EVENT-BASED SURVEILLANCE IN HEALTH FACILITIES AND COMMUNITIES AND INTERNET-EVENT BASED SURVEILLANCE

TRAINING CURRICULUM

U.S. Centers for Disease Control and Prevention

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GLOSSARY OF TERMS

Community-based surveillance (CBS): CBS is the systematic detection and reporting of events of public health significance within a community, by community members. Community health volunteers (CHV), the public, religious leaders, civil society members, teachers, and similar groups are engaged and trained to detect and immediately report events or health risks occurring in their communities. CBS may also be known as community health surveillance or community event-based surveillance.

Community health volunteers (CHV): According to a WHO study group, CHVs may be members of the communities where they work, should be selected by the communities, are answerable to the communities for their activities, and should be supported by the health system but not necessarily a part of its organization. They may also be known as community health workers, among other terms.

Early Warning and Response (EWAR): The organized mechanism to detect as early as possible any abnormal occurrence or any divergence from the usual or normally observed frequency of phenomena.

Epidemic Intelligence: The systematic collection, analysis and communication of any information to detect, verify, assess and investigate events and health risks with an early warning objective.

Event: The International Health Regulations (IHR) define an event as "[…] a manifestation of disease or an occurrence that creates a potential for disease; […]". This includes 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 either the 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.
Intermediate administrative level:	Intermediate administrative levels may be defined differently in different countries. For the purpose of this document, an intermediate level is the public health administrative level below the national level that is responsible for conducting preliminary investigations and implementing responses to reported public health events or suspected outbreaks in a given jurisdiction. The intermediate level may otherwise be referred to as districts or counties, among other terms.
Local administrative level:	Local administrative levels may be defined differently in different countries. For the purpose of this document, a local administrative level is the lowest administrative division within a country, directly above the community level.
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. 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, may also constitute an outbreak and should be reported and investigated.
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 have to 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.
Risk characterization:	According to WHO, once a risk assessment team has carried out hazard, exposure, and context assessments of an event, a level of risk should be assigned. This process is called risk characterization.
Signals:	Patterns of disease or other information considered by the Early Warning and Response 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 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.
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 State 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 cross-checking of the validity (veracity) of the signals collected by Early Warning and Response, by contacting the original source, additional sources, or by performing field investigation. Verification requires that hoaxes, false rumors, and artefacts are eliminated from further consideration.

EXECUTIVE SUMMARY

Event-based surveillance is the organized collection, monitoring, assessment, and interpretation of mainly unstructured ad hoc information regarding health events that may represent an acute public health risk. Event-based surveillance is an essential component of early warning within public health surveillance systems and can expedite the detection and notification of health events.

The *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance* offers guidance and instructions to public health practitioners to facilitate training for event-based surveillance implementation in health facilities and communities within a country. This curriculum focuses on training relevant public health practitioners at the intermediate administrative level, in health facilities, and communities. Additionally, it provides trainers with guidance on how best to facilitate training and to mentor those who have been trained, as well as training evaluation tools, to ensure that the knowledge and skills required for event-based surveillance are transferred sustainably.

This curriculum has been organized in a modular fashion. A brief description of each module, accompanied by a schematic diagram, can be found below.

Module 1: Overview of Event-Based Surveillance
This module broadly describes event-based surveillance within the context of early warning and response and public health surveillance, outlines how event-based surveillance may be defined in a country, and describes the various sources of event-based surveillance information.

Module 2: Facilitation and Mentorship
This module is comprised of two chapters that describe the functions of facilitation and mentorship within the context of event-based surveillance and guides public health practitioners to be effective facilitators and mentors.

Module 3: Intermediate Level Event-Based Surveillance
This module describes how to train public health personnel at the intermediate administrative level on event-based surveillance implementation in health facilities and communities, including their roles and responsibilities. It consists of a facilitator guide, participant guide, and accompanying presentations and exercises to facilitate training.

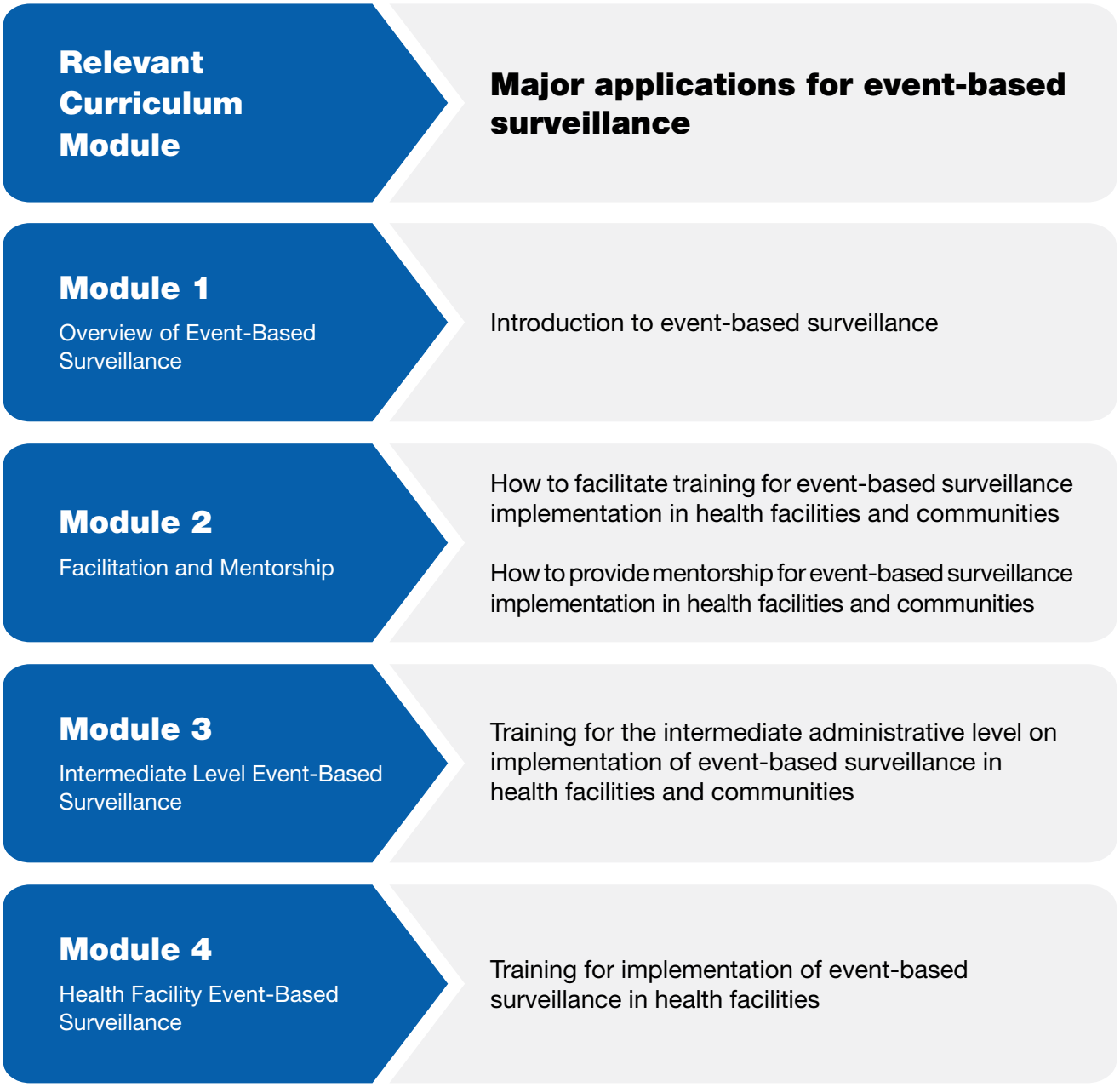
Module 4: Health Facility Event-Based Surveillance
This module describes how to train clinicians, nurses, and other relevant healthcare workers on how to conduct event-based surveillance in health facilities. It consists of a facilitator guide, participant guide, and accompanying presentations and exercises to facilitate training.

Module 5: Community-Based Surveillance
This module describes how to train community health volunteers and local-level supervisors on how to conduct community-based surveillance. It consists of a facilitator guide and participant guide, which contain lectures and exercises to facilitate training.

Module 6: Internet Event-Based Surveillance
This module describes how internet event-based surveillance is conducted: “epidemic intelligence” is collected from formal and informal sources, including media reports, to detect potential public health events to verify and take action on. It consists of a facilitator guide, participant guide, and accompanying lectures and exercises to facilitate training.

Module 7: Event-Based Surveillance Training Evaluation Tools
This module provides two sets of evaluation tools that can be adapted and applied following the completion of event-based surveillance training. The first is a post-training evaluation tool that should be used directly after the training is completed. The second is an event-based surveillance training impact evaluation that can be used approximately three months following completion of the training.

Figure 1. Organization of the Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance



Module 5
Community-Based Surveillance

Training for implementation of community-based surveillance

Module 6
Internet Event-Based Surveillance Training Module

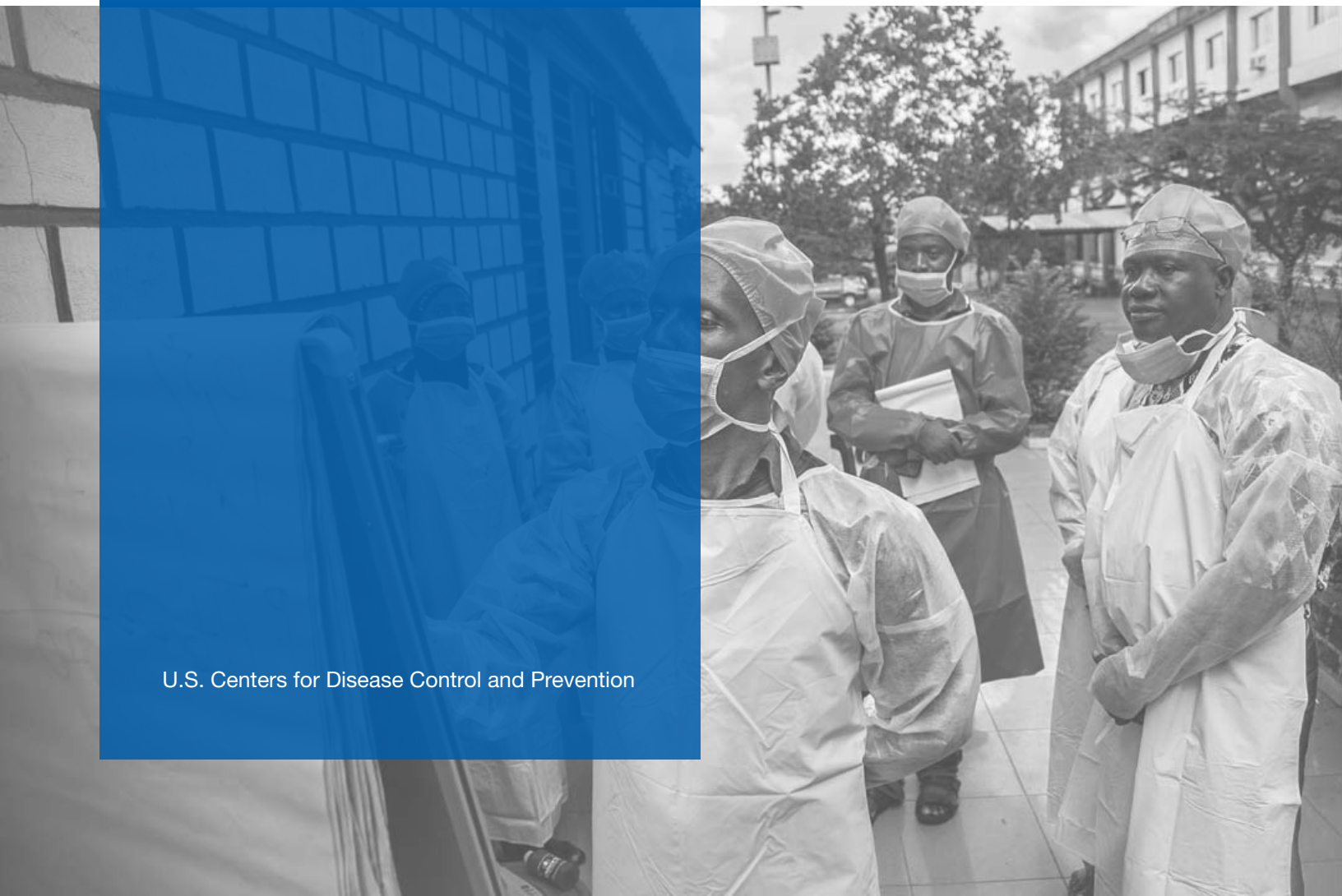
Training for implementation of internet event-based surveillance

Module 7
Event-Based Surveillance Training Evaluation Tools

Tools to effectively evaluate training for event-based surveillance in the short and long term

MODULE 1

OVERVIEW OF EVENT-BASED SURVEILLANCE



U.S. Centers for Disease Control and Prevention

INTRODUCTION

The International Health Regulations (IHR; 2005) identifies timely detection of all events with potential public health risk, and immediate reporting and response, as core capacities of surveillance. The IHR expands the usual notification of infectious diseases to include surveillance of public health events of various origins (e.g. nuclear, chemical or unknown). The IHR encourages 196 countries, including all World Health Organization (WHO) Member States, to build the capacity to detect, assess, notify and respond to all acute health events or health risks that may constitute a threat to human health. The WHO Joint External Evaluation (JEE) tool measures country-level progress in achieving these capacities and the WHO has also developed benchmarks to inform the actions countries can take to build IHR capacities, including surveillance capacity, appropriately.

Surveillance, Early Warning and Response, and Epidemic Intelligence

Public health surveillance has two main objectives:

- to measure disease burden, including monitoring morbidity and mortality trends over time to effectively guide control programs and allocation of resources; and
- to enable rapid detection of public health events for effective response and control.

The organized mechanism to achieve rapid detection of public health events is referred to as early warning and response (EWAR). EWAR should collect information from different relevant sources and guide public health response to acute public health events of all origins. The mechanisms of detection and data collection from both indicator-based and event-based surveillance systems, as well as the processes of data management and information-sharing, are collectively called epidemic intelligence. Epidemic intelligence is the systematic collection, analysis and communication of any information to detect, verify, assess, and investigate events and health risks with an early warning objective.

Indicator-Based Surveillance and Event-Based Surveillance

Epidemic intelligence has two components: traditional or indicator-based surveillance (IBS), and event-based surveillance (EBS).

Indicator-Based Surveillance

IBS primarily relies upon information collected in health facilities and focuses on the detection of a list of communicable diseases using standardized case definitions. Thus, IBS is well-suited for monitoring disease trends over time and defining transmission patterns, and is useful for understanding, for instance, the start of regular seasonal outbreaks of endemic disease such as seasonal influenza. Data provided by IBS are essential to EWAR, but IBS may not always be helpful for smaller events because signals are either averaged out in large datasets or lost in the noise of smaller datasets. Additionally, data from IBS systems can often be delayed, incomplete, and may provide information only on a pre-defined list of known public health risks. Emerging or unknown pathogens may, therefore, be missed, along with rapidly escalating outbreaks or non-communicable events such as those attributable to toxicological contaminants.

Event-Based Surveillance

The World Health Organization (WHO) defines EBS as the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks. Information from EBS can come from anywhere, including pharmacies, animal health sectors, clinicians, schoolteachers and community members, among others.

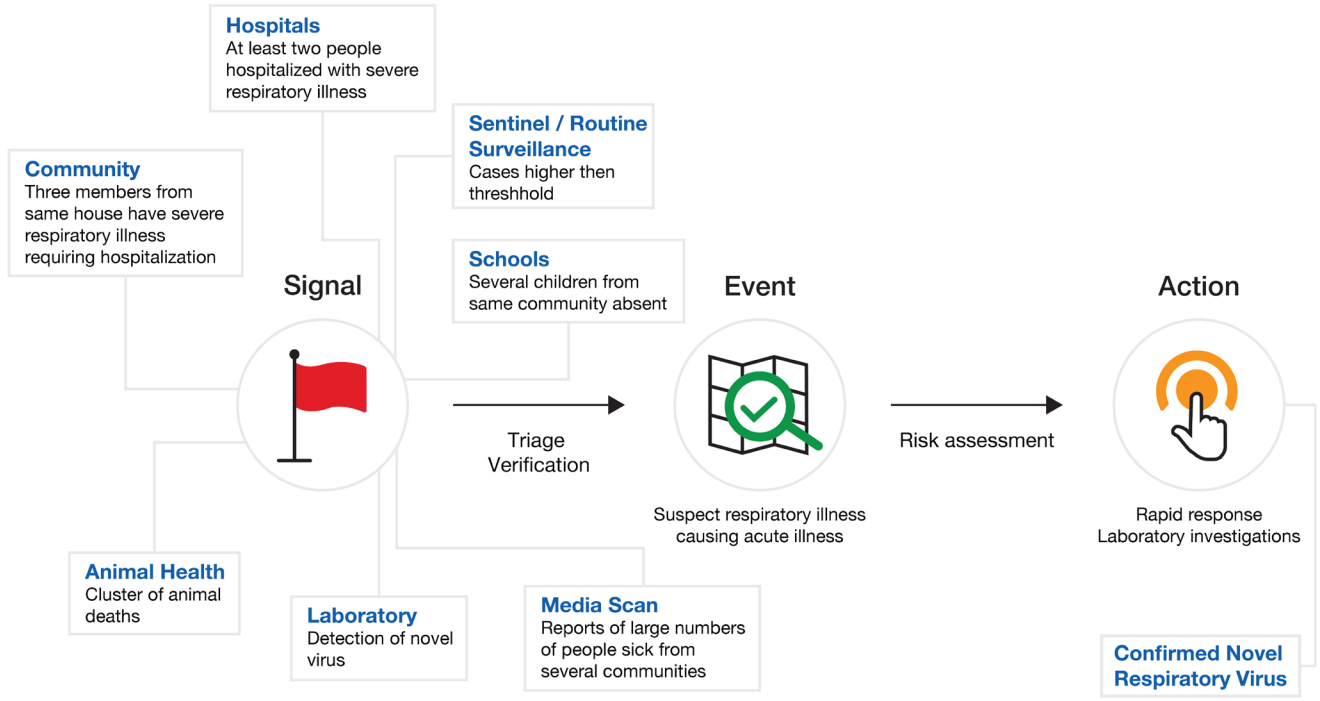
When fully functional, an EBS system:

- Strengthens country preparedness for epidemics and pandemics,
- Complements and enhances existing surveillance and reporting systems,
- Follows an all-hazards approach incorporating One Health, and
- Promotes and facilitates multi-sectoral collaboration and communication, including public and private sectors.

In IHR, an event is defined as "[...]a manifestation of a disease or an occurrence that creates a potential for disease; [...]" and might represent a threat to public health that needs urgent attention, such as an emerging outbreak (see figure below). Events of public health importance vary widely and can be outbreaks of infectious disease; the reappearance of diseases that have been eliminated from a community; outbreaks of human diseases related to food contamination, chemical spills or radiation leaks; or outbreaks of disease in animals that threaten human health.

EBS is a functional component of EWAR that collects information before human cases occur or before an event is detected and reported through traditional reporting systems such as IBS. An optimal EBS system will significantly increase the sensitivity of the public health system and ensure a rapid response to acute public health events of all origins, resulting in mitigation of the public health impact. As such, an EBS system requires, at minimum, an event assessment team/unit and rapid response capacity. It also requires reinforced existing coordination and multi-sectoral collaboration among all stakeholders within and outside of the health sector.

Figure 2. Interaction among different EBS sources



The above figure illustrates an example of how a novel respiratory virus can be detected through a comprehensive EBS system. In this hypothetical scenario, the early warning can come through several sources:

- A CHV or a key informant in the community receiving information about three members of the same household that are severely ill, with two of them rushed to a hospital with severe respiratory illness
- A hospital receiving two severely ill patients from the same household in the emergency unit
- The animal health sector sharing reports of sudden illness and deaths of poultry in several communities and an animal market
- The national public health laboratory detecting an un-typeable virus from hospitalized patients
- Media reporting of increasing public anxiety over several hospitalized cases from one municipality
- A school reporting several children absent with severe respiratory illness

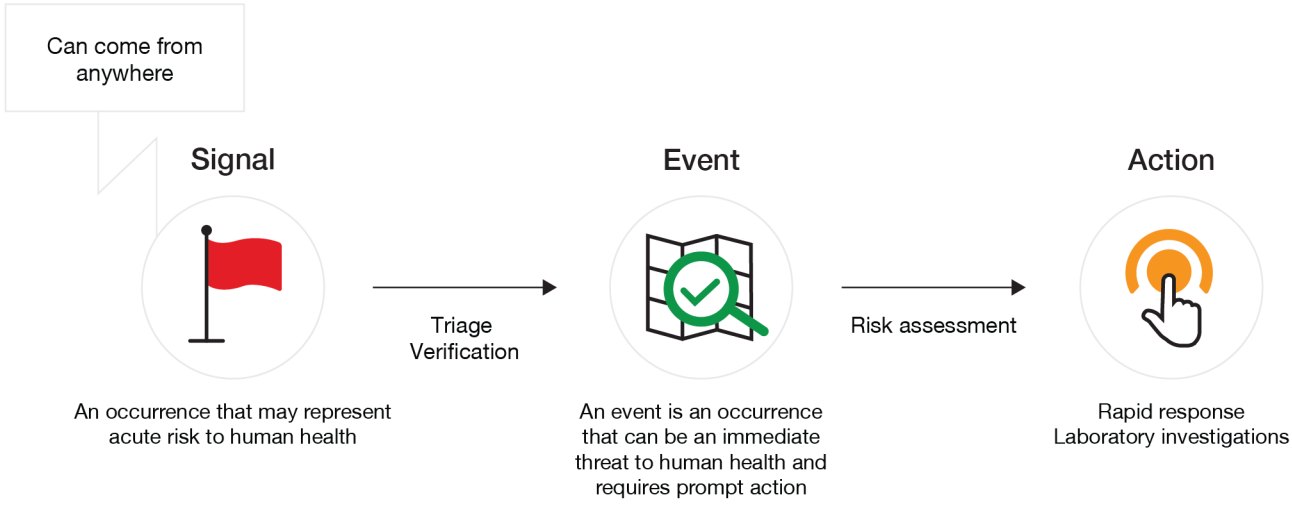
A signal entering the public health system through any source should initiate immediate triage and verification. Since, in this example, the event is verified as a suspected cluster of severe respiratory illness, appropriate response mechanisms can swing into place with coordination across sectors, resulting in rapid intervention that can save lives.

The process of EBS starts with the identification of signals, or observations that indicate an event occurring in a population. Signals can be patterns of disease, such as clusters of similar illness in a community, clusters of disease or death in animals, or even single cases of a high-priority illness such as a child with acute flaccid paralysis or a patient with a viral hemorrhagic fever in a country at risk for the Ebola virus disease. Signals can come from numerous diverse sources, including key informants in community settings, human and animal health care providers, health facilities, media publications, and others.

Each source will define signals differently and may even be more suited for different kinds of disease processes. For instance, community-based surveillance (CBS) is best suited for the early detection of localized events in a community, including those that may subsequently spread. Some of these may only need a local response, as in a case of rabies, while others need to be immediately escalated to a higher level of the public health system for a more aggressive response, such as a case of hemorrhagic fever or a cluster of severe acute respiratory infections. Often, community-level signals need to be defined with simple terms and not using medical jargon.

Because signal definitions are broad and may be detected by informal sources, once detected, signals must be evaluated to determine the likelihood that they truly represent an event. This process includes the steps of triage and verification. Triage is comprised of the sorting of data and information in order to discard duplicates, misinformation, and irrelevant information, to enable the identification of real events. Once triage has been performed, verification is used to confirm the verity and authenticity of the signal, and to collect additional information. Once the signal has been triaged and verified as truly occurring, it may be classified as an event (see figure below). As such, it enters, and is integrated into, the public health surveillance reporting system for appropriate recording and response.

Figure 3. Functions of EBS: From signal to action



All events need to be assessed to determine the level of risk to human health. This step is called risk assessment. Once a risk level is assigned, the appropriate investigation, response/action, and control measures can be elaborated and implemented. Risk assessment should be a dynamic process and may depend in large part on the severity of the underlying process:

- whether or not it is resulting in severe cases or deaths,
- the size of the event, and
- whether or not it is thought to represent a novel occurrence, such as a disease caused by a new pathogen or a disease in a new geographical area.

The use of decision trees can help communities determine which events need urgent high-level responses (e.g., a case of hemorrhagic disease) and those that can be investigated and handled at a lower level (e.g., a rabid dog).

As with IBS, EBS systems should be linked to existing response mechanisms such that events are responded to appropriately and in a timely manner. Response efforts may include field investigation, deployment of a Rapid Response Team (RRT), laboratory testing, immunization campaigns, and appropriate infection control and prevention measures. As EBS facilitates the detection of all hazards, events detected may not necessarily be limited to infectious diseases, and response will require the involvement of stakeholders in multiple sectors.

Definition, Use, and Prioritization of Signals in Event-Based Surveillance

When defining signals for use in an EBS system, it is important to consider the elements of sensitivity and specificity to find the right balance between the two. The use of highly sensitive signals that try to capture too much can overburden surveillance systems and result in excessive signal noise, obscuring the appearance of true events. Alternatively, overly specific signals may reduce the ability of EBS to capture all events. Achieving the right balance may require piloting and revision of signals before they are finalized.

Signals should also be country- or region-specific and tailored to the specific concerns of the context in which they are used. As a first step, diseases and events of interest or concern, including non-infectious disease events (i.e., "all hazards" events), should be prioritized. This prioritization process should be conducted in consultation with all EBS stakeholders through multisectoral collaboration.

Moreover, the process of signal selection should be flexible and dynamic, and readily amenable to additions or deletions as the need arises. The list of events should also be relevant to the source (i.e., in community or health facility settings). For example, seasonal diseases such as dengue and seasonal influenza may be best detected though IBS in health facilities rather than through CBS, while the detection of foodborne illnesses can be relevant in both settings.

Sources for Event-Based Surveillance included in the Training Curriculum for Event-Based Surveillance in Health Facilities and Communities

EBS requires a multisectoral approach and relies on sources of information beyond traditional health system sources. Some of the most commonly used EBS sources include health facilities, laboratories, communities, traditional healers and media, among others. This section highlights the EBS sources included in the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities*.

Health facilities

Besides being a crucial source of information for the more traditional IBS, health facilities are an important source for EBS. Cases requiring immediate reporting are essentially events under the EBS working definition that may signal a larger problem needing immediate response. Limiting event reporting from health facilities to those that have recognized or suspected etiologies (i.e., reporting using disease-specific case definitions) limits the usefulness of the system. Defining signals for immediate reporting beyond a list of notifiable diseases can improve the sensitivity of the early warning system and emphasizes the role of health facilities in EBS. A recent example of this was the case of Middle East Respiratory Syndrome (MERS) that was first reported as a signal in Jordan many months before the disease was recognized. Examples of signals for use in EBS in health facilities include a sudden increase in admission of cases with similar signs and symptoms; a case with unusual presentation or clinical course; or a health care provider (or group of providers) who develops acute illness after caring for similarly ill patients. An additional type of signal using health facility data involves the definition of alert thresholds in these data, especially for common seasonal diseases.

For the management of EBS, each health facility may consider nominating a focal point to receive the signal reports from the healthcare workers in that facility. Existing surveillance focal points may also carry out this role. In order to serve its purpose and be as representative as possible, EBS should count on the contribution and participation of every health facility in a given area, including public and private facilities. Once a list of signals is identified for health facilities, all healthcare workers should be routinely sensitized to look for, and immediately report, anything unusual to their focal points using the available list of signals (see examples in Table 1). Every focal point should participate in EBS training to support healthcare workers and be responsible for immediate reporting of signals to intermediate-level public health authorities through predefined and structured reporting mechanisms. These authorities are then responsible for the triage, verification, and risk assessment of signals reported from health facilities.

Table 1. Examples of signals for health facilities

1. Severe illness requiring hospital admission in health care workers after caring for patients with similar symptoms
2. Large, unexpected, sudden increases in admissions for any illness of the same type, including patients in intensive care units
3. Severe, unusual, unexplainable illness including failure to respond to standard treatment

Community-Based Surveillance

The importance of the CBS platform in EBS lies in its ability to detect events before they become widespread and apparent to healthcare workers.

EBS at the community level can be conducted by community health workers (CHW), community health volunteers (CHV), or a local level public health office working through key informants in the community. CBS programs need active engagement from the public health unit at the local administrative level to successfully maintain a network of key informants. Public health authorities within the local public health unit can supervise the CHWs in their geographic area. Where local public health units do not exist, nurses or doctors in primary health facilities may serve as local level supervisors for CHWs. In any case, workers at the local level are the first responders to signals detected through CBS, and are responsible for triaging, verifying, and reporting signals to designated public health authorities at the intermediate level. They should also encourage the CHWs, CHVs, and key informants with regular feedback and refresher training, where necessary.

Key informants are community members who have a strong relationship with their communities and can include traditional healers, village/community leaders, members of women's groups, agricultural unions, shop owners, and priests. Other key informants might include representatives from educational institutions, factories, farmers unions, and pharmacists. Key informants can be very helpful in limiting signal noise that may occur if reporting is expanded to include the entire community.

Signals defined for CBS need to be simply worded without technical jargon, to allow for greater understanding and effective use by key informants who may have no medical training or background. The table below shows an example of a signal list for the community.

Table 2. Examples of signals for communities

1. Any child less than 15 years old:

- With sudden weakness of limb(s)
- With fever and skin rash

2. A single case severe enough to require admission to hospital or causing death of any of the following:

- Three or more rice watery stools in 24 hours with dehydration (fatigue, thirst or sunken eyes)
- A respiratory infection with fever in someone who has been traveling abroad in the last 14 days
- Illness after contact with sick or dead animals
- Illness with fever, watery diarrhea and unexplained bleeding (gums, skin, or eyes, stool or urine)

3. Two or more hospitalized cases and/or deaths with similar type of symptoms occurring in the same community, school or workplace in the same seven-day period, especially:

- With high fever, stiff neck
- With high fever, yellow eyes or skin

4. Unexpected large numbers of:

- Deaths of poultry or other animals
- Children absent from school due to the same illness in the same seven-day period

5. Any event that poses a risk to public health, including natural disasters, or symptoms / diseases rarely seen in the community

Other Sources for Event-Based Surveillance

Animal health sector

Most countries may have animal health surveillance and response systems that are parallel to the human health system and collect information from the community through animal health workers, wildlife health laboratories, and veterinary clinics, among others. Connections need to be established between human and animal health sectors at each administrative level, corresponding to the source of signals in EBS. For example, CHWs might be the first in a community to be aware of a die-off of a backyard poultry flock, or exposure to a rabid dog, and should be trained to notify their animal health counterpart. Animal health workers who detect similar signals that may impact human health should notify their CHW counterpart as well. Signals of animal disease that may be important to a human EBS program can involve the detection and reporting of animal events such as unusually high rates of abortions in goats, or the sudden death or signs of hemorrhage in domestic and wild-hooved mammals or migratory bird flocks. Diseases or patterns of illness in animals that might represent a threat to human health should be notified to public health authorities as events. This is especially true of zoonotic diseases like rabies, anthrax, and brucellosis, which can be passed between animals and humans. There should also be cross-reporting of events between animal and human health systems that may have long-term negative consequences on human well-being, such as animal diseases like African swine fever that can decimate animal populations, impacting both food security and trade. These would, however, be reported through other mechanisms outside of EBS, such as information sharing at the national administrative level.

