HEBS (Slide 6)

Some examples of signals for HEBS are:

- ▶ Any severe illness in health staff after taking care of a patient with similar illness,
- ▶ A large, sudden increase in admission for any severe illness of the same type, and/or
- ▶ Any severe, unusual, unexplainable illness, including a failure to respond to standard treatment.

List of pre-determined HEBS signals for the country (Slide 7)

Adapt the list of signals pre-determined by the country's national public health authorities.

How are signals detected? (Slide 8)

Signal detection is key to HEBS. Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designed by national public health authorities. Healthcare workers, including physicians, nurses, and infection control officers, should be able to recognize signals and report them immediately. Depending on the structure of the existing surveillance system, healthcare workers can either directly report to designated public health authorities or surveillance focal points identified within their health facilities. In some facilities, health workers involved in disease surveillance may already report priority diseases to public health authorities through routine IBS. These people are well-positioned to act as surveillance focal points.

Step 3: Close the presentation

Facilitators will complete the presentation and introduce the case study exercise by saying the following:

We are now going to participate in a case study exercise to develop skills for identifying signals in health facilities.

► **ACTIVITY 4.2**

SIGNAL DETECTION FOR HEALTH FACILITY EVENT-BASED SURVEILLANCE



Detect signals within health facilities, and

Determine if a signal should be reported



Interactive case study exercise



60 minutes

Note: Review the handout Case Study Exercise for Facilitators (Appendix F in this guide) at the beginning of this session prior to facilitating this case study.

Step 1: Explain the importance of using case studies

Explain the importance of using case studies in the HEBS training by reading the following:

Case studies are written accounts of real or fictional situations or problems with sufficient details for participants to determine appropriate actions that need to be taken. They are designed to simulate reality; draw upon participants' experiences and knowledge; and develop critical thinking and decision-making skills. The interactive case studies included in this HEBS training are of situations that may indicate emerging pathogens and possible outbreaks in the country.

Step 2: Prepare participants for the case study

Divide the larger group into four groups of no more than six participants. Ask each group to locate the case study exercise in their *Participant Guide*. They should use this handout as a guide to complete the exercise.

Provide each group with flipchart paper and a marker. Remind groups that they have 45 minutes to complete the case study exercise. Each group must choose a group member to be a recorder and another a presenter who will share their findings and final conclusions with the larger group.

Step 3: Facilitate group discussion

Conduct a discussion after the groups have completed the exercise. Ask each group to share what was discussed in the groups. Facilitators should use the handout *Case Study Exercise for Facilitators* (Appendix F in this guide) to conduct the discussion. This handout contains suggested answers to all questions from case studies. Please do not show the answers to the participants before completing the discussion.

Step 4: Wrap up session with key message

Prior to moving to the next session, reinforce the key takeaway message in the box below.



A signal is a pattern or an unusual occurrence that may be an event representing a threat to public health.

It is important to remember that once a signal has been detected in a health facility, it should be reported immediately to the surveillance focal point and to local/intermediate-level public health authorities.

▶ **SESSION 5**

SIGNAL REPORTING

This session focuses on how healthcare workers and surveillance focal points should report signals.



Learning Objectives

By the end of this session, participants will be able to:

- ▶ Describe the flow of information from signal detection to reporting,
- ▶ Explain when healthcare workers and surveillance focal points should report signals and to whom,
- ▶ Describe what information is reported after detection of a signal, and
- ▶ Identify various signal reporting mechanisms.



Materials

Facilitator

- ▶ Laptop, LCD projector, and screen
- ▶ PowerPoint presentation
- ▶ Prepared flipchart paper with four separate quadrants (one for each group)
- ▶ Markers

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide pages 25-28



Total time: 35 minutes

► **ACTIVITY 5.1**

SIGNAL REPORTING



Describe the flow of information from signal detection to reporting



Q&A discussion and lecture



10 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled Health Facility Event-Based Surveillance Signal Reporting (also in Appendix G of this guide) and ask participants to review the slides in their Participant Guide and to make notes as needed.

Step 2: Deliver lecture on signal reporting

When and to whom should signals be reported? (Slide 3)

The general responsibilities of healthcare workers are (1) the detection of signals, and (2) their immediate reporting to the HEBS focal point. The main responsibilities of the HEBS focal points are (1) to ensure that healthcare workers in their health facility understand the types of signals that need to be reported, and (2) coordinate the reporting of all signals to authorities at higher levels within the public health system.

Reporting signals (Slide 4)

Health facilities engaged in EBS should designate a focal point who will be responsible for receiving signal information and reporting to public health authorities. The focal point will have the contact information of the public health authorities in their jurisdiction.

How can signals be reported? (Slide 5)

(Based on the existing structure in the country)

The health facility can report the signal by any means, such as telephone or SMS.

What information is needed to report? (Slide 6)

Some basic information should be shared when a signal is reported, such as:

- ▶ *What is the signal?*
- ▶ *What are the signs and symptoms?*
- ▶ *When was it detected?*
- ▶ *Is this ongoing?*
- ▶ *How many cases are there?*

What happens after signal reporting? (Slide 7-9)

Signals are detected in health facilities. The detected signals are then reported immediately to the designated points of contact within the public health system. Once the surveillance focal point has received the reported signal from healthcare workers, they must then immediately communicate the signal to designated local or intermediate-level public health authorities. After a signal has been reported, the signal will be triaged, verified, and a risk assessment will be performed to define additional action.

Throughout this process, healthcare workers and surveillance focal points may be asked to assist with information gathering, including requests for additional information, assistance with the investigation, collection of laboratory specimens, and control measures.

Feedback (Slide 10)

Equally important to timely reporting is timely, routine feedback. Intermediate-level authorities should provide feedback about events and signals to surveillance focal points, who in turn provide feedback to healthcare workers at the respective facility. Regular feedback on the signals and events reported is essential to sustain motivation for reporting among healthcare workers and surveillance focal points.

Before ending the presentation, facilitators should state the following:

Please keep in mind that you (health workers) and surveillance focal points may be asked to provide additional assistance with information gathered during the triage, verification, and risk assessment process.

► **ACTIVITY 5.2**

SIGNAL REPORTING FOR HEALTH FACILITY EVENT-BASED SURVEILLANCE



Identify various signal reporting mechanisms



Small group exercise



25 minutes

Step 1: Set up the small the group exercise

Introduce the small group exercise by referring to the flipchart Small Group Exercise: Signal Reporting (Appendix H in this guide, and page 29 of the Participant Guide). Tell participants that they will be divided into groups, and will work to complete all four sections of the flipchart by answering the following questions.

Ask participants to go back to the same groups that were formed during the introductory icebreaker activity. Each group should be made up of at least four participants. Give each group a piece of prepared flipchart paper and marker once everyone has found their group. Each team should select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter).

Step 2: Get participants to discuss and record answers to the questions

Ask participants the following questions and capture the answers in a prepared flipchart with four equally divided spaces:

- *Who should report signals detected in health facilities? To whom?*
- *When should signals be reported?*
- *How are signals reported (i.e., what are the mechanisms)?*
- *What information should be included in your report?*

Explain that this is a brainstorming exercise and therefore active participation from every group member is very important.

Step 3: Facilitate group presentations and feedback

Monitor the time of the exercise. After 10 minutes, ask the groups to direct their attention to the larger group for the group presentations. Inform the groups that they will have 2 minutes to present. Provide no more than 10 minutes to complete this discussion.

Ask if there is a group that wants to present first. If no group volunteers, randomly select a group to present first. Ask participants to be mindful of the time and show respect towards each reporter by not engaging in side conversations.

Step 4: Summarize and wrap up the session

Summarize common points from the presentations by including input from every group. Wrap up the exercise by stating the following:

Now that we have discussed and understood how to report signals for HEBS, we will start our next session, which focuses on how to engage healthcare workers to participate in HEBS.



In summary, the success of HEBS depends on you, the healthcare workers, as frontline reporters to detect early and report quickly any signal that may pose a health threat to humans.

1. Signals detected by healthcare workers are to be reported immediately to the surveillance focal point.
2. The surveillance focal point should report immediately to local/intermediate-level public health authorities.
3. Health care workers and surveillance focal points can report a signal in person, by telephone, or by text (SMS) message.

▶ **SESSION 6**

ENGAGEMENT OF HEALTHCARE WORKERS

This session focuses on strategies needed to engage healthcare workers in HEBS.



Learning Objectives

By the end of this session, participants will be able to:

- ▶ Discuss effective strategies for engaging healthcare workers and other facility staff in reporting signals in HEBS



Materials

Facilitator

- ▶ Prepared flipchart paper and markers

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide pages 29-30



Total time: 20 minutes

► **ACTIVITY 6.1**

ENGAGING HEALTHCARE WORKERS AND OTHER FACILITY STAFF



Discuss effective strategies for engaging healthcare workers and other facility staff in reporting signals in HEBS



Brainstorming group exercise



20 minutes

Step 1: Introduce the brainstorming group exercise

Explain that the purpose of this exercise is to allow healthcare workers the opportunity to brainstorm and discuss effective strategies needed to engage healthcare workers in health facilities. Write the question below on flipchart paper:

“How can you increase healthcare worker engagement in HEBS in your facility?”

Step 2: Allow time for group discussion

Allow 5 minutes for participants to share strategies. Write responses on the flipchart paper.

Step 3: Summarize common points shared by participants

Summarize common points from the exercise and ask participants if they have any questions or additional comments before moving on.

Step 4: Close the brainstorming exercise

Close the brainstorming exercise by reading the following:

HEBS involves the participation of all healthcare workers to report signals. All healthcare workers are encouraged to always look for signs that there may be a health threat. However, due to the large workload of patient care and management, not all are engaged in HEBS. It is important to sensitize healthcare workers to the role and responsibility they have as the 'eyes and ears' inside health facilities. In order to increase engagement of healthcare workers, local and intermediate-level public health authorities will need to ensure strong communication between the facilities and the public health system. In addition, local and intermediate-level public health authorities will need to:

- ▶ Provide routine refresher training and materials for HEBS,
- ▶ Provide ongoing, routine monitoring visits,
- ▶ Develop and provide communication materials (e.g. posters, pamphlets) to help healthcare workers detect signals,
- ▶ Establish mechanisms for rapid reporting (phone, hotline, SMS, etc.), and
- ▶ Thank participants and highlight the work of healthcare workers in the detection and reporting of signals.

Summarize the exercise by reading the key takeaway message. Inform participants that the next session will be a brief summary review and training wrap-up for healthcare workers.

Step 4: Review and wrap up the session



It is essential that healthcare workers have strong communication channels with local and intermediate public health authorities. In addition, they need to be reminded of the importance of signal detection in health facilities through regular EBS refresher training and updated resources as needed. Furthermore, to successfully ensure healthcare workers are engaged and dedicated to HEBS, they should be thanked for their work and contribution to regular surveillance. By being vigilant and reporting immediately, healthcare workers are stopping the spread of disease and supporting patient care.

▶ **SESSION 7**

WRAP-UP AND CLOSING

This session will give participants the opportunity to review training information and provide feedback to facilitators regarding their satisfaction with the training.



Purpose

- ▶ Summarize lessons learned from the training, and
- ▶ Provide training feedback and evaluation.



Materials

Facilitator

- ▶ Prepared flipchart paper and markers (if available)
- ▶ Copies of Event-Based Surveillance Post-Training Evaluation survey (one per participant)

Participants

- ▶ Health Facility Event-Based Surveillance Training Module Participant Guide page 31



Total time: 10 minutes

► **ACTIVITY 7.1**

TAKEAWAYS FROM THE TRAINING



Summarize lessons learned
from the training



Group discussion



10 minutes

Step 1: Review the agenda and what has been learned

Ask participants to refer to their agenda to review what was discussed during the training. For every session, ask participants to share key takeaway points that were discussed and learned. Write their answers on the flipchart paper (if available) and encourage participants to take notes (10 minutes).

► **ACTIVITY 7.2**

PARTICIPANT FEEDBACK AND CLOSING



Provide training feedback
and evaluation



Group activity



10 minutes

Step 1: Ask participants for feedback on the training

Ask participants to share their comments about the training with a focus on their expectations and accomplishing their goals. You should also seek feedback on the day's training using the Event-Based Surveillance Training Evaluation survey.

Step 2: Thank participants and close

Thank participants for attending the training and actively participating by saying the following:

On behalf of the HEBS training facilitators team, I would like to thank you for attending this training and actively participating. We discussed how to conduct EBS in your health facilities, and everyone learned from the experiences and knowledge that you brought to the training. As your colleagues and facilitators, we are encouraged by your commitment to public health. We hope we met the expectations you expressed in the introductory icebreaker this morning. We strongly encourage you to share what we have discussed and learned today with other healthcare workers who were not able to attend, as well as your surveillance focal points. Once again, thank you very much.

► APPENDIX A

INTRODUCTION TO HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING



► Learning Objectives

- To build and strengthen healthcare workers' capacity to conduct surveillance
- To improve communication between health facilities personnel and public health system personnel

2

► Agenda

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Group activity	
► Welcome and introductory icebreaker	Introductions	20 minutes
► Training overview and agenda	Lecture	
2. Overview of Surveillance	Group discussion and lecture	30 minutes
► EWAR, IBS, and EBS		
3. HEBS Overview	Lecture	40 minutes
► HEBS overview	Small group exercise	
► Why is HEBS important?		
4. Signal Detection	Lecture	75 minutes
► What is signal detection	Interactive case study exercise	
► Signal detection for HEBS		

Morning Break (15 minutes)

Opportunity to interact with colleagues and mentors

3

► Agenda

SESSION	ACTIVITIES	TIME
5. Signal Reporting	Lecture	35 minutes
► Signal reporting	Small group exercise	
► Signal reporting for HEBS		
6. Engagement of Healthcare Workers	Brainstorming group exercise	20 minutes
► Engaging healthcare workers and other facility staff		
7. Wrap-Up and Closing	Group discussion	20 minutes
► Takeaways from the training	Group activity	
► Participant feedback and closing		
HEBS Training		Total 4 hours

4



► Ground Rules

- Switch your mobile phone to silent mode/no side conversations
- Respect others and their opinions
- If something is not clear, do not hesitate to ask
- Participate actively and contribute with your own experience
- Different opinions are welcomed and valued

5

► APPENDIX B

OVERVIEW OF SURVEILLANCE



► Public Health Surveillance

“Surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know.”

4

► Why do surveillance?

- Monitor the burden of a disease over time
- Detect outbreaks in a timely manner
- Determine risk factors for the disease and populations at greatest risk
- Guide immediate public health actions for individual patients or the community
- Guide programs to prevent and control disease and evaluate those programs

5

► Early Warning and Response (EWAR)

- The organized mechanism for the early detection of public health events requiring rapid investigation and response, in order to ensure that events of all origins are rapidly detected and controlled
- Embedded in overall surveillance
- Relies on two main channels of information: indicator-based surveillance (IBS) and event-based surveillance (EBS)

6



► Indicator-Based Surveillance (IBS)

“The systematic (regular) collection, monitoring, analysis and interpretation of **structured data**, i.e., of indicators produced by a number of well-identified, mostly health-based, formal sources”

7

► Event-Based Surveillance (EBS)

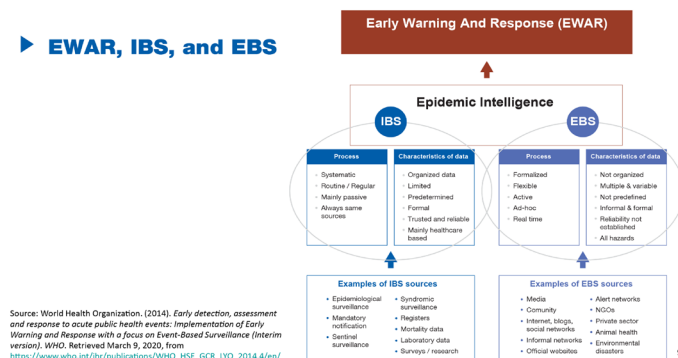
“The organized collection, monitoring, assessment and interpretation of mainly **unstructured ad hoc information** regarding health events or risks, which may represent an acute risk to human health”

Data for EBS systems can originate from a variety of sources, including:

- Community residents
- Health facilities
- News reports of deaths causing public anxiety
- Schools
- Animal and environmental sectors

8

► EWAR, IBS, and EBS



9

► IBS and EBS Comparing Processes

IBS	EBS
• Systematic • Routine / Regular • Mainly passive • Always the same sources	• Non-formal • Flexible • Active • Ad-hoc • Real time

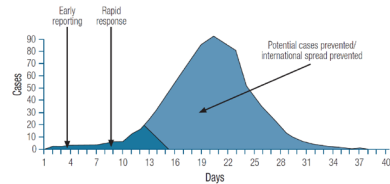
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► IBS and EBS Main Characteristics

IBS	EBS
• Specific case definitions • Disease-specific • Immediate, weekly, or monthly reporting • Facility-based • Trigger: Pre-defined thresholds • Best for seasonal endemic disease (seasonal flu, dengue etc.) • May be slow to respond	• Broad signal • Not disease-specific • Immediate reporting • Unstructured: Reports can enter from anywhere (community, hospitals, etc.) • Best for localized outbreaks, emerging pathogens, areas with poor healthcare access • Rapid response

11

► Early Outbreak Detection Can Result in Rapid Response



Source: The World Health report 2007; a safer future, global public health security in the 21st century. (2008). Scitech Book News, 32(1). Retrieved from <http://search.proquest.com/docview/200164111/>

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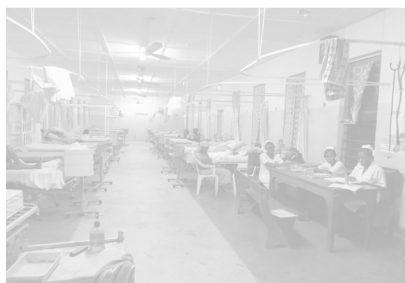
► APPENDIX C

HEALTH FACILITY EVENT-BASED SURVEILLANCE OVERVIEW

► What is HEBS?

- HEBS is event-based surveillance (EBS) that is conducted in health facilities
- A health facility is any establishment that is engaged in direct, on-site patient care
- Healthcare workers such as physicians, nurses, etc., are the primary reporters detecting and reporting signals that may be predictive of an emerging event

3



► What is a signal?