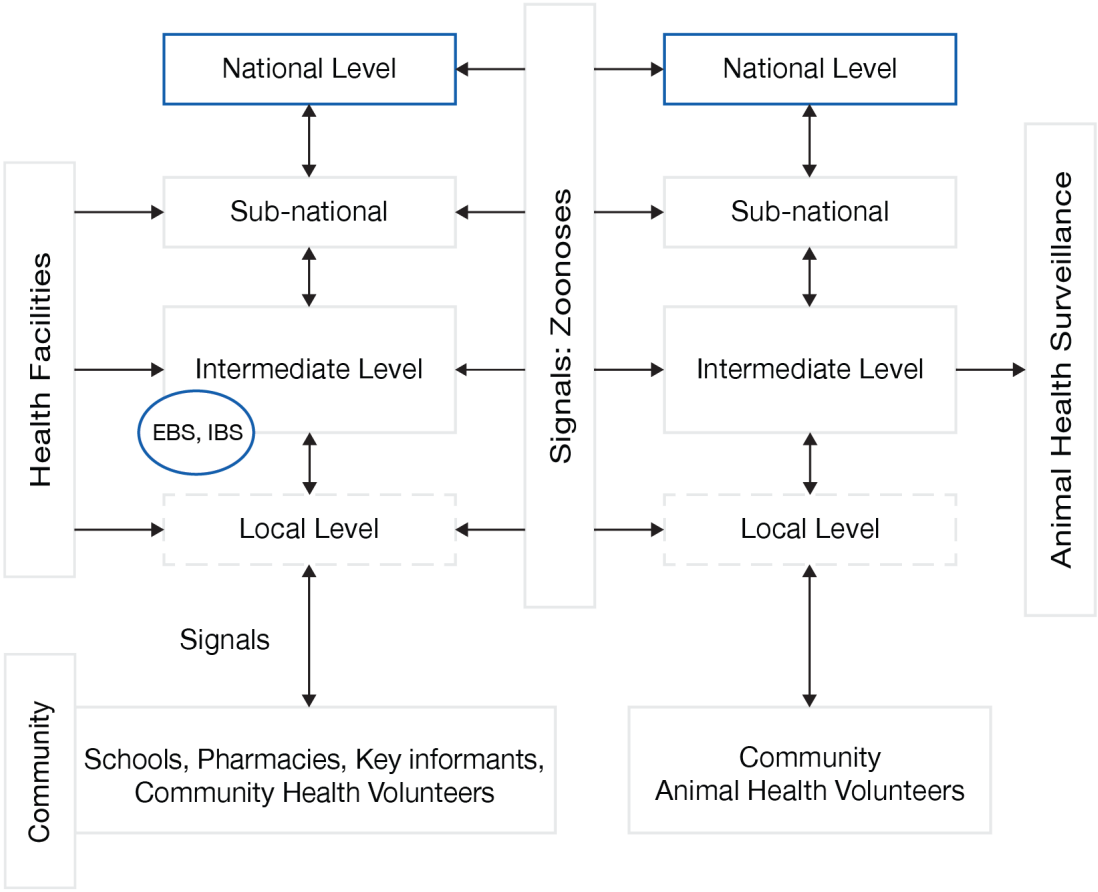
It would thus be important for countries to consider designing a list of signals for recognizing zoonotic events for the conduct of EBS (see Table 3).

Table 3. Examples of signals for the animal health sector

1. Severe illness in veterinarians, wildlife staff, or community members after contact (culling, feeding, treating, vaccinating) with a sick or dead animal
2. Large, unexpected, sudden increases in disease or death of animals
3. Sudden increase in abortions in animals
4. All immediately notifiable zoonoses

Once the list of signals is available, both animal health workers and CHWs should be trained to recognize and immediately report to public health authorities at the relevant administrative level. In countries that have a well-organized animal surveillance system, signals and events can be communicated at every level between the animal health and human health sectors from the local to the national level (see figure below). Additionally, there should be mechanisms in place at the national level, and if resources allow, at the intermediate level for immediate notification of zoonotic events by both sectors. Such mechanisms should also enable joint responses to be conducted.

Figure 4. Importance of cross-reporting between human and animal sectors in EBS



Monitoring media and other electronic sources

Media monitoring is the process of tracking media coverage with the aim of early detection of signals with potential public health impact. With the explosion of information on the Internet, monitoring information that is freely available in online media and other electronic sources has become an important source of epidemic intelligence that can be implemented at the national level, and at other sub-national levels where resources exist. Monitoring media and other electronic sources can be a useful supplement to the community, health facility, and intermediate level components of the EBS system and can be useful to monitor the course of an event. Electronic sources can be either official (e.g., Ministry of Health, Agricultural, or other Ministry websites) or unofficial (e.g., newspapers, social media, and blogs). As with other EBS strategies, signals from media sources must be defined, and once reported, triaged and verified.

Several tools for monitoring media and other electronic sources are available at no or limited cost. The Global Public Health Intelligence Network (GPHIN), one of the earliest programs to automate media scanning, was developed by the Public Health Agency of Canada in partnership with WHO in the late 1990s and is a useful free tool for this activity. In addition, there are now several other aggregator systems that provide moderated content such as ProMed and HealthMap that are useful to monitor global events. There are also aggregator systems such as MediSys that work by searching thousands of news media and other online information sources in multiple languages and identifying signals through keyword matches with predefined search terms. Most recently, WHO, in collaboration with the European Union, created a "system of systems", the Epidemic Intelligence from Open Sources (EIOS) system, that pulls together existing epidemic intelligence aggregator systems and incorporates additional sources and categories customized to meet the needs and priorities of individual user communities (i.e., by country or organization). While not yet employed and accessible universally, EIOS will allow for the use of Boolean search terms and filters that can be user-defined, and a variety of machine learning techniques to score articles by relevance. The media monitoring team is an interdisciplinary group of analysts who perform scanning of open sources of information on the web, triage and verification of potential signals, and risk assessment of events.

A training curriculum that prepares public health practitioners to carry out EBS through the monitoring of media and other electronic sources has been developed and published by the U.S. Centers for Disease Control and Prevention's Global Disease Detection Operations Center in collaboration with Georgetown University's Center for Global Health Science and Security. These materials are available at: https://ghss.georgetown.edu/ebs/.

Hotlines and toll-free numbers

Existing hotline and toll-free number systems have been employed and leveraged to incorporate the reporting of signals, both from members of the community and healthcare workers. They have also been designed to receive signal reports through SMS and other messaging applications such as Facebook Messenger, Twitter, and WhatsApp. A monitoring team should be trained on the list of priority signals and the use of standard data collection tools, to ensure that the minimum information needed for triage and verification is collected. All received information should be registered into a signal database to continue the process of triage and verification as previously outlined in this module.

Notably, hotlines were used during the Ebola outbreak in West Africa in 2013-14, during which they were open to the public to report suspected Ebola virus disease cases or deaths 24 hours per day. However, hotlines present several limitations and need to be optimized to overcome some challenges, including difficulty in localizing callers when calls are received at a central facility and generation of large amounts of signal noise in the system attributable to overreporting of unverified signals by the general public. They also can raise the expectations of the general public that some action will be taken as a result of the reporting, ultimately resulting in dissatisfaction when these expectations are not met. One method to address some of these issues is to limit use to a select group of key informants and public health professionals.

Laboratories

In laboratories, signals take the form of the detection of pathogens that are immediately notifiable (e.g., the detection of Ebola virus in a clinical sample) and unusual patterns of detection (e.g., a sudden increase in a pathogen detection in a given time period, detection of a rare pathogen from body fluids (e.g., fungi from sterile body fluids), detection of multi-drug resistant pathogens, clusters of specific organisms, and unexpected increases in the detection of organisms from unusual places). All public and private laboratories should report notifiable diseases and other signals to public health authorities and contribute to EBS.

Table 4. Examples of signals for laboratories

1. A pathogen that has not been detected for a long time in that country or a new pathogen
2. Large/sudden unexpected increase in numbers of specimens with the same testing request, or positive result for the same pathogen (including the pathogens that are resistant to multiple antibiotics)
3. Any pathogen on the immediately notifiable list
4. Un-subtypeable or new influenza strain from a patient with Severe Acute Respiratory Infection (SARI)

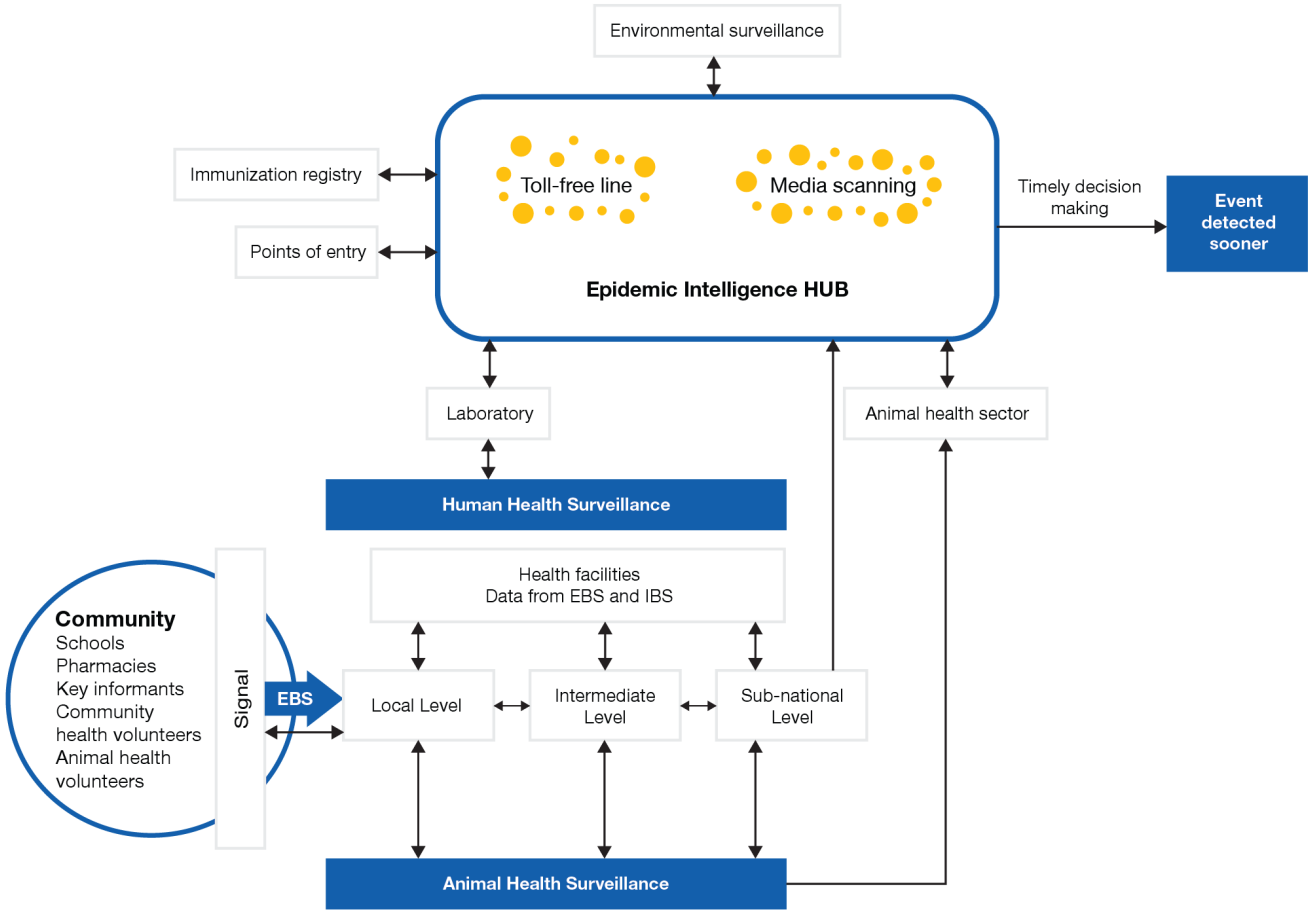
Other sources

Events can originate from other sectors such as educational institutions, military hospitals, other specific surveillance systems such as those for border health, and environmental sectors. It is not necessary that these sectors share all the information/data that they are collecting with the human health sector – only data or signals that may predict human health events. As with other sources described above, these sectors can share relevant data based on a predetermined list of signals.

Epidemic Intelligence Data Hubs

It may be useful to establish an epidemic intelligence hub nationally (and sub-nationally) with the capacity to receive, interpret, and visualize surveillance data from multiple sources and in multiple formats. This hub would ideally receive structured data collected through IBS systems; verified events from EBS systems that include animal events from the animal health sector; data from immunization registries, environmental sectors, and other sectors; and media and scientific publications. By receiving this information, the data hub could facilitate the quick identification of any event which may threaten the public's health (see figure below).

Figure 5. Possible functioning of an epidemic intelligence hub



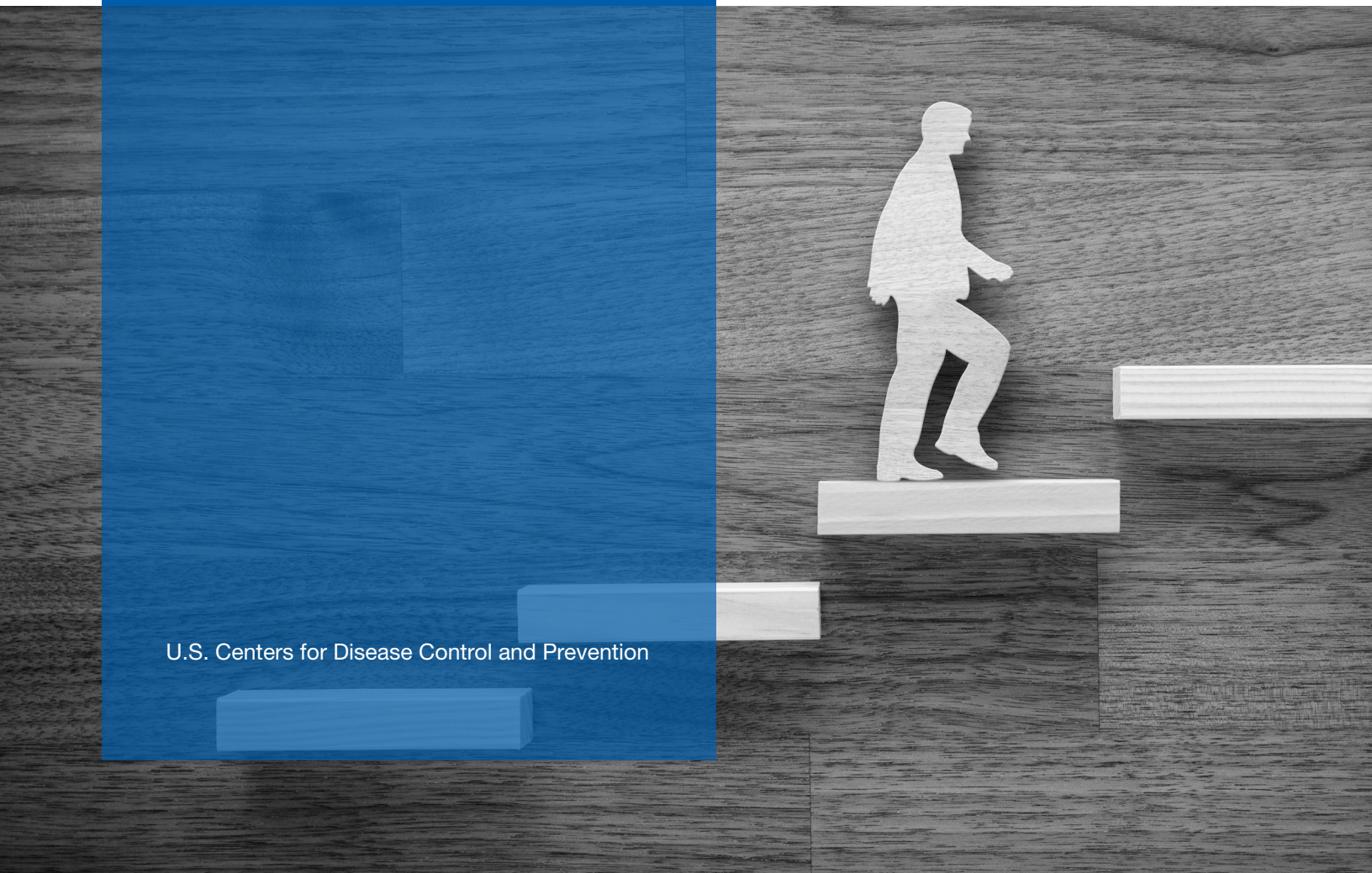
In these data hubs, data streams could be integrated and displayed on dashboards using automated routine analyses to improve accessibility and utility of the surveillance data. Many countries now have Public Health Emergency Operation Centers (PHEOC) that serve as data hubs for epidemic intelligence. Having all of the data together facilitates the work of trained analysts who evaluate and synthesize the data that are provided to decision-makers and responders.

Conclusion

Recent history has demonstrated the consequences of late detection of public health events. The need to detect emerging and re-emerging diseases and public health events early is essential for rapid response and containment, having a direct impact on the security of the public's health. The EWAR framework outlines how information from both IBS and EBS can enable the early detection of, and response to, public health events. While data from IBS is restricted to mainly formal sources of information within a surveillance system, data from EBS can come from numerous, diverse sources. In this all-hazards approach, EBS can facilitate the early detection and rapid reporting of emerging public health events.

MODULE 2

FACILITATION AND MENTORSHIP



U.S. Centers for Disease Control and Prevention

MODULE 2.1
THE ROLE OF FACILITATION IN EVENT-BASED SURVEILLANCE TRAINING

Defining Facilitation

Facilitation is a form of teaching that puts the student at the center of the learning process. It asks them to actively engage with the curriculum to develop their understanding and skills under the expert guidance of the facilitator. In a facilitation setting, students are more like 'participants' in the learning process; the classroom is an arena for experimentation, discussion, and small group activities; and the facilitator is chief navigator and subject matter guide.

Facilitation techniques are frequently used in adult education settings because adults respond well to active engagement in the learning process and being asked to take responsibility for their learning. Additionally, they have experiences and existing knowledge that can be valuable sources of learning if they are allowed to operate in a learner-centered environment, rather than being told what they need to know by the 'expert,' as can happen in more traditional classroom environments.

How Does It Differ From Mentorship?

Facilitation can be distinguished from mentorship in that mentorship usually involves a sustained relationship between the mentor and mentee, whereas facilitation often involves just a single encounter between the facilitator and participants. In mentorship, the mentor functions as an experienced and trusted advisor to the mentee, whereas in facilitation, the facilitator acts as a learning guide who helps participants to find the answers for themselves. More information on mentorship can be found in *Module 2.2 The Role of Mentorship in Event-Based Surveillance* of this module.

Key Principles of Facilitation Within the Scope of the Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance

Facilitation can be distinguished from more traditional ways of teaching according to the following principles:

- It recognizes that learners must be intellectually active to learn.
- It helps students reach their own conclusions by encouraging critical inquiry.
- It is an act of guiding students to the right answers rather than telling them what they are.
- It fosters self-directed learning.

Within the scope of the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance*, these principles are applied by:

- Providing frequent opportunities for active learning through small group discussions, role-plays, and case study analyses,
- Developing critical inquiry using brainstorming and question and answer techniques,
- Encouraging multiple viewpoints while helping participants see how they fit or diverge with expert advice from the field, and
- Providing opportunities for students to reflect on the learning process and what is needed to achieve the learning objectives.

Knowing Your Audience

This approach to facilitation combines several approaches to adult education that have been developed according to the unique characteristics of adult learners. Adult learners are used to taking responsibility for their actions and making decisions for themselves, and therefore need to be considered by others as capable of self-direction. They come to the classroom with a wealth of experience and various beliefs that should be recognized and valued as a source of learning in themselves. Adult learners need to know why they are learning and what they will be learning in advance. They are ready to learn what they need to know to deal with situations they will encounter in their real lives, and they need to be actively involved in the learning process.

These characteristics inform the principles that should be used to guide adult education program delivery:

- Set clear goals and learning objectives in advance and communicate these to your learners at the start of each learning intervention.
- Wherever possible, present authentic, real-world scenarios that are relevant and useful to the situations that learners will encounter in their lives.
- Connect learners' experiences and existing knowledge to the curriculum being taught.
- Provide opportunities for reflection about what is being learned and how it is being learned.
- Provide opportunities for learning through activities rather than instructions.
- Know your learners and, wherever possible, tailor learning to their needs, objectives, and the context in which the learning will be applied.

FACILITATING EVENT-BASED SURVEILLANCE TRAINING

Who Should Facilitators Be?

Facilitators will be selected to assist in event-based surveillance (EBS) training at intermediate, health facility, and community levels. Facilitators should have experience with indicator-based surveillance (IBS) in their countries, as well as have a deep understanding of all aspects of EBS. In addition, they should have knowledge and expertise on group facilitation using adult learning theories and principles, and should be familiar with the training materials in advance.

Facilitator Role

Facilitators will be tasked with effectively administering EBS training to staff at various administrative levels. This includes preparation and set-up of the training; delivery of the training and management of participants; and reinforcing concepts and encouraging learning for the duration of the training. Facilitators should also remain neutral and objective throughout the training process.

Facilitator Skills

In addition to familiarity with adult learning principles and group facilitation techniques, facilitators should possess the following skills and competencies:

- Strong communication skills to effectively communicate EBS concepts, build rapport with participants, and keep them on track throughout the training,
- Active listening to accurately understand participants' needs and understanding of EBS concepts,
- The ability to read and manage the room, including making changes as necessary to accommodate participants' learning pace and group dynamics to ensure everyone is comfortable participating, and
- The ability to remain flexible and exhibit a positive and encouraging attitude throughout the training.

Facilitation Techniques

Facilitators should be familiar with the following facilitation techniques, as they are used throughout the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance* to support the principles described earlier in this chapter.

Icebreaker Activities

These are simple activities to use at the beginning of training to get participants engaging with each other for the first time in a fun and non-demanding way. As the name suggests, these activities are used to break down barriers between participants and help position the training as a group project requiring frequent communication between group members, including the facilitator.

Energizers

These activities can be used to break up the training and re-energize participants whenever the facilitator senses the group is losing focus or tiring during the workshops. They are simple, fun activities, such as the lie detector game, that provide light relief from the serious work at hand. The facilitator should be alert to signs that participants are tiring and feel free to use an energizer, even if it's not scheduled in the agenda.

Brainstorming

Brainstorming sessions are used to generate ideas about a topic or problem by getting participants to articulate what they already know, what they imagine the topic is about, or what the solution might be. There should be no right or wrong answers in a brainstorming session, as the aim is to generate ideas and solutions where previously there were none or only a limited number. The facilitator's job is to encourage the participants to be as spontaneous and creative as possible by valuing all responses equally, withholding judgement, and ensuring that all ideas are recorded during the session. Once the brainstorming is finished, the facilitator should help the group evaluate the proposals based on their merits.

Small-Group Discussions

Facilitators will frequently be asked to set up small group discussions during EBS training. These are usually guided discussions where the group is given a set of questions to answer together. Small group discussions give all participants an opportunity to be involved in the conversation, especially those who might not feel confident to speak in front of the whole group. They enable collaborative, active learning, and generate multiple perspectives on the topic. The facilitator should monitor these discussions and be ready to steer the conversation in the right direction if groups are struggling for ideas or are clearly off-course, and be prepared to answer questions if they arise. Feedback sessions provide an opportunity for groups to present their answers and for the facilitator to guide participants in evaluating the merits of the answers being presented.

Plenary Discussions

In plenary discussions, the facilitator helps the group as a whole develop their understanding of the topic using a range of questioning techniques such as: asking for clarification; questioning the underlying assumptions inherent in participants' answers; asking for reasons and evidence for certain viewpoints; teasing out implications and consequences; and asking questions about the question such as, 'Why do you think I asked that?'. In this way, facilitators help participants develop their critical thinking about the topic and encourage active learning.

Lectures

Lectures are used throughout the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance* to consolidate the discussion work and present model answers and threshold concepts. They are an important method of communicating key definitions and processes that are mission-critical to EBS and for which participants need a clear answer. Participants can still be active during lectures by making notes in their journals and participant guides and asking clarification questions if needed.

Role-Plays

Role-plays are used at various points in the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance* to facilitate learning on several levels. Firstly, role-plays help contextualize learning by getting participants to imagine the real-life environments in which scenarios are taking place. This can help them develop a richer understanding of what they will experience in the field and help them prepare for unpredictable and sometimes hostile settings. Secondly, they are a way for students to practice what they are learning by enacting processes and using communication strategies they will need to use in their surveillance roles. It is, therefore, a great way to help participants develop skills. Thirdly, role-plays can help participants develop their understanding of different viewpoints and behaviors by asking them to take on the role of others and feel what they are feeling and act as they would act. This helps participants develop empathy with those they will be working with and choose appropriate strategies to achieve desired results.

Case Studies

Case study analyses provide participants with opportunities to learn from authentic, real-world scenarios so that they can predict how things might play out in the field based on lessons learned from the past. They can be used to develop participants' analytical, problem-solving, and decision-making skills by asking them to identify successful strategies from the examples being presented. The facilitator thus has an important role to play in helping participants make these connections and see applications to their own work in the field.

MODULE 2.2
THE ROLE OF MENTORSHIP IN EVENT-BASED SURVEILLANCE

Defining Mentorship

Mentorship is a sustained, reciprocal relationship between a person with significant experience in a field (the mentor) and a person with less experience (the mentee), with the purpose of developing the mentee's professional and personal capabilities in that field. Mentors provide mentees with advice, support, and counsel, through coaching, teaching, and modelling behaviors needed for mentees to become established members of their professional domain.

Mentoring in professional settings provides benefits to both mentors and mentees. Mentoring helps mentees achieve career goals such as better performance on the job, enhanced professional identity, increased career satisfaction, less stress and role conflict, promotion, and greater acceptance within the organization as a whole. Mentors may derive satisfaction and a sense of achievement through their mentees' successes, as well as a greater commitment to their own role. Mentoring may also equip mentors with a deeper understanding of how it relates to their own personal goals and the goals of the organization.

Key Principles of Mentorship

Mentorship typically requires a combination of knowledge, attitude, and skills. Mentors require a deep understanding of the domain in which they operate, as well as the domain of mentorship itself. It is not enough to be an expert in the field. Knowledge of mentoring methods and when to apply them are essential for promoting the growth of the mentee. Mentors and mentees also require the right attitude for the relationship to be successful. Trust, mutual respect, and a sincere desire to achieve positive outcomes for the mentee should be the drivers of the relationship. As with most domains, mentorship comes with a set of techniques that, when skillfully applied, can help both mentor and mentee achieve their goals. Skills such as coaching, challenging the mentee, sponsoring them to take on new roles, affirming and encouraging them to take on increasing responsibility, providing emotional support, protecting them, and correcting them when needed are just some of the techniques that can be used during the mentorship. With the right combination of knowledge, attitude, and skills, the mentee will achieve the growth they desire, benefiting them, their mentor, and the organization as a whole.

How Does Mentorship Differ From Facilitation?

Mentorship can be distinguished from facilitation in that mentorship is usually sustained over time. The mentor and mentee enter into a relationship in which the mentor functions as an experienced and trusted advisor to the mentee. The mentor's job is to listen, provide feedback, help their mentee explore the options available, provide them with the resources needed to support their decision-making process, and help them develop new capabilities. In contrast, facilitation may involve just a single encounter between facilitator and participant with the facilitator guiding the participant to find the answers for themselves rather than coaching them towards answers based on their experience. More information on facilitation can be found in *Module 2.1 The Role of Facilitation in Event-Based Surveillance Training* in this module.

MENTORSHIP FOR EVENT-BASED SURVEILLANCE IMPLEMENTATION

As event-based surveillance (EBS) is a relatively new concept, mentorship can be employed to develop and sustain the capacity of public health workers to implement EBS within their countries. In a given country, a network of mentors with an in-depth knowledge of EBS and how it is applied in their countries can provide peer-to-peer support and training for the implementation of EBS. Mentors should be trained on all aspects of EBS,

how to be a mentor, and how to train public health workers in EBS. They should be involved in the training of public health workers, as well as providing ongoing support to them tailored to their individual needs.

Why Is It Important?

EBS mentors play an important role in increasing the number of public health workers who are able to implement EBS within their countries, as well as helping address the gaps in knowledge of EBS and ways to implement it. Mentorship allows for increased understanding of EBS concepts, which are likely to be new for many staff and may otherwise not be acquired as thoroughly. It will also contribute to the development of a sustainable and country-owned EBS program. As mentors will be nationals of the implementing country, they can ensure that mentees receive contextually appropriate EBS mentorship.

Mentor Role

EBS mentors should have a strong background in epidemiology and surveillance, as well as previous training in, and a deep understanding of, all aspects of EBS. They should have facilitation skills and the ability to engage adult learners in training as they will play a vital role in delivering the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance*. They will need to be committed to intermediate and/or long-term mentoring for those implementing EBS, and should be wholly committed to the successful implementation of EBS in their country. Additionally, mentors should be willing to advocate for EBS among a diverse group of stakeholders at the community, local, intermediate, and regional levels.

Mentors are expected to support the advocacy of EBS to a diverse group of stakeholders, train staff in EBS, and support the implementation of EBS in their countries, in both the short- and long-term. This means that they should remain available to provide guidance and assistance to staff on EBS as needed throughout EBS implementation.

Mentor Skills

To fulfill the mentorship role, individuals should possess the following skills and competencies:

- Strong interpersonal and communication skills,
- Ability to build rapport with staff involved in EBS implementation,
- Ability to promote and maintain interest in EBS implementation among staff,
- Ability to effectively correct, direct, and advise staff in a positive and encouraging manner, and
- A positive attitude.

MODULE 3

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING MODULE

U.S. Centers for Disease Control and Prevention

MODULE 3.1

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING MODULE

FACILITATOR GUIDE

U.S. Centers for Disease Control and Prevention

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ACRONYMS

US CDC	U.S. Centers for Disease Control and Prevention
CBS	Community-Based Surveillance
CHV	Community Health Volunteer
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

Community-based surveillance (CBS):	CBS is the systematic detection and reporting of events of public health significance within a community, by community members. Community health volunteers (CHV), the public, religious leaders, civil society members, teachers, and similar groups are engaged and trained to detect and immediately report events or health risks occurring in their communities. CBS may also be known as community health surveillance or community event-based surveillance.
Community health volunteers (CHV):	According to a WHO study group, CHVs may be members of the communities where they work, should be selected by the communities, are answerable to the communities for their activities, and should be supported by the health system but not necessarily a part of its organization. They may also be known as community health workers, among other terms.
Event:	The International Health Regulations (IHR) define an event as "[…] a manifestation of disease or an occurrence that creates a potential for disease; […]". This includes 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 either the 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.

Intermediate administrative level:	Intermediate administrative levels may be defined differently in different countries. For the purpose of this document, an intermediate level is the public health administrative level below the national level that is responsible for conducting preliminary investigations and implementing responses to reported public health events or suspected outbreaks in a given jurisdiction. The intermediate level may otherwise be referred to as districts or counties, among other terms.
Local administrative level:	Local administrative levels may be defined differently in different countries. For the purpose of this document, a local administrative level is the lowest administrative division within a country, directly above the community level.
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. 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, may also constitute an outbreak and should be reported and investigated.
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 have to 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.
Risk characterization:	According to WHO, once a risk assessment team has carried out hazard, exposure, and context assessments of an event, a level of risk should be assigned. This process is called risk characterization.
Signals:	Patterns of disease or other information considered by the Early Warning and Response 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:	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.
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 State 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 cross-checking of the validity (veracity) of the signals collected by Early Warning and Response, by contacting the original source, additional sources, or by performing field investigation. Verification requires that hoaxes, false rumors, and artefacts 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 threat 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 the community, media, healthcare workers, pharmacies and NGOs. 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.

Implementation of EBS in health facilities and communities requires public health authorities at the intermediate level of a public health surveillance system to be trained to analyze the reports that they receive from those communities and health facilities in their jurisdiction. These individuals would also be required to organize and conduct supportive supervision and EBS training for communities and health facilities in order to create a local network of EBS collaborators. Additionally, since reporting does not require laboratory results, EBS in health facilities and communities may be practical and simple to establish and sustain. This type of surveillance can be readily extended to private practices, health facilities, or into community settings that may not participate in routine reporting through traditional surveillance.

OVERVIEW

Purpose

The Intermediate-Level Event-Based Surveillance Training Module will provide public health authorities at the intermediate level (such as districts or counties) with the knowledge, skills, and tools necessary to effectively implement EBS in the health facilities and communities in their jurisdiction. The module will additionally help to plan, organize and deliver EBS trainings at the community and health facility levels, to organize and conduct supportive supervisory visits, and to maintain regular contact with their supervisees.

This module is divided into eleven sessions, including a pre-test to set the baseline knowledge of participants on EBS and a post-test to check their progress after the training.

Audience

This training is targeted to public health authorities at the intermediate level responsible for EBS who will also be actively involved in training others on CBS and on HEBS.

Specific Learning Objectives

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

- Supervise and conduct effective EBS activities in health facilities and communities that are in line with the routine surveillance strategy, and
- Contribute to the flow of surveillance-related information between the community level and the existing public health surveillance system.

Facilitator Guide

The Intermediate-Level Event-Based Surveillance Training Module is comprised of a Participant Guide, as well as a “how-to” training Facilitator Guide. This component, the Facilitator Guide, is to be used by facilitators to provide effective training to intermediate level public health authorities on EBS implementation in health facilities and communities.

This guide contains eleven sessions including content, training materials, and the appendices including the presentations and basic templates. It also provides guidance on how best to facilitate activities if materials such as flipchart paper and markers are not available.

Agenda

The suggested agenda for this intermediate EBS training is a two-day training, split into eleven sessions. The proposed agenda may be revised as needed based on EBS implementation and country context.

Materials

Participants should receive a copy of the Intermediate-Level Event-Based Surveillance Training Module Participant Guide at the beginning of the workshop. The Participant Guide contains materials for their use both during and after training.

Preparation

All facilitators for this intermediate-level EBS training should review the materials needed to carry out each session, found in each section of this guide. They will also receive the slide sets (electronic version) included in this guide as appendices. Once facilitators are familiar with the content, they should take the time to develop the prepared flipcharts that are required in the sessions.