A signal is an observation that may represent an event occurring in a population including:

- A pattern, such as a cluster of cases with similar illnesses
- Something that is unusual, such as treatment failure on a standard drug regimen

4



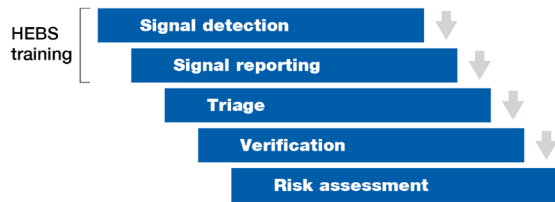
► What is an event?

An event is an occurrence that can threaten public health. An event can be:

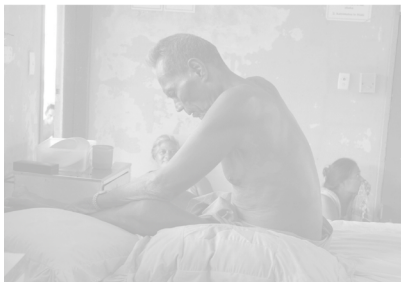
- A single case of disease in some settings
 - Notifiable diseases, e.g. cholera
 - Diseases under elimination, e.g. polio
- Clusters/outbreaks
- Unusual diseases such as drug-resistant tuberculosis

5

► Functions of EBS



Source: Africa CDC. (2018). Africa CDC event-based surveillance framework. Addis Ababa: African Union.



► Signal Detection

- Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designated by national public health authorities
- Healthcare workers detect signals in health facilities

7



► Signal Reporting

- Reporting signals means communicating this information to a public health authority
- Healthcare workers who detect a signal should report it immediately

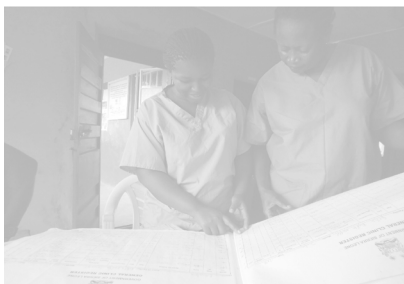
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► Triage

- Sorting of information into "likely to be relevant" or "not likely to be relevant" for early warning and response (EWAR)
- Enables identification of real events

9



► Verification

- Confirms the authenticity of the signal (is the information true or false?)
- May need additional information

10



► Verification

- Not all signals become events
- Signals that are triaged and verified as true become an event

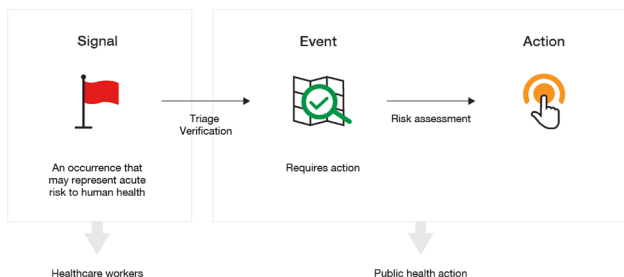
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► Risk Assessment (RA)

- RA is done after an event is confirmed
- RA means determining the level of risk of an event to human health and the appropriate level of investigation and response
- Intermediate/national-level public health authorities should lead risk assessment

12

► Signal and Events



13

► **Why is HEBS important?**

- Healthcare workers are front line reporters who can detect an emerging public health threat rapidly
- Detecting a health threat early is important to save the threat from spreading
- HEBS relies on healthcare workers' experiences and intuition to recognize and report when something unusual happens

14



► APPENDIX D

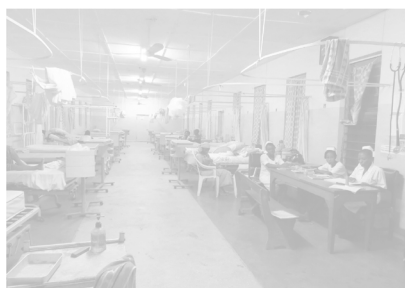
SMALL GROUP EXERCISE: WHY IS HEALTH FACILITY EVENT-BASED SURVEILLANCE IMPORTANT?

Prepared flipchart for the small group exercise:

Q1: How do you (physicians, nurses, and other healthcare workers) currently conduct surveillance in your health facility?	Q2: Do you (physicians, nurses, and other healthcare workers) know the purpose and importance of EBS? Yes. Why? No. Why not?
Q3: What is the value of adding EBS to the current surveillance in your health facility?	Q4: What is an event?

► APPENDIX E

HEALTH FACILITY EVENT-BASED SURVEILLANCE SIGNAL DETECTION



► What is a signal?

A signal is an observation that may represent an event occurring in a population. This may include:

- A pattern, such as a cluster of cases with similar illnesses
- Something that is unusual, such as treatment failure on a standard drug regimen

3



► What is an event?

An event is an occurrence that can threaten public health. An event can be:

- A single case of disease in some settings
 - Notifiable diseases, e.g. cholera
 - Diseases under elimination, e.g. polio
- Clusters/outbreaks
- Unusual diseases such as drug-resistant tuberculosis

4

► Examples of Signals and Events

Signal	Event
• A critical care physician hospitalized with a severe respiratory illness with travel history to Saudi Arabia • Siblings (3) are admitted with severe dehydration and profuse diarrhea • A case of typhoid fever with failure to respond to ceftriaxone treatment • A 4-year-old child admitted with fever, rash, coughing, coryza, and conjunctivitis	• A suspected case of MERS • A cluster of suspect cholera cases • A suspected case of extensively drug-resistant (XDR) typhoid fever • A suspected case of measles

5



► Examples of Signals for HEBS

- Any severe illness in health staff after taking care of a patient with similar illness
- Large, sudden increases in admission for any severe illness of the same type
- Any severe, unusual, unexplainable illness including a failure to respond to standard treatment

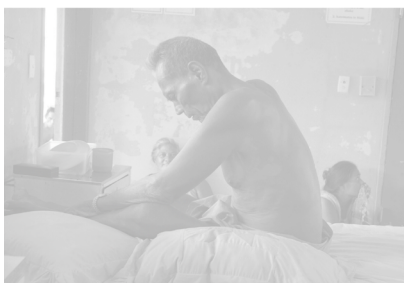
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► List of Signals for HEBS

Adapt the list of signals pre-determined by national public health authorities in each country

- TBD
- TBD
- TBD
- TBD
- TBD
- TBD

7



► How are signals detected?

- Healthcare workers, including physicians, nurses, and infection control officers, should be sensitized to recognize signals and report them immediately
- Healthcare workers can use the list of predetermined HEBS signals defined for the country

8

► APPENDIX F

CASE STUDY EXERCISE FOR FACILITATORS

Case #1

On September 20, 2019, Mrs. Khan, a 42-year-old nurse, was taking care of a patient with severe pneumonia for five days. The patient developed respiratory failure and died one week after his admission. Three days later, Mrs. Khan developed a fever, muscle pain, loss of appetite, nausea, extreme fatigue, sore throat, and a cough. After self-medicating with ampicillin and ibuprofen for three days, her husband brought her to the hospital, because she had been complaining of shortness of breath since the previous night. She was admitted to the emergency ward with the following vital signs: temperature of 39°C, heart rate of 112 beats per minute, respiratory rate of 26 breaths per minute, and blood pressure of 140/100 mmHg. Dr. Ali, a medical resident, provided her with supplemental oxygen, a first dose of antibiotic, and transferred her to the intensive care unit (ICU).

Questions and answers

1. Does this situation represent a signal that needs to be reported?

Yes, it does. As a nurse who was taking care of a patient with severe pneumonia, it is possible that Mrs. Khan acquired her infection from her patient. If that patient had a highly transmissible pathogen, other healthcare workers, patients, and family members may be at risk of infection.

2. How important is it to report this signal?

It is very important. This signal should raise concern for healthcare-associated transmission of a serious respiratory pathogen, which should be reported and immediately investigated to prevent the potential for further nosocomial spread.

3. What are the next steps and why?

Dr. Ali should report this immediately to the hospital surveillance focal point. If there is no focal point, the hospital medical director and the public health department in this jurisdiction should be notified.

4. If Mrs. Khan had developed a mild gastrointestinal disease with one or two episodes of diarrhea instead of the respiratory symptoms, would you have reported this situation as a signal?

Not at this time. If she develops a respiratory illness and needs to be hospitalized, it will be necessary to report this situation immediately, given that Mrs. Khan was recently caring for a patient with severe pneumonia.

Review of key principles from Case Study 1

- Even a single case of a relatively common syndrome, such as respiratory symptoms requiring hospitalization, may warrant notification to the next level. Here, a healthcare worker developed a respiratory illness after caring for a patient with fatal pneumonia, and this could represent the first case of an outbreak of a highly transmissible pathogen.
- Not all cases of sick healthcare workers represent signals.

Case #2

Dr. Quine works at a tertiary public health hospital and is having lunch with a former medical school classmate, Dr. Wells. Dr. Wells works at a private health care facility in the same area. Dr. Wells reports that two patients have been admitted to his hospital's intensive care unit (ICU) in the past two days. They have nearly identical clinical tests in both patients, syndromes of influenza-like illness, jaundice, purpuric rash, and vomiting blood. Laboratory tests in both patients revealed no evidence of known pathogens. Dr. Quine is surprised since he also has two patients from the same community who have been admitted to the ICU with similar symptoms.