LOGISTICS AND SUPPLIES

Training Location and Space Setup

Training locations may vary, and can include office spaces, health centers, hospitals, church premises, or others. Five to six tables with a seating capacity of five to six participants per table are 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) should 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 several markers beside the screen for the speaker.

Class Preparation Checklist

TASK	✓
Verify that the LCD projector and computer are functioning properly	
Obtain an adequate number of flipchart packages, including stands, paper, and markers (one for every team of participants)	
Obtain an adequate supply of sticky notes, pens, and paper	
Verify that the training room is set-up with grouped tables with 5-8 chairs at each table	
Make plans to conduct pre-test on the first morning	
Make plans to conduct post-test on the last day of training	
Make sufficient copies of the Intermediate-Level Event-Based Surveillance Training Module Facilitator Guide for co-facilitators	
Make one copy per-participant of the Intermediate-Level Event-Based Surveillance Training Module Participant Guide	
Make two copies per participant of Appendix B: Intermediate-Level Event-Based Surveillance Training Knowledge Check	
Make one copy per-participant of the Event-Based Surveillance Post-Training Evaluation survey	

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING

DAY 1

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Icebreaker	15 minutes
2. Training Objectives, Pre-Test, and Agenda	Agenda Pre-test	30 minutes
3. Event-Based Surveillance Overview ▶ Why is Event-Based Surveillance Important?	Lecture Small group exercise	50 minutes
4. List of Signals for Event-Based Surveillance In-Country: Signals for Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	35 minutes
5. Functions of Event-Based Surveillance at the Intermediate Level ▶ Conducting Triage, Verification, and Risk Assessment	Lecture Case study	80 minutes
6. How to Record Data for Event-Based Surveillance ▶ How to Record Event Data in the District Logbook	Lecture Case study	60 minutes
Intermediate-Level Event-Based Surveillance Training Day 1		**Total 4.5 hours**

DAY 2

SESSION	ACTIVITIES	TIME
Review of Day 1		30 minutes
7. Flow of Information	Lecture Group discussion	30 minutes
8. Supportive Supervision	Lecture Role-play	75 minutes
9. Multisectoral Collaboration	Lecture Q&A discussion	45 minutes
10. How to Train Others on Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	60 minutes
11. Training Review, Post-Test, and Close	Post-test	30 minutes
Intermediate-Level Event-Based Surveillance Training Day 2		**Total 4.5 hours**

SESSION 1

WELCOME AND INTRODUCTIONS

This session introduces the training and any necessary logistics announcements that should be made. In addition, an icebreaker activity is conducted to allow participants to introduce themselves and get to know each other.

Purpose

- Get participants to introduce themselves and get to know each other, and
- Warm up the conversation to the topic of the training.

Materials

Facilitator

- Colorful postcards/index cards
- Flipchart paper for each group
- List of icebreaker questions
- Markers

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide page 11

Total time: 15 minutes

ACTIVITY 1.1

WELCOME AND INTRODUCTORY ICEBREAKER

Get participants to introduce themselves and get to know each other

Warm up the conversation to the topic of the training

Group activity

15 minutes

Step 1: Introduce yourself

Begin the training module with a warm welcome and some background on your experience working in surveillance and interest in facilitating the training. This should provide a friendly 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 you and your co-facilitator (if you have one), and the activity should motivate participants to interact with each other for the remainder of the training.

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.

Step 3: Call for team leads

Once everyone is in their work groups, ask for participants to volunteer to play the role of team leads. You can say something like the following to do this:

In order to successfully meet the goals and objectives of this event-based surveillance training as well as meet your expectations, we will need your help facilitating. We are aware that some of you have experience teaching, facilitating, and mentoring your peers, therefore we are asking for a volunteer from each group to help us with this training.

You will be team leads during the small group exercises, discussions, and case studies. In your role, you will:

- *Read out information and instructions for role-plays, small group exercises, and case studies found in the Participant Guide and handouts,*
- *Facilitate and guide discussion in your group,*
- *Encourage participation from members in your group, and*
- *Record information discussed in your group and present it to the larger group during presentation and feedback activities.*

Please let us know if you are interested in taking this leadership role by standing up and introducing yourself.

You should provide each volunteer an opportunity to say their name, what community they come from, and why they want to be a team lead during this training. Make sure to thank them all for volunteering. Once everyone has their team leads, give each group a piece of flipchart paper, list of questions, and marker (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 4: 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:

- What is your name and where do you work?
- What two things do you enjoy most about the work you do?
- What is one expectation you have for this training?
- What two core values or ground rules should the group have during this training?

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 the time and show respect towards each reporter by refraining from side conversations.

Finish the activity by establishing the expectations for group participation and respect for the ground rules that have been brought about in the introductions activity. You can use the following script:

"Our goal as facilitators is to make this training as informative and interactive as possible. For us to successfully meet the expectations you shared during the icebreaker, we are asking for everyone's participation. We encourage you to share your work experiences and learn from each other. At the same time, we ask that we all respect the ground rules we have listed. If you have any questions or concerns, please feel free to speak to one of us."

SESSION 2

TRAINING OBJECTIVES, PRE-TEST, AND AGENDA

This session focuses on reviewing the training objectives, content and agenda. In addition, a pre-test is administered to assess the baseline knowledge of participants before starting the training.

Purpose

- Familiarize participants with the objectives and content of the training,
- Give participants a roadmap for the workshop via the agenda, logistics, and materials, and
- Assess their current knowledge of EBS implementation in health facilities and communities.

Materials

Facilitator

- Laptop, LCD projector, and screen
- PowerPoint presentation
- One copy per participant of Appendix B: Intermediate-Level Event-Based Surveillance Training Knowledge Check

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide: pages 12-13

Total time: 30 minutes

ACTIVITY 2.1

TRAINING OBJECTIVES, CONTENT, AND AGENDA

Familiarize participants with the objectives and content of the training

Give participants a roadmap for the workshop via the agenda, logistics, and materials

Agenda

10 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled Introduction (also in Appendix A of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Present the PowerPoint

Present the objectives, contents, agenda, and ground rules for the training by presenting the PowerPoint slides.

Step 3: Ask for questions

Ask participants if they have any questions regarding the content. Clarify and answer any questions before moving to the next activity.

ACTIVITY 2.2

PRE-TEST

Assess their current knowledge of EBS implementation in health facilities and communities

Questionnaire

20 minutes

Step 1: Prepare participants for the knowledge check

Introduce the knowledge check by reading the script below:

> *Prior to starting our first session, we're going to complete a short survey to assess your knowledge, understanding, and application of EBS implementation in health facilities and communities.*

Distribute Appendix B: Intermediate-Level Event-Based Surveillance Training Knowledge Check to participants and read the instructions out loud as follows:

> *You will have 15 minutes to complete the knowledge check. You are encouraged to ask us if you have any questions or need clarification on questions asked. Please respect everyone's time by not engaging in side conversations once you have completed your own test.*

Step 2: Finalize the session

After all participants have completed the knowledge check, collect their questionnaires and thank participants for completing the pre-test before moving on to the next session.

SESSION 3

EVENT-BASED SURVEILLANCE OVERVIEW

This session focuses on the importance of EBS, including key theoretical aspects, and the role public health authorities at the intermediate level play.

Learning objectives

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

- Define key terms, steps and characteristics of EBS,
- Describe the importance of EWAR and EBS, and
- Describe how EBS is conducted.

Materials

Facilitator

- Laptop, LCD projector, and screen
- PowerPoint presentation
- Prepared flipchart: Why is event-based surveillance important? (Appendix E of this guide)
- Markers

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 14-21

Total time: 50 minutes

ACTIVITY 3.1

HEALTH FACILITY EVENT-BASED SURVEILLANCE OVERVIEW

Define key terms, steps and characteristics of EBS

Explain the importance of EWAR

Describe how EBS is conducted

Lecture

20 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled Overview of Event-Based Surveillance (also in Appendix D of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Deliver lecture on EWAR

What are early warning and response systems? (Slide 4)

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 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 regard, EWAR relies on a process called epidemic intelligence, consisting of two main channels of information, indicator-based surveillance (IBS), and event-based surveillance (EBS).

Why is EWAR important? (Slide 5)

EWAR ensures that public health threats are detected in a timely manner. This can lead to faster interventions and increases the potential for the prevention of outbreaks.

What is IBS? (Slide 6)

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. Data are analyzed in comparison with baseline values and thresholds to determine unusual disease patterns. The Integrated Disease Surveillance and Response (IDSR) is an example of primarily IBS activities.

What is EBS? (Slide 7)

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. As such, EBS can be implemented in communities, schools, pharmacies, the animal health sector, health facilities, 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.

Integration of IBS and EBS (Slide 8-11)

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 (EI) 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). EI should integrate both IBS and EBS to efficiently detect acute public health events and/or risks.

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 notification and programmatic purposes; data/indicators are developed accordingly and are collected and transmitted in routine and mostly passive reporting. Conversely, in EBS, both content and format of information collected are not defined (i.e., unstructured information). Data sources for EBS are diverse, intended for varying audiences, including some with non-human health objectives (e.g., environmental health, wildlife and fisheries, and animal health).

What is CBS? (Slide 12)

In June 2018, a group of technical experts defined community-based surveillance (CBS) as "the systematic detection and reporting of events of public health significance within a community by community members". This definition encompasses the detection and reporting of events. To ensure consistency with this definition, this module will employ the term CBS.

What is HEBS? (Slide 13)

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; rather, it relies on detecting unusual occurrences and patterns of disease (signals) which are primarily reported by healthcare workers.

What is a signal? (Slide 14)

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 unusual, such as a treatment failure for infectious diseases on a standard drug regimen or unexpected deaths.

What is an event? (Slide 15)

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

What are the major steps for EBS? (Slide 16)

EBS can be organized into five main steps:

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

Signal detection (Slide 17)

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.

Signal reporting (Slide 18)

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

Triage (Slide 19)

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

Verification (Slide 20-21)

Verification is an essential step to confirm the validity and authenticity of the reported signals (is the information truly occurring or false?). According to the WHO, verification must take place within 24 hours of signal detection. This step may require additional information. Once a signal has been triaged and verified, it becomes an event. It is important to mention that not all signals become events.

Risk assessment (Slide 22)

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 the 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. According to WHO, a risk assessment of an event must be conducted within 48 hours of the initial signal detection. Intermediate-/national-level public health authorities should lead risk assessment efforts.

Signals and events (Slide 23)

While events are typically occurrences of patterns of disease, such as clusters of similar illnesses, 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 and will be integrated into the routine disease reporting system, such as the IDSR programs common in African countries.

ACTIVITY 3.2

WHY IS EVENT-BASED SURVEILLANCE IMPORTANT?

Explain the importance of EBS

Small group exercise

30 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 event-based surveillance important? (Appendix E of this guide) and ask participants to locate the corresponding handout in Section 3 of 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 should 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 currently conduct surveillance in your jurisdiction?*
- *What is EBS?*
- *Do you know the purpose and importance of EBS? Why is it important?*
- *What is the value of adding EBS to your current surveillance?*

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

Now that we have some ideas on what EBS is, why it is important, and how it should be conducted at the intermediate level, we will start Session Four focused on how to identify signals for detection.

SESSION 4

LIST OF SIGNALS FOR EVENT-BASED SURVEILLANCE IN-COUNTRY: SIGNALS FOR COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

This session defines signals for CBS and HEBS in-country.

Learning Objectives

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

- Define signals and events,
- Identify differences between signals and events, and
- Describe CBS and HEBS signals in their country.

Materials

Facilitator

- Laptop, LCD projector, and screen
- PowerPoint presentation

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 22-24

Total time: 35 minutes

ACTIVITY 4.1

LIST OF SIGNALS FOR COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

Define signals and events

Identify differences between signals and events

Describe CBS and HEBS signals in their country

Lecture

35 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 List of Signals for Event-Based Surveillance In-Country (also in Appendix F of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Deliver lecture on signals for CBS and HEBS

Examples of signals and events (Slide 5)

Some examples illustrating the difference between signals and events are:

- *A critical care physician hospitalized with a severe respiratory disease with travel history to Saudi Arabia may be a signal requiring reporting. After triage and verification of the signal, there could be more elements to suspect a case of Middle East Respiratory Syndrome as an event.*
- *A case of typhoid fever that fails to respond to standard treatment may be a signal. After triage and verification, this signal could become an event as a suspected case of extensively drug-resistant typhoid fever.*
- *A 4-year-old child with fever and rash in the community may be a signal. It can become an event, such as a case of measles, after triage and verification.*

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 ceftriaxone treatment ▶ A 4-year old child admitted with fever, rash, coughing, coryza, and conjunctivitis	▶ A suspected case of Middle East Respiratory Syndrome MERS ▶ A cluster of suspect cholera cases ▶ A suspected case of extensively drug-resistant (XDR) typhoid fever ▶ A suspected case of measles

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 a 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.*

Examples of signals for CBS (Slide 7)

Some examples of signals for CBS are:

- *Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week,*
- *A cluster of unexplained animal deaths within one week,*
- *An illness with novel or rare symptoms (Note: Novel and rare can be explained as signs/symptoms that the community has not seen before), and/or*
- *Any person with fever and rash.*

List of pre-determined CBS signals for the country (Slide 8)

When presenting the list of signals for CBS, it is worth spending some time on the signals to ensure that participants understand each signal well. For each of the signals presented on this slide, ask participants to answer the following questions:

- *What do you think we are trying to detect with this signal?*
- *Why do you think this signal is important for EBS?*
- *How would you describe this signal to a layperson in your community (community resident)?*

List of pre-determined HEBS signals for the country (Slide 9)

When presenting the list of signals for HEBS, it is worth spending some time on the signals to ensure that training participants understand each signal well. For each of the signals presented on this slide, ask participants to answer the following questions:

- *What do you think we are trying to detect with this signal?*
- *Why do you think this signal is important for EBS?*

Step 3: Wrap up session with key message

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

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

Each country should elaborate a list of signals for CBS and HEBS. These will guide signal detection in communities and health facilities.

SESSION 5

FUNCTIONS OF EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

This session focuses on the functions of EBS at the intermediate level.

Learning Objectives

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

- Recognize the functions of EBS at the intermediate level,
- Describe triage, verification and risk assessment at the intermediate level,
- Identify signals relevant to EWAR by conducting triage,
- Verify authenticity and conformity of triaged signals, and
- Conduct risk assessment to categorize the overall risk of events.

Materials

Facilitator

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

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 25-33

Total time: 80 minutes

ACTIVITY 5.1

FUNCTIONS OF EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

Recognize the functions of EBS at the intermediate level

Describe triage, verification and risk assessment at the intermediate level

Lecture

20 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 Functions of Event-Based Surveillance at the Intermediate Level (also in Appendix G of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Deliver lecture on functions of EBS at the intermediate level

Functions of EBS at the intermediate level (Slide 4, 5)

In contrast to IBS, where case definitions are narrow and disease-specific, EBS requires the detection and immediate reporting of signals, which are broad and could indicate the possibility of a serious public health event. Signals that are verified as truly occurring are classified as events.

Public health authorities at the intermediate level may receive EBS-related information in the form of signals or events from a variety of sources. This training focuses specifically on two sources: communities and health facilities. If an event is reported by local-level supervisors through CBS, the intermediate level should conduct only risk assessment. If a signal is reported from a health facility through HEBS, the intermediate level should conduct triage, verification, and risk assessment.

Triage (Slide 6)

Public health authorities at the intermediate level may receive signals from health facilities conducting health facility EBS or HEBS. When authorities receive information about a reported signal, they should conduct triage. Because of its high sensitivity, EBS is likely to generate signals from non-events. Therefore, the authenticity of the signal needs to be established.

Figure 1 summarizes the triage process and provides possible questions to ask. Because EBS operates as a sensitive surveillance system, authorities at the intermediate level should continue to encourage the reporting of signals even if they may be later discarded as "non-events."

Figure 1: Possible question to ask during triage (Slide 7)

Questions to ask during triage

Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?

Was this signal previosly reported (i.e., is this signal a duplicate)?

Verification (Slide 8)

Intermediate-level authorities receiving signals from health facilities must also verify these signals before they are determined to be events. Verification is the determination that a signal is valid (i.e., it is not a false alarm or a false rumor), reliable, and that it corresponds to at least one of the signals pre-defined for EBS implementation. Criteria for verification may include asking questions to those who have reported the signal to ensure that they have correctly understood the signal, whether or not the signal has been confirmed by at least two different sources, or the fact that the signal has been reported by a person with medical authority (veterinarian, physician, or laboratory assistant). Verification must be completed within 24 hours of signal detection.

(Slide 9)

The result of verification is the confirmation that a signal is true or false. Once a signal is verified as true, it becomes an event. If confirmed as an event, information related to the event must be entered into a logbook or register at the intermediate level. Systematic verification of all signals detected through EBS is essential to avoid wasting public health system resources on false signal investigations and responses based on unreliable information.

(Slide 10; Appendix H)

As EBS is highly sensitive, it is essential to verify the authenticity of a reported signal and its characteristics. Local-level supervisors are recommended to use the Verification Tool to complete this process. This verification process involves actively cross-checking the validity of available information and collecting additional information about the report using reliable sources as needed. The process of signal verification should answer three main questions:

- *Is the report accurate (i.e., is it true)?*
- *Has the information been reported by a reliable source or sources?*
- *Does the report meet the criteria for one or more signals?*

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal signals

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, hospital focal point, or key informants)

Risk Assessment (Slides 11-16; Appendix I)

Risk assessment is the systematic and ongoing process of gathering, evaluating and documenting information that will form the basis of the actions required to manage and minimize the negative consequences of a public health event. The process results in assigning a level of risk that an event presents to human health. The defined levels of risk may be adapted based on the context of the country. Risk assessment should be conducted by intermediate-level public health authorities who propose the action or response that must be taken to manage and minimize the negative consequences of public health events.

(Slide 12)

Risk assessment should be conducted continuously from the detection of a signal to the end of the response to an event. Public health authorities evaluate all available information and then assess or characterize the level of risk that the situation poses to public health. As new information about the situation can arise at any time, the ongoing risk assessment ensures that the appropriate response is triggered and that it reflects the level of risk the event poses to public health. The first risk assessment of an event must take place within 48 hours of the detection of one or more signals.

(Slide 13)

Regardless of the source of information, risk assessment should be carried out at the intermediate level and, if relevant, at higher administrative levels as well. This may involve collaboration between authorities in the public health system at these administrative levels with communities and health facilities. It is also important that risk assessment covers all relevant sectors to take into account the extent of human, animal and environmental risks. All information collected during the risk assessment should be recorded systematically.

Once enough information about the event has been gathered, intermediate-level public health authorities can determine the outcome of the risk assessment. Risk assessment can have three different outcomes:

- *No new investigation or action is required, and the event may be closed,*
- *The event must be monitored, or*
- *An investigation and a response must be initiated.*

ACTIVITY 5.2

CONDUCTING TRIAGE, VERIFICATION, AND RISK ASSESSMENT

Identify signals relevant to EWAR by conducting triage

Verify authenticity and conformity of triaged signals

Conduct risk assessment to categorize overall risk of events

Small group exercise

60 minutes
(45 minutes small group exercise and 15 minutes for feedback discussion)

Step 1: Set up the small the group exercise

Ask participants to locate the case studies in Section 5 of their Participant Guides. Introduce the small group case study exercise and explain how the exercise is to be completed as follows:

We will now discuss and demonstrate the functions of EBS at the intermediate level—triage, verification, and risk assessment—by engaging in a small group, case study exercise. These interactive case studies are of unusual health occurrences and priority diseases, which may indicate emerging pathogens and possible outbreaks in the country.

The objectives of this small group case study exercise are for participants to:

- *Conduct an appropriate triage to determine if signals reported are duplicates and relevant to EWAR,*
- *Verify authenticity and conformity of triaged signals reported, and*
- *Categorize overall risk of events reported at the community level and by health facilities through an appropriate risk assessment.*

Each group should be given handouts of the case studies (if available), flipchart paper and markers. Divide larger groups into two groups of up to 10 participants and assign one of two case studies to each group.

Each team should select a group member to take notes (recorder) and another to present the group's findings and final conclusions to the audience (presenter). Participants should discuss their scenario and complete the Q&A handout with members of their group.

Step 2: Feedback on discussions through small group presentations

Remind groups that they will have 45 minutes allotted to complete the case study exercise and 15 minutes for the feedback discussion. Once 45 minutes have passed, ask everyone to direct their attention to the larger group for presentations. Ask if there is a group that wants to present first. If no group volunteers, randomly select one to present.

Ask each group to share what was discussed in the group, including the tools used to complete the questions. Wrap up the small group case study exercise by summarizing common points from the group presentations, making sure to include every group's input.

SESSION 6

HOW TO RECORD DATA FOR EVENT-BASED SURVEILLANCE

This session focuses on the importance of recording all events at the intermediate level and how these data should be recorded in the recording tool.

Learning Objectives

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

- Describe the importance of EBS data recording at the intermediate level, and
- Record EBS data from health facilities and communities at the intermediate level using an example of an event logbook, the IDSR District Log of Suspected Outbreaks and Rumors.

Materials

Facilitator

- Laptop, LCD projector, and screen
- PowerPoint presentation
- Flipchart paper
- Markers
- Appendix J: Event-Based Surveillance Functions Case Studies
- Appendix L: IDSR District Log of Suspected Outbreaks and Rumors

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 34-36

Total time: 60 minutes

ACTIVITY 6.1

EVENT-BASED SURVEILLANCE DATA RECORDING AT THE INTERMEDIATE LEVEL

Describe the importance of EBS data recording at the intermediate level

Lecture

20 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled How to Record Data for Event-Based Surveillance (also in Appendix K of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Deliver lecture on EBS data recording at the intermediate level

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

Data recording (Slide 3, 4)

Events reported to public health authorities at the intermediate level from health facilities and communities can be recorded using existing surveillance data collection tools (where available) to ensure that data collected through these EBS sources are integrated into existing data platforms. An example of one such tool that enables the collection of event data is the IDSR District Log of Suspected Outbreaks and Rumors.

The IDSR District Log of Suspected Outbreaks and Rumors is an example of a logbook that may be adapted by intermediate-level public health authorities to record information about events detected through HEBS or CBS. Note that signal information should not be entered in this logbook.

Table Information Key for EBS Information Using the IDSR District Log of Suspected Outbreaks and Rumors (Slide 5; Appendix L)

- 'Condition or Disease or Event' should be completed with a brief description of the event (e.g., suspected measles, cluster of suspected cholera, earthquake).
- 'Number of cases initially reported' indicates the number of cases reported when the initial signal was reported.
- State the name of the location where the event is occurring, as precisely and exactly as possible. If an address is available, record it.
- 'Date district notified' is the date that the intermediate-level public health authorities were notified about the event. Enter date in the DD-MM-YYYY format.
- 'Date suspected outbreak was investigated by the district' is the date that the intermediate-level public health authorities began investigation of the reported event. Enter the date in the DD-MM-YYYY format.
- 'Result of district investigation' asks public health authorities to state whether the event was ruled out or confirmed as a suspected outbreak requiring a response, or whether the status is still unknown.
- 'Date outbreak began' is the date that the event began, or the date of symptom onset of the index case. Depending on the event occurring, this may also be the date the threshold was crossed for a seasonal disease, or the date the first cluster of cases was recognized. Enter the date in the DD-MM-YYYY format.
- 'Date a case was first seen at a health facility' is the earliest known date that a case sought medical care. Enter the date in the DD-MM-YYYY format.
- 'Date specific intervention began' is the date a response was initiated. Enter the date in the DD-MM-YYYY format.
- 'Type of concrete intervention that was begun' asks public health authorities to describe what was conducted as part of the response.
- 'Date district notified national level of the outbreak' is the date the intermediate-level public health authorities communicated with higher levels about the occurrence of an outbreak. Enter the date in the DD-MM-YYYY format.
- 'Date district received national response' is the date that intermediate-level public health authorities received response support from the national level. Enter the date in the DD-MM-YYYY format.
- Enter any further comments in this field.

ACTIVITY 6.2

HOW TO RECORD EVENT DATA IN THE DISTRICT LOGBOOK

Record EBS data at the intermediate level using the IDSR District Log of Suspected Outbreaks and Rumors

Small group exercise

40 minutes

Step 1: Set up the small group exercise

Introduce the small group case study exercise by reading out loud the description of the situation and instruction handout in Appendix J: Event-Based Surveillance Functions Case Studies. Remind participants that these case studies are the same as those used in Session Five on triage, verification, and risk assessment.

Each group should be given handouts of the case studies (if available), flipchart paper and markers. Divide larger groups into two or three groups of up to six participants and ensure each participant has a copy of the case study description and IDSR District Log of Suspected Outbreaks and Rumors.

Each team should select a group member to take notes (recorder) and another to present the group's findings and final conclusions to the audience (presenter). Participants should discuss their scenario and complete the exercise with members of their group.

Read the description of the two case studies aloud, then ask if anyone has any questions. Tell groups that, based on both case studies, they are to complete the IDSR District Log of Suspected Outbreaks and Rumors together as a group.

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

Remind groups that they have 10 minutes to discuss and complete an entry in the IDSR District Log of Suspected Outbreaks and Rumors (Appendix L in Facilitator Guide, Appendix C of their Participant Guides).

After groups have completed their entry, ask each group's team lead as well as group members to share what was discussed in the group and what information they used to complete the handout. Facilitate a discussion by asking open-ended questions about the case study. Write down key points from the discussion on flipchart paper.

Case study discussion questions:

- Did you have all the information you needed to complete the IDSR District Log of Suspected Outbreaks and Rumors?
- List what additional information would be helpful to complete it.
- Describe how completing this case study will help you better conduct EBS at the intermediate level.

Step 3: Wrap up session with key message

End the discussion by asking participants to share one takeaway message they got from this case study with the group. After receiving 3-5 answers, summarize the session by reinforcing the key takeaway message below.

Event data should be registered in a logbook that incorporates the recording of events, such as the IDSR District Logbook of Suspected Outbreaks and Rumors as soon as they are reported by communities or health facilities.

SESSION 7

FLOW OF INFORMATION

This session focuses on the flow of EBS information, indicating the flow of data collected through HEBS and CBS, as well as feedback to reporters.

Learning Objectives

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

- Identify when information should be reported up administrative levels,
- Describe how information should be reported up administrative levels, and
- Explain the importance of feedback to reporters in communities and health facilities.

Materials

Facilitator

- Prepared flipchart paper with four separate quadrants (one for each group)
- Markers

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide page 37

Total time: 30 minutes

ACTIVITY 7.1

FLOW OF EVENT-BASED SURVEILLANCE INFORMATION

Identify when information should be reported up administrative levels

Describe how information should be reported up administrative levels

Explain the importance of feedback to reporters in communities and health facilities

Group discussion and lecture

30 minutes

Step 1: Set up the small group exercise

Introduce the small group exercise by referring to the prepared flipchart Small Group Exercise - Flow of Information (Appendix M of this guide) and ask participants to locate the corresponding handout in Session 7 of their Participant Guides.

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

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

Ask participants to close their Participant Guides and capture their answers to the following questions on a prepared flipchart with four equally divided spaces:

- *When should information be reported up administrative levels? Why?*
- *How should information be reported up administrative levels? Why?*
- *Why is feedback to reporters in communities and health facilities important?*

Step 3: Facilitate group presentations and feedback by presenting the model answer

Monitor the time of the exercise. After ten minutes, ask everyone to direct their attention to the larger group for presentations. Inform the groups that they will have two minutes to present. Provide no more than ten 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. Remind participants to be mindful of the time and show respect towards each reporter by not engaging in side conversations. Provide model answers for each of the questions following each presentation.

Model answer: When should information be reported up administrative levels?

Intermediate-level public health authorities may receive EBS-related information in the form of signals or events from a variety of sources, including communities and health facilities. Signals detected in communities by CHVs, key informants, or small health facilities are typically reported to local-level authorities who conduct triage and verification of signals. Public health authorities at the intermediate level may receive signal information from large health facilities, such as large hospitals, which require triage and verification.

Regardless of the source of EBS information, public health authorities at the intermediate level conduct risk assessment to help define additional actions, which may include immediate reporting to higher administrative levels. All events must be reported and investigated according to the existing national surveillance and reporting structure.

Model answer: How should information be reported?

Intermediate-level public health authorities can record and report data using existing surveillance data collection tools (where available) to ensure that data collected through EBS is integrated into existing data platforms, such as IDSR. These reporting tools may be electronic or paper-based but should be clearly defined among all administrative levels to ensure consistent EBS reporting and feedback.

Model answer: Why is feedback to immediate lower levels necessary?

Equally important to timely reporting is timely, routine feedback. Intermediate-level public health authorities should provide feedback about events and signals to surveillance focal points at health facilities and local-level supervisors, who in turn provide feedback to health care workers, community health volunteers, and key informants. Providing regular feedback on the signals and events reported is essential to sustain motivation for reporting among communities and health facilities.

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 understand more about the flow of information, we will move on to supportive supervision.

SESSION 8

SUPPORTIVE SUPERVISION

This session focuses on how to provide supportive supervision to supervisees.

Learning Objectives

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

- List the supportive behaviors to improve commitment and performance,
- Identify the most suitable supportive behavior according to circumstances, and
- Demonstrate how to use supportive behaviors in practice.

Materials

Facilitator

- Laptop, LCD projector, and screen
- PowerPoint presentation
- Appendix O: Role-Play Scenarios

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 38-47

Total time: 75 minutes

ACTIVITY 8.1

SUPPORTIVE SUPERVISION

List the supportive behaviors to improve commitment and performance

Identify the most suitable supportive behavior according to circumstances

Lecture

30 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled Supportive Supervision (also in Appendix N of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Deliver lecture on supportive supervision

Definition (Slide 3)
Ask one of the participants to read the definition of supportive supervision on this slide.

Slides 4-6
Read through the points made on each of these slides, clarifying as necessary.

Supportive supervision techniques to improve commitment and performance (Slide 7)
These are behaviors that will help you improve the commitment of the people under your supervision as well as the quality of their performance as they aim to achieve the common goal.

Supervision should be facilitative and not fault-finding: when supervising someone, remember that that person is crucial for the achievement of the common goal; in this case, the quality of EBS in your jurisdiction. Your role is to increase the commitment of your collaborators so that they can ultimately improve the quality of their job, and hence the achievement of the common objective. You don't start the supervision by saying what went wrong, but instead by trying to understand why an issue occurred and by facilitating the process of finding a solution together.

Always praise work well done before raising problems. You may want to start your supervision visit by acknowledging the hard work they have done, despite, for instance, their work conditions. Then you can state the objective(s) of your visit and start analyzing the situation together.

If you see a problem, check if the supervisee sees the same problem: very often mistakes are made because of a lack of knowledge, not because of bad performance. Therefore, before pointing the finger at something done wrong, check if your supervisee shares the same perspective and sees the same problem. By doing this you can identify where the problem is. If the supervisee doesn't see the same problem, your solution should simply be to guide them through the procedures in order to make sure that he/she shares the same understanding.

Analyze problems with the supervisee to gain a good understanding of the underlying causes. Once you have both identified the problems and what can be improved, work together to find a creative solution to address the issue.

Let the supervisee suggest possible solutions, as this facilitates ownership and acceptance of the solutions. Once you have identified the problem, let the supervisee suggest possible solutions and limit yourself in guiding the process. Sometimes the knowledge of the context helps to formulate a solution that you may not have thought of. Also, if the supervisee finds a solution to the problem, you can be sure that they understand how they may be able implement it.

Step 3: Ask for questions

Ask participants if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 8.2

ROLE-PLAY SCENARIOS

Demonstrate how to use supportive behaviors in practice

Role-play

45 minutes

Step 1: Prepare for the role-play

Introduce the role-play exercise by telling participants that there are up to four scenarios that will be role-played in front of the group in the allotted time (45 minutes). Each scenario will require different volunteers to play the role of actors.

Start by setting up the room with a "stage" area visible to all participants. Ask for volunteers to act out the roles in the first scenario, and ask them to locate the scripts in Section 8 of their Participant Guides. Give the actors up to 5 minutes to review and work on the scene, then invite them to the stage and ask them to role-play the scenes.

Step 2: Conduct the role-play

During the role-play, observe the actors and take notes to use during the debriefing session. Only interrupt if an actor is having difficulty or you want to stop the scene to ask questions.

Step 3: Feedback on role-play

Once the actors have completed the role-play, invite them to join the rest of the group and start the debriefing session. Facilitate discussion by first asking the actors to present their impressions of the scenario, followed by feedback from the rest of the group:

- *What was your overall impression of the role-play?*
- *Could you identify the issue related to EBS?*
- *Did you agree on the suggested solution?*

Once the debriefing session is completed, brainstorm with the whole group about:

- *Main points and take-home messages of this session*
- *Whether they would be able to train other people on these principles*

Conduct as many role-play scenarios as possible in the allotted time.

Step 4: Summarize and wrap up the role-play

Summarize and close the role-play session by thanking everyone for their participation.