Questions and answers

1. Does this situation represent a signal that needs to be reported?

Yes, there are at least four patients with similar symptoms requiring hospitalizations from the same community in the same time period.

2. If this is a signal, who should report it? To whom should it be reported?

Both Dr. Quine and Dr. Wells should report this signal immediately to the designated surveillance focal point. If there is no focal point, reporting should be done to the hospital medical director and their hospital supervisors. Although this may seem redundant, it is important for each hospital to be aware of the situation and to report the signals to their respective public health authorities.

3. No pathogens have been identified in any of these patients. Is that concerning? Why or why not?

Yes, it is concerning. The inability to identify a pathogen in these four patients who are severely ill with nearly identical clinical presentations raises the possibility of a novel pathogen or non-infectious etiology. Not knowing the etiology can hinder containment efforts. If prompt public health action is not taken, further occurrences of severe illnesses are likely.

Review of key principles from Case Study 2

- ▶ Signals of public health events can come to light through informal lines of communication that are not part of routine public health reporting. Every effort should be made to direct such communications through the public health structure.
- ▶ For severe public health events such as this one, duplicate or redundant reporting is not only acceptable, it is encouraged.
- ▶ The failure to identify a pathogen may indicate the emergence of a novel pathogen, the re-emergence of a controlled disease, or non-infectious causes for which diagnostic tests are not yet routinely available.

Case #3

You are a healthcare worker at a district hospital. A pregnant woman at 22 weeks gestation has been admitted to the hospital with fever, moderate abdominal pain, vomiting, diarrhea, and moderate dehydration. This patient has not traveled since she learned that she is pregnant. She lives in an urban area and no one else close to her has similar symptoms. Laboratory results are still in process.

Questions and answers

1. Does this situation represent a signal that needs to be reported?

No. This scenario, based on the provided information, does not represent a signal for HEBS. The etiology of this woman's symptoms should be investigated, and usual notification procedures should be followed to identify the etiologic agent and a gastrointestinal illness.

2. If this is a signal, who should report it? To whom should it be reported?

This condition is not a signal and should not be reported for HEBS. However, it is important to continue monitoring the patient. If her clinical condition worsens or deteriorates rapidly in an inexplicable way, it might be considered as a signal of a public health event and should be reported to the identified surveillance focal point and/or public health authorities.

3. On admission, this patient was started on antibiotics and IV fluids were administered. However, she developed multi-organ failure 48 hours later. No pathogens had been detected by the laboratory at that time. Does this situation represent a signal that needs to be reported?

Yes. The patient had a treatment failure and developed a rapidly progressive illness and worsening of symptoms. It is important to keep in mind that a patient who doesn't meet the signal criteria at a given time could meet them later as their clinical case evolves.

Review of key principles from Case Study 3

- ▶ Not all admitted cases with moderate to severe disease represent signals.
- ▶ Increases in the number of unexplained deaths, increases in ICU admissions for the same illness, and increases in treatment failure (including unexplained worsening and/or rapidly progressive disease in an individual patient) should be reported as a signal.

Case #4

In early March 2019, the chief of the internal medicine ward of a regional hospital reports a large increase since February 2019 of admissions for severe pneumonia in young people. In mid-March 2019, the ICU physicians of the same hospital report a remarkable increase in the numbers of admissions and deaths related to an unexplained, severe pneumonia in young people over a two week period.

Questions and answers

1. Does this situation represent a signal that needs to be reported?

Yes, it does. Unusual increases in the number of admissions of severe cases of the same illness or occurrence of unexplained deaths should be reported as a signal.

2. If this is a signal, who should report it? To whom should it be reported?

Both the chief of internal medicine ward and the ICU physicians should report this signal immediately to the designated surveillance focal point. If there is no focal point, reporting should be done to the hospital director and their hospital supervisors.

3. How important is it to report this signal?

It is very important. This signal should raise concern for outbreaks of respiratory diseases.

Review of key principles from Case Study 4

- ▶ Unexpected increases in the number of admissions for the same illness, unexplained deaths, increases in treatment failure, including unexplained worsening and/or rapidly progressive disease in an individual patient, should be reported as a signal.
- ▶ Signals are data/information that may be an early sign that an event of public health risk may be occurring.

Case #5

You are a healthcare worker at the district hospital. A patient is admitted with severe dehydration and profuse, rice-water stools.

Questions and answers

1. Is this situation a signal?

Yes. The patient has presented with symptoms of cholera, which is an immediately notifiable disease.

2. What are the next steps?

Report to public health authorities immediately.

3. How important is it to report this signal?

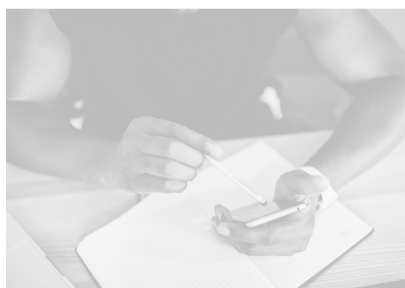
It is very important. Cholera is a highly transmissible disease.

Review of key principles from Case Study 5

- ▶ A single case of suspected cholera warrants immediate notification to the next level. Such immediate notification can help with the early and swift management of cholera.

► APPENDIX G

HEALTH FACILITY EVENT-BASED SURVEILLANCE SIGNAL REPORTING



► Signals in Health Facilities

Healthcare workers should detect signals and report signals **immediately**.

3

► Reporting Signals

Health facilities engaged in EBS should:

- Designate a focal point who will be responsible for receiving signal information and reporting it to public health authorities
- Identify and have the contact information of the public health authorities in their jurisdiction

4



► Reporting Signals

The health facility can report the signal by any means:

- Telephone
- SMS
- Hotlines
- Other

5

► Reporting Signals and Additional Information

Quick and rapid information sharing to public health authorities:

- What is the signal?
- Signs and symptoms
- When was it detected?
- Is the event still ongoing?
- How many cases?

6

► Public Health Authorities Conduct Triage and Verification

- Once a signal is reported, public health authorities will take further steps to triage and verify signals
- Throughout this process, healthcare workers and surveillance focal points may be asked to assist with information gathering

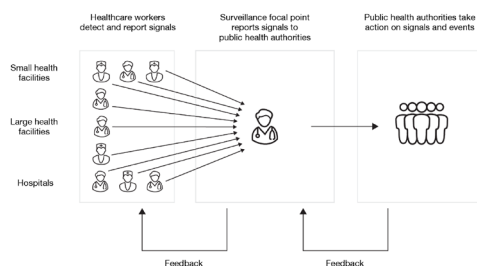
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► All Events Require an Action

- Once the signal is triaged and verified as an event, the public health authorities will perform a risk assessment to inform action
- Actions could include:
 - Requesting more information or investigation
 - Collection of laboratory specimens
 - Control measures

8

► Flow of Information for HEBS



9



► Feedback

- Public health authorities should provide routine feedback to health facilities
- Regular feedback on the signals and events reported is imperative to sustain motivation to report among healthcare workers and surveillance focal points

10

► APPENDIX H

SMALL GROUP EXERCISE: SIGNAL REPORTING

Prepared flipchart for the small group exercise:

Q1: Who should report signals detected in health facilities? To whom? Why?	Q2: When should signals be reported? Why?
Q3: How are signals reported (i.e., what are the mechanisms)?	Q4: What information should be included in a report? Why?

MODULE 4.2

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING MODULE

PARTICIPANT GUIDE



U.S. Centers for Disease Control and Prevention



► TABLE OF CONTENTS

Acronyms	003
Glossary of Terms	004
Introduction	007
Purpose	007
General Objectives	007
Health Facility Event-Based Surveillance Training Agenda	008
S1. Welcome and Introductions	010
S2. Overview of Surveillance	011
S3. Health Facility Event-Based Surveillance Overview	014
S4. Signal Detection	018
S5. Signal Reporting	025
S6. Engagement of Healthcare Workers	029
S7. Wrap-Up and Closing	031
Appendices	032
Appendix A. Notes for Session 2: Overview of Surveillance	033
Appendix B. Notes for Session 3: Health Facility Event-Based Surveillance Overview	035
Appendix C. Notes for Session 4: Signal Detection	037
Appendix D. Notes for Session 5: Signal Reporting	038

► **ACRONYMS**

US CDC	U.S. Centers for Disease Control and Prevention
EBS	Event-Based Surveillance
EI	Epidemic Intelligence
EWAR	Early Warning and Response
HEBS	Health Facility Event-Based Surveillance
IBS	Indicator-Based Surveillance
IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations (2005)
MOH	Ministry of Health
MS	Member States
NGO	Non-Governmental Organization
WHO	World Health Organization

► GLOSSARY OF TERMS

Event:	The International Health Regulations (IHR) define an event as “[...] a manifestation of disease or an occurrence that creates a potential for disease [...]” (which can include events that are infectious, zoonotic, food safety, chemical, radiological or nuclear in origin and whether transmitted by persons, vectors, animals, goods/food, or through the environment).
Event-based surveillance (EBS):	Defined by the World Health Organization (WHO) as the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks, which may represent an acute risk to health. Such information can come from diverse sectors and may include animal, environment and other sectors.
Health facility:	Defined by WHO as any establishment that is engaged in direct on-site patient care.
Health facility event-based surveillance (HEBS):	EBS that is conducted in health facilities. Healthcare workers are involved as primary reporting sources, such as during patient consultations, or as secondary sources reporting unusual health events or health risks picked up through patient consultations.
Indicator-based surveillance (IBS):	Defined by WHO as the systematic (regular) collection, monitoring, analysis, and interpretation of structured data, i.e., of indicators produced by a number of well-identified, mostly health-based, formal sources.
One Health:	An approach to address a shared health threat at the human-animal-environment interface based on collaboration, communication, and coordination across all relevant sectors and disciplines, with the ultimate goal of achieving optimal health outcomes for both people and animals. A One Health approach applies to the local, regional, national, and global levels.
Outbreak:	A disease outbreak is the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season. An outbreak may occur in a restricted geographical area or may extend over several countries. It may last for a few days or weeks, or for several years. Other situations that may constitute an outbreak include a single case of a communicable disease long absent from a population, or caused by an agent (e.g. bacterium or

virus) not previously recognized in that community or area, or the emergence of a previously unknown disease.