SESSION 9

MULTISECTORAL COLLABORATION

This session focuses on the importance of multisectoral collaboration to improve EBS.

Learning Objectives

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

- Understand the importance of multisectoral collaboration in EBS,
- List the stakeholders that can be involved in EBS implementation in health facilities and communities, and
- Identify the most suitable method to involve them.

Materials

Facilitator

- Flipcharts

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 48-49

Total time: 45 minutes

ACTIVITY 9.1

MULTISECTORAL COLLABORATION

Describe the importance of multisectoral collaboration in EBS

List the stakeholders that can be involved in EBS implementation in health facilities and communities

Identify the most suitable method to involve them

Lecture & Q&A discussion

45 minutes

Step 1: Review the content of this activity

Ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Introduce the multisectoral approach

Introduce the multisectoral approach by reading the definition and importance of the approach to students.

The multisectoral approach (MSA) refers to deliberate collaboration among various stakeholder groups (e.g., government, civil society, and private sector) and sectors (e.g., health, environment, and economy) to jointly achieve a policy outcome (in this case: to complete and improve EBS).

The multisectoral approach is important because it:

- Makes EBS more efficient
- Synergizes efforts and maximizes outcomes
- Reduces challenges
- Aids resource pooling
- Helps complete the information with additional sources
- Includes all involved sectors in EBS

Step 3: Set up the small group discussion

Instruct participants to form groups of four to five participants and provide each group with a flipchart and a marker. Each team should select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter). Allow 10 minutes for students to discuss and record responses to each of the three questions in Step 4.

Step 4: Get students to discuss and record answers to the questions

1. Use the flipchart to draw the existing flow of disease surveillance in your country.
2. Make a list of additional actors that could be involved to improve or to complete EBS
3. For actors not yet involved, brainstorm:
    - How to involve them
    - How to maintain EBS discussions
    - How to benefit from the collaboration

Once all the groups have finished the tasks invite each group to present their work and take notes for the final debriefing session. When the last group has presented, summarize the main points from each of the groups and the take-home messages of this session.

Step 5: Ask for questions

Ask participants if they have any questions regarding the lecture or activity. Clarify and answer any questions before moving to the next session.

SESSION 10

HOW TO TRAIN OTHERS ON COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

This session focuses on training methods that can be used for EBS implementation in health facilities and communities.

Learning Objectives

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

- Describe different learning strategies and techniques to use when training others, and
- Identify the most suitable training method according to the context.

Materials

Facilitator

- Laptop, LCD projector, and screen
- PowerPoint presentation

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide pages 50-55

Total time: 60 minutes

ACTIVITY 10

HOW TO TRAIN OTHERS ON COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

Describe different learning strategies and techniques, and

Identify the most suitable training method according to the context

Lecture

60 minutes

Step 1: Review the content of this activity

Open the PowerPoint file titled How to Train Others on CBS and HEBS (also in Appendix P of this guide) and ask participants to make notes in their Participant Guide as they listen to the lecture.

Step 2: Deliver lecture on training others on CBS and HEBS

Deliver the lecture on training others on CBS and HEBS by referring to the slides in Appendix P. Students can follow along in their Participant Guides and make notes in their journals.

Design of training activities (Slide 3)
Before presenting the different training methods, it is worth spending some time zooming out on the topic and looking at how to design training activities.

In this slide you can see that "how to teach" is only one of the elements to be taken into consideration when preparing training activities.

We will not go into too much detail on the other elements, but perhaps we can have a look and comment together so we are aware of the complexity of such an activity.

The elements are:

- ***Why and what to teach:*** *Make sure that the objectives of our training are clear and well formulated. They could be related to knowledge, procedures, or attitudes.*

- ***When to teach:*** *Timing is also important. We normally design and deliver training to adult professionals, and they are busy with their routine activities. We need to take that into account when deciding the timing of our training for it to be successful, to gather the maximum number of participants and to have them on board for the duration of training.*
- ***How to teach:*** *Choose the best training methodology according to the object of your training, whether that be a PowerPoint presentation, lecture, focus group discussion or role-play. We will see each of these techniques in a minute.*
- ***Last, but not least:*** *Always include time in your schedule to evaluate your training activity. This includes evaluation of the trainer, the suitability of the program for the audience, how well the messages in the program were delivered, and how engaged (attentive, interactive, etc.) the participants were. The Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance includes a Post-Training Evaluation that can be used immediately following training, as well as an Event-Based Surveillance Training Impact Evaluation that can be used to understand knowledge retention in the months following the training.*

What to promote in adult learning methods (Slide 4)

In this slide, you can see the general elements that have to be considered when organizing and delivering training for adults.

- ***Interactivity:*** *Keep the activities interactive and promote structured interactivity with the audience. Use their experience and let them talk and contribute to the activity.*
- ***Discussion:*** *The presentation should not be a monologue. Promote discussion with the audience and give them space to share their own experiences. Make sure to keep an eye on the time and do not entertain endless discussions.*
- ***Experience:*** *Your audience will likely include experienced people who have learned their jobs by doing them, facing challenges, and finding their own solutions. You may need to use those experiences and facilitate sharing with the rest of the group.*
- ***Appropriate motivation context:*** *Normally, adults participating in training are driven by the motivation of learning something new that will help them in their daily jobs. Keep an eye on that motivation and always keep it high.*
- ***Applied to real-life problems:*** *The training material needs to be adapted to the audience. Make sure to use examples, situations and contexts that "speak to" your audience.*

Topics (Slide 5)

List the topics of the presentation.

Lectures (Slide 6)

A lecture is the most traditional (and probably the oldest) method of teaching. Lectures are typically one-way presentations.

Lectures can be delivered without any support by speaking directly to the audience. However, lectures can be made more effective by using technical support, such as PowerPoint presentations or even some prepared points to launch the discussion.

How to effectively deliver a lecture (Slide 7)

To make a lecture effective you need to:

- ***Prepare:*** *Take time to prepare your material, making sure your slides are clear, simple, and not too busy. We'll see how to prepare a PowerPoint presentation in the next few slides.*
- ***Practice:*** *Take time to practice your presentation.*

- ***Be clear:*** *State the objective(s) of your lecture in one of the first few slides.*
- ***Be succinct:*** *Limit the number of messages you want to convey with your lecture. Ideally focus on one. A few messages could also be acceptable, but make sure that the audience is following you if you introduce a new objective/message.*
- ***Adapt:*** *Adapt to the audience and use examples and situations that are familiar to them. Engage the audience in the discussion and ask for feedback throughout the presentation rather than just at the end.*
- ***Show enthusiasm:*** *When giving your presentation, you need to convey a message, and it must be effective. It is important that you believe in that message yourself.*
- ***Summarize:*** *Make sure to take some time at the end of your presentation to summarize the main points of the presentation and reinforce the key messages.*
- ***Answer questions:*** *Include time for answering questions at the end of the presentation.*

PowerPoint presentations (Slide 8)

A PowerPoint presentation is a collection of slides that helps you present your topic. It is a tool that allows you to be clearer and more effective in delivering your message. Therefore, a PowerPoint presentation ***requires preparation*** *and time to practice, to make sure that your message is clear.*

Formulate the objectives *in a way that they will be clear to the audience and state the objective(s) of your presentation at the beginning.*

Target your audience*, making sure that you know something about the audience in advance to tailor your presentation accordingly, in terms of jargon, language, etc.*

Engage your audience *in the discussion, avoiding monologues and regularly checking the pulse of the situation by asking for questions and feedback.*

PowerPoint presentations (Slide 9)

These are some Dos and Don'ts when using a PowerPoint presentation as the tool to clearly convey your messages. These include:

The Dos:

- ***Do put one message on each slide:*** *It is easier to guide the audience if the slide is simple.*
- ***Do use key phrases or key words in the slides*** *and complete your thought when talking. The slides should be an aid for you rather than a textbook's worth of content (see Don'ts: no karaoke slides). You need to use keywords to prompt your memory, and to make sure that you don't forget any important points/messages that you want to convey.*
- ***Do use contrasting colors so slides are clearly visible:*** *Use contrasting colors for the text and background, making sure (where possible) that you design with the venue of your presentation in mind (e.g., is the room too dark or too light?).*
- ***Do practice presenting to test amount of text in your slide:*** *You should practice presenting the slide in less than one minute. Although less than one minute is ideal, this does not apply to slides that require more time to explain, such as formulas.*
- *As with everything we do in our work: prepare, design, and deliver.*

Now the Don'ts:

- ***Don't put more than one message on each slide:*** *It is already difficult to make sure that one message is clear for the audience.*
- ***Don't put too much text on the slides:*** *Although text helps you convey the message, you should only put a few keywords on your slides and complete your sentences when talking.*
- ***Don't overuse animations and special effects:*** *They are distracting and take the attention of the audience away from your message.*
- ***Don't read off of the slides:*** *If you simply put keywords on your slides it will be more natural to use those words and complete your thoughts by talking.*
- ***Don't use 3D graphs:*** *They are difficult to interpret and see properly.*
- ***Don't include more than 5 or 6 bullet points in the slides****, otherwise, the slide will be too busy.*

Group discussion (Slide 10)

Now we'll see what we mean by group discussion.
Ask one of the participants to read the slide.

How to facilitate a group discussion (Slide 11)

A discussion could be endless and ineffective if not moderated well and if there is no facilitation. That is your role.

- ***Make sure that participants know the objective of the discussion*** *and the reason that they are in that group. Present the objective of the discussion in the beginning and make sure it is clear to everybody. Confirm the reason why they are there. For example, you can say, "Good morning everybody, thanks for coming, I invited you here to discuss together how to …and I invited you here because you are …"*
- ***Start the discussion*** *and be involved in it in the beginning, but then, Encourage all participants to contribute****.*** *Observe the room and make sure that each of the participants is contributing to the discussion. If not, try a discreet way to involve the "silent" participants, but also a discreet way to avoid parallel discussion in small groups among a subset of participants.*
- ***Keep an eye on the time of the session*** *to make sure that you reach the objective of the discussion within the allocated time.*
- ***Keep the focus of the discussion on the topic.*** *You may allow side discussions, but keep them short, and if they continue, remind the audience about the objective of the discussion.*
- ***At the end of the allocated time****, make sure to summarize the main points of the discussion, and if you have formulated some action points together, make sure they are clear to the group and distributed to the appointed responsible person(s).*

Effective facilitation and communication tips (Slide 12)

In this slide you can see some tips that can be applied to any facilitation task that you may be involved in, whether it's a meeting you're moderating, a case study, a group discussion, or a meeting with your collaborator.

- ***Active listening*** *is a technique that allows you to establish effective communication with another person. It relies on a trusting environment that you must build, often in a very short period of time (think of a visit to a doctor).*
- ***To demonstrate concern*** *about the topic of the discussion, you may repeat the sentence, changing the words of the other person to show understanding of the situation.*
- ***Non-verbal communication*** *is crucial: eye contact and nodding are the most common.*
- ***Brief verbal affirmations*** *such as "I see" or "I know" show interest and attention to the conversation.*
- ***Give each participant the opportunity to contribute****. You may miss an important contribution if one of the participants feels left out of the discussion.*
- ***Remain neutral*** *during the discussion. Your role is to moderate and facilitate the discussion and to gather the different opinions in the room, not to convince or to impose your opinion on others.*

Role-play technique (Slide 13)
And now another learning technique: the role-play.
Ask one of the participants to read the slide.

Role-play facilitation tips (Slide 14)
In order to facilitate a role-play effectively, you should:

- *Present the purpose of the exercise and its ground rules at the beginning*
- *Arrange the room in a way that allows all participants to observe what is happening during the role-play*
- *Ask the participants to note their observations*
- *Distribute the roles to participants before you start the play, taking time to ensure that each participant understands their role-play*
- *Let the play start*
- *Observe and take notes, but avoid intervening unless needed (e.g., if participants go off the script)*
- *Once the play is over, allow some time to collect feedback from the actors as well as the other participants, then facilitate a brief group discussion to summarize the main points of the exercise and what has been learned*

Case study technique (Slide 15)
Now we will discuss the last learning technique: the case study.

Ask one of the participants to read the first bullet point, then ask another participant to read the second bullet point.

You can then complete the slide by saying, "The case study is often used in the field of epidemiology to present a real case scenario and guide participants through the real investigation or experiences of the authors. There's no correct answer in a case study; rather, it is the real experience of the authors that we are learning from."

Case study facilitation tips (Slide 16)

Some tips that may increase the effectiveness of the case study as a learning technique include the following:

- *Be conscious of the context in which you're using a specific case study and be prepared to adapt it to your context if needed. Use examples that "speak to your audience" and that they are familiar with already.*
- *When facilitating a case study, be available to answer questions and provide clarification as needed. You'll always find the "facilitators' notes" in the facilitators' version of the case study. These will help you address questions and will also provide additional clarification for the audience.*
- *When facilitating a case study, it is important that you guide participants through the case study without including your personal opinion.*
- *Make sure that all participants contribute to the discussion and observe if you have "silent" participants in the group that may require help contributing.*

Demonstration (Slide 17)

Demonstration is a useful technique when you need to train a group of people to do something new, such as learn a new software or a new reporting form that they will be using in the future.

- *Begin by demonstrating the new skill.*
- *Next, ask participants to try themselves.*
- *While they are attempting the skill, you can observe, take notes, and supervise. If mistakes are observed, you can intervene to correct them.*
- *After the practical session, make sure that you allocate some time for follow-up questions and to share your notes with the group during the debriefing.*

Choosing the right technique (Slide 18)

Now that we have learned a number of new techniques, you may be wondering how to choose the right technique for your training program. The answer is, it depends on the objectives of your training.

Categories of objectives (Slide 19)

These are the three domains of learning:

- ***Cognitive:** This is related mostly to the domain of the concepts and knowing more about something.*
- ***Skills:** This is a more practical domain, where the objective is to learn how to do something.*
- ***Attitudinal:** This relates more to attitudes, values, interests.*

We'll see a few examples now and try to associate the right learning activity to each of them.

Training with a cognitive objective (Slide 20)

These are examples of a training program with a cognitive objective.

At the end of the training, participants will know more about the topics on the slide (click for animation).

A learning strategy that we can use for this type of training includes the use of interactive PowerPoint lectures, something that we are very familiar with and that we have used a lot during this training.

Training with a skills objective (Slide 21)
These are examples related to the other learning categories: the skills. In other words: every time the objective is to know how to do something and it is very practical.

The most effective techniques to learn skills are:

- *Demonstration*
- *Supervised practice and follow-up*

Training with an attitudinal objective (Slide 22)
And finally, the attitudinal objective. This relates more to a change in behavior or attitude towards a common goal or concept. In the slide, you can see a few examples of attitudinal objectives.

NOTE for the speaker: Read just a couple of examples

In this case, the techniques that can help in interacting with your audience are:

- *Role-play*
- *Brainstorming*
- *Group discussion*

These activities need facilitation as we have seen earlier. During these activities, the facilitator has, among others, the crucial role of observing the audience and making sure that each participant contributes to the discussion.

Summary (Slide 23)
In summary:

The learning strategy is only one of the components of a training, together with logistics, the facilitators, and most importantly, you, the audience. In this session, we have learned the most commonly-used strategies for adult learning, and you have had the opportunity to practice them all. As you have experienced in other sessions in this two-day training, we have chosen different techniques according to the learning objectives that we wanted to achieve. If you now look back at the different sessions in the training, you should understand why we did not always choose to give a PowerPoint presentation, and why for certain activities, we have preferred a group discussion or a role-play.

What do you think? Now that you know most of the techniques, would you have chosen a different learning strategy or method for any of the activities in this training? If so, which activity and what other strategy would you have replaced it with?

Allow 5-10 minutes for discussion, making sure that participants grasp the difference among the presented strategies and can choose the right strategy according to their needs.

Step 3: Ask for questions

Ask participants if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

SESSION 11

TRAINING REVIEW, POST-TEST

This session will give participants the opportunity to review the training they just received, evaluate the knowledge and skills acquired, and provide any final feedback to facilitators.

Purpose

- Reflect on the knowledge and skills acquired, and
- Provide final feedback to facilitators.

Materials

Facilitator

- Training agenda
- Appendix C: Intermediate-Level Event-Based Surveillance Training Knowledge Check Answers
- Copies of Appendix B: Event-Based Surveillance Training Knowledge Check to distribute to participants

Participants

- Intermediate-Level Event-Based Surveillance Training Module Participant Guide page 56

Total time: 30 minutes

ACTIVITY 11.1

TRAINING REVIEW AND POST-TEST

Review training

Administer the post-test

Training review and post-test

30 minutes

Step 1: Review the agenda and what has been learned

Ask participants to refer to their agendas to review what was discussed during the second half of the training. For every session, ask participants to share key takeaway points discussed and learned. Write their answers on the flipchart paper (if available) and encourage participants to take notes in their journals.

Step 2: Facilitate the post-training knowledge check

Distribute Appendix B: Event-Based Surveillance Training Knowledge Check and read the instructions out loud as follows:

> *You will have 15 minutes to individually take the post-test. You are encouraged to ask us, the facilitators, if you have any questions or need clarification on questions asked on the post-test.*

Remind participants to respect everyone's time by not engaging in side conversations once they have completed their tests.

Step 3: Collect questionnaires and review answers

After all participants have completed the questionnaires, collect them and review the answers with everyone using Appendix C: Intermediate-Level Event-Based Surveillance Training Knowledge Check Answers. Participants can fill in the correct answers in Appendix D of their Participant Guides. Allow five minutes for any clarification questions or final feedback that participants would like to provide. Thank participants for attending the training and actively participating.

APPENDICES

APPENDIX A

INTRODUCTION

INTRODUCTION

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

[Insert name & credentials of facilitator]

Objectives

- To strengthen public health authorities at the intermediate level
- To improve performance and effectiveness of EBS in their jurisdiction

2

Agenda

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Icebreaker	15 minutes
2. Training Objectives, Pre-Test, and Agenda	Agenda Pre-test	30 minutes
3. Event-Based Surveillance Overview ▸ Why is Event-Based Surveillance Important?	Lecture Small group exercise	50 minutes
4. List of Signals for Event-Based Surveillance In-Country: Signals for Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	35 minutes
5. Functions of Event-Based Surveillance at the Intermediate Level ▸ Conducting Triage, Verification, and Risk Assessment	Lecture Case study	80 minutes
6. How to Record Data for Event-Based Surveillance ▸ How to Record Event Data in the District Logbook	Lecture Case study	60 minutes
Intermediate-Level Event-Based Surveillance Training Day 1		Total 4.5 hours

3

Agenda

SESSION	ACTIVITIES	TIME
Review of Day 1		30 minutes
7. Flow of Information	Lecture Group discussion	30 minutes
8. Supportive Supervision	Lecture Role-play	75 minutes
9. Multisectoral Collaboration	Lecture Q&A discussion	45 minutes
10. How to Train Others on Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	60 minutes
11. Training Review, Post-Test, and Close	Post-test	30 minutes
Intermediate-Level Event-Based Surveillance Training Day 2		**Total 4.5 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

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING KNOWLEDGE CHECK

The purpose of this test is to assess your knowledge, understanding, and application of event-based surveillance. This test should be completed by intermediate-level public health authorities participating in EBS training. Please circle the best answer.

1. Fill in the blank: Event-based surveillance requires the detection and _____ reporting of signals which may indicate the possibility of a serious public health event.

2. Intermediate-level public health staff are not responsible for the triage of signals reported from health facilities.

a) True **b)** False

3. Verification is conducted to determine if a signal reported is true or false.

a) True **b)** False

4. Intermediate-level public health authorities are responsible for leading risk assessment.

a) True **b)** False

5. Risk assessment should be conducted continuously from the confirmation of an event to the end of the response to an event.

a) True **b)** False

6. Fill in the blank: The three possible outcomes of risk assessment are _____, _____, and _____.

7. Intermediate-level supervisors are responsible for only providing feedback to reporters from health facilities.

a) True **b)** False

8. Fill in the blanks: List two reasons why supportive supervision is important:

_____

_____

9. Supportive supervision requires effective communication that does not include_____.

a) active learning
b) constructive performance feedback
c) finding faults
d) encouragement

10. Cross-communication between the Ministry of Health and other relevant sectors (including animal and environmental health) ensures that signals are ultimately reported through EBS.

a) True **b)** False

11. Effective EBS training facilitators continuously _____

a) Build rapport with training participants

b) Assess the participants' needs by asking questions

c) Use learning techniques that promote interactivity and motivation

d) All the above

APPENDIX C

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING KNOWLEDGE CHECK ANSWERS

The purpose of this test is to assess your knowledge, understanding, and application of event-based surveillance. This pre-test should be completed by intermediate-level public health authorities participating in EBS training. Please circle the best answer.

1. Fill in the blank: Event-based surveillance requires the detection and **immediate** reporting of signals which may indicate the possibility of a serious public health event.

2. Intermediate-level public health staff are not responsible for the triage of signals reported from health facilities.

   a) True **b) False**

3. Verification is conducted to determine if a signal reported is true or false.

   a) True **b)** False

4. Intermediate-level public health authorities are responsible for leading risk assessment.

   a) True **b)** False

5. Risk assessment should be conducted continuously from the confirmation of an event to the end of the response to an event.

   a) True **b)** False

6. Fill in the blank: The three possible outcomes of risk assessment are **closing the event**, **monitoring the event**, and **investigating/responding to an event**.

7. Intermediate-level supervisors are responsible for only providing feedback to reporters from health facilities.

   a) True **b) False**

8. Fill in the blanks: List two reasons why supportive supervision is important:

   _____

   _____

Responses may include:

- It can increase staff capacity to collect, manage, and use data
- It helps staff improve their own work performance continuously
- It helps in establishing a collaborative working environment
- It facilitates understanding of the common goal
- It is an opportunity to improve knowledge and skills of health staff
- It encourages open, two-way communication, and building team approaches that facilitate problem-solving

9. Supportive supervision requires effective communication that does not include_____.

a) active learning
b) constructive performance fback
c) finding faults
d) encouragement

10. Cross-communication between the Ministry of Health and other relevant sectors (including animal and environmental health) ensures that signals are ultimately reported through EBS.

a) True
b) False

11. Effective EBS training facilitators continuously _____

a) Build rapport with training participants

b) Assess the participants' needs by asking questions

c) Use learning techniques that promote interactivity and motivation

d) All the above

APPENDIX D

OVERVIEW OF EVENT-BASED SURVEILLANCE

OVERVIEW OF EVENT-BASED SURVEILLANCE

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

[Insert name & credentials of facilitator]

Learning Objectives

- Define key terms, steps and characteristics of event-based surveillance (EBS)
- Describe the importance of early warning and response (EWAR) and EBS
- Describe how EBS is conducted

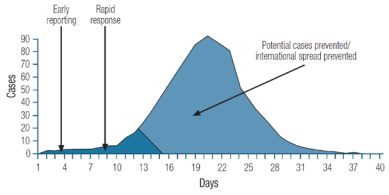
2

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)

4

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/

5

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"

6

Event-Based Surveillance (EBS)

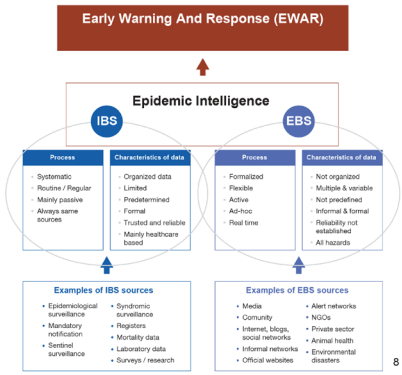
"The organized collection, monitoring, assessment and interpretation of mainly ***unstructured ad hoc information*** regarding health events or risks, which may represent an acute risk to human health"

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

7

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/hr/publications/WHO_HSE_GCR_LYO_2014.4/en/

8

IBS and EBS Processes

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

9

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

10

Sources of Information for EBS at the Intermediate Level

- Community (key informants, health volunteers, community members, etc.)
  Also referred to as community-based surveillance (CBS)
- Health facilities (healthcare workers such as clinicians, nurses, infection control officers, etc.)
  Also referred to as health facility event-based surveillance (HEBS)

11

What is CBS?

"The systematic detection and reporting of events of public health significance within a community by community members" (France, 2019)

- This definition encompasses the detection and reporting of events
- This module will employ the term CBS as it is defined above

Guerra, J., Bayugo, Y., Acharya, P., Adjabeng, M., Bamadas, C., Bellizzi, S., ... Cognat, S. (2019). A definition for community-based surveillance and a way forward: Results of the who global technical meeting, France, 26 to 28 June 2018. Eurosurveillance. https://doi.org/10.2807/1560-7917.ES.2019.24.2.1800681

12

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

13

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

14

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

15

Functions of EBS

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

16

Signal Detection

- Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designated by national public health authorities
- Signals can be detected from various sources, including communities and health facilities

17

Signal Reporting

- Reporting signals means communicating this information to a designated public health authority
- All signals that are detected must be reported immediately

18

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

19

Verification

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

20

Verification

- Not all signals become events
- Signals that are triaged and verified as true become events
- Verification must take place within 24 hours of initial signal detection

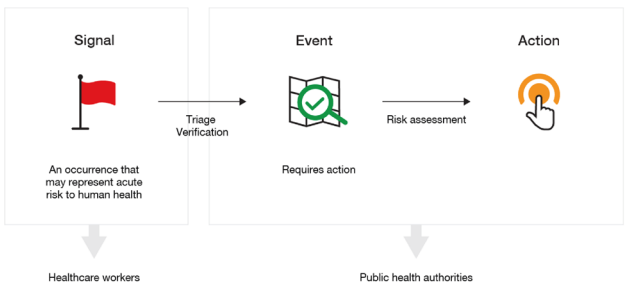
21

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 RA
- Initial RA of an event must take place within 48 hours of original signal detection

22

Signals and Events



23

Summary

- Early detection is key to control the spread of disease
- EWAR detects public health events early
- IBS and EBS form epidemic intelligence, and are EWAR components
- Data from EBS can come from a variety of sources
- EBS is an all hazards approach

24

APPENDIX E

SMALL GROUP EXERCISE – WHY IS EVENT-BASED SURVEILLANCE IMPORTANT?

Prepared flipchart paper for the small group exercise:

Q1: How do you currently conduct surveillance in your jurisdiction?	**Q2:** What is EBS?
Q3: Do you know the purpose and importance of EBS? Why is it important?	**Q4:** What is the value of adding EBS to the current surveillance?

APPENDIX F

LIST OF SIGNALS FOR EVENT-BASED SURVEILLANCE IN-COUNTRY

LIST OF SIGNALS FOR EBS IN-COUNTRY

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

[Insert name & credentials of facilitator]

Learning Objectives

- Define signals and events
- Identify differences between signals and events
- Describe community-based surveillance (CBS) and health facility event-based surveillance (HEBS) signals in their country

2

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	• A suspected case of MERS
• Siblings (3) are admitted with severe dehydration and profuse diarrhea	• A cluster of suspect cholera cases
• A case of typhoid fever with failure to respond to ceftriaxone treatment	• A suspected case of extensively drug-resistant (XDR) typhoid fever
• A 4-year-old child admitted with fever, rash, coughing, coryza, and conjunctivitis	• 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

6

Examples of signals for CBS

- Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week.
- A cluster of unexplained animal deaths within one week.
- An illness with novel or rare symptoms (NB: Novel and rare can be explained as signs/symptoms that the community has not seen before)
- Any person with fever and rash

7

List of Signals for CBS

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

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

8

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

9

Summary

- Signal detection is key for EBS
- A list of pre-determined signals for CBS and HEBS is necessary to guide signal detection

10

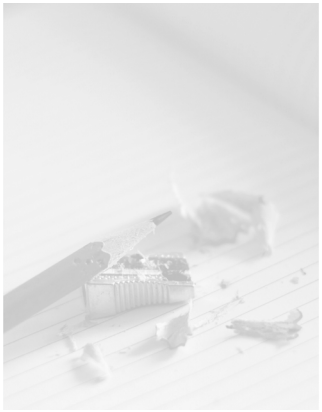
APPENDIX G

FUNCTIONS OF EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

FUNCTIONS OF EBS AT THE INTERMEDIATE LEVEL

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

[Insert name & credentials of facilitator]

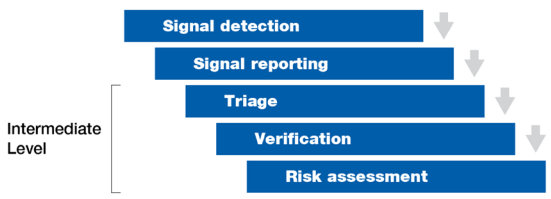


Learning Objectives

- Recognize the functions of event-based surveillance (EBS) at the intermediate level
- Describe triage, verification and risk assessment at the intermediate level

2

Functions of EBS



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

3

EBS Functions at the Intermediate Level

- Public health authorities at the intermediate level may receive EBS-related information in the form of signals or events from a variety of sources, including communities and health facilities
- Regardless of the source of EBS information, the functions of EBS implementation that take place at the intermediate level are triage, verification, and risk assessment

4

EBS Functions at the Intermediate Level

Source of information	EBS function
• Community	• Risk assessment
• Health facility	• Triage • Verification • Risk Assessment

5

Triage

- Public health authorities at the intermediate level may receive signals from health facilities conducting health facility EBS, or HEBS
- Because of its high sensitivity, EBS is likely to generate signals from non-events
- When authorities receive information about a reported signal, they conduct triage
- Triage: The process of screening out the data and information that are relevant for early detection purposes

6

Triage

Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?

Was this signal previosly reported (i.e., is this signal a duplicate)?

7

Verification

- Intermediate-level authorities receiving signals from health facilities must also verify these signals before they are determined to be events
- Verification is the determination that a signal is valid (i.e. it is not a false alarm or a false rumor), reliable, and that it corresponds to at least one of the signals pre-defined for EBS implementation
- Verification must take place within 24 hours of initial signal detection

8

Verification

- The result of verification is the confirmation that a signal is true or false. Once a signal is verified, it becomes an event
  An event is an occurrence that can threaten public health
- If confirmed as an event, information related to the event must be entered into a logbook or registered at the intermediate level

9

How to Determine the Outcome of Signal Verification

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal signals

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, hospital focal point, or key informants)

10

Risk Assessment

- Risk assessment (RA) is done after an event is confirmed
- RA is the systematic process of gathering, assessing and documenting information to assign a level of risk to human health to an event
- Regardless of the source of the information, a risk assessment should be carried out at the intermediate level and, if relevant, at the higher levels as well

11

Risk Assessment

- Public health authorities evaluate all available information and then assess or characterize the level of risk that the situation poses to public health
- The first risk assessment of an event must take place within 48 hours of the detection of one or more signals

12

Processes and Possible Outcomes of RA

No investigation required if...

- Report is a rumour

Monitor if...

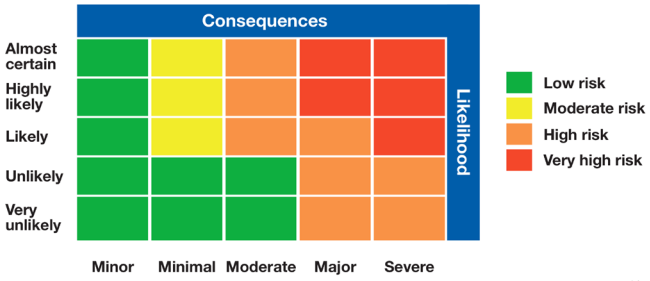
- Report is verified as true
- Mortality/morbidity is as expected for the disease
- Severity of cases is low

Investigate /respond if...

- Report is verified as true
- Mortality/morbidity is higher than expected
- The disease is unexpected/novel to the community
- There are possible consequences to trade and/or travel
- Severity of cases is high or higher than expected for the disease
- The public health event creates major panic in the community
- The number of cases is increasing

13

Risk Characterization Matrix



14

Interpretation of Risk Level

Low risk	Managed according to standard response protocols, routine control programs and regulation (e.g. monitoring through routine surveillance systems)
Moderate risk	Roles and responsibility for the response must be specified. Specific monitoring or control measures required (e.g. enhanced surveillance, additional vaccination campaigns)
High risk	Senior management attention needed: there may be a need to establish command and control structures; a range of additional control measures will be required some of which may have significant consequences
Very high risk	Immediate response required even if the event is reported out of normal working hours. Immediate senior management attention needed (e.g. the command and control structure should be established within hours); the implementation of control measures with serious consequences is highly likely

15

Summary

- Public health authorities at the intermediate level may receive EBS-related information in the form of signals or events from communities and health facilities
- The intermediate level will conduct only RA for all events reported through CBS, and triage, verification and RA for all signals reported through HEBS
- The intermediate level should report all events and RA results to the corresponding upper administrative level

16

APPENDIX H

EVENT-BASED SURVEILLANCE VERIFICATION TOOL

As EBS is highly sensitive, it is essential to verify the authenticity of a reported signal and its characteristics. This process of verification involves actively cross-checking the validity of available information and collecting additional information about the report using reliable sources as needed. The process of signal verification should answer three main questions:

- Is the report accurate (i.e., true)?
- Has the information been reported by a reliable source or sources?
- Does the report meet the criteria for one or more signals?

The graphic shown below can be used to determine the outcome of signal verification, once sufficient information has been collected and validated.

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal criteria

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, health facility focal point, or key informants)

The examples on the following pages demonstrate the process of signal verification using specific signals that may be utilized in CBS or HEBS.

Two or more persons presenting with similar severe illnesses in the same setting (e.g., household, workplace, school, street) within one week

Discard if...

- There is only one person presenting with illness
- The persons present with dissimilar signs and symptoms
- There is no temporal association, and >1 week separates the patients' illness
- The persons presenting with similar symptoms reside in different settings that are physically well-separated

Confirm as an event if...

- There are two or more persons presenting with similar signs and symptoms who live or work in the same setting
- The ill persons had an opportunity for exposure or close contact with one another
- The persons' illness requires hospitalization
- One or more persons has died
- There is a common source of exposure

Unexpected large number of deaths of poultry or other (domestic) animals

Discard if...

- The number of animal deaths is what is normally expected
- There is a reasonable explanation for the animal deaths

Confirm as an event if...

- The number of animal deaths is not what is usually expected
- There are multiple clusters/groups of animal deaths
- There is no explanation for the animal deaths

Severe illness of a healthcare worker after exposure to patients with similar symptoms

Discard if...

- The ill healthcare worker did not have exposure to patients with similar symptoms
- The healthcare worker's illness does not require hospitalization
- The healthcare worker did not have exposure to patients

Confirm as an event if...

- The ill healthcare worker had exposure to patients with similar symptoms
- There are multiple clusters/groups of severely ill healthcare workers with exposure to patients with similar symptoms
- The healthcare workers' illness requires hospitalization
- One or more patients have died
- One or more healthcare workers have died

One or more hospitalized patients with unexplained severe illness, including failure to respond to standard treatment

Discard if...

- The patient is not severely ill (i.e., does not require hospitalization)
- There is a reasonable explanation for the patient's illness
- The patient is responding to standard treatment

Confirm as an event if...

- The patient is severely ill (i.e., requires hospitalization)
- There are multiple clusters/groups of severely ill patients and/or deaths with similar symptoms
- There is no explanation for the patient's illness
- The patient is not responding to standard treatment
- One or more patients have died

APPENDIX I

EVENT-BASED SURVEILLANCE RISK ASSESSMENT TOOL

In order to assess the nature and magnitude, or risk, of an acute public health event, it is important to continuously and systematically gather, assess, and document information using reliable sources. Risk assessment should be conducted on a recurring basis as more information is gathered about an event. Additional information may include, but is not limited to:

- Nature of the event/agent/disease
- Source of event identification
- Location of the event
- Potential origin (infectious, chemical, radiological, nuclear)
- Date of event or date of onset
- Number of cases/deaths, severity of the case
- Number of people potentially exposed to the hazard
- Groups affected (e.g. age, occupation, gender)
- Common clinical/laboratory characteristic among affected
- Likelihood of an intentional release
- Likelihood of group intoxication/contamination
- Potential for importation of cases to the country (for international events)

The following tool can be used to determine the outcome of a risk assessment, once sufficient information has been collected and analyzed. The outcome of a risk assessment should inform response efforts. Note that no matter what the outcome is, all information must be reported up to the next level within the public health structure.

No investigation required if...

- Report is a rumour

Monitor if...

- Report is verified as true
- Mortality/morbidity is as expected for the disease
- Severity of cases is low

Investigate /respond if...

- Report is verified as true
- Mortality/morbidity is higher than expected
- The disease is unexpected/novel to the community
- There are possible consequences to trade and/or travel
- Severity of cases is high or higher than expected for the disease
- The public health event creates major panic in the community
- The number of cases is increasing

APPENDIX J

EVENT-BASED SURVEILLANCE FUNCTIONS CASE STUDIES

Case 1: Cluster of gastrointestinal disease in the community

Scenario description:

One morning, Dr. Fasso, a surveillance officer at the intermediate level, received a call from Khady Diallo, the local-level supervisor in the village of Butumba. Ms. Diallo told him that she was informed by a CHV that five sick persons (two children and three adults) were taken to a traditional healer after they fell ill with the same symptoms. Ms. Diallo informed Dr. Fasso that all five persons had attended a wedding ceremony at a neighboring village the day before, had eaten from the same bowl with their hands, and had drunk water from the same cup. Around 12 hours later, all became ill with severe vomiting and abdominal pain. All of them were attended to in the local clinic and received intravenous fluid therapy to treat moderate dehydration. The two children were referred to the nearest hospital because their clinical condition did not improve. The youngest (4 years old) died two hours ago.

Questions: Complete the following questions using the triage, verification, and risk assessment tools

(Facilitator notes provided)

1. Is the information reported by the CHV a signal? Why?

Yes, it seems to be a signal. Two or more cases of the same illness (in this case, vomiting and abdominal pain) in the same location and within a 1-week period is typically a pre-determined signal for CBS. It might represent a cluster of gastrointestinal disease.

2. If this information is a signal, who should conduct the triage?

Once the signal is reported by the CHV to the corresponding local-level supervisor, the latter (Ms. Diallo) must triage the signal.

3. Describe how triage should be conducted for this case scenario.

Triage means screening out duplicates and the information which is not relevant to EWAR. The following questions should be answered:

- Has this signal (information) been reported previously (is it duplicate or not)? If it is a duplicate, the triage stops.
- If it is not a duplicate, is the signal (information) reported relevant to EWAR? An apparent cluster of gastrointestinal disease cases with common origins is relevant to EWAR because foodborne disease outbreaks are considered a major public health problem and an important cause of morbidity and mortality.

4. If the signal is not a duplicate and is relevant to EWAR, what is the next step?

Since the information is not a duplicate and is relevant to EWAR, the signal should be verified.

5. Who should verify this signal?

The local-level supervisor, Ms. Diallo, should verify the signal.

6. How should signal verification be conducted?

Verification means confirming the reality of the signal and its characteristics and should be done within 24 hours of initial signal detection. The following questions should be answered:

- **Is this signal true?**
  Interview the CHV who reported the signal first, and patients, including relatives, if possible.
  Collect clinical and epidemiological information by phone or in person. Try to verify if the signal truly occurred. If the signal occurred, test if the source is reliable, otherwise, verification stops.
- **Has the signal been reported by credible sources?**
  Credible sources include CHVs and local-level supervisors. If a credible source has been involved, verification can continue.
- **Does the signal meet at least one of the pre-determined signal definitions for the community?**
  The signal reported must meet the definition, "Two or more cases of similar illness among individuals from the same location within a 1-week period" (adapt this definition according to the list of signals pre-determined by the country). This is the list of pre-determined signals for CBS.
  The signal must have been verified to be considered an event. Clinical and epidemiological information suggests the presence of a foodborne disease outbreak.

7. If the signal has been verified as an event, what is the next step?

The local-level supervisor, Ms. Diallo, should immediately report the event to the intermediate level supervisor, Dr. Fasso.

8. Once the event has been reported, what is the next step? Please explain.

The next step is to conduct an initial risk assessment to categorize the overall risk of the event. This categorization will provide the basis to take actions and define the type of response needing to be implemented.

9. Who should conduct the initial risk assessment?

The intermediate-level supervisor, Dr. Fasso, should conduct the initial risk assessment within 48 hours of the detection of the signal.

10. Describe how the initial risk assessment should be conducted.

Dr. Fasso should call the risk assessment team at the intermediate level and formulate the most relevant risk questions for a suspected outbreak of foodborne disease. The next step is to compile all available information collected through triage and verification. Since the type of event is a foodborne disease, the following risk questions could be addressed:

- Does the suspected foodborne disease have a high potential for spread?
- Is there a higher than expected mortality or morbidity reported for the event?
- Is the event unusual or unexpected in the community?
- Does the disease have possible consequences for trade or travel?
- Does the event have possible consequences for human health?
- Does the event affect livestock/wildlife?
- Are there environmental consequences?

Since the event involves severe cases and one death, it should be considered a high-risk event.

11. What should the decision of the risk assessment team be after evaluating the event and available information?

- No response/investigation
- No response but monitor
- Respond and investigate immediately

Dr. Fasso should implement an immediate response and conduct an investigation.

Case 2: Sudden bleeding and multi-organ failure in a pregnant woman

Scenario description:

Dr. Chan, a surveillance officer, received a call from the HEBS focal point at the county hospital. The call was from Dr. Xi who reported that two days earlier, a 23-year-old pregnant woman (3rd trimester) had been admitted to the emergency room with fever, general malaise, weakness, headache, vomiting and shortness of breath. A chest X-ray revealed bilateral lobar pneumonia. A standard pneumonia treatment plan was initiated. The patient developed bleeding in the gums and nose 5 hours after being admitted, and her clinical condition worsened with facial swelling and pain in the chest, back, and abdomen. She has been transferred to the intensive care unit (ICU). In spite of adequate treatment, the patient has developed shock and multi-organ failure. The head of the ICU reported the case to the HEBS focal point as a signal because he thinks the patient presents unusual clinical manifestation and failed to respond to standard therapy.

Questions: Complete the following questions using the triage, verification, and risk assessment tools.

(Facilitator notes provided)

1. Is this case a signal? Why?

Yes, it appears to be a signal. The rapid clinical deterioration and the presence of bleeding could represent a severe hemorrhagic fever or severe influenza.

2. If this information is a signal, who should conduct the triage?

It is important to note that the signal reporting has been done properly until now. Once the doctor identified the signals, he reported it immediately to the corresponding HEBS focal point, who in turn, reported it to the district (intermediate) surveillance officer.

The surveillance officer, Dr. Chan, should conduct triage.

3. Describe how the triage should be conducted:

Triage means screening out duplicates and information that is not relevant to EWAR.
The following questions should be answered:

- Has this signal (information) been reported previously (is it duplicate or not)? If it is a duplicate, the triage stops.
- If it is not a duplicate, is the signal (information) reported relevant to EWAR?
  This hemorrhagic fever syndrome, with a sudden clinical deterioration, is relevant to EWAR because it could represent the appearance of a case of Ebola, Lassa Fever, or influenza, among others. A single case of hemorrhagic fever is considered a health emergency due to high morbidity and mortality rates and needs to be reported immediately.

4. If the signal is not duplicate and is relevant to EWAR, what is the next step?
Since the information is not duplicate and is relevant to EWAR, the signal should be verified.

5. Who should verify this signal?
The surveillance officer, Dr. Chan, should verify the signal.

6. How should signal verification be conducted?
Verification means confirming the reality of the signal and its characteristics and should be done within 24 hours of initial signal detection. The following questions should be answered:

- **Is this signal true?**
  Interview the HEBS focal point who reported the signal first (the doctor) followed by the patient's family members. Collect clinical and epidemiological information by phone or in-person, such as date of onset, exposure to animals (e.g. rodents), contacts, travel history, etc. Try to verify if the signal truly occurred. If the signal occurred, test if the source is reliable, otherwise, verification stops.
- **Has the signal been reported by credible sources?**
  The doctor who is treating the patient is considered a reliable source, so, verification can continue.
- **Does the signal meet at least one of the pre-determined signal definitions for the community?**
  The signal meets the definition, "A single case with unusual clinical manifestation or failure to respond to standard treatment" (adapt this definition according to the list of signals pre-determined by the country),which is in the list of pre-determined signals for CBS.
  The signal has been verified and is considered an event. Clinical and epidemiological information suggest the presence of a viral hemorrhagic fever.

7. If the signal has been verified as an event, what is the next step?
Dr. Chan should immediately report the event to the upper administrative level.

8. Once the event has been reported, what is the next step? Please explain.
The next step is to conduct an initial risk assessment in order to categorize the overall risk of the event. This step must be conducted within 48 hours of initial signal detection. This categorization will provide the basis for actions to be taken and will define the type of response requiring implementation.

9. Who should conduct the initial risk assessment?
The surveillance officer, Dr. Chan, should conduct the initial risk assessment.

10. Describe how the initial risk assessment should be conducted.
Dr. Chan has to call the risk assessment team at the intermediate level and formulate the most relevant risk questions for a suspected case of viral hemorrhagic disease. The next step is to compile all available information collected through triage and verification. The following risk questions should be addressed:

- Does the suspected viral hemorrhagic fever case have a high potential for spread?
- Is there a higher than expected mortality or morbidity reported for the event?
- Is the event unusual or unexpected in the community?
- Does the disease have possible consequences for trade or travel?
- Does the event have possible consequences for human health?
- Are there environmental consequences?

Since the event involves a suspected case of viral hemorrhagic fever in a patient in critical condition, it should be considered a very high-risk event.

11. What should the decision of the risk assessment team be after evaluating the event and information available?

- No response/investigation
- No response but monitor
- Respond and investigate immediately

Dr. Chan should implement an immediate response and conduct an investigation as soon as possible. A rapid response team should be deployed to conduct a field investigation.

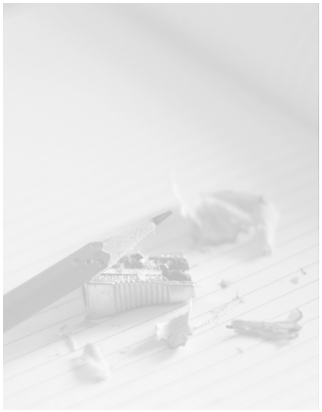
APPENDIX K

HOW TO RECORD DATA FOR EVENT-BASED SURVEILLANCE

HOW TO RECORD DATA FOR EVENT-BASED SURVEILLANCE

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

[Insert name & credentials of facilitator]



Learning Objectives

- Describe the importance of EBS data recording at the intermediate level
- Record EBS data from health facilities and communities at the intermediate level using an example of an event logbook, the IDSR District Log of Suspected Outbreaks and Rumors

2

Data Recording

- EBS data recording is important for reporting purposes
- Public health authorities at the intermediate level should be able to record EBS data from health facilities and communities using a tool that enables the collection of event data

3

Recording EBS Data Reported by the Community and Health Facilities

- The intermediate-level should only record events reported from the community level or events verified by the intermediate level from signals reported by health facilities
- Event data should be registered in a logbook that incorporates the recording of events, such as the IDSR District Logbook of Suspected Outbreaks and Rumors

4

IDSR District Log of Suspected Outbreaks and Rumors

Record verbal or written information from health facilities or communities or social media about suspected outbreaks, alerts or reports of unexplained events. Record the steps taken and any response activities carried out.

Condition or Disease or Event	Source of suspected outbreak or rumour (newspaper, telephone etc.)	Number of cases initially reported	Number of deaths initially reported	Location (health centre)	Date district was notified	Date suspected outbreak was investigated by the district	Result of district investigation (Confirmed, Ruled Out, or Unknown)	Date outbreak began

5

IDSR District Log of Suspected Outbreaks and Rumors

Date onset of index case	Date crossed threshold or first cluster	Date a case was first seen at a health facility	Date specific intervention began	Type of concrete intervention that was begun	Date on which district notified national level of the outbreak	Date district received national response	Comment (include if sample taken and results)	Name and signature

6

Summary

- The intermediate level should record all events that are reported and verified from health facilities and communities
- Event data should be registered in a logbook that incorporates the recording of events, as soon as they are reported or verified

7

APPENDIX L

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE DISTRICT LOG OF SUSPECTED OUTBREAKS AND RUMORS

Record verbal or written information from health facilities or communities or social media about suspected outbreaks, alerts or reports of unexplained events. Record the steps taken and any response activities carried out.

Condition or Disease or Event	Source of suspected outbreak or rumour (newspaper, telephone etc.)	Number of cases initially reported	Number of deaths initially reported	Location (health centre)	Date district was notified	Date suspected outbreak was investigated by the district	Result of district investigation (Confirmed, Ruled Out, or Unknown)	Date outbreak began

Date onset of index case	Date crossed threshold or first cluster	Date a case was first seen at a health facility	Date specific intervention began	Type of concrete intervention that was begun	Date on which district notified national level of the outbreak	Date district received national response	Comment (include if sample taken and results)	Name and signature

APPENDIX M

SMALL-GROUP EXERCISE - FLOW OF INFORMATION

Prepared flipchart paper for the small-group exercise:

Q1: When should information be reported up administrative levels? Why?	**Q2:** How should information be reported up administrative levels? Why?
Q3: Why is feedback back to reporters in communities and health facilities important?	

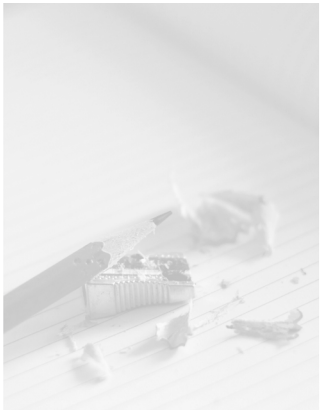
APPENDIX N

SUPPORTIVE SUPERVISION

SUPPORTIVE SUPERVISION

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

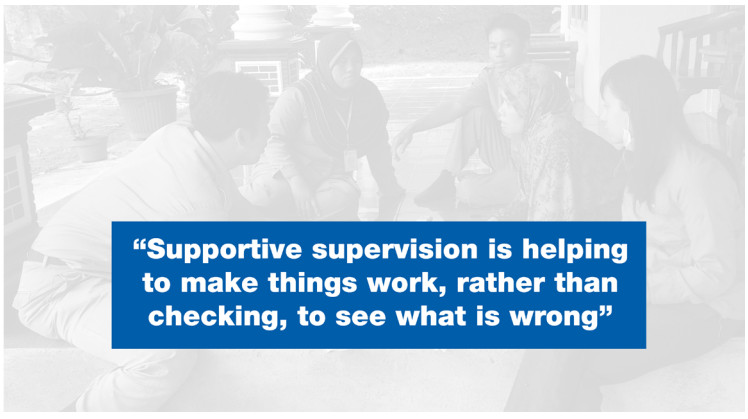
[Insert name & credentials of facilitator]



Learning Outcomes

- List the supportive behaviors to improve commitment and performance
- Identify the most suitable supportive behavior according to circumstances

2



Why Is It important?

- It can increase staff capacity to collect, manage, and use data
- It helps staff to improve their own work performance continuously
- It helps to establish a collaborative working environment
- It facilitates understanding of common goals
- It is carried out in a respectful and non-authoritarian way with a focus on using supervisory visits as an opportunity to improve knowledge and skills of health staff
- It encourages open, two-way communication, and team-building approaches that facilitate problem-solving

4

Comparison of Two Supervision Approaches

Non-Supportive Supervision	Supportive Supervision
• Focus is on finding faults with individuals • Supervisor is like a policeman • Episodic problem-solving • Little or no follow-up • Punitive actions intended	• Focus is on improving performance and building relationships • More like a teacher, coach or mentor • Uses local data to monitor performance and solve problems • Follows up regularly • Only support is provided

World Health Organization. (2008). Training for mid-level managers (MLM). 4. Supportive Supervision. Geneva.

5

The Three 'Rs' for Effective Supportive Supervision

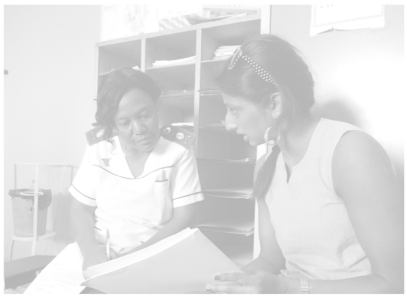
- Right supervisors: A core set of supervisors, well trained on supportive supervision techniques and with updated information and skills on EBS issues
- Right tools: Availability of training materials and job aids to update skills of health workers during supervision visits, and checklists and forms for recording recommendations and follow up
- Right resources: Sufficient vehicles, per diems, and time allocated for supervision and follow-up

6

Supportive Supervision Techniques to Improve Commitment and Performance

- Supervision should be facilitative, not fault-finding
- Always praise work well done before raising problems
- If you see a problem, check if the supervisee sees the same problem
- Analyze problems with the supervisee to gain a good understanding of the underlying causes
- Let the supervisee suggest possible solutions; this facilitates ownership and acceptance of the solutions

7



Conducting a Supportive Supervisory Visit

- Observation
- Use of data
- Problem-solving
- On-the-job training
- Recording observations and feedback

8

Summary

- Supportive supervision is important to improve performance and commitment
- Plan for supervisory visits
- During the visits: adopt supportive supervision techniques
- After the visits: follow-up and regular contact

9

APPENDIX O

ROLE-PLAY SCENARIOS

Scenario 1: CBS local-level supervisors are not conducting triage correctly

Context

Dr. Gonzales is the surveillance officer in charge of District X. His district is the largest in the country, including 50 communities with a total population of 10,000 inhabitants. Since EBS has been introduced in the country, it has been well integrated into the national IBS system. During the first three months of the implementation of EBS, Dr. Gonzales was able to train at least one person in each community and recommended that this person organize a cascade training, or at least instruct one person among the staff about EBS. Dr. Gonzales has also conducted at least one supervisory visit in each of the communities in his district. However, in the last month, due to important meetings on surveillance at the national level, he has been out of his office and left his deputy, Dr. Gomez, in charge.

Upon his return, Dr. Gonzales calls Dr. Gomez for a debrief of any important issues during his absence. Dr. Gomez is a medical doctor particularly interested in epidemiological surveillance and EBS, which he finds fascinating. During the debriefing, Dr. Gomez immediately reports on the EBS activity, pointing to one community in particular. He thinks that something is going on in that community and that the reports of Mr. Linera, the point of contact for that community, have been strange and inconsistent lately. It seems that the same report on a number of diarrhea cases had been sent twice, and the name of the school where the cases occurred was the same, indicating two different events. Dr. Gonzales asks Dr. Gomez whether he had undertaken any actions to explore that situation, but Dr. Gomez replies that he has not, as he prefers to discuss this with Dr. Gonzales before taking action.

After the debriefing, Dr. Gonzales calls Mr. Linera on the phone to ask if everything is fine. Mr. Linera sounds unwell and says that he has been in bed for the last week with the flu. He says that he has delegated all his tasks, including EBS, to another person, Mrs. Chavez, and that she had reported nothing unusual in the last week.

Dr. Gonzales wishes Mr. Linera a quick recovery and agrees to visit him the week after.

The following week, Dr. Gonzales, together with Dr. Gomez, organizes a supervisory visit to Mr. Linera.

When they arrive to Mr. Linera's community, Mr. Linera is waiting for them at the post office. They go to Mr. Linera's house together and his wife prepares coffee for everybody. Mr. Linera, still recovering from his illness, calls Mrs. Chavez to join them.

Mr. Linera is a very organized man and very well respected in his community. He had appointed Mrs. Chavez to his tasks as she was his cousin's wife and had also lived in that community for a long time. Mr. Linera had shared the EBS training material with her and they had gone through the training together to make sure that everything was clear. Mrs. Chavez was very precise and attentive, and she could rely on a number of CHVs in the community that she knew personally.

Role-play starts during tea at Mr. Linera's house
Instructor presents: Mr. Linera, his wife, Dr. Gonzales, Dr. Gomez, Mrs. Chavez

Mr. Linera: Thanks a lot for coming all the way here, it's always an honor to have you both in my small community.

Dr. Gonzales: Thanks a lot, Mr. Linera, it's always a pleasure to be here.

After a small round of pleasantries, Dr. Gonzales starts exploring the situation discretely to understand what has happened.

Dr. Gonzales: As you know, I was away for a week but wanted to see how you are doing. Is everything okay with EBS? How have you managed the situation during the week that you were sick? Was Mrs. Chavez in charge?

Mr. Linera: Yes, indeed, Mrs. Chavez has always covered in my absence. Is there any problem?

Mrs. Chavez looks nervous, and it is clear that she wants to say something. She realizes that Dr Gonzales has invited her to intervene.

Mrs. Chavez: Dr Gonzales, first I really wanted to thank you for your visit. EBS is a very interesting activity, and I am very proud to be part of the team. It has also been an excellent opportunity to be in very close contact with the community. There is something I actually wanted to report myself, as in the last week we have received information about a certain number of diarrhea cases in a small village nearby. The CHV in charge of that part of the community is relatively new, and I am not sure that he reported correctly.

Dr. Gomez: Now that you mention that, I have to say that we had noticed that small inconsistency and that is actually one of the reasons for our visit. What do you think was the problem?

Mrs. Chavez: I am not sure, the only thing I could think of was that there is a new CHV in that community and I wanted to pay a visit to his neighborhood to check if he's doing well.

Mr. Linera: Mrs Chavez, is there a way to call this CHV and ask him to join us here to understand together what happened?

Mrs. Chavez: Sure, let me call him.

Mrs. Chavez talks on the phone with the CHV who agrees to join the meeting.

CHV: Good morning everybody. Sorry I am late.

Mr. Linera: No problem, it's a pleasure meeting you. I've heard that you are new in the community. First, I wanted to thank you for the very important work that you are doing for our community.

CHV: Thanks, Mr. Linera, it's an honor for me to be part of the team. Yes, as you know, I have recently moved here from the other town, and EBS was a very good way to integrate into this community.

I have reported all the unusual things that may happen in my community, sometimes I do not know whether it is relevant, but I report them anyway. Last week, for instance, I heard that in the school where my son goes there were 10 cases of diarrhea, and I thought that it was something to report. Two days later, another of my friends told me that in the same school there were 10 cases of diarrhea, and I reported them. I am afraid I have to go now (and he looks at his watch), I need to go pick up my son at school.

Mr. Linera: Sure, no problem, thanks so much for coming. Keep up the good work that you are doing. We may organize another training session for CHVs soon, since you were not in the previous one as you have just moved, please make sure that you will attend this one.

CHV: Sure thing, you can count me in.

When the CHV leaves the house, Mr. Linera looks at Dr. Gonzales and Dr. Gomez.

Mr. Linera: Dr. Gonzales, Dr. Gomez, I have to apologize. I just realized what has happened here: there was a problem in the triage as the second report of the CHV is a duplicate. I am really sorry.

Dr. Gonzales: Mr. Linera, not a problem at all, we know that we can trust you, and I am sure that you will organize a training session for the new CHV very soon. If I may give you some advice: if there are not too many new CHVs, perhaps you can just have an individual meeting with each of them and go through the forms together whenever they have something to report. Working with them to show them how, if, and what to report will be very effective.

Mr Linera: Thanks, Dr. Gonzales, for your understanding, for your trust and for your advice. It is an excellent idea.

Questions for the group:

- What do you think of this scenario? Do you think it is possible to have duplicate reporting? Why/why not?
- What if it happened in your jurisdiction? Would your participation in/observation of the role-play help you manage the situation?
- Do you think Mr. Linera and Dr. Gonzales handled this scenario well? Why/why not?
- What would you have done differently and how?

Scenario 2: Health facility is not reporting any signals

Wonderland is a big country with 25 districts, each consisting of an average of 30 health facilities and one hospital. Traditional medicine is still practiced there, though the medical doctors at the health facilities know the local traditional practitioners well and often collaborate with them.

Dr. Jain is the District Medical Officer of District Lake, which is the biggest district in the country. District Lake includes more than 50 health facilities and two hospitals, Hospital A, situated in the North of the district, and Hospital B, in the center of the district. The country has recently undergone a major reorganization, and District Lake has formed as a result of two smaller districts being merged. In the reorganization, Hospital A will be dismantled, but it will take some time as the personnel have to be reassigned and/or absorbed by the other hospital. The process will take at least six months to one year, and for the time being, all the personnel of the two hospitals have been instructed to conduct their routine activity as usual.

Dr. Jain is aware of this situation, and his appointment as Medical Officer of that district was instrumental for this re-organization. His previous experience as Medical Officer at the national level in the Surveillance Department of the Ministry of Health provides him with the professional experience to accept this new appointment.

Dr. Jain is originally from that district, which is one of the reasons why he welcomed this new appointment. The appointment gave him a way to return home, as the capital was becoming too crowded and busy for him. He will be retiring in three years.

At the national level, Dr. Jain was responsible for EBS and would collect all the reports coming from the districts. He organized and delivered EBS training at the district level when EBS was first introduced in the country.

District Lake, or at least each of the former districts constituting what is now called District Lake, was one of the best-performing districts in EBS. They were very timely in their reporting, their triage was always perfect, and their response activities were appropriate for the events detected. He thought that this new appointment was going to be easy.

A couple of weeks into his new appointment, Dr. Jain noticed that some cholera cases being reported by a group of small health facilities in the North of the country were not being fully reported to him. From the reports, the situation looked very serious, and he was surprised that he only knew of their incidence but not pertinent details such as admission to the hospital.

After this incomplete reporting came to his attention, Dr. Jain decided to visit Hospital A as he suspected that with the reorganization, something could have gone wrong.

He called Dr. Chopra, the Medical Officer in charge of Hospital A, but Dr. Chopra's phone number had been disconnected. He then called the Deputy Medical Officer of Hospital A, and after a few attempts, succeeded in reaching Dr. Sharma. Dr. Sharma was a young medical doctor that had been appointed as interim deputy during the transition process, and was in charge of the Infection Control Unit at Hospital B. Dr. Jain managed to set up a visit to Hospital A for the following morning and immediately started organizing his five-hour drive to Hospital A.

The next morning, Dr. Jain went to Hospital A to meet Dr. Sharma, who was waiting for him in his office. Dr. Sharma had a large pile of documents on his desk and looked very busy.

Dr. Sharma: Good morning Dr. Jain, it is such a pleasure meeting you, thank you so much for the visit, I need your help!

Dr. Jain: Dr. Sharma, of course, I am here to assist you. How can I help?

Dr. Sharma: Actually, Dr. Jain, as you know, last year there was a team that came here from the capital to train the medical doctors on EBS. Unfortunately, in this time of transition, most of the doctors have left and accepted other positions in other hospitals in the country. We only have three doctors left, and all of them are overwhelmed with work. In addition, they often do not have time for surveillance, so I am afraid routine surveillance, as well as EBS, has been neglected lately.

Dr. Jain: I understand Dr. Sharma. It is very common, unfortunately, but I am sure they are doing their best to treat the patients and are taking care of their priorities.

Dr. Sharma: That is true Dr. Jain, but I really do not know what to do with routine surveillance and with EBS, that is so important.

Dr Jain: I cannot agree more, of course. Let me think.
After careful consideration, Dr. Jain suggests a possible creative solution that might resolve the issue.

Dr. Jain: Dr. Sharma, what about involving the nurses? Do you think it is possible to create a pool of nurses that might be interested and motivated to contribute to routine surveillance and to EBS?

Dr. Sharma: This is an excellent idea Dr. Jain. Traditionally it was a group of nurses in charge of surveillance here. We could reinstate that tradition, and I am sure that the nurses will be happy to receive that recognition. With your permission, I can immediately call the senior nurse to organize a meeting with all nurses and decide a plan of action together. If I remember correctly, she has already attended training on EBS in the past.

Dr. Sharma calls Mrs. Malik, the senior nurse, on the phone and she arrives to Dr. Sharma's office after 10 minutes.

Dr. Sharma: Mrs. Malik, thanks a lot for coming so quickly. This is Dr. Jain from the district, here to assist us in resuscitating routine surveillance and EBS. He was suggesting that you and your team could be in charge of these two activities again.

Mrs. Malik: I would love to, and though the nurses on my team are new, I would be happy to organize a training for them. I would just need the updated documents and forms, if any, and some help in organizing the logistics. Also, if I may, Dr. Jain, it would be such an honor for us if you could attend. That would help me a lot to motivate the team. Dr. Jain, what do you think?

Dr. Jain: Mrs. Malik, Dr. Sharma, the answer, of course, is yes. I would be extremely happy to contribute, and I'll tell you more. This is the very hospital where I started my career as a medical doctor, before moving to epidemiology and public health. It would also be of sentimental value to do so. Mrs. Malik, Dr. Sharma, with your help the team will be up and running in no time.

The three of them start planning, and the training starts the next day. The nurses are very happy and proud to be in charge of surveillance and EBS again. They know that this new knowledge and experience will be of great value for them in their future career.

Questions for the group:

- What do you think of this scenario? Do you think clinicians frequently neglect reporting surveillance information because they consider it not to be a priority?
- What would you have done differently and how?

Scenario 3: CBS local-level supervisors are incorrectly filling out data

Dr. Abebe is the district supervisor in Mji, a relatively large town in the country. He has 20 villages/communities in his district and EBS has already been implemented for a year or so. He has conducted extensive training sessions, and he knows that he can rely on community leaders and on the health facilities in his territory to conduct EBS well.

It was during Christmas time when reports coming from one particular community (Community A) started looking strange and contradictory. Sometimes the information was recorded twice, clearly a duplication, but other times it was as though there was a miscoding or a misclassification of information. Community A was a small community in the East of the district with a population of about 600. Dr. Abebe remembered that the CHVs in this community participated actively in their training session, and understood EBS well.

Dr. Abebe called Mrs. Umoja the day after he noticed the odd reports. Mrs. Umoja, who was the local level supervisor for EBS, sounded nervous on the phone but agreed to receive Dr. Abebe for a visit two days later.