Reporting:

The process by which health events and health risks are brought to the knowledge of the health authorities.

Response:

Any public health action triggered by the detection of a public health risk (e.g., monitoring of the event, information of the public, triggering field investigation and/or implementation of any control or mitigation measures). The nature of the response will be adapted according to the nature of the public health risk.

Risk:

The likelihood of an event resulting in negative consequences for public health.

Risk assessment:

A systematic process for gathering, assessing and documenting information to assign a level of risk to human health to an event. Risk assessment is conducted as part of an investigation of an event.

Signals:

Patterns of disease or other information considered by the EWAR System as representing potential acute risk to human health, such as an outbreak. All signals may not become events and as such need to be triaged and verified before a response is initiated. Signals may consist of reports of cases or deaths (individual or aggregated), potential exposure of human beings to biological, chemical or radiological and nuclear hazards, or occurrence of natural or man-made disasters.

Surveillance:

The IHR define surveillance as “[...] the systematic on-going collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary”.

Triage:

The process of screening out the data and information that are relevant for early detection purposes (i.e., the screening out of mild/irrelevant events from potential acute public health events and the cleaning to eliminate duplicates and correct obvious mistakes).

Verification:

In the context of the IHR (article 1): “[...] the provision of information by a State Party to WHO confirming the status of an event within the territory or territories of that State Party”. Under the IHR, all States Parties are required to provide verification upon request by WHO within a limited time period. In the current document, verification is also the pro-active crosschecking of the validity (veracity) of the signals collected by EWAR, by contacting the original source and additional sources, or by performing field investigation verification that ensures that hoaxes, false rumors, and artifacts are eliminated from further consideration.

► INTRODUCTION

EBS is defined by the WHO as the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks which may represent an acute risk to health. EBS may allow for the recognition of emerging or re-emerging public health threats because it is not disease-specific, requires immediate reporting, and is highly sensitive and broad. For EBS, information can come from any source, including community, media, healthcare workers, pharmacies and non-governmental organizations. This information, termed a signal, needs to be triaged and verified before the signal becomes an event. An event is an occurrence that could be a public health threat.

Health facility event-based surveillance (HEBS) requires trained physicians, nurses, and other relevant healthcare workers to recognize and report signals, i.e., observations that may represent an event. Additionally, since reporting does not require laboratory results and relies on physicians' experiences, HEBS may be practical and simple to establish and sustain. This type of surveillance can be readily extended to private practices or health facilities that may not participate in routine reporting through traditional surveillance.

Purpose

This Health Facility Event-Based Surveillance Training Module provides healthcare workers with the knowledge, skills, and tools necessary to effectively implement EBS in health facilities.

General Objectives

This training module has two general objectives:

- To build and strengthen the capacity of healthcare workers in health facilities to conduct EBS, and
- To improve the flow of surveillance information between health facilities and their respective local/intermediate public health administrative levels.

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING AGENDA

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Group activity	
▶ Welcome and introductory icebreaker	Introductions	20 minutes
▶ Training overview and agenda	Lecture	
2. Overview of Surveillance		
▶ EWAR, IBS, and EBS	Group discussion and lecture	30 minutes
3. Health Facility Event-Based Surveillance Overview		
▶ HEBS overview	Lecture	40 minutes
▶ Why is HEBS important?	Small group exercise	
4. Signal Detection		
▶ What is signal detection?	Lecture	75 minutes
▶ Signal detection for HEBS	Interactive case study exercise	

Morning Break (15 minutes)

Opportunity to interact with colleagues and mentors

SESSION	ACTIVITIES	TIME
5. Signal Reporting	Lecture	35 minutes
▶ Signal reporting ▶ Signal reporting for HEBS	Small group exercise	
6. Engagement of Healthcare Workers	Brainstorming group exercise	20 minutes
▶ Engaging healthcare workers and other facility staff		
7. Wrap-Up and Closing	Group discussion	20 minutes
▶ Takeaways from the training ▶ Participant feedback and closing	Group activity	
HEBS Training		Total 4 hours

▶ **SESSION 1**

WELCOME AND INTRODUCTIONS



Purpose

- ▶ Getting to know each other
- ▶ Group formation



Total time: 15 minutes



Introductions questions

Please answer the following questions and share your answers with those in your group.

1. What is your name and what health facility do you work in?	2. What two things do you enjoy most about the work that you do?
3. What is one expectation you have for this training?	4. What two core values or ground rules should the group have during this training?
5. What two words best describe the people who frequent your health facility?	

▶ SESSION 2

OVERVIEW OF SURVEILLANCE



Purpose

- ▶ Explain the importance of EWAR and public health surveillance
- ▶ Describe surveillance systems, including the major surveillance systems, IBS and EBS



Total time: 40 minutes

Listen to the presentation and take notes

Learn about the importance of EWAR and the features of major surveillance systems by listening to the lecture and taking notes on the slides below.



▶ Public Health Surveillance

“Surveillance is the ongoing systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know.”

4

▶ Why do surveillance?

- Monitor the burden of a disease over time
- Detect outbreaks in a timely manner
- Determine risk factors for the disease and populations at greatest risk
- Guide immediate public health actions for individual patients or the community
- Guide programs to prevent and control disease and evaluate those programs

5

► Early Warning and Response (EWAR)

- The organized mechanism for the early detection of public health events requiring rapid investigation and response, in order to ensure that events of all origins are rapidly detected and controlled
- Embedded in overall surveillance
- Relies on two main channels of information: indicator-based surveillance (IBS) and event-based surveillance (EBS)

6



► Indicator-Based Surveillance (IBS)

“The systematic (regular) collection, monitoring, analysis and interpretation of **structured data**, i.e., of indicators produced by a number of well-identified, mostly health-based, formal sources”

7

► Event-Based Surveillance (EBS)

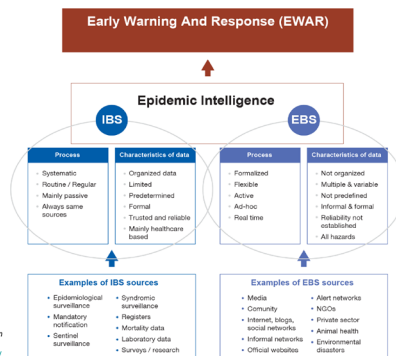
“The organized collection, monitoring, assessment and interpretation of mainly **unstructured ad hoc information** regarding health events or risks, which may represent an acute risk to human health”

Data for EBS systems can originate from a variety of sources, including:

- Community residents
- Health facilities
- News reports of deaths causing public anxiety
- Schools
- Animal and environmental sectors

8

► EWAR, IBS, and EBS



Source: World Health Organization. (2014). *Early detection, assessment and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance (Interim version)*. WHO. Retrieved March 9, 2020, from https://www.who.int/tr/publications/WHO_HSE_GCR_LYO_2014.4/en/

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► IBS and EBS Comparing Processes

IBS	EBS
• Systematic • Routine / Regular • Mainly passive • Always the same sources	• Non-formal • Flexible • Active • Ad-hoc • Real time

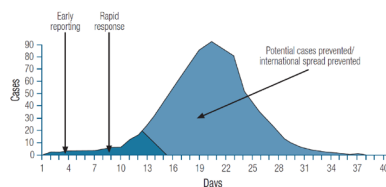
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► IBS and EBS Main Characteristics

IBS	EBS
• Specific case definitions • Disease-specific • Immediate, weekly, or monthly reporting • Facility-based • Trigger: Pre-defined thresholds • Best for seasonal endemic disease (seasonal flu, dengue etc.) • May be slow to respond	• Broad signal • Not disease-specific • Immediate reporting • Unstructured: Reports can enter from anywhere (community, hospitals, etc.) • Best for localized outbreaks, emerging pathogens, areas with poor healthcare access • Rapid response

11

► Early Outbreak Detection Can Result in Rapid Response



Source: The World Health report 2007: a safer future, global public health security in the 21st century. (2008). Scitech Book News, 32(1). Retrieved from <http://search.proquest.com/docview/200164111/>

12



EWAR, through IBS and EBS, enables countries to rapidly detect and control acute public health events of any origin.