The visit

Mrs. Umoja was waiting for Dr. Abebe when he arrived in the main square of Community A. They went to Mrs. Umoja's office at the local clinic (she was the general practitioner's assistant in addition to being the local level supervisor) together. There were many patients in the waiting room, mostly mothers with children. It was vaccination week for measles for a special catch-up campaign that the WHO had organized.

Dr. Abebe: Good morning Mrs. Umoja. How are you and how are things over here?

Mrs. Umoja: Doctor, it is such a pleasure to have you here. As you see we are very busy with this vaccination campaign and definitely understaffed, as you know.

Dr. Abebe wanted to be sensitive about the situation and avoid taking too much time of Mrs. Umoja's already busy schedule, so he went straight to the point.

Dr. Abebe: Mrs. Umoja, I notice that some of the EBS reporting forms that you sent me were strange. Knowing how excellent your work normally is, I was wondering whether something had changed.

Mrs. Umoja (looking extremely nervous now): Dr. Abebe, I am really sorry about this. The fact is that during the preparation for this week's vaccination, I delegated the EBS task to a newly hired nurse. I had no time to train her and to show her the forms and the instructions, but at the beginning, I was able to supervise her and double-check the reports before she would send them to you. However, this last week I have been really busy with the vaccination campaign and have been unable to supervise her. I thought that everything was clear and she never complained during the week. She told me that she had sent everything to you.

Dr. Abebe: Indeed, your timeliness in reporting is excellent, and you never miss a week. However, in this last week, some of the signals reported as verified were not true signals, and there was also a duplicate in the reports. That's why I have decided to organize this visit. I understand that it might have been difficult for you to manage all this, and it was a very good idea to involve the newly hired nurse to do the job. I am sure that your supervision was excellent, and I am sure that this is an excellent opportunity for her to learn about EBS and to contribute to improving the health of the population in this community. Perhaps we could meet with her so we can go through the forms together? Then the new nurse could officially replace you in this task. It would be for me an opportunity to meet her and include her in the staff.

Mrs. Umoja was very happy with Dr. Abebe's reaction and immediately called the nurse on the phone, asking her to join her in the office. Mrs. Ima (the new nurse) arrived 15 minutes later and was extremely nervous to meet with the district supervisor.

Dr. Abebe: Good afternoon Mrs. Ima, it is such a pleasure to meet you. Mrs. Umoja is telling me that you have been involved in EBS during this busy period. How do you like it?

Mrs. Ima (very shy): Good morning Dr. Abebe, it is an honor to meet you. Yes, Mrs. Umoja asked me to help her with this task, and I am actually learning a lot. However, if I have to be honest with you, when Mrs. Umoja left me alone with the EBS I was not sure that I was doing a good job. But I did not want to bother Mrs. Umoja, as I know she is very busy with the campaign. I hope I can be involved officially one day in EBS, I really like it, and I think it is very important for our population.

Dr. Abebe: Actually Mrs. Ima, this is precisely what I want to talk to you about. That day is already today, and I would like to go through the forms together with you and with Mrs. Umoja so that you can start officially being the focal point for EBS in this community. What do you think?

Mrs. Ima was very happy about this good news and accepted the task. Dr. Abebe went through the documents with her, using the opportunity to show Mrs. Ima what was not correct in the previous forms. This was also a way for Dr. Abebe to show Mrs.Umoja that her supervisory style was probably too present: a better approach would be to let Mrs. Ima complete the job on her own first, and then coming together at the end to review and revise the forms if necessary.

After that visit, the reports from that community were always on time and filled in very well.

Questions for the group:

- What do you think of this scenario? Do you think it is common for a supervisor to do the supervisee's job, in order to make it better or do it faster, and neglect to explain why? Do you think it is common for a supervisee to not want to bother a supervisor with their questions, from the fear of being judged?
- What would you have done differently and how?

Scenario 4: Community residents are unaware of CBS

Dr. Lulu, a district EBS officer, wants to organize a second training for her 50 CHVs but has very limited resources. She had already conducted an initial training six months earlier and thought it was successful. However, she is now concerned about one community in particular (Village B) because she heard that all of the CHVs in that community had died. This community only had three CHVs, all of whom were elderly and had been selected because they were very well respected by the whole community. Unfortunately, all three had died in the recent cholera outbreak, and Dr. Lulu did not know who was in charge now.

Dr. Lulu calls her cousin Angela, who lives in Village B and tells her that she will be travelling to Village B the week after to visit her, but also to better understand the situation.

Dr. Lulu arrives in Village B and meets with Angela.

Dr. Lulu: Angela, thanks for meeting on such short notice. I have a problem with this community as I have the feeling that nobody knows about EBS now that the three CHVs have died of cholera. What do you think?

Angela: Dear cousin, it is so nice that you came. You are always very busy in the big city with your work. Yes, the situation is not good over here. As you know, the recent cholera outbreak was very bad, and many people died, including your CHVs. Their families left the village, and now I have no idea who is in charge of EBS. People don't trust the public health system anymore and are relying more on traditional medicine for their diseases or conditions.

Dr. Lulu is worried that nobody is in charge of EBS and that it will be difficult to manage the mistrust in the system that the outbreak has generated. She is a determined woman though, and after thinking for some time, she decides to organize a meeting with several community leaders for the next day. She calls her supervisor (at the national level) to ask if he can join their meeting. There are two issues at stake that require the involvement of someone from the capital: the first is the lack of EBS reporting in the community, and the second is the lack of trust the village has in the public health system.

The day of the meeting

Dr. Lulu: Good morning, everybody. Thanks for coming to this meeting. I am very happy to see you all here. How many of you know about EBS?

The attendees look at each other as though Dr. Lulu is from another planet. One attendee, Mr. X, says:

Mr. X: Of course we know about EBS. We have even recently attended a two-day training on EBS. But you know, the last cholera outbreak hit this community very hard, and people don't want to see a doctor now. They prefer to go to a traditional practitioner. Also, we are still working on gathering people to show how to treat water, and we have no time to spend on additional tasks. People are scared of getting ill, and they have no time for these meetings.

Dr. Lulu looks at her cousin, who does not look surprised by what Mr. X is saying. Taking advantage of the side discussions happening in the crowd, Dr. Lulu takes a few minutes to talk to her cousin about her ideas. With her cousin's approval, she then regains the floor to share some of these ideas with the audience.

Dr. Lulu: Sir, sir, please, I understand that the situation is not easy, but as you may remember from the EBS training, performing excellent EBS helps the population to prevent outbreaks such as the cholera outbreak you just had. If the signal is immediately reported and verified as true, then action can be implemented immediately, and many cases of cholera can be avoided. Please, follow me for another five minutes.

We had a couple of ideas. I know that this is a particularly religious community and that you all gather in church on Sundays. Also, my cousin tells me that there are still three schools in this village and two of them are still working. I understand that people are busy, but we were wondering whether those places (church and schools) could be used to spread the word about EBS and refresh the value of EBS in this community. It is very sad what happened here, but we need to use this very sad occasion to show people that we can do better to avoid such a situation from happening again. What do you think?

Mr. X: Dr Lulu, you are right. This is a very sad situation, but I know my people are strong and will survive this challenge. Faith will help us all to do so. I am not sure about the schools at the moment, because since the outbreaks happened, not many kids are going to school. But we can certainly try with the church. I go myself every Sunday, and the majority of the community still goes. I am sure that the reverend will agree on using his sermon to help us.

Questions for the group:

- What do you think of this scenario? Is it possible that trust in the public health system is so low? Can this happen in your community?
- What do you think of the suggested solution? Would it work in your community? If not, what other opportunities could you use to achieve the objective?

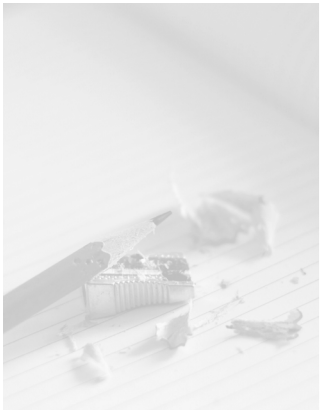
APPENDIX P

HOW TO TRAIN OTHERS ON COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

HOW TO TRAIN OTHERS ON CBS AND HEBS

EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

[Insert name & credentials of facilitator]



Learning Objectives

- Describe different learning strategies and techniques
- Identify the most suitable training method according to the context

2

Design of Training Activities

3

What to Promote in Adult Learning Methods

- Interactivity
- Active participation (interaction with others)
- Discussion
- Experience
- Appropriate motivational context
- Application to real life problems

4

Topics

- Lectures
- PowerPoint presentations
- Facilitating a group discussion
- Effective facilitation and communication tips
- Role-play facilitation tips
- Case study facilitation tips

5

Lectures

Traditional and the oldest method of training by an instructor to a group of learners

- Talking without any support
- Using a PowerPoint presentation
- Using a discussion

6

How to Effectively Deliver a Lecture

- Take time to prepare
  - Collect the needed information
  - Practice your lecture
- State the objective(s) of your lecture in the beginning
- Limit the number of messages conveyed
- Adapt to and engage the audience
- Show enthusiasm
- Summarize the main points of the lecture at the end
- Allow some time for questions at the end

7

PowerPoint Presentations

- Collection of individual slides that contain information on a topic
- Requires preparation
- Requires practice
- Requires a clear objective
- Should target the audience
- Should engage the audience

8

PowerPoint Presentations

Do's	Don'ts
• Put one message per slide • Limit to 5 to 6 bullet points per slide • Use key phrases and include only essential information • Use contrasting colors for text and background. • Allow one minute per slide • Prepare, design, deliver	• Put more than one message per slide • Create overly "busy" slides with too much text • Overuse special effects such as animations and sounds • Read the slides • Use 3D graphs • "Karaoke" slides

9

Group Discussion

- A communicative situation that allows participants to share their views and opinions with other participants
- A systematic exchange of information, views, and opinions about a topic, problem, issue or situation
- Discussion takes place among the members of a group who share some common objectives

10

How to Facilitate a Group Discussion

- Make sure all participants know the objective of the discussion and the reason to be in that group
- Be involved in the discussion from the beginning
- Encourage all participants to contribute
- Keep the time
- Maintain the focus of the discussion on the relevant topic
- Summarize the main points at the end
- Share a list of action points at the end

11

Effective Facilitation and Communication Tips

- Active listening techniques
  - Building trust and establishing rapport
  - Demonstrating concern
  - Paraphrasing to show understanding
  - Nonverbal cues which show understanding such as nodding, eye contact, and leaning forward
  - Brief verbal affirmations like “I see,” “I know,” “Sure,” “Thank you,” or “I understand”
- Give each participant the opportunity to contribute
- Remain neutral during the discussion

12

Role-Play Technique

- A **technique** that allows participants to explore realistic situations by interacting with other people in a managed way
- Objective is to develop experience and trial different strategies in a supported environment

13

Role-Play Facilitation Tips

- Make sure to present the purpose of the exercise and its ground rules
- Arrange the room to allow all participants to observe the players
- Ask participants to take notes
- Talk through the roles and the play with the “actors”
- Let the role-play start
- Observe and take notes
- Allow some time for feedback and discussion after the role-play

14

Case Study Technique

- Analyzes a defined problem consisting of a real situation and uses real information as methodological tool
- Allows students to develop and enhance different skills (e.g., comprehension and analysis of real problems and the capacity to propose and evaluate alternatives)

15

Case Study Facilitation Tips

- Adapt the details of the case study to fit the participants' reality and that of their country and/or community
- Be available to answer questions or provide clarification if needed
- Guide the participants through the case study without interfering
- Make sure that all participants contribute

16

Demonstration

- Show how to do it
- Ask participants to do it
- Supervise their practice
- Follow-up with debriefing and questions

17

How can I choose the right technique?

- According to the objective(s) of the learning activity

18

Categories of objectives

- The three domains of learning are:
  - **Cognitive** domain that emphasizes thinking and knowledge (concepts)
  - **Skills** domain that features manually or physically performing actions (psychomotor)
  - **Attitudinal** domain that highlights attitudes, values, interests, attentions, concerns, responsibilities, and the ability to listen, respond and demonstrate interactions with others

19

Training with a cognitive objective

- Describe the concepts of virology, bacteriology and immunology related to different test formats
- Define the advantages and limitations of forecasting
- Define surveillance of vaccine-preventable diseases, vaccine uptake, vaccine safety, immune status, sero-epidemiology and vaccine effectiveness

→Interactive lectures with PowerPoint presentations

20

Training with a skills objective

- Develop basic computer programmatic and analytical skills
- Apply criteria and algorithms to decide on reporting at the national level
- Carry out analysis for cohort and (matched) case-control studies, including stratified and multivariable analysis

→Demonstrations
→Supervised practice
→Follow-up

21

Training with an attitudinal objective

- Be comfortable in the communication of a decision
- Encourage collaboration between groups to share information
- Implement collaborative activities and teamwork with other professionals
- Critically appraise and cope with the consequences of wrong decisions
- Negotiate a project
- Improve teamwork skills

→Role play
→Brainstorming
→Group discussion

22

Summary

- Learning strategies are only one component of training
- There are different strategies in adult learning
- It is important to choose the most appropriate according to the context

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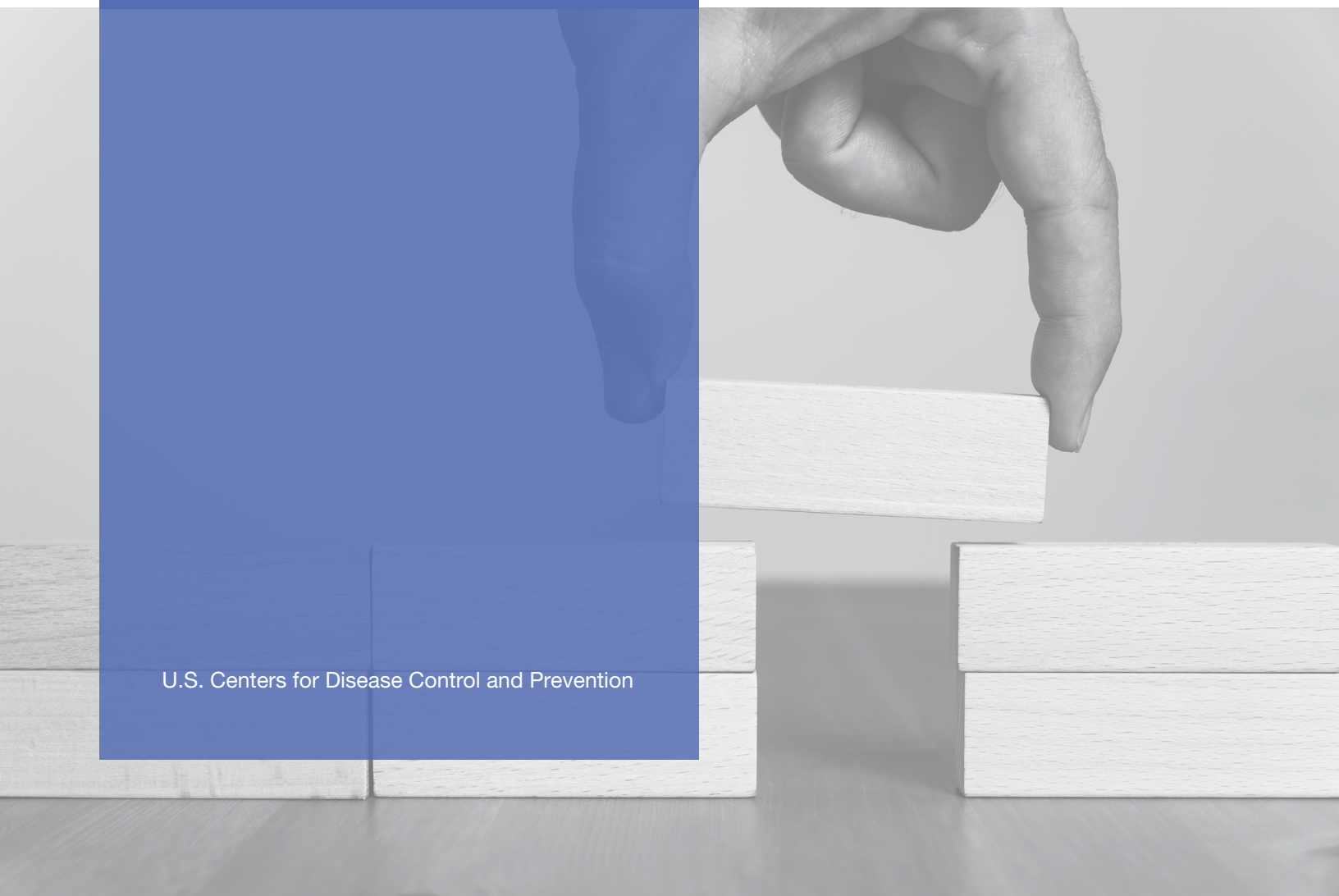
MODULE 3.2

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING MODULE

PARTICIPANT GUIDE



U.S. Centers for Disease Control and Prevention

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ACRONYMS

US CDC	U.S. Centers for Disease Control and Prevention
CBS	Community-Based Surveillance
CHV	Community Health Volunteer
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

Community-based surveillance (CBS):	CBS is the systematic detection and reporting of events of public health significance within a community, by community members. Community health volunteers (CHV), the public, religious leaders, civil society members, teachers, and similar groups are engaged and trained to detect and immediately report events or health risks occurring in their communities. CBS may also be known as community health surveillance or community event-based surveillance.
Community health volunteers (CHV):	According to a WHO study group, CHVs may be members of the communities where they work, should be selected by the communities, are answerable to the communities for their activities, and should be supported by the health system but not necessarily a part of its organization. They may also be known as community health workers, among other terms.
Event:	The International Health Regulations (IHR) define an event as "[…] a manifestation of disease or an occurrence that creates a potential for disease; […]". This includes 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 either the 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.

Intermediate administrative level:	Intermediate administrative levels may be defined differently in different countries. For the purpose of this document, an intermediate level is the public health administrative level below the national level that is responsible for conducting preliminary investigations and implementing responses to reported public health events or suspected outbreaks in a given jurisdiction. The intermediate level may otherwise be referred to as districts or counties, among other terms.
Local administrative level:	Local administrative levels may be defined differently in different countries. For the purpose of this document, a local administrative level is the lowest administrative division within a country, directly above the community level.
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. 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, may also constitute an outbreak and should be reported and investigated.
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 have to 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.
Risk characterization:	According to WHO, once a risk assessment team has carried out hazard, exposure, and context assessments of an event, a level of risk should be assigned. This process is called risk characterization.
Signals:	Patterns of disease or other information considered by the Early Warning and Response 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:	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.
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 State 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 cross-checking of the validity (veracity) of the signals collected by Early Warning and Response, by contacting the original source, additional sources, or by performing field investigation. Verification requires that hoaxes, false rumors, and artefacts are eliminated from further consideration.

INTRODUCTION

Event-based surveillance (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 threat 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 the 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.

Implementation of EBS in health facilities and communities requires public health authorities at the intermediate level of a public health surveillance system to be trained to analyze the reports that they receive from those communities and health facilities in their jurisdiction. These individuals would also be required to organize and conduct supportive supervision and EBS training for communities and health facilities in order to create a local network of EBS collaborators. Additionally, since reporting does not require laboratory results and relies on clinicians' experiences, EBS in health facilities and communities 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

The Intermediate-Level Event-Based Surveillance Training Module will provide public health authorities at the intermediate-level with the knowledge, skills, and tools necessary to effectively implement EBS in the health facilities and communities in their jurisdiction. The module will additionally help you plan, organize and deliver EBS trainings at the community and health facility levels, to organize and conduct supportive supervisory visits, and to maintain regular contact with supervisees.

This module is divided into eleven sessions, including a pre- and a post-test to set the baseline knowledge of participants on EBS and to check the progress after the module, respectively.

General Objectives

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

- Supervise and conduct effective EBS activities in the health facilities and communities in their jurisdiction in line with the routine surveillance strategy, and
- Contribute to the flow of surveillance-related information between the community level and the existing public health surveillance system.

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING

DAY 1

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Icebreaker	15 minutes
2. Training Objectives, Pre-Test, and Agenda	Agenda Pre-test	30 minutes
3. Event-Based Surveillance Overview ▶ Why is Event-Based Surveillance Important?	Lecture Small group exercise	50 minutes
4. List of Signals for Event-Based Surveillance In-Country: Signals for Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	35 minutes
5. Functions of Event-Based Surveillance at the Intermediate Level ▶ Conducting Triage, Verification, and Risk Assessment	Lecture Case study	80 minutes
6. How to Record Data for Event-Based Surveillance ▶ How to Record Event Data in the District Logbook	Lecture Case study	60 minutes
Intermediate-Level Event-Based Surveillance Training Day 1		**Total 4.5 hours**

DAY 2

SESSION	ACTIVITIES	TIME
Review of Day 1		30 minutes
7. Flow of Information	Lecture Group discussion	30 minutes
8. Supportive Supervision	Lecture Role-play	75 minutes
9. Multisectoral Collaboration	Lecture Q&A discussion	45 minutes
10. How to Train Others on Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	60 minutes
11. Training Review, Post-Test, and Close	Post-test	30 minutes
Intermediate-Level Event-Based Surveillance Training Day 2		**Total 4.5 hours**

SESSION 1

WELCOME AND INTRODUCTIONS

Purpose

- Getting to know each other
- Group formation

Total time: 15 minutes

Introductions

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

- What is your name and where do you work?
- What two things do you enjoy most about the work you do?
- What is one expectation you have for this training?
- What two core values or ground rules should the group have during this training?

Ask questions

Ask any questions that you may have regarding expectations for the training and the ground rules.

SESSION 2

TRAINING OBJECTIVES, PRE-TEST, AGENDA

Purpose

- Understand the objectives, content, agenda, logistics, and materials for the training
- Test your current knowledge of event-based surveillance implementation in health facilities and communities

Total time: 30 minutes

Review the content of this activity

Review the training objectives, content and agenda by listening to the lecture and taking notes on the slides below.

Agenda

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Icebreaker	15 minutes
2. Training Objectives, Pre-Test, and Agenda	Agenda Pre-test	30 minutes
3. Event-Based Surveillance Overview ▸ Why is Event-Based Surveillance Important?	Lecture Small group exercise	60 minutes
4. List of Signals for Event-Based Surveillance In-Country: Signals for Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	35 minutes
5. Functions of Event-Based Surveillance at the Intermediate Level ▸ Conducting Triage, Verification, and Risk Assessment	Lecture Case study	80 minutes
6. How to Record Data for Event-Based Surveillance ▸ How to Record Event Data in the District Logbook	Lecture Case study	60 minutes
Intermediate-Level Event-Based Surveillance Training Day 1		Total 4.5 hours

3

Agenda

SESSION	ACTIVITIES	TIME
Review of Day 1		30 minutes
7. Flow of Information	Lecture Group discussion	30 minutes
8. Supportive Supervision	Lecture Role-play	75 minutes
9. Multisectoral Collaboration	Lecture Q&A discussion	45 minutes
10. How to Train Others on Community-Based Surveillance and Health Facility Event-Based Surveillance	Lecture	60 minutes
11. Training Review, Post-Test, and Close	Post-test	30 minutes
Intermediate-Level Event-Based Surveillance Training Day 2		Total 4.5 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

Complete the pre-test

The purpose of this test is to assess your knowledge, understanding, and application of event-based surveillance. Your facilitator will distribute the test for you to complete.

Ask questions

Ask any questions that you may have regarding the training objectives, content, or agenda.

SESSION 3

EVENT-BASED SURVEILLANCE OVERVIEW

Purpose

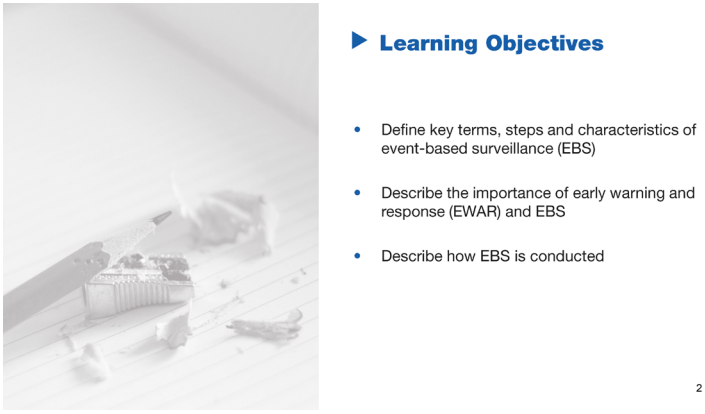
- Define key terms, steps and characteristics of EBS
- Describe the importance of EWAR and EBS
- Describe how EBS is conducted

Total time: 50 minutes

View the presentation

Learn the importance of EBS, key theoretical aspects, and the role public health authorities at the intermediate-level play by listening to the lecture and taking notes on the slides below.

Detailed lecture notes can be reviewed after the presentation in Appendix E: Notes for Session 3: Event-Based Surveillance Overview.

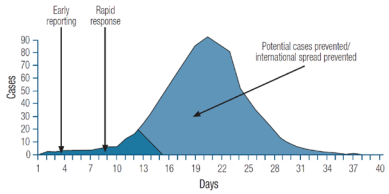


Early Warning and Response (EWAR)

- 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)

4

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/

5

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”

6

Event-Based Surveillance (EBS)

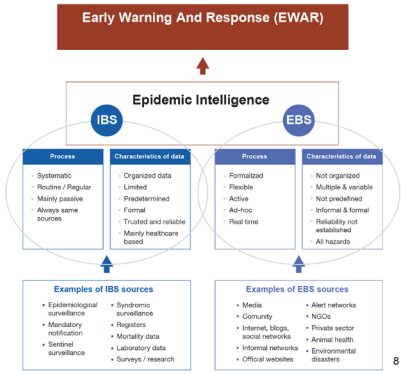
"The organized collection, monitoring, assessment and interpretation of mainly ***unstructured ad hoc information*** regarding health events or risks, which may represent an acute risk to human health"

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

7

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/ihr/publications/WHO_HSE_GCR_LYO_2014.4/en/

8

IBS and EBS Processes

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

9

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

10

Sources of Information for EBS at the Intermediate Level

- Community (key informants, health volunteers, community members, etc.)
  Also referred to as community-based surveillance (CBS)
- Health facilities (healthcare workers such as clinicians, nurses, infection control officers, etc.)
  Also referred to as health facility event-based surveillance (HEBS)

11

What is CBS?

"The systematic detection and reporting of events of public health significance within a community by community members" (France, 2019)

- This definition encompasses the detection and reporting of events
- This module will employ the term CBS as it is defined above

Guerra, J., Bayugo, Y., Acharya, P., Adjabeng, M., Barnadas, C., Bellizzi, S., ... Cognat, S. (2019). A definition for community-based surveillance and a way forward: Results of the who global technical meeting, France, 26 to 28 June 2018. Eurosurveillance. https://doi.org/10.2807/1560-7917.ES.2019.24.2.1800681

12

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

13

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

14

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

15

Functions of EBS

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

16

Signal Detection

- Detecting a signal means identifying or suspecting the occurrence of one of the pre-determined signals designated by national public health authorities
- Signals can be detected from various sources, including communities and health facilities

17

Signal Reporting

- Reporting signals means communicating this information to a designated public health authority
- All signals that are detected must be reported immediately

18

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

19

Verification

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

20

Verification

- Not all signals become events
- Signals that are triaged and verified as true become events
- Verification must take place within 24 hours of initial signal detection

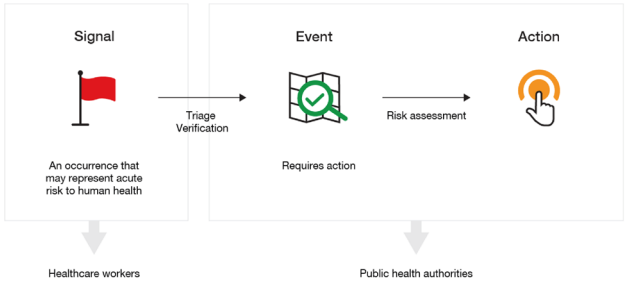
21

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 RA
- Initial RA of an event must take place within 48 hours of original signal detection

22

Signals and Events



23

Summary

- Early detection is key to control the spread of disease
- EWAR detects public health events early
- IBS and EBS form epidemic intelligence, and are EWAR components
- Data from EBS can come from a variety of sources
- EBS is an all hazards approach

24

Participate in the small-group exercise

Return to the same groups formed during the introductory icebreaker activity to complete the small-group exercise below.

Answer the following questions on the prepared flipchart or in the space below:

Q1: How do you currently conduct surveillance in your jurisdiction?	**Q2:** What is EBS?
Q3: Do you know the purpose and importance of EBS? Why is it important?	**Q4:** What is the value of adding EBS to the current surveillance?

Ask questions

Ask any questions that you may have regarding the content.

Now that we have some ideas about what EBS is, why it is important, and how it should be conducted at the intermediate level, we will start Session Four focused on how to identify signals for detection.

SESSION 4

LIST OF SIGNALS FOR EVENT-BASED SURVEILLANCE IN-COUNTRY: SIGNALS FOR COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

Purpose

- Define signals and events
- Identify differences between signals and events
- Describe CBS and HEBS signals in your country

Total time: 35 minutes

View the presentation

Learn about signals for CBS and HEBS in-country by listening to the lecture and taking notes on the slides below.

Detailed lecture notes can be reviewed after the presentation in Appendix F: Notes for Session 4: Signals for Community-Based Surveillance and Health Facility Event-Based Surveillance.

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	• A suspected case of MERS
• Siblings (3) are admitted with severe dehydration and profuse diarrhea	• A cluster of suspect cholera cases
• A case of typhoid fever with failure to respond to ceftriaxone treatment	• A suspected case of extensively drug-resistant (XDR) typhoid fever
• A 4-year-old child admitted with fever, rash, coughing, coryza, and conjunctivitis	• 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

6

Examples of signals for CBS

- Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week.
- A cluster of unexplained animal deaths within one week.
- An illness with novel or rare symptoms (NB: Novel and rare can be explained as signs/symptoms that the community has not seen before)
- Any person with fever and rash

7

List of Signals for CBS

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

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

8

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

9

Summary

- Signal detection is key for EBS
- A list of pre-determined signals for CBS and HEBS is necessary to guide signal detection

10

Ask questions

Ask any questions that you may have regarding the content.

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

Each country should elaborate a list of signals for CBS and HEBS. These will guide signal detection in communities and health facilities.

SESSION 5

FUNCTIONS OF EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

Purpose

- Recognize the functions of EBS at the intermediate level
- Describe triage, verification and risk assessment at the intermediate level
- Identify signals relevant to EWAR by conducting triage
- Verify authenticity and conformity of triaged signals
- Conduct risk assessment to categorize the overall risk of events

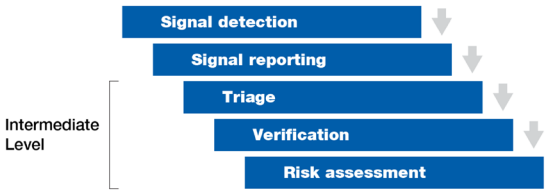
Total time: 80 minutes

View the presentation

Learn the functions of EBS at the intermediate level by listening to the lecture and taking notes on the slides below.

Detailed lecture notes can be reviewed after the presentation in Appendix G: Notes for Session 5: Functions of Event-Based Surveillance at the Intermediate Level.

Functions of EBS



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

3

EBS Functions at the Intermediate Level

- Public health authorities at the intermediate level may receive EBS-related information in the form of signals or events from a variety of sources, including communities and health facilities
- Regardless of the source of EBS information, the functions of EBS implementation that take place at the intermediate level are triage, verification, and risk assessment

4

EBS Functions at the Intermediate Level

Source of information	EBS function
• Community	• Risk assessment
• Health facility	• Triage • Verification • Risk Assessment

5

Triage

- Public health authorities at the intermediate level may receive signals from health facilities conducting health facility EBS, or HEBS
- Because of its high sensitivity, EBS is likely to generate signals from non-events
- When authorities receive information about a reported signal, they conduct triage
- Triage: The process of screening out the data and information that are relevant for early detection purposes

6

Triage

Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?

Was this signal previosly reported (i.e., is this signal a duplicate)?

7

Verification

- Intermediate-level authorities receiving signals from health facilities must also verify these signals before they are determined to be events
- Verification is the determination that a signal is valid (i.e. it is not a false alarm or a false rumor), reliable, and that it corresponds to at least one of the signals pre-defined for EBS implementation
- Verification must take place within 24 hours of initial signal detection

8

Verification

- The result of verification is the confirmation that a signal is true or false. Once a signal is verified, it becomes an event
  An event is an occurrence that can threaten public health
- If confirmed as an event, information related to the event must be entered into a logbook or registered at the intermediate level

9

How to Determine the Outcome of Signal Verification

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal signals

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, hospital focal point, or key informants)

10

Risk Assessment

- Risk assessment (RA) is done after an event is confirmed
- RA is the systematic process of gathering, assessing and documenting information to assign a level of risk to human health to an event
- Regardless of the source of the information, a risk assessment should be carried out at the intermediate level and, if relevant, at the higher levels as well

11

Risk Assessment

- Public health authorities evaluate all available information and then assess or characterize the level of risk that the situation poses to public health
- The first risk assessment of an event must take place within 48 hours of the detection of one or more signals

12

Processes and Possible Outcomes of RA

No investigation required if...