▶ SESSION 3

HEALTH FACILITY EVENT-BASED SURVEILLANCE OVERVIEW



Purpose

- ▶ Define HEBS
- ▶ Explain the importance of HEBS
- ▶ Describe how HEBS is conducted



Total time: 40 minutes

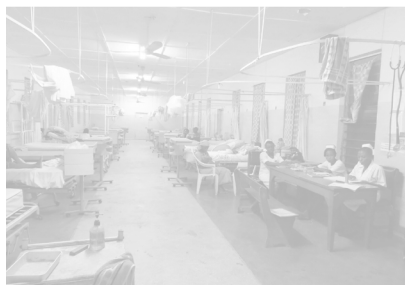
Listen to the presentation and take notes

Learn about the importance of HEBS and verification and how they are conducted by listening to the lecture and taking notes on the slides below.

▶ What is HEBS?

- HEBS is event-based surveillance (EBS) that is conducted in health facilities
- A health facility is any establishment that is engaged in direct, on-site patient care
- Healthcare workers such as physicians, nurses, etc., are the primary reporters detecting and reporting signals that may be predictive of an emerging event

3



▶ What is a signal?

A signal is an observation that may represent an event occurring in a population including:

- A pattern, such as a cluster of cases with similar illnesses
- Something that is unusual, such as treatment failure on a standard drug regimen

4



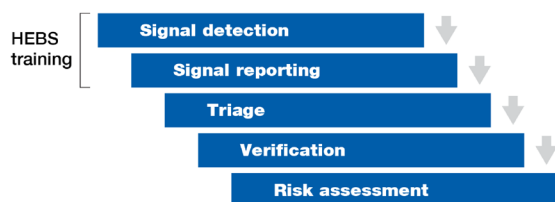
► What is an event?

An event is an occurrence that can threaten public health. An event can be:

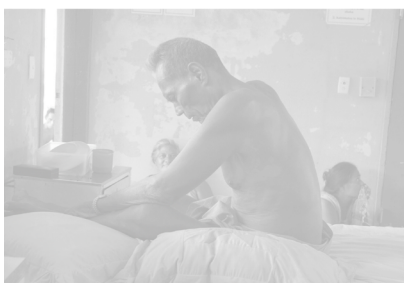
- A single case of disease in some settings
 - Notifiable diseases, e.g. cholera
 - Diseases under elimination, e.g. polio
- Clusters/outbreaks
- Unusual diseases such as drug-resistant tuberculosis

5

► Functions of EBS



Source: Africa CDC. (2018). Africa CDC event based surveillance framework. Addis Ababa: African Union.



► Signal Detection

- Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designated by national public health authorities
- Healthcare workers detect signals in health facilities

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► Signal Reporting

- Reporting signals means communicating this information to a public health authority
- Healthcare workers who detect a signal should report it immediately

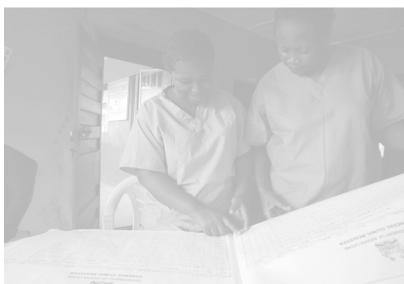
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► Triage

- Sorting of information into “likely to be relevant” or “not likely to be relevant” for early warning and response (EWAR)
- Enables identification of real events

9



► Verification

- Confirms the authenticity of the signal (is the information true or false?)
- May need additional information

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► Verification

- Not all signals become events
- Signals that are triaged and verified as true become an event

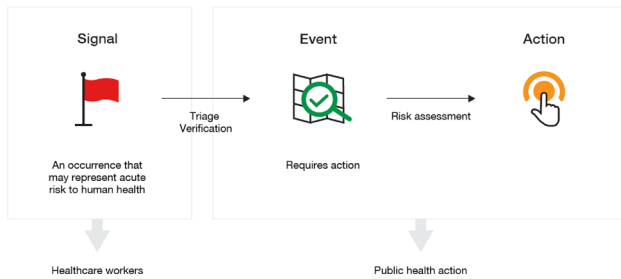
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► Risk Assessment (RA)

- RA is done after an event is confirmed
- RA means determining the level of risk of an event to human health and the appropriate level of investigation and response
- Intermediate/national-level public health authorities should lead risk assessment

12

► Signal and Events



13

► Why is HEBS important?

- Healthcare workers are front line reporters who can detect an emerging public health threat rapidly
- Detecting a health threat early is important to save the threat from spreading
- HEBS relies on healthcare workers' experiences and intuition to recognize and report when something unusual happens

14



Healthcare workers are frontline reporters who can rapidly detect an emerging public health threat within health facilities. They can use their intuition and experience to identify something unusual or unexpected. Within health facilities, EBS can be practical and easy to implement. Health facility staff can engage in rapid detection and reporting when provided with clear guidance and an established reporting mechanism.

► SESSION 4

SIGNAL DETECTION



Purpose

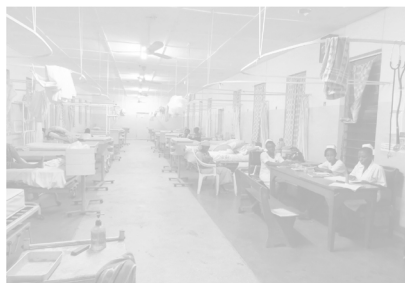
- Define signals and events
- List HEBS signals that are predefined by the country
- Detect signals within health facilities
- Determine if a signal should be reported



Total time: 75 minutes

Listen to the presentation and take notes

Learn about the difference between signals and events and how to detect them in health facilities by listening to the lecture and taking notes on the slides below.



► What is a signal?

A signal is an observation that may represent an event occurring in a population. This may include:

- A pattern, such as a cluster of cases with similar illnesses
- Something that is unusual, such as treatment failure on a standard drug regimen

3



► What is an event?

An event is an occurrence that can threaten public health. An event can be:

- A single case of disease in some settings
 - Notifiable diseases, e.g. cholera
 - Diseases under elimination, e.g. polio
- Clusters/outbreaks
- Unusual diseases such as drug-resistant tuberculosis

4

► Examples of Signals and Events

Signal	Event
- A critical care physician hospitalized with a severe respiratory illness with travel history to Saudi Arabia - Siblings (3) are admitted with severe dehydration and profuse diarrhea - A case of typhoid fever with failure to respond to ceftriaxone treatment - A 4-year-old child admitted with fever, rash, coughing, coryza, and conjunctivitis	- A suspected case of MERS - A cluster of suspect cholera cases - A suspected case of extensively drug-resistant (XDR) typhoid fever - A suspected case of measles

5



► Examples of Signals for HEBS

- Any severe illness in health staff after taking care of a patient with similar illness
- Large, sudden increases in admission for any severe illness of the same type
- Any severe, unusual, unexplainable illness including a failure to respond to standard treatment

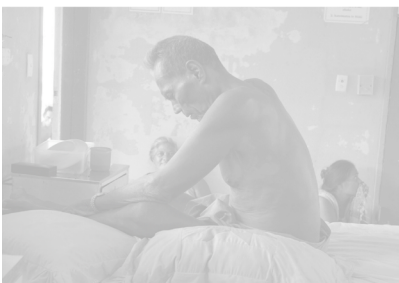
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► List of Signals for HEBS

Adapt the list of signals pre-determined by national public health authorities in each country

- TBD
- TBD
- TBD
- TBD
- TBD
- TBD

7



► How are signals detected?

- Healthcare workers, including physicians, nurses, and infection control officers, should be sensitized to recognize signals and report them immediately
- Healthcare workers can use the list of predetermined HEBS signals defined for the country

8

Case studies

Review each case study and complete the questions that follow.

Case #1

On September 20, 2019, Mrs. Khan, a 42-year-old nurse, was taking care of a patient with severe pneumonia for five days. The patient developed respiratory failure and died one week after his admission. Three days later, Mrs. Khan developed a fever, muscle pain, loss of appetite, nausea, extreme fatigue, sore throat, and a cough. After self-medicating with ampicillin and ibuprofen for three days, her husband brought her to the hospital, because she had been complaining of shortness of breath since the previous night. She was admitted to the emergency ward with the following vital signs: temperature of 39°C, heart rate of 112 beats per minute, respiratory rate of 26 breaths per minute, and blood pressure of 140/100 mmHg. Dr. Ali, a medical resident, provided her with supplemental oxygen, a first dose of antibiotic, and transferred her to the intensive care unit (ICU).

Questions

1. Does this situation represent a signal that needs to be reported?
2. How important is it to report this signal?
3. What are the next steps and why?
4. If Mrs. Khan had developed a mild gastrointestinal disease with one or two episodes of diarrhea instead of the respiratory symptoms, would you have reported this situation as a signal?

Case #2

Dr. Quine works at a tertiary public health hospital and is having lunch with a former medical school classmate, Dr. Wells. Dr. Wells works at a private health care facility in the same area. Dr. Wells reports that two patients have been admitted to his hospital's intensive care unit (ICU) in the past two days. They have nearly identical clinical syndromes of influenza-like illness, jaundice, purpuric rash, and vomiting blood. Laboratory tests in both patients revealed no evidence of known pathogens. Dr. Quine is surprised since he also has two patients from the same community who have been admitted to the ICU with similar symptoms.

Questions

1. Does this situation represent a signal that needs to be reported?
2. If this is a signal, who should report it? To whom should it be reported?
3. No pathogens have been identified in any of these patients. Is that concerning? Why or why not?

Case #3

You are a healthcare worker at a district hospital. A pregnant woman at 22 weeks gestation has been admitted to the hospital with fever, moderate abdominal pain, vomiting, diarrhea, and moderate dehydration. This patient has not traveled since she learned that she is pregnant. She lives in an urban area and no one else close to her has similar symptoms. Laboratory results are still in process.

Questions

- 1. Does this situation represent a signal that needs to be reported?**
- 2. If this is a signal, who should report it? To whom should it be reported?**
- 3. On admission, this patient was started on antibiotics and IV fluids were administered. However, she developed multi-organ failure 48 hours later. No pathogens had been detected by the laboratory at that time. Does this situation represent a signal that needs to be reported?**

Case #4

In early March 2019, the chief of the internal medicine ward of a regional hospital reports a large increase since February 2019 of admissions for severe pneumonia in young people. In mid-March 2019, ICU physicians of the same hospital report a remarkable increase in the numbers of admissions and deaths related to an unexplained, severe pneumonia in young people over a two week period.

Questions

- 1. Does this situation represent a signal that needs to be reported?**

- 2. If this is a signal, who should report it? To whom should it be reported?**

- 3. How important is it to report this signal?**

Case #5

You are a healthcare worker at the district hospital. A patient is admitted with severe dehydration and profuse, rice-water stools.

Questions

1. Is this situation a signal?
2. What are the next steps?
3. How important is it to report this signal?



A signal is a pattern or an unusual occurrence that may be an event representing a threat to public health.

It is important to remember that once a signal has been detected in a health facility, it should be reported immediately to the surveillance focal point and to local/intermediate-level public health authorities.

► SESSION 5

SIGNAL REPORTING



Purpose

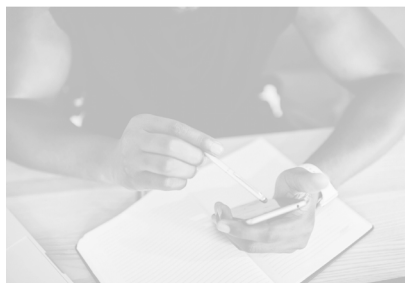
- Describe the flow of information from signal detection to reporting
- Explain when healthcare workers and surveillance focal points should report signals and to whom
- Describe what information is reported after detection of a signal
- Identify various signal reporting mechanisms



Total time: 35 minutes

Listen to the presentation and take notes

Learn about signal reporting and how it is conducted by listening to the lecture and taking notes on the slides below.



► Signals in Health Facilities

Healthcare workers should detect signals and report signals **immediately**.

3

► Reporting Signals

Health facilities engaged in EBS should:

- Designate a focal point who will be responsible for receiving signal information and reporting it to public health authorities
- Identify and have the contact information of the public health authorities in their jurisdiction

4



► Reporting Signals

The health facility can report the signal by any means:

- Telephone
- SMS
- Hotlines
- Other

5

► Reporting Signals and Additional Information

Quick and rapid information sharing to public health authorities:

- What is the signal?
- Signs and symptoms
- When was it detected?
- Is the event still ongoing?
- How many cases?

6

► Public Health Authorities Conduct Triage and Verification

- Once a signal is reported, public health authorities will take further steps to triage and verify signals
- Throughout this process, healthcare workers and surveillance focal points may be asked to assist with information gathering

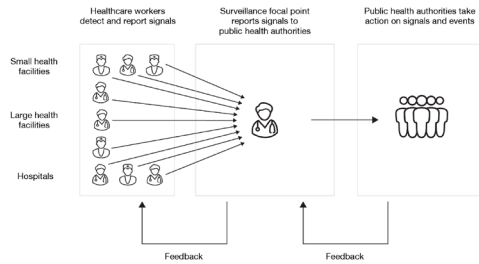
7

► All Events Require an Action

- Once the signal is triaged and verified as an event, the public health authorities will perform a risk assessment to inform action
- Actions could include:
 - Requesting more information or investigation
 - Collection of laboratory specimens
 - Control measures

8

► Flow of Information for HEBS



9



► Feedback

- Public health authorities should provide routine feedback to health facilities
- Regular feedback on the signals and events reported is imperative to sustain motivation to report among healthcare workers and surveillance focal points

10

Signal reporting for HEBS

In your groups discuss and answer the following questions.

Q1: Who should report signals detected in health facilities? To whom? Why?	Q2: When should signals be reported? Why?
Q3: How are signals reported (i.e., what are the mechanisms)?	Q4: What information should be included in a report? Why?

▶ **SESSION 6**

ENGAGEMENT OF HEALTHCARE WORKERS



Purpose

- ▶ Discuss effective strategies for engaging healthcare workers and other facility staff in reporting signals in HEBS



Total time: 20 minutes

Brainstorming exercise

The purpose of this exercise is to allow healthcare workers the opportunity to brainstorm and discuss effective strategies needed to engage healthcare workers in health facilities.

Write the question below and your responses on flipchart paper:

How can you increase healthcare worker engagement in HEBS in your facility?



It is essential that healthcare workers have strong communication channels with local and intermediate public health authorities. In addition, they need to be reminded of the importance of signal detection in health facilities through regular EBS refresher training and updated resources as needed. Furthermore, to successfully ensure healthcare workers are engaged and dedicated to HEBS, they should be thanked for their work and contribution to regular surveillance. By being vigilant and reporting immediately, healthcare workers are stopping the spread of disease and supporting patient care.

▶ **SESSION 7**

WRAP-UP AND CLOSING



Purpose

- ▶ Summarize lessons learned from the training
- ▶ Provide training feedback and evaluation



Total time: 20 minutes

Takeaways from training

Refer to the agenda to review what was discussed during training. For every session, reflect on and share the key takeaway points that you learned. Take notes below:

My key takeaways from training were:

Many thanks for your participation!

Many thanks for your participation today! We are encouraged by your commitment to working and supporting your communities. We hope we met the expectations you expressed in the introductory icebreaker. We strongly encourage you to share what we have discussed and learned today with other healthcare workers who were not able to attend, as well as your surveillance focal points. Once again, thank you very much.

► APPENDICES

► **APPENDIX A**

NOTES FOR SESSION 2: OVERVIEW OF SURVEILLANCE

Q1. What is surveillance? (Slide 4)

Surveillance is a primary function of public health. It is the ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice. It is closely integrated with the timely dissemination of these data to those who need to know.

Q2. What are the objectives of public health surveillance? (Slide 5)

The objectives of public health surveillance are:

- Monitor the burden of a disease over time,
- Detect outbreaks in a timely manner,
- Determine risk factors for the disease and populations at greatest risk,
- Guide immediate public health actions for individual patients or the community,
- Guide programs to prevent and control disease and evaluate those programs, and
- In some cases, to estimate the population-based burden of disease.

Q3. What is early warning and response? (Slide 6)

Early warning and response (EWAR) is the organized mechanism to detect, as early as possible, any abnormal occurrence or divergence from the normally observed frequency of phenomena. The general objective of EWAR is to rapidly detect and control acute public health events of any origin, with particular attention to nationally-prioritized health risks (“detect earlier to better protect”).

It is embedded in overall surveillance. To ensure efficiency, the EWAR data collection and analysis processes need to be systematized and formalized. In this respect, EWAR relies on a process: epidemic intelligence and two main channels of information, IBS, and EBS.

Q4. What is indicator-based surveillance? (Slide 7)

IBS is defined as the systematic collection, monitoring, analysis, and interpretation of structured data. The collection of IBS data is a routine, regular process, which is primarily passive. Data are collected according to established case definitions, which are either disease-specific or syndromic. They may be collected as individual or aggregated data and originate from either exhaustive or sentinel systems.

The primary function of IBS is to monitor disease and pathogen circulation trends, and not to function as an early warning system. However, it can be a useful supplement to early warning systems as data are analyzed in comparison to baseline values and thresholds to determine unusual disease patterns. The Integrated Disease Surveillance and Response (IDSR) is an example of a primarily IBS-driven system.

Q5. What is event-based surveillance? (Slide 8)

EBS is defined as the organized collection, monitoring, assessment and interpretation of unstructured ad hoc information regarding health events or risks, which may represent an acute risk to health. Data for EBS systems can originate from a variety of sources, including community residents, health facilities, news reports of deaths causing public anxiety, schools, and animal and environmental sectors, among others. As such, EBS can be implemented in communities, schools, pharmacies, health facilities, the animal health sector, or at the national level through hotlines and media scanning.

A key feature of EBS is the emphasis on immediate detection and rapid reporting of signals. When implemented correctly, EBS provides a simple and adaptable form of surveillance, that can be tailored to different settings according to the needs of the country or context.

Integration of indicator-based surveillance and event-based surveillance (Slide 9)

IBS and EBS are complementary sources of information, and both contribute to the early warning function critical for a prompt and proportioned response. The two are not necessarily separate surveillance systems; both are processed through a single activity (epidemic intelligence), and some of the surveillance functions might be common to both types.

Epidemic intelligence is defined as the systematic collection, analysis and communication of any information to detect, verify, assess, and investigate events and health risks with an early warning objective (as opposed to monitoring of disease trends or burdens). Epidemic intelligence should integrate both IBS and EBS to efficiently detect acute public health events and/or risks.