- Report is a rumour

Monitor if...

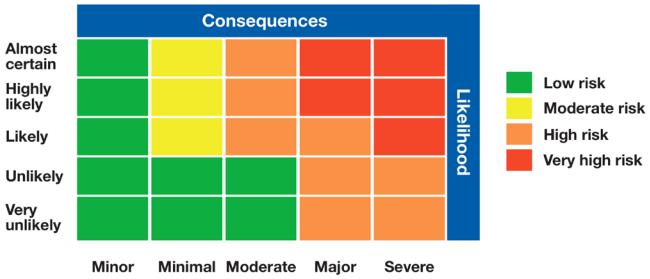
- Report is verified as true
- Mortality/morbidity is as expected for the disease
- Severity of cases is low

Investigate /respond if...

- Report is verified as true
- Mortality/morbidity is higher than expected
- The disease is unexpected/novel to the community
- There are possible consequences to trade and/or travel
- Severity of cases is high or higher than expected for the disease
- The public health event creates major panic in the community
- The number of cases is increasing

13

Risk Characterization Matrix



14

Interpretation of Risk Level

Low risk	Managed according to standard response protocols, routine control programs and regulation (e.g. monitoring through routine surveillance systems)
Moderate risk	Roles and responsibility for the response must be specified. Specific monitoring or control measures required (e.g. enhanced surveillance, additional vaccination campaigns)
High risk	Senior management attention needed: there may be a need to establish command and control structures; a range of additional control measures will be required some of which may have significant consequences
Very high risk	Immediate response required even if the event is reported out of normal working hours. Immediate senior management attention needed (e.g. the command and control structure should be established within hours); the implementation of control measures with serious consequences is highly likely

15

Summary

- Public health authorities at the intermediate level may receive EBS-related information in the form of signals or events from communities and health facilities
- The intermediate level will conduct only RA for all events reported through CBS, and triage, verification and RA for all signals reported through HEBS
- The intermediate level should report all events and RA results to the corresponding upper administrative level

16

Participate in the small-group exercise

Complete the interactive case study exercise in groups of up to 10 participants. Start by reviewing the case study assigned to your group, then answer the questions that follow.

Refer to Appendices A and B for the EBS verification and risk assessment tools.

Case 1: Cluster of a gastrointestinal disease in the community

Scenario description

One morning, Dr. Fasso, a surveillance officer at the intermediate level, received a call from Khady Diallo, the local-level supervisor in the village of Butumba. Ms. Diallo told him that she was informed by a CHV that five sick persons (two children and three adults) were taken to a traditional healer after they fell ill with the same symptoms. Ms. Diallo informed Dr. Fasso that all five persons had attended a wedding ceremony at a neighboring village the day before, had eaten from the same bowl with their hands, and had drunk water from the same cup. Around 12 hours later, all became ill with severe vomiting and abdominal pain. All of them were attended to in the local clinic and received intravenous fluid therapy to treat moderate dehydration. The two children were referred to the nearest hospital because their clinical condition did not improve. The youngest (4 years old) died two hours ago.

Questions: Complete the following questions using the triage, verification, and risk assessment tools.

1. Is this information reported by the CHV a signal? Why?

2. If this information is a signal, who should conduct the triage?

3. Describe how the triage should be conducted for this case scenario.

4. If the signal is not a duplicate and is relevant to EWAR, what is the next step?

5. Who should verify this signal?

6. How should signal verification be conducted?

7. If the signal has been verified as an event, what is the next step?

8. Once the event has been reported, what is the next step? Please explain.

9. Who should conduct the initial risk assessment?

10. Describe how the initial risk assessment should be conducted.

11. What should the decision of the risk assessment team be after evaluating the event and available information?

Case 2: Sudden bleeding and multi-organ failure in a pregnant woman

Scenario description

Dr. Chan, a surveillance officer, received a call from the HEBS focal point at the county hospital. The call was from Dr. Xi who reported that 2 days earlier, a 23-year-old pregnant woman (in her 3rd trimester) had been admitted to the emergency room with a fever, general malaise, weakness, headache, vomiting and shortness of breath. A chest X-ray revealed bilateral lobar pneumonia. A standard pneumonia treatment plan was initiated. The patient developed bleeding in the gums and nose 5 hours after being admitted, and her clinical condition worsened with facial swelling and pain in the chest, back, and abdomen. She has been transferred to the intensive care unit (ICU). In spite of adequate treatment, the patient has developed shock and multi-organ failure. The head of the ICU reported the case to the HEBS focal point as a signal because he thinks the patient presents unusual clinical manifestation and failed to respond to standard therapy.

Questions: Complete the following questions using the triage, verification, and risk assessment tools.

1. Is this case a signal? Why?

2. If this information is a signal, who should conduct the triage?

3. Describe how the triage should be conducted.

4. If the signal is not a duplicate and is relevant to EWAR, what is the next step?

5. Who should verify this signal?

6. How should signal verification be conducted?

7. If the signal has been verified as an event, what is the next step?

8. Once the event has been reported, what is the next step? Please explain.

9. Who should conduct the initial risk assessment?

10. Describe how the initial risk assessment should be conducted.

11. What should the decision of the risk assessment team be after they evaluate the event and information available?

Ask questions

Ask any questions that you may have regarding the content.

SESSION 6

HOW TO RECORD DATA FROM EVENT-BASED SURVEILLANCE

Purpose

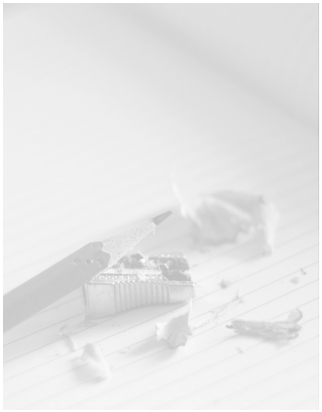
- Describe the importance of EBS data recording at the intermediate level
- Record EBS data from health facilities and communities at the intermediate level using an example of an event logbook, the IDSR District Log of Suspected Outbreaks and Rumors

Total time: 60 minutes

View the presentation

Learn how to record EBS data at the intermediate level by listening to the lecture and taking notes on the slides below.

Detailed lecture notes can be reviewed after the presentation in Appendix H: Notes for Session 6: Event-Based Surveillance Data Recording at the Intermediate Level.



Learning Objectives

- Describe the importance of EBS data recording at the intermediate level
- Record EBS data from health facilities and communities at the intermediate level using an example of an event logbook, the IDSR District Log of Suspected Outbreaks and Rumors

2

Data Recording

- EBS data recording is important for reporting purposes
- Public health authorities at the intermediate level should be able to record EBS data from health facilities and communities using a tool that enables the collection of event data

3

Recording EBS Data Reported by the Community and Health Facilities

- The intermediate-level should only record events reported from the community level or events verified by the intermediate level from signals reported by health facilities
- Event data should be registered in a logbook that incorporates the recording of events, such as the IDSR District Logbook of Suspected Outbreaks and Rumors

4

IDSR District Log of Suspected Outbreaks and Rumors

Record verbal or written information from health facilities or communities or social media about suspected outbreaks, alerts or reports of unexplained events. Record the steps taken and any response activities carried out.

Condition or Disease or Event	Source of suspected outbreak or rumour (newspaper, telephone etc.)	Number of cases initially reported	Number of deaths initially reported	Location (health centre)	Date district was notified	Date suspected outbreak was investigated by the district	Result of district investigation (Confirmed, Ruled Out, or Unknown)	Date outbreak began

5

IDSR District Log of Suspected Outbreaks and Rumors

Date onset of index case	Date crossed threshold or first cluster	Date a case was first seen at a health facility	Date specific intervention began	Type of concrete intervention that was begun	Date on which district notified national level of the outbreak	Date district received national response	Comment (include if sample taken and results)	Name and signature

6

Summary

- The intermediate level should record all events that are reported and verified from health facilities and communities
- Event data should be registered in a logbook that incorporates the recording of events, as soon as they are reported or verified

7

Participate in the small-group exercise

Complete this exercise by returning to the case studies presented in Session 5 and answer the questions, below. You should also refer to the IDSR District Log of Suspected Outbreaks and Rumors in Appendix C.

Answer the following questions as a group:

- Did you have all the information you needed to complete the IDSR District Log of Suspected Outbreaks and Rumors?
- List what additional information would be helpful to complete it.
- Describe how completing this case study will help you better conduct EBS at the intermediate level.

Ask questions

Ask any questions that you may have regarding the content.

Event data should be registered in a logbook that incorporates the recording of events, such as the IDSR District Logbook of Suspected Outbreaks and Rumors as soon as they are reported by communities or health facilities.

SESSION 7

FLOW OF INFORMATION

Purpose

- Identify when information should be reported up administrative levels
- Describe how information should be reported up administrative levels
- Explain the importance of feedback to reporters in communities and health facilities

Total time: 20 minutes

Participate in the small-group exercise

Return to the same groups formed during the introductory icebreaker to complete the interactive case study exercise below.

Answer the following questions on prepared flipchart paper or in the space provided:

Q1: When should information be reported up administrative levels? Why?	**Q2:** How should information be reported up administrative levels? Why?
Q3: Why is feedback back to reporters in communities and health facilities important?	

Ask questions

Ask any questions that you may have regarding the content.

SESSION 8

SUPPORTIVE SUPERVISION

Purpose

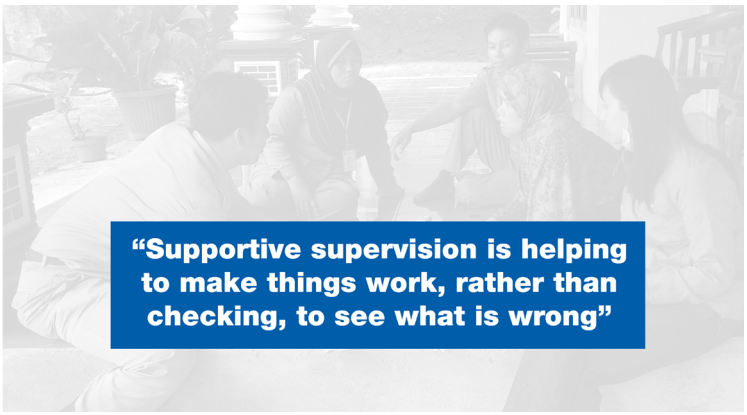
- List the supportive behaviors to improve commitment and performance
- Identify the most suitable supportive behavior according to circumstances
- Demonstrate how to use supportive behaviors in practice

Total time: 60 minutes

View the presentation

Learn how to provide supportive supervision to supervisees by listening to the lecture and taking notes on the slides below.

Detailed lecture notes can be reviewed after the presentation in Appendix J: Notes for Session 8: Supportive Supervision.



Why Is It important?

- It can increase staff capacity to collect, manage, and use data
- It helps staff to improve their own work performance continuously
- It helps to establish a collaborative working environment
- It facilitates understanding of common goals
- It is carried out in a respectful and non-authoritarian way with a focus on using supervisory visits as an opportunity to improve knowledge and skills of health staff
- It encourages open, two-way communication, and team-building approaches that facilitate problem-solving

4

Comparison of Two Supervision Approaches

Non-Supportive Supervision	Supportive Supervision
• Focus is on finding faults with individuals • Supervisor is like a policeman • Episodic problem-solving • Little or no follow-up • Punitive actions intended	• Focus is on improving performance and building relationships • More like a teacher, coach or mentor • Uses local data to monitor performance and solve problems • Follows up regularly • Only support is provided

World Health Organization. (2008). Training for mid-level managers (MLM). 4. Supportive Supervision. Geneva.

5

The Three 'Rs' for Effective Supportive Supervision

- Right supervisors: A core set of supervisors, well trained on supportive supervision techniques and with updated information and skills on EBS issues
- Right tools: Availability of training materials and job aids to update skills of health workers during supervision visits, and checklists and forms for recording recommendations and follow up
- Right resources: Sufficient vehicles, per diems, and time allocated for supervision and follow-up

6

Supportive Supervision Techniques to Improve Commitment and Performance

- Supervision should be facilitative, not fault-finding
- Always praise work well done before raising problems
- If you see a problem, check if the supervisee sees the same problem
- Analyze problems with the supervisee to gain a good understanding of the underlying causes
- Let the supervisee suggest possible solutions; this facilitates ownership and acceptance of the solutions

7

Conducting a Supportive Supervisory Visit

- Observation
- Use of data
- Problem-solving
- On-the-job training
- Recording observations and feedback

8

Summary

- Supportive supervision is important to improve performance and commitment
- Plan for supervisory visits
- During the visits: adopt supportive supervision techniques
- After the visits: follow-up and regular contact

9

Participate in the small-group exercise

Practice supportive supervision techniques by role-playing the four different scenarios below.

Scenario 1: CBS local-level supervisors are not conducting triage correctly

Context

Dr. Gonzales is the surveillance officer in charge of District X. His district is the largest in the country, including 50 communities with a total population of 10,000 inhabitants. Since EBS has been introduced in the country, it has been well integrated into the national IBS system. During the first three months of the implementation of EBS, Dr. Gonzales was able to train at least one person in each community and recommended that this person organize a cascade training, or at least instruct one person among the staff about EBS. Dr. Gonzales has also conducted at least one supervisory visit in each of the communities in his district. However, in the last month, due to important meetings on surveillance at the national level, he has been out of his office and left his deputy, Dr. Gomez, in charge.

Upon his return, Dr. Gonzales calls Dr. Gomez for a debrief of any important issues during his absence. Dr. Gomez is a medical doctor particularly interested in epidemiological surveillance and EBS, which he finds fascinating. During the debriefing, Dr. Gomez immediately reports on the EBS activity, pointing to one community in particular. He thinks that something is going on in that community and that the reports of Mr. Linera, the point of contact for that community, have been strange and inconsistent lately. It seems that the same report on a number of diarrhea cases had been sent twice, and the name of the school where the cases occurred was the same, indicating two different events. Dr. Gonzales asks Dr. Gomez whether he had undertaken any actions to explore that situation, but Dr. Gomez replies that he has not, as he prefers to discuss this with Dr. Gonzales before taking action.

After the debriefing, Dr. Gonzales calls Mr. Linera on the phone to ask if everything is fine. Mr. Linera sounds unwell and says that he has been in bed for the last week with the flu. He says that he has delegated all his tasks, including EBS, to another person, Mrs. Chavez, and that she had reported nothing unusual in the last week.

Dr. Gonzales wishes Mr. Linera a quick recovery and agrees to visit him the week after.

The following week, Dr. Gonzales, together with Dr. Gomez, organizes a supervisory visit to Mr. Linera.

When they arrive to Mr. Linera's community, Mr. Linera is waiting for them at the post office. They go to Mr. Linera's house together and his wife prepares coffee for everybody. Mr. Linera, still recovering from his illness, calls Mrs. Chavez to join them.

Mr. Linera is a very organized man and very well respected in his community. He had appointed Mrs. Chavez to his tasks as she was his cousin's wife and had also lived in that community for a long time. Mr. Linera had shared the EBS training material with her and they had gone through the training together to make sure that everything was clear. Mrs. Chavez was very precise and attentive, and she could rely on a number of CHVs in the community that she knew personally.

Role-play starts during tea at Mr. Linera's house

Instructor presents: Mr. Linera, his wife, Dr. Gonzales, Dr. Gomez, Mrs. Chavez

Mr. Linera: Thanks a lot for coming all the way here, it's always an honor to have you both in my small community.

Dr. Gonzales: Thanks a lot, Mr. Linera, it's always a pleasure to be here.

After a small round of pleasantries, Dr. Gonzales starts exploring the situation discretely to understand what has happened.

Dr. Gonzales: As you know, I was away for a week but wanted to see how you are doing. Is everything okay with EBS? How have you managed the situation during the week that you were sick? Was Mrs. Chavez in charge?

Mr. Linera: Yes, indeed, Mrs. Chavez has always covered in my absence. Is there any problem?

Mrs. Chavez looks nervous, and it is clear that she wants to say something. She realizes that Dr. Gonzales has invited her to intervene.

Mrs. Chavez: Dr. Gonzales, first I really wanted to thank you for your visit, EBS is a very interesting activity, and I am very proud to be part of the team. It has also been an excellent opportunity to be in very close contact with the community. There is something I actually wanted to report myself, as in the last week we have received information about a certain number of diarrhea cases in a small village nearby. The CHV in charge of that part of the community is relatively new, and I am not sure that he reported correctly.

Dr. Gomez: Now that you mention that, I have to say that we had noticed that small inconsistency and that is actually one of the reasons for our visit. What do you think was the problem?

Mrs. Chavez: I am not sure, the only thing I could think of was that there is a new CHV in that community and I wanted to pay a visit to his neighborhood to check if he's doing well.

Mr. Linera: Mrs Chavez, is there a way to call this CHV and ask him to join us here to understand together what happened?

Mrs. Chavez: Sure, let me call him.

Mrs. Chavez talks on the phone with the CHV who agrees to join the meeting.

CHV: Good morning everybody. Sorry I am late.

Mr. Linera: No problem, it's a pleasure meeting you. I've heard that you are new in the community. First, I wanted to thank you for the very important work that you are doing for our community.

CHV: Thanks, Mr. Linera, it's an honor for me to be part of the team. Yes, as you know, I have recently moved here from the other town, and EBS was a very good way to integrate into this community.

I have reported all the unusual things that may happen in my community, sometimes I do not know whether it is relevant, but I report them anyway. Last week, for instance, I heard that in the school where my son goes there were 10 cases of diarrhea, and I thought that it was something to report. Two days later, another of my friends told me that in the same school there were 10 cases of diarrhea, and I reported them. I am afraid I have to go now (and he looks at his watch), I need to go pick up my son at school.

Mr. Linera: Sure, no problem, thanks so much for coming. Keep up the good work that you are doing. We may organize another training session for CHVs soon. Since you were not in the previous one as you have just moved, please make sure that you will attend this one.

CHV: Sure thing, you can count me in.

When the CHV leaves the house, Mr. Linera looks at Dr. Gonzales and Dr. Gomez.

Mr. Linera: Dr. Gonzales, Dr. Gomez, I have to apologize. I just realized what has happened here: there was a problem in the triage as the second report of the CHV is a duplicate. I am really sorry.

Dr. Gonzales: Mr. Linera, not a problem at all, we know that we can trust you, and I am sure that you will organize a training session for the new CHV very soon. If I may give you some advice: if there are not too many new CHVs, perhaps you can just have an individual meeting with each of them and go through the forms together whenever they have something to report. Working with them to show them how, if, and what to report will be very effective.

Mr Linera: Thanks, Dr. Gonzales, for your understanding, for your trust and for your advice. It is an excellent idea.

Questions for the group:

- What do you think of this scenario? Do you think it is possible to have duplicate reporting? Why/why not?
- What if it happened in your jurisdiction? Would your participation in/observation of the role-play help you manage the situation?
- Do you think Mr. Linera and Dr. Gonzales handled this scenario well? Why/why not?
- What would you have done differently and how?

Scenario 2: Health facility is not reporting any signals

Wonderland is a big country with 25 districts, each consisting of an average of 30 health facilities and one hospital. Traditional medicine is still practiced there, though the medical doctors at the health facilities know the local traditional practitioners well and often collaborate with them.

Dr. Jain is the District Medical Officer of District Lake, which is the biggest district in the country. District Lake includes more than 50 health facilities and two hospitals, Hospital A, situated in the North of the district, and Hospital B, in the center of the district. The country has recently undergone a major reorganization, and District Lake has formed as a result of two smaller districts being merged. In the reorganization, Hospital A will be dismantled, but it will take some time as the personnel have to be reassigned and/or absorbed by the other hospital. The process will take at least six months to one year, and for the time being, all the personnel of the two hospitals have been instructed to conduct their routine activity as usual.

Dr. Jain is aware of this situation, and his appointment as Medical Officer of that district was instrumental for this re-organization. His previous experience as Medical Officer at the national level in the Surveillance Department of the Ministry of Health provides him with the professional experience to accept this new appointment.

Dr. Jain is originally from that district, which is one of the reasons why he welcomed this new appointment. The appointment gave him a way to return home, as the capital was becoming too crowded and busy for him. He will be retiring in three years.

At the national level, Dr. Jain was responsible for EBS and would collect all the reports coming from the districts. He organized and delivered EBS training at the district level when EBS was first introduced in the country.

District Lake, or at least each of the former districts constituting what is now called District Lake, was one of the best-performing districts in EBS. They were very timely in their reporting, their triage was always perfect, and their response activities were appropriate for the events detected. He thought that this new appointment was going to be easy.

A couple of weeks into his new appointment, Dr. Jain noticed that some cholera cases being reported by a group of small health facilities in the North of the country were not being fully reported to him. From the reports, the situation looked very serious, and he was surprised that he only knew of their incidence but not pertinent details such as admission to the hospital.

After this incomplete reporting came to his attention, Dr. Jain decided to visit Hospital A as he suspected that with the reorganization, something could have gone wrong.

He called Dr. Chopra, the Medical Officer in charge of Hospital A, but Dr. Chopra's phone number had been disconnected. He then called the Deputy Medical Officer of Hospital A, and after a few attempts, succeeded in reaching Dr. Sharma. Dr. Sharma was a young medical doctor that had been appointed as interim deputy during the transition process, and was in charge of the Infection Control Unit at Hospital B. Dr. Jain managed to set up a visit to Hospital A for the following morning and immediately started organizing his five-hour drive to Hospital A.

The next morning, Dr. Jain went to Hospital A to meet Dr. Sharma, who was waiting for him in his office. Dr. Sharma had a large pile of documents on his desk and looked very busy.

Dr. Sharma: Good morning Dr. Jain, it is such a pleasure meeting you, thank you so much for the visit, I need your help!

Dr. Jain: Dr. Sharma, of course, I am here to assist you. How can I help?

Dr. Sharma: Actually, Dr. Jain, as you know, last year there was a team that came here from the capital to train the medical doctors on EBS. Unfortunately, in this time of transition, most of the doctors have left and accepted other positions in other hospitals in the country. We only have three doctors left, and all of them are overwhelmed with work. In addition, they often do not have time for surveillance, so I am afraid routine surveillance, as well as EBS, has been neglected lately.

Dr. Jain: I understand Dr. Sharma. It is very common, unfortunately, but I am sure they are doing their best to treat the patients and are taking care of their priorities.

Dr. Sharma: That is true Dr. Jain, but I really do not know what to do with routine surveillance and with EBS, that is so important.

Dr Jain: I cannot agree more, of course. Let me think.
After careful consideration, Dr. Jain suggests a possible creative solution that might resolve the issue.

Dr. Jain: Dr. Sharma, what about involving the nurses? Do you think it is possible to create a pool of nurses that might be interested and motivated to contribute to routine surveillance and to EBS?

Dr. Sharma: This is an excellent idea Dr. Jain. Traditionally it was a group of nurses in charge of surveillance here. We could reinstate that tradition, and I am sure that the nurses will be happy to receive that recognition. With your permission, I can immediately call the senior nurse to organize a meeting with all nurses and decide a plan of action together. If I remember correctly, she has already attended training on EBS in the past.

Dr. Sharma calls Mrs. Malik, the senior nurse, on the phone and she arrives to Dr. Sharma's office after 10 minutes.

Dr. Sharma: Mrs. Malik, thanks a lot for coming so quickly. This is Dr. Jain from the district, here to assist us in resuscitating routine surveillance and EBS. He was suggesting that you and your team could be in charge of these two activities again.

Mrs. Malik: I would love to, and though the nurses in my team are new, I would be happy to organize a training for them. I would just need the updated documents and forms, if any, and some help in organizing the logistics. Also, if I may, Dr. Jain, it would be such an honor for us if you could attend. That would help me a lot to motivate the team. Dr. Jain, what do you think?

Dr. Jain: Mrs. Malik, Dr. Sharma, the answer, of course, is yes. I would be extremely happy to contribute, and I'll tell you more. This is the very hospital where I started my career as a medical doctor, before moving to epidemiology and public health. It would also be of sentimental value to do so. Mrs. Malik, Dr. Sharma, with your help the team will be up and running in no time.

The three of them start planning, and the training starts the next day. The nurses are very happy and proud to be in charge of surveillance and EBS again. They know that this new knowledge and experience will be of great value for them in their future career.

Questions for the group:

- What do you think of this scenario? Do you think clinicians frequently neglect reporting surveillance information because they consider it not to be a priority?
- What would you have done differently and how?

Scenario 3: CBS local-level supervisors are incorrectly filling out data

Dr. Abebe is the district supervisor in Mji, a relatively large town in the country. He has 20 villages/communities in his district and EBS has already been implemented for a year or so. He has conducted extensive training sessions, and he knows that he can rely on community leaders and on the health facilities in his territory to conduct EBS well.

It was during Christmas time when reports coming from one particular community (Community A) started looking strange and contradictory. Sometimes the information was recorded twice, clearly a duplication, but other times it was as though there was a miscoding or a misclassification of information. Community A was a small community in the East of the district with a population of about 600. Dr. Abebe remembered that the CHVs in this community participated actively in their training session, and understood EBS well.

Dr. Abebe called Mrs. Umoja the day after he noticed the odd reports. Mrs. Umoja, who was the local level supervisor for EBS, sounded nervous on the phone but agreed to receive Dr. Abebe for a visit two days later.

The visit

Mrs. Umoja was waiting for Dr. Abebe when he arrived in the main square of Community A. They went to Mrs. Umoja's office at the local clinic (she was the general practitioner's assistant in addition to being the local level supervisor) together. There were many patients in the waiting room, mostly mothers with children. It was vaccination week for measles for a special catch-up campaign that the WHO had organized.

Dr. Abebe: Good morning Mrs. Umoja. How are you and how are things over here?

Mrs. Umoja: Doctor, it is such a pleasure to have you here. As you see we are very busy with this vaccination campaign and definitely understaffed, as you know.

Dr. Abebe wanted to be sensitive about the situation and avoid taking too much time of Mrs. Umoja's already busy schedule, so he went straight to the point.

Dr. Abebe: Mrs. Umoja, I notice that some of the EBS reporting forms that you sent me were strange. Knowing how excellent your work normally is, I was wondering whether something had changed.

Mrs. Umoja (looking extremely nervous now): Dr. Abebe, I am really sorry about this. The fact is that during the preparation for this week's vaccination, I delegated the EBS task to a newly hired nurse. I had no time to train her and to show her the forms and the instructions, but at the beginning, I was able to supervise her and double-check the reports before she would send them to you. However, this last week I have been really busy with the vaccination campaign and have been unable to supervise her. I thought that everything was clear and she never complained during the week. She told me that she had sent everything to you.

Dr. Abebe: Indeed, your timeliness in reporting is excellent, and you never miss a week. However, in this last week, some of the signals reported as verified were not true signals, and there was also a duplicate in the reports. That's why I have decided to organize this visit. I understand that it might have been difficult for you to manage all this, and it was a very good idea to involve the newly hired nurse to do the job. I am sure that your supervision was excellent, and I am sure that this is an excellent opportunity for her to learn about EBS and to contribute to improving the health of the population in this community. Perhaps we could meet with her so we can go through the forms together? Then the new nurse could officially replace you in this task. It would be for me an opportunity to meet her and include her in the staff.

Mrs. Umoja was very happy with Dr. Abebe's reaction and immediately called the nurse on the phone, asking her to join her in the office. Mrs. Ima (the new nurse) arrived 15 minutes later and was extremely nervous to meet with the district supervisor.

Dr. Abebe: Good afternoon Mrs. Ima, it is such a pleasure to meet you. Mrs. Umoja is telling me that you have been involved in EBS during this busy period. How do you like it?

Mrs. Ima (very shy): Good morning Dr. Abebe, it is an honor to meet you. Yes, Mrs. Umoja asked me to help her with this task, and I am actually learning a lot. However, if I have to be honest with you, when Mrs. Umoja left me alone with the EBS I was not sure that I was doing a good job. But I did not want to bother Mrs. Umoja, as I know she is very busy with the campaign. I hope I can be involved officially one day in EBS, I really like it, and I think it is very important for our population.

Dr. Abebe: Actually Mrs. Ima, this is precisely what I want to talk to you about. That day is already today, and I would like to go through the forms together with you and with Mrs. Umoja so that you can start officially being the focal point for EBS in this community. What do you think?

Mrs. Ima was very happy about this good news and accepted the task. Dr. Abebe went through the documents with her, using the opportunity to show Mrs. Ima what was not correct in the previous forms. This was also a way for Dr. Abebe to show Mrs. Umoja that her supervisory style was probably too present: a better approach would be to let Mrs. Ima complete the job on her own first, and then come together at the end to review and revise the forms if necessary.

After that visit, the reports from that community were always on time and filled in very well.

Questions for the group:

- What do you think of this scenario? Do you think it is common for a supervisor to do the supervisee's job, in order to make it better or do it faster, and neglect to explain why? Do you think it is common for a supervisee to not want to bother a supervisor with their questions, for fear of being judged?
- What would you have done differently and how?

Scenario 4: Community residents are unaware of CBS

Dr. Lulu, a district EBS officer, wants to organize a second training for her 50 CHVs but has very limited resources. She had already conducted an initial training six months earlier and thought it was successful. However, she is now concerned about one community in particular (Village B) because she heard that all of the CHVs in that community had died. This community only had three CHVs, all of whom were elderly and had been selected because they were very well respected by the whole community. Unfortunately, all three had died in the recent cholera outbreak, and Dr. Lulu did not know who was in charge now.

Dr. Lulu calls her cousin Angela, who lives in Village B and tells her that she will be travelling to Village B the week after to visit her, but also to better understand the situation.

Dr. Lulu arrives in Village B and meets with Angela.

Dr. Lulu: Angela, thanks for meeting on such short notice. I have a problem with this community as I have the feeling that nobody knows about EBS now that the three CHVs have died of cholera. What do you think?

Angela: Dear cousin, it is so nice that you came. You are always very busy in the big city with your work. Yes, the situation is not good over here. As you know, the recent cholera outbreak was very bad, and many people died, including your CHVs. Their families left the village, and now I have no idea who is in charge of EBS. People don't trust the public health system anymore and are relying more on traditional medicine for their diseases or conditions.

Dr. Lulu is worried that nobody is in charge of EBS and that it will be difficult to manage the mistrust in the system that the outbreak has generated. She is a determined woman though, and after thinking for some time, she decides to organize a meeting with several community leaders for the next day. She calls her supervisor (at the national level) to ask if he can join their meeting. There are two issues at stake that require the involvement of someone from the capital: the first is the lack of EBS reporting in the community, and the second is the lack of trust the village has in the public health system.

The day of the meeting

Dr. Lulu: Good morning, everybody. Thanks for coming to this meeting. I am very happy to see you all here. How many of you know about EBS?

The attendees look at each other as though Dr. Lulu is from another planet. One attendee, Mr. X, says:

Mr. X: Of course we know about EBS. We have even recently attended a two-day training on EBS. But you know, the last cholera outbreak hit this community very hard, and people don't want to see a doctor now. They prefer to go to a traditional practitioner. Also, we are still working on gathering people to show how to treat water, and we have no time to spend on additional tasks. People are scared of getting ill, and they have no time for these meetings.

Dr. Lulu looks at her cousin, who does not look surprised by what Mr. X is saying. Taking advantage of the side discussions happening in the crowd, Dr. Lulu takes a few minutes to talk to her cousin about her ideas. With her cousin's approval, she then regains the floor to share some of these ideas with the audience.

Dr. Lulu: Sir, sir, please, I understand that the situation is not easy, but as you may remember from the EBS training, performing excellent EBS helps the population to prevent outbreaks such as the cholera outbreak you just had. If the signal is immediately reported and verified as true, the action can be implemented immediately, and many cases of cholera can be avoided. Please, follow me for another five minutes.

We had a couple of ideas. I know that this is a particularly religious community and that you all gather in church on Sundays. Also, my cousin tells me that there are still three schools in this village and two of them are still working. I understand that people are busy, but we were wondering whether those places (church and schools) could be used to spread the word about EBS and refresh the value of EBS in this community. It is very sad what happened here, but we need to use this very sad occasion to show people that we can do better to avoid such a situation from happening again. What do you think?

Mr. X: Dr Lulu, you are right. This is a very sad situation, but I know my people are strong and will survive this challenge. Faith will help us all to do so. I am not sure about the schools at the moment, because since the outbreaks happened, not many kids are going to school. But we can certainly try with the church. I go myself every Sunday, and the majority of the community still goes. I am sure that the reverend will agree to use his sermon to help us.

Questions for the group:

- What do you think of this scenario? Is it possible that trust in the public health system is so low? Can this happen in your community?
- What do you think of the suggested solution? Would it work in your community? If not, what other opportunities could you use to achieve the objective?