Comparing indicator-based surveillance and event-based surveillance processes (Slide 10, 11)

Both IBS and EBS present intrinsic characteristics in terms of processes and type of data or information collected. The IBS process is defined by public health professionals for their own specific programmatic use; data/indicators are developed accordingly and are collected and transmitted in routine (i.e., passive) reporting. Conversely, in EBS, both content and format of information collected is not defined (i.e., unstructured information). Data sources for EBS are diverse and intended for different audiences, including some with non-human health objectives (e.g., environmental health, wildlife and fisheries, animal health).

Why is early warning and response important? (Slide 12)

EWAR can ensure the timely detection of public health threats. This can lead to an early response and increases the potential for outbreak prevention.

► **APPENDIX B**

NOTES FOR SESSION 3: HEALTH FACILITY EVENT-BASED SURVEILLANCE OVERVIEW

What is health facility event-based surveillance? (Slide 3)

When EBS is conducted in health facilities, including hospitals, it is called health facility event-based surveillance (HEBS). A health facility is defined as any establishment that is engaged in direct on-site patient care. HEBS is not disease-specific; it relies upon detecting unusual occurrences and patterns of disease—also known as signals, which are primarily reported by healthcare workers.

What is a signal? (Slide 4)

A signal is an observation that may represent an event occurring in a population. Signals can be patterns of diseases, such as a cluster of cases with a similar illness or something that is unusual, such as a treatment failure for infectious diseases on a standard drug regimen or unexpected deaths. A signal is determined to be of public health significance when it is triaged and verified to be an event.

What is an event? (Slide 5)

An event is an occurrence that can threaten public health. It can be a single case of a disease in some settings (a notifiable disease like measles or diseases under elimination like polio), clusters/outbreaks, or unusual events such as someone presenting with drug-resistant tuberculosis.

How is health facility event-based surveillance conducted? (Slide 6)

EBS can be organized in five main steps:

- **Detection** of signals
- **Reporting** of signals
- **Triage** of signals
- **Verification** of signals
- **Risk assessment** of events

Signal detection (Slide 7)

The process of EBS starts with the identification of a signal, which is an observation that might represent an event occurring in a population. Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designated by national public health authorities. At health facilities, signals are most likely to be detected by healthcare professionals, including physicians and nurses, because of their close contact with patients.

Signal reporting (Slide 8)

Reporting signals means communicating this information to a public health authority. Healthcare workers who detect a signal should report it immediately. Modes of signal reporting may differ depending on available resources and existing surveillance structures, and may include telephone, SMS, or verbal notification.

Triage (Slide 9)

Because of the often-informal nature of signal sources, once detected, signals must be evaluated to determine the likelihood that they truly represent events through the process of triage and verification. The process of triage comprises the review of information in order to discard duplicates, misinformation, irrelevant information, and false information to allow the identification of real events.

Verification (Slide 10-11)

Once a signal has been triaged and verified, it becomes an event. Verification is an essential step to confirm the validity and authenticity of the reported signals (i.e., is the information truly occurring?). This step must be conducted within 24 hours of the signal being detected. Additional information may be required. It is important to note that not all signals become events.

Risk assessment (Slide 12)

An event needs to be assessed to determine the level of risk to human health and to determine the appropriate level of investigation and control measures. Once a signal is verified as an event, risk assessment begins. Risk assessment is a systematic and continuous process for gathering, assessing, and documenting information to provide the basis for actions required to manage and reduce the negative consequences of an acute public health event. Every assessment is a process by which the available information about a real event is analyzed and a judgment is made as to whether it poses an immediate risk to public health. In this case, a full risk assessment is done. Intermediate and/or national-level public health authorities should lead risk assessment efforts. Initial risk assessments must be conducted within 48 hours of signal detection.

Events may manifest as occurrences of patterns of disease, such as clusters of similar illnesses or cases of non-laboratory confirmed illnesses with high-risk exposures (e.g., severe pneumonia in a poultry slaughterer). Alternatively, single cases of diseases in some settings can constitute an event because that illness/disease may be of high priority (e.g., a child with acute flaccid paralysis or the isolation of an Ebola virus in a laboratory). In the latter case, the event can constitute a notifiable disease within the routine surveillance system or a novel infectious threat that requires further investigation. In both instances, after triage and verification, an event enters the public health surveillance structure where it will be integrated into the routine disease reporting system, such as the Integrated Disease Surveillance and Response (IDSR) programs common in African countries.

Why is health facility event-based surveillance important? (Slide 13)

Due to the heavy workload that healthcare workers have in patient care and clinical management, it is important that EBS in health facilities does not increase their burden of work, but rather is easily integrated into their daily roles and activities. Healthcare workers will use a list of signals to detect events. Once a signal is recognized, it should be reported immediately to surveillance focal points already identified in their health facilities. A signal will have to be triaged and verified to become an event, and this process is performed in collaboration with public health authorities.

► **APPENDIX C**

NOTES FOR SESSION 4: SIGNAL DETECTION

What is a signal? (Slide 3)

A signal is an observation that may represent an event occurring in a population. Signals can be patterns of diseases, such as a cluster of cases with a similar illness, or an unusual health-related occurrence, for example, severe healthcare worker sickness after treating patients, unexpected deaths, etc.

All signals may not become events, so a reported signal needs to be triaged and verified before a response is initiated. Signals may consist of reports of cases or deaths (individual or aggregated); potential exposure of human beings to biological, chemical or radiological and nuclear hazards; or the occurrence of natural or man-made disasters.

What is an event? (Slide 4)

An event is an occurrence that can threaten public health. It can be a single case of a disease in some settings (a notifiable disease like measles or diseases with ongoing elimination efforts like polio), or an occurrence that creates the potential for a disease, like clusters of people presenting with similar severe symptoms.

Examples of signals and events (Slide 5)

Some examples illustrating the difference between signals and events are:

- ▶ A critical care physician with a recent travel history to Saudi Arabia who has been hospitalized for a severe respiratory disease is considered a signal that requires reporting. After triage and verification of the signal, there may be more evidence to suspect the event as a case of MERS.
- ▶ A case of typhoid fever that has failed to respond to standard treatment is considered a signal. After triage and verification, there may be sufficient evidence to suspect the event as a case of extensively drug-resistant typhoid fever.
- ▶ A 4-year-old child with fever, rash, cough, coryza, and conjunctivitis could be a signal. This could become an event, such as a case of measles, after triage and verification.

Examples of signals for HEBS (Slide 6)

Some examples of signals for HEBS are:

- ▶ Any severe illness in health staff after taking care of a patient with similar illness,
- ▶ A large, sudden increase in admission for any severe illness of the same type, and/or
- ▶ Any severe, unusual, unexplainable illness, including a failure to respond to standard treatment.

List of pre-determined HEBS signals for the country (Slide 7)

[Adapt the list of signals pre-determined by the country's national public health authorities.](#)

How are signals detected? (Slide 8)

Signal detection is key to HEBS. Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designed by national public health authorities. Healthcare workers, including physicians, nurses, and infection control officers, should be able to recognize signals and report them immediately. Depending on the structure of the existing surveillance system, healthcare workers can either directly report to designated public health authorities or surveillance focal points identified within their health facilities. In some facilities, health workers involved in disease surveillance may already report priority diseases to public health authorities through routine IBS. These people are well-positioned to act as surveillance focal points.

► **APPENDIX D**

NOTES FOR SESSION 5: SIGNAL REPORTING

When and to whom should signals be reported? (Slide 3)

The general responsibilities of healthcare workers are (1) the detection of signals, and (2) their immediate reporting to the HEBS focal point. The main responsibilities of the HEBS focal points are (1) to ensure that healthcare workers in their health facility understand the types of signals that need to be reported, and (2) to coordinate the reporting of all signals to authorities at higher levels within the public health system.

Reporting signals (Slide 4)

Health facilities engaged in EBS should designate a focal point who will be responsible for receiving signal information and reporting to public health authorities. The focal point will have the contact information of the public health authorities in their jurisdiction.

How can signals be reported? (Slide 5)

(Based on the existing structure in the country)

The health facility can report the signal by any means, such as telephone or SMS.

What information is needed to report? (Slide 6)

Some basic information should be shared when a signal is reported, such as:

- What is the signal?
- What are the signs and symptoms?
- When was it detected?
- Is this ongoing?
- How many cases are there?

What happens after signal reporting? (Slide 7-9)

Signals are detected in health facilities. The detected signals are then reported immediately to the designated points of contact within the public health system. Once the surveillance focal point has received the reported signal from healthcare workers, they must then immediately communicate the signal to designated local or intermediate-level public health authorities. After a signal has been reported, the signal will be triaged, verified, and a risk assessment will be performed to define additional action.

Throughout this process, healthcare workers and surveillance focal points may be asked to assist with information gathering, including requests for additional information, assistance with the investigation, collection of laboratory specimens, and control measures.

Feedback (Slide 10)

Equally important to timely reporting is timely, routine feedback. Intermediate-level authorities should provide feedback about events and signals to surveillance focal points, who in turn provide feedback to healthcare workers at the respective facility. Regular feedback on the signals and events reported is essential to sustain motivation for reporting among healthcare workers and surveillance focal points.