Ask questions

Ask any questions that you may have regarding the content.

SESSION 9

MULTISECTORAL COLLABORATION

Purpose

- Describe the importance of multisectoral collaboration in EBS
- List the stakeholders that can be involved in EBS implementation in health facilities and communities
- Identify the most suitable method to involve them

Total time: 45 minutes

Participate in the Q&A discussion

Form groups of 4-5 and participate in the guided Q&A discussion by completing the small group activities below:

1. Use the flipchart to draw the existing flow of disease surveillance in your country.

2. Make a list of additional actors that could be involved to improve or complete the EBS.

3. For actors not yet involved, brainstorm:
   - How to involve them
   - How to maintain EBS discussions
   - How to benefit from the collaboration

Ask questions

Ask any questions that you may have regarding the content.

SESSION 10

HOW TO TRAIN OTHERS ON COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

Purpose

- Describe different learning strategies and techniques to use when training others
- Identify the most suitable training method according to the context

Total time: 60 minutes

View the presentation

Learn about different learning strategies by listening to the lecture and taking notes on the slides below.

Detailed lecture notes can be reviewed after the presentation in Appendix K: Notes for Session 10: How to Train Others on Community-Based Surveillance and Health Facility Event-Based Surveillance.

Design of Training Activities

3

What to Promote in Adult Learning Methods

- Interactivity
- Active participation (interaction with others)
- Discussion
- Experience
- Appropriate motivational context
- Application to real life problems

4

Topics

- Lectures
- PowerPoint presentations
- Facilitating a group discussion
- Effective facilitation and communication tips
- Role-play facilitation tips
- Case study facilitation tips

5

Lectures

Traditional and the oldest method of training by an instructor to a group of learners

- Talking without any support
- Using a PowerPoint presentation
- Using a discussion

6

How to Effectively Deliver a Lecture

- Take time to prepare
  - Collect the needed information
  - Practice your lecture
- State the objective(s) of your lecture in the beginning
- Limit the number of messages conveyed
- Adapt to and engage the audience
- Show enthusiasm
- Summarize the main points of the lecture at the end
- Allow some time for questions at the end

7

PowerPoint Presentations

- Collection of individual slides that contain information on a topic
- Requires preparation
- Requires practice
- Requires a clear objective
- Should target the audience
- Should engage the audience

8

PowerPoint Presentations

Do's	Don'ts
• Put one message per slide • Limit to 5 to 6 bullet points per slide • Use key phrases and include only essential information • Use contrasting colors for text and background. • Allow one minute per slide • Prepare, design, deliver	• Put more than one message per slide • Create overly "busy" slides with too much text • Overuse special effects such as animations and sounds • Read the slides • Use 3D graphs • "Karaoke" slides

9

Group Discussion

- A communicative situation that allows participants to share their views and opinions with other participants
- A systematic exchange of information, views, and opinions about a topic, problem, issue or situation
- Discussion takes place among the members of a group who share some common objectives

10

How to Facilitate a Group Discussion

- Make sure all participants know the objective of the discussion and the reason to be in that group
- Be involved in the discussion from the beginning
- Encourage all participants to contribute
- Keep the time
- Maintain the focus of the discussion on the relevant topic
- Summarize the main points at the end
- Share a list of action points at the end

11

Effective Facilitation and Communication Tips

- Active listening techniques
  - Building trust and establishing rapport
  - Demonstrating concern
  - Paraphrasing to show understanding
  - Nonverbal cues which show understanding such as nodding, eye contact, and leaning forward
  - Brief verbal affirmations like "I see," "I know," "Sure," "Thank you," or "I understand"
- Give each participant the opportunity to contribute
- Remain neutral during the discussion

12

Role-Play Technique

- A **technique** that allows participants to explore realistic situations by interacting with other people in a managed way
- Objective is to develop experience and trial different strategies in a supported environment

13

Role-Play Facilitation Tips

- Make sure to present the purpose of the exercise and its ground rules
- Arrange the room to allow all participants to observe the players
- Ask participants to take notes
- Talk through the roles and the play with the “actors”
- Let the role-play start
- Observe and take notes
- Allow some time for feedback and discussion after the role-play

14

Case Study Technique

- Analyzes a defined problem consisting of a real situation and uses real information as methodological tool
- Allows students to develop and enhance different skills (e.g., comprehension and analysis of real problems and the capacity to propose and evaluate alternatives)

15

Case Study Facilitation Tips

- Adapt the details of the case study to fit the participants’ reality and that of their country and/or community
- Be available to answer questions or provide clarification if needed
- Guide the participants through the case study without interfering
- Make sure that all participants contribute

16

Demonstration

- Show how to do it
- Ask participants to do it
- Supervise their practice
- Follow-up with debriefing and questions

17

How can I choose the right technique?

- According to the objective(s) of the learning activity

18

Categories of objectives

- The three domains of learning are:
  - **Cognitive** domain that emphasizes thinking and knowledge (concepts)
  - **Skills** domain that features manually or physically performing actions (psychomotor)
  - **Attitudinal** domain that highlights attitudes, values, interests, attentions, concerns, responsibilities, and the ability to listen, respond and demonstrate interactions with others

19

Training with a cognitive objective

- Describe the concepts of virology, bacteriology and immunology related to different test formats
- Define the advantages and limitations of forecasting
- Define surveillance of vaccine-preventable diseases, vaccine uptake, vaccine safety, immune status, sero-epidemiology and vaccine effectiveness

→Interactive lectures with PowerPoint presentations

20

Training with a skills objective

- Develop basic computer programmatic and analytical skills
- Apply criteria and algorithms to decide on reporting at the national level
- Carry out analysis for cohort and (matched) case-control studies, including stratified and multivariable analysis

→Demonstrations
→Supervised practice
→Follow-up

21

Training with an attitudinal objective

- Be comfortable in the communication of a decision
- Encourage collaboration between groups to share information
- Implement collaborative activities and teamwork with other professionals
- Critically appraise and cope with the consequences of wrong decisions
- Negotiate a project
- Improve teamwork skills

→Role play
→Brainstorming
→Group discussion

22

Summary

- Learning strategies are only one component of training
- There are different strategies in adult learning
- It is important to choose the most appropriate according to the context

23

Ask questions

Ask any questions that you may have regarding the content.

SESSION 11

TRAINING REVIEW, POST-TEST

Purpose

- Reflect on the knowledge and skills acquired
- Provide final feedback to facilitators

Total time: 30 minutes

Review the agenda and what has been learned

Review the training you have just received by referring to your agendas and the items discussed during the second half of training.

Complete the post-test

The purpose of the post-test is to assess your knowledge, understanding, and application of EBS now that you have finished the training. Your facilitator will distribute the questionnaire to you to complete.

Review post-test answers

After all participants have completed their questionnaires, you will review the correct answers to the post-test with the facilitator. You can record the correct answers in Appendix D: Intermediate-Level Event-Based Surveillance Training Knowledge Check.

APPENDIX A

EVENT-BASED SURVEILLANCE VERIFICATION TOOL

As EBS is highly sensitive, it is essential to verify the authenticity of a reported signal and its characteristics. This process of verification involves actively cross-checking the validity of available information and collecting additional information about the report using reliable sources as needed. The process of signal verification should answer three main questions:

- Is the report accurate (i.e., true)?
- Has the information been reported by a reliable source or sources?
- Does the report meet the criteria for one or more signals?

The graphic shown below can be used to determine the outcome of signal verification, once sufficient information has been collected and validated.

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal criteria

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, health facility focal point, or key informants)

The examples on the following pages demonstrate the process of signal verification using specific signals that may be utilized in CBS or HEBS.

Two or more persons presenting with similar severe illnesses in the same setting (e.g., household, workplace, school, street) within one week

Discard if...

- There is only one person presenting with illness
- The persons present with dissimilar signs and symptoms
- There is no temporal association, and >1 week separates the patients' illness
- The persons presenting with similar symptoms reside in different settings that are physically well-separated

Confirm as an event if...

- There are two or more persons presenting with similar signs and symptoms who live or work in the same setting
- The ill persons had an opportunity for exposure or close contact with one another
- The persons' illness requires hospitalization
- One or more persons has died
- There is a common source of exposure

Unexpected large number of deaths of poultry or other (domestic) animals

Discard if...

- The number of animal deaths is what is normally expected
- There is a reasonable explanation for the animal deaths

Confirm as an event if...

- The number of animal deaths is not what is usually expected
- There are multiple clusters/groups of animal deaths
- There is no explanation for the animal deaths

Severe illness of a healthcare worker after exposure to patients with similar symptoms

Discard if...

- The ill healthcare worker did not have exposure to patients with similar symptoms
- The healthcare worker's illness does not require hospitalization
- The healthcare worker did not have exposure to patients

Confirm as an event if...

- The ill healthcare worker had exposure to patients with similar symptoms
- There are multiple clusters/groups of severely ill healthcare workers with exposure to patients with similar symptoms
- The healthcare workers' illness requires hospitalization
- One or more patients have died
- One or more healthcare workers have died

One or more hospitalized patients with unexplained severe illness, including failure to respond to standard treatment

Discard if...

- The patient is not severely ill (i.e., does not require hospitalization)
- There is a reasonable explanation for the patient's illness
- The patient is responding to standard treatment

Confirm as an event if...

- The patient is severely ill (i.e., requires hospitalization)
- There are multiple clusters/groups of severely ill patients and/or deaths with similar symptoms
- There is no explanation for the patient's illness
- The patient is not responding to standard treatment
- One or more patients have died

APPENDIX B

EVENT-BASED SURVEILLANCE RISK ASSESSMENT TOOL

In order to assess the nature and magnitude, or risk, of an acute public health event, it is important to continuously and systematically gather, assess, and document information using reliable sources. Risk assessment should be conducted on a recurring basis as more information is gathered about an event. Additional information may include, but is not limited to:

- Nature of the event/agent/disease
- Source of event identification
- Location of the event
- Potential origin (infectious, chemical, radiological, nuclear)
- Date of event or date of onset
- Number of cases/deaths, severity of the case
- Number of people potentially exposed to the hazard
- Groups affected (e.g. age, occupation, gender)
- Common clinical/laboratory characteristic among affected
- Likelihood of an intentional release
- Likelihood of group intoxication/contamination
- Potential for importation of cases to the country (for international events)

The following tool can be used to determine the outcome of a risk assessment, once sufficient information has been collected and analyzed. The outcome of a risk assessment should inform response efforts. Note that no matter what the outcome is, all information must be reported up to the next level within the public health structure.

No investigation required if...

- Report is a rumour

Monitor if...

- Report is verified as true
- Mortality/morbidity is as expected for the disease
- Severity of cases is low

Investigate /respond if...

- Report is verified as true
- Mortality/morbidity is higher than expected
- The disease is unexpected/novel to the community
- There are possible consequences to trade and/or travel
- Severity of cases is high or higher than expected for the disease
- The public health event creates major panic in the community
- The number of cases is increasing

APPENDIX C

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE DISTRICT LOG OF SUSPECTED OUTBREAKS AND RUMORS

Record verbal or written information from health facilities or communities or social media about suspected outbreaks, alerts or reports of unexplained events. Record the steps taken and any response activities carried out.

Condition or Disease or Event	Source of suspected outbreak or rumour (newspaper, telephone etc.)	Number of cases initially reported	Number of deaths initially reported	Location (health centre)	Date district was notified	Date suspected outbreak was investigated by the district	Result of district investigation (Confirmed, Ruled Out, or Unknown)	Date outbreak began

Date onset of index case	Date crossed threshold or first cluster	Date a case was first seen at a health facility	Date specific intervention began	Type of concrete intervention that was begun	Date on which district notified national level of the outbreak	Date district received national response	Comment (include if sample taken and results)	Name and signature

APPENDIX D

INTERMEDIATE-LEVEL EVENT-BASED SURVEILLANCE TRAINING KNOWLEDGE CHECK

The purpose of this test is to assess your knowledge, understanding, and application of event-based surveillance. This test should be completed by intermediate-level public health authorities participating in EBS training. Please circle the best answer.

1. Fill in the blank: Event-based surveillance requires the detection and _____ reporting of signals which may indicate the possibility of a serious public health event.

2. Intermediate-level public health staff are not responsible for the triage of signals reported from health facilities.

a) True **b)** False

3. Verification is conducted to determine if a signal reported is true or false.

a) True **b)** False

4. Intermediate-level public health authorities are responsible for leading risk assessment.

a) True **b)** False

5. Risk assessment should be conducted continuously from the confirmation of an event to the end of the response to an event.

a) True **b)** False

6. Fill in the blank: The three possible outcomes of risk assessment are _____, _____, and _____.

7. Intermediate-level supervisors are responsible for only providing feedback to reporters from health facilities.

a) True **b)** False

8. Fill in the blanks: List two reasons why supportive supervision is important:

_____

_____

9. Supportive supervision requires effective communication that does not include_____.

a) active learning
b) constructive performance feedback
c) finding faults
d) encouragement

10. Cross-communication between the Ministry of Health and other relevant sectors (including animal and environmental health) ensures that signals are ultimately reported through EBS.

a) True **b)** False

11. Effective EBS training facilitators continuously _____

a) Build rapport with training participants

b) Assess the participants' needs by asking questions

c) Use learning techniques that promote interactivity and motivation

d) All the above

APPENDIX E

NOTES FOR SESSION 3: EVENT-BASED SURVEILLANCE OVERVIEW

What are early warning and response systems? (Slide 4)

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 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 regard, EWAR relies on a process called **epidemic intelligence,** consisting of two main channels of information, indicator-based surveillance (IBS), and event-based surveillance (EBS).

Why is EWAR important? (Slide 5)

EWAR ensures that public health threats are detected in a timely manner. This can lead to faster interventions and increases the potential for the prevention of outbreaks.

What is IBS? (Slide 6)

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. Data are analyzed in comparison with baseline values and thresholds to determine unusual disease patterns.

The Integrated Disease Surveillance and Response (IDSR) is an example of primarily IBS activities.

What is EBS? (Slide 7)

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. As such, EBS can be implemented in communities, schools, pharmacies, the animal health sector, health facilities, 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.

Integration of IBS and EBS (Slide 8-11)

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 (EI) 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). EI should integrate both IBS and EBS to efficiently detect acute public health events and/or risks.

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 notification and programmatic purposes; data/indicators are developed accordingly and are collected and transmitted in routine and mostly passive reporting. Conversely, in EBS, both content and format of information collected are not defined (i.e., unstructured information). Data sources for EBS are diverse, intended for varying audiences, including some with non-human health objectives (e.g., environmental health, wildlife and fisheries, and animal health).

What is CBS? (Slide 12)

In June 2018, a group of technical experts defined community-based surveillance (CBS) as "the systematic detection and reporting of events of public health significance within a community by community members". This definition encompasses the detection and reporting of events. To ensure consistency with this definition, this module will employ the term CBS.

What is HEBS? (Slide 13)

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; rather, it relies on detecting unusual occurrences and patterns of disease (signals) which are primarily reported by healthcare workers.

What is a signal? (Slide 14)

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 unusual, such as a treatment failure for infectious diseases on a standard drug regimen or unexpected deaths.

What is an event? (Slide 15)

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

What are the major steps for EBS? (Slide 16)

EBS can be organized into five main steps:

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

Signal detection (Slide 17)

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.

Signal reporting (Slide 18)

Reporting signals means communicating this information to a public health authority. Informants who detect a signal should report it immediately. Modes of signal reporting can differ depending on available resources but may include telephone, SMS, or verbal notification.

Triage (Slide 19)

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

Triage (Slide 19)

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

Verification (Slide 20-21)

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 (is the information truly occurring or false?). According to the WHO, verification must take place within 24 hours of signal detection. This step may require additional information. **Not all signals become events.**

Risk assessment (Slide 22)

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 the 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. According to WHO, a risk assessment of an event must be conducted within 48 hours of the initial signal detection. Intermediate-/national-level public health authorities should lead risk assessment efforts.

Signals and events (Slide 23)

While events are typically occurrences of patterns of disease, such as clusters of similar illnesses, 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 and will be integrated into the routine disease reporting system, such as the IDSR programs common in African countries.

APPENDIX F

NOTES FOR SESSION 4: SIGNALS FOR COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

Examples of signals and events (Slide 5)

Some examples illustrating the difference between signals and events are:

- A critical care physician hospitalized with a severe respiratory disease with travel history to Saudi Arabia may be a signal requiring reporting. After triage and verification of the signal, there could be more elements to suspect a case of Middle East Respiratory Syndrome as an event.
- A case of typhoid fever that fails to respond to standard treatment may be a signal. After triage and verification, this signal could become an event as a suspected case of extensively drug-resistant typhoid fever.
- A 4-year-old child with fever and rash in the community may be a signal. It can 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 a 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.

Examples of signals for CBS (Slide 7)

Some examples of signals for CBS are:

- Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week,
- A cluster of unexplained animal deaths within one week,
- An illness with novel or rare symptoms (Note: Novel and rare can be explained as signs/symptoms that the community has not seen before), and/or
- Any person with fever and rash.

List of pre-determined CBS signals for the country (Slide 8)

When presenting the list of signals for CBS, it is worth spending some time on the signals to ensure that participants understand each signal well. For each of the signals presented on this slide, ask participants to answer the following questions:

- What do you think we are trying to detect with this signal?
- Why do you think this signal is important for EBS?
- How would you describe this signal to a layperson in your community (community resident)?

List of pre-determined HEBS signals for the country (Slide 9)

When presenting the list of signals for HEBS, it is worth spending some time on the signals to ensure that training participants understand each signal well. For each of the signals presented on this slide, ask participants to answer the following questions:

- What do you think we are trying to detect with this signal?
- Why do you think this signal is important for EBS?

APPENDIX G

NOTES FOR SESSION 5: FUNCTIONS OF EVENT-BASED SURVEILLANCE AT THE INTERMEDIATE LEVEL

Functions of EBS at the intermediate level (Slide 4, 5)

In contrast to IBS, where case definitions are narrow and disease-specific, EBS requires the detection and immediate reporting of signals, which are broad and could indicate the possibility of a serious public health event. Signals that are verified as truly occurring are classified as events.

Public health authorities at the intermediate level may receive EBS-related information in the form of signals or events from a variety of sources, including communities and health facilities. If an event is reported by local-level supervisors, the intermediate level should conduct only risk assessment. If a signal is reported from a health facility, the intermediate level should conduct triage, verification, and risk assessment.

Triage (Slide 6)

Public health authorities at the intermediate level may receive signals from health facilities conducting health facility EBS or HEBS. When authorities receive information about a reported signal, they should conduct triage. Because of its high sensitivity, EBS is likely to generate signals from non-events. Therefore, the authenticity of the signal needs to be established. Figure 1 summarizes the triage process and provides possible questions to ask. Because EBS operates as a sensitive surveillance system, authorities at the intermediate level should continue to encourage the reporting of signals even if they may be later discarded as "non-events."

Figure 1: Possible question to ask during triage (Slide 7)

Questions to ask during triage:

Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?

Was this signal previously reported (i.e., is this signal a duplicate)?

Verification (Slide 8)

Intermediate-level authorities receiving signals from health facilities must also verify these signals before they are determined to be events. Verification is the determination that a signal is valid (i.e., it is not a false alarm or a false rumor), reliable, and that it corresponds to at least one of the signals pre-defined for EBS implementation. Criteria for verification may include asking questions to those who have reported the signal to ensure that they have correctly understood the signal, whether or not the signal has been confirmed by at least two different sources, or the fact that the signal has been reported by a person with medical authority (veterinarian, physician, or laboratory assistant). Verification must be completed within 24 hours of signal detection.

(Slide 9)

The result of verification is the confirmation that a signal is true or false. Once a signal is verified as true, it becomes an event. If confirmed as an event, information related to the event must be entered into a logbook or register at the intermediate level. Systematic verification of all signals detected through EBS is essential to avoid wasting public health system resources on false signal investigations and responses based on unreliable information.

(Slide 10)
As EBS is highly sensitive, it is essential to verify the authenticity of a reported signal and its characteristics. Local-level supervisors are recommended to use the Verification Tool to complete this process. This verification process involves actively cross-checking the validity of available information and collecting additional information about the report using reliable sources as needed. The process of signal verification should answer three main questions:

- Is the report accurate (i.e., is it true)?
- Has the information been reported by a reliable source or sources?
- Does the report meet the criteria for one or more signals?

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal criteria

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, health facility focal point, or key informants)

Risk Assessment (Slide 11)
Risk assessment is the systematic and ongoing process of gathering, evaluating and documenting information that will form the basis of the actions required to manage and minimize the negative consequences of a public health event. The process results in assigning a level of risk that an event presents to human health. Risk assessment should be conducted by intermediate-level public health authorities who propose the action or response that must be taken to manage and minimize the negative consequences of public health events.

(Slide 12)
Risk assessment should be conducted continuously from the detection of a signal to the end of the response to an event. Public health authorities evaluate all available information and then assess or characterize the level of risk that the situation poses to public health. As new information about the situation can arise at any time, the ongoing risk assessment ensures that the appropriate response is triggered and that it reflects the level of risk the event poses to public health. The first risk assessment of an event must take place within 48 hours of the detection of one or more signals.

(Slide 13)
Regardless of the source of information, risk assessment should be carried out at the intermediate level and, if relevant, at higher administrative levels as well. This may involve collaboration between authorities in the public health system at these administrative levels with communities and health facilities. It is also important that risk assessment covers all relevant sectors to take into account the extent of human, animal and environmental risks. All information collected during the risk assessment should be recorded systematically.

Once enough information about the event has been gathered, intermediate-level public health authorities can determine the outcome of the risk assessment. Risk assessment can have three different outcomes:

- No new investigation or action is required, and the event may be closed,
- The event must be monitored, or
- An investigation and a response must be initiated.

APPENDIX H

NOTES FOR SESSION 6: EVENT-BASED SURVEILLANCE DATA RECORDING AT THE INTERMEDIATE LEVEL

Data recording (Slide 3, 4)

Events reported to public health authorities at the intermediate level can be recorded using existing surveillance data collection tools (where available) to ensure that data collected through EBS are integrated into existing data platforms. It is recommended that countries use the District Log of Suspected Outbreaks and Rumors available through the IDSR framework to collect data on events.

The IDSR District Log of Suspected Outbreaks and Rumors may be adapted by intermediate-level public health authorities to record information about events detected through EBS. Note that signal information should not be entered in this logbook.

Table information key for EBS information using the IDSR district logbook (Slide 5)

- 'Condition or Disease or Event' should be completed with a brief description of the event (e.g., suspected measles, cluster of suspected cholera, earthquake).
- 'Number of cases initially reported' indicates the number of cases reported when the initial signal was reported.
- State the name of the location where the event is occurring, as precisely and exactly as possible. If an address is available, record it.
- 'Date district notified' is the date that the intermediate-level public health authorities were notified about the event. Enter date in the DD-MM-YYYY format.
- 'Date suspected outbreak was investigated by the district' is the date that the intermediate-level public health authorities began investigation of the reported event. Enter the date in the DD-MM-YYYY format.
- 'Result of district investigation' asks public health authorities to state whether the event was ruled out or confirmed as a suspected outbreak requiring a response, or whether the status is still unknown.
- 'Date outbreak began' is the date that the event began, or the date of symptom onset of the index case. Depending on the event occurring, this may also be the date the threshold was crossed for a seasonal disease, or the date the first cluster of cases was recognized. Enter the date in the DD-MM-YYYY format.
- 'Date a case was first seen at a health facility' is the earliest known date that a case sought medical care. Enter the date in the DD-MM-YYYY format.
- 'Date specific intervention began' is the date a response was initiated. Enter the date in the DD-MM-YYYY format.
- 'Type of concrete intervention that was begun' asks public health authorities to describe what was conducted as part of the response.
- 'Date district notified national level of the outbreak' is the date the intermediate-level public health authorities communicated with higher levels about the occurrence of an outbreak. Enter the date in the DD-MM-YYYY format.
- 'Date district received national response' is the date that intermediate-level public health authorities received response support from the national level. Enter the date in the DD-MM-YYYY format.
- Enter any further comments in this field.

APPENDIX I

NOTES FOR SESSION 7: FLOW OF INFORMATION

Model answer: When should information be reported up administrative levels?

Intermediate-level public health authorities may receive EBS-related information in the form of signals or events from a variety of sources, including communities and health facilities. Signals detected in communities by CHVs, key informants, or small health facilities are typically reported to local-level authorities who conduct triage and verification of signals. Public health authorities at the intermediate level may receive signal information from large health facilities, such as large hospitals, which require triage and verification. Regardless of the source of EBS information, public health authorities at the intermediate level conduct risk assessment to help define additional actions, which may include immediate reporting to higher administrative levels. All events must be reported and investigated according to the existing national surveillance and reporting structure.

Model answer: How should information be reported?

Intermediate-level public health authorities can record and report data using existing surveillance data collection tools (where available) to ensure that data collected through EBS is integrated into existing data platforms, such as IDSR. These reporting tools may be electronic or paper-based but should be clearly defined among all administrative levels to ensure consistent EBS reporting and feedback.

Model answer: Why is feedback to immediate lower levels necessary?

Equally important to timely reporting is timely, routine feedback. Intermediate-level public health authorities should provide feedback about events and signals to surveillance focal points at health facilities and local-level supervisors, who in turn provide feedback to health care workers, community health volunteers, and key informants. Providing regular feedback on the signals and events reported is essential to sustain motivation for reporting among communities and health facilities.

APPENDIX J

NOTES FOR SESSION 8: SUPPORTIVE SUPERVISION

Supportive supervision techniques to improve commitment and performance (Slide 7)
These are behaviors that will help you improve the commitment of the people under your supervision as well as the quality of their performance as they aim to achieve the common goal.

Supervision should be facilitative and not fault-finding: when supervising someone, remember that that person is crucial for the achievement of the common goal; in this case, the quality of EBS in your jurisdiction. Your role is to increase the commitment of your collaborators so that they can ultimately improve the quality of their job, and hence the achievement of the common objective. You don't start the supervision by saying what went wrong, but instead by trying to understand why an issue occurred and by facilitating the process of finding a solution together.

Always praise work well done before raising problems. You may want to start your supervision visit by acknowledging the hard work they have done, despite, for instance, their work conditions. Then you can state the objective(s) of your visit and start analyzing the situation together.

If you see a problem, check if the supervisee sees the same problem: very often mistakes are made because of a lack of knowledge, not because of bad performance. Therefore, before pointing the finger at something done wrong, check if your supervisee shares the same perspective and sees the same problem. By doing this you can identify where the problem is. If the supervisee doesn't see the same problem, your solution should simply be to guide them through the procedures in order to make sure that he/she shares the same understanding.

Analyze problems with the supervisee to gain a good understanding of the underlying causes. Once you have both identified the problems and what can be improved, work together to find a creative solution to address the issue.

Let the supervisee suggest possible solutions, as this facilitates ownership and acceptance of the solutions. Once you have identified the problem, let the supervisee suggest possible solutions and limit yourself in guiding the process. Sometimes the knowledge of the context helps to formulate a solution that you may not have thought of. Also, if the supervisee finds a solution to the problem, you can be sure that they understand how they may be able implement it.

APPENDIX K

NOTES FOR SESSION 10: HOW TO TRAIN OTHERS ON COMMUNITY-BASED SURVEILLANCE AND HEALTH FACILITY EVENT-BASED SURVEILLANCE

Design of training activities (Slide 3)

In this slide you can see that "how to teach" is only one of the elements to be taken into consideration when preparing training activities.

We will not go into too much detail on the other elements, but perhaps we can have a look and comment together so we are aware of the complexity of such an activity.

The elements are:

- **Why and what to teach:** Make sure that the objectives of our training are clear and well formulated. They could be related to knowledge, procedures, or attitudes.
- **When to teach:** Timing is also important. We normally design and deliver training to adult professionals, and they are busy with their routine activities. We need to take that into account when deciding the timing of our training for it to be successful, to gather the maximum number of participants and to have them on board for the duration of training.
- **How to teach:** Choose the best training methodology according to the object of your training, whether that be a PowerPoint presentation, lecture, focus group discussion or role-play. We will see each of these techniques in a minute.
- **Last, but not least:** Always include time in your schedule to **evaluate** your training activity. This includes evaluation of the trainer, the suitability of the program for the audience, how well the messages in the program were delivered, and how engaged (attentive, interactive, etc.) the participants were. *The Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance* includes a Post-Training Evaluation that can be used immediately following training, as well as an Event-Based Surveillance Training Impact Evaluation that can be used to understand knowledge retention in the months following the training.

What to promote in adult learning methods (Slide 4)

In this slide, you can see the general elements that have to be considered when organizing and delivering training for adults.

- **Interactivity:** Keep the activities interactive and promote structured interactivity with the audience. Use their experience and let them talk and contribute to the activity.
- **Discussion:** The presentation should not be a monologue. Promote discussion with the audience and give them space to share their own experiences. Make sure to keep an eye on the time and do not entertain endless discussions.
- **Experience:** Your audience will likely include experienced people who have learned their jobs by doing them, facing challenges, and finding their own solutions. You may need to use those experiences and facilitate sharing with the rest of the group.
- **Appropriate motivation context:** Normally, adults participating in training are driven by the motivation of learning something new that will help them in their daily jobs. Keep an eye on that motivation and always keep it high.
- **Applied to real-life problems:** The training material needs to be adapted to the audience. Make sure to use examples, situations and contexts that "speak to" your audience.

Lectures (Slide 6)
A lecture is the most traditional (and probably the oldest) method of teaching. Lectures are typically one-way presentations.

Lectures can be delivered without any support by speaking directly to the audience. However, lectures can be made more effective by using technical support, such as PowerPoint presentations or even some prepared points to launch the discussion.

How to effectively deliver a lecture (Slide 7)
To make a lecture effective you need to:

- **Prepare:** Take time to prepare your material, making sure your slides are clear, simple, and not too busy. We'll see how to prepare a PowerPoint presentation in the next few slides.
- **Practice:** Take time to practice your presentation.
- **Be clear:** State the objective(s) of your lecture in one of the first few slides.
- **Be succinct:** Limit the number of messages you want to convey with your lecture. Ideally focus on one. A few messages could also be acceptable, but make sure that the audience is following you if you introduce a new objective/message.
- **Adapt:** Adapt to the audience and use examples and situations that are familiar to them. Engage the audience in the discussion and ask for feedback throughout the presentation rather than just at the end.
- **Show enthusiasm:** When giving your presentation, you need to convey a message, and it must be effective. It is important that you believe in that message yourself.
- **Summarize:** Make sure to take some time at the end of your presentation to summarize the main points of the presentation and reinforce the key messages.
- **Answer questions:** Include time for answering questions at the end of the presentation.

PowerPoint presentations (Slide 8)
A PowerPoint presentation is a collection of slides that helps you present your topic. It is a tool that allows you to be clearer and more effective in delivering your message. Therefore, a PowerPoint presentation **requires preparation** and time to practice, to make sure that your message is clear.

Formulate the objectives in a way that they will be clear to the audience and state the objective(s) of your presentation at the beginning.

Target your audience, making sure that you know something about the audience in advance to tailor your presentation accordingly, in terms of jargon, language, etc.

Engage your audience in the discussion, avoiding monologues and regularly checking the pulse of the situation by asking for questions and feedback.

PowerPoint presentations (Slide 8)
These are some Dos and Don'ts when using a PowerPoint presentation as the tool to clearly convey your messages. These include:

The Dos

- **Do put one message on each slide:** It is easier to guide the audience if the slide is simple.

- **Do use key phrases or key words in the slides** and complete your thought when talking. The slides should be an aid for you rather than a textbook's worth of content (see Don'ts: no karaoke slides). You need to use keywords to prompt your memory, and to make sure that you don't forget any important points/messages that you want to convey.
- **Do use contrasting colors so slides are clearly visible:** Use contrasting colors for the text and background, making sure (where possible) that you design with the venue of your presentation in mind (e.g., is the room too dark or too light?).
- **Do practice presenting to test amount of text in your slide:** You should practice presenting the slide in less than one minute. Although less than one minute is ideal, this does not apply to slides that require more time to explain, such as formulas.
- As with everything we do in our work: prepare, design, and deliver.

Now the Don'ts:

- **Don't put more than one message on each slide:** It is already difficult to make sure that one message is clear for the audience.
- **Don't put too much text on the slides:** Although text helps you convey the message, you should only put a few keywords on your slides and complete your sentences when talking.
- **Don't overuse animations and special effects:** They are distracting and take the attention of the audience away from your message.
- **Don't read off of the slides:** If you simply put keywords on your slides it will be more natural to use those words and complete your thoughts by talking.
- **Don't use 3D graphs:** They are difficult to interpret and see properly.
- **Don't include more than 5 or 6 bullet points in the slides**, otherwise, the slide will be too busy

Group discussion (Slide 10)
Now we'll see what we mean by group discussion.

How to facilitate a group discussion (Slide 11)
A discussion could be endless and ineffective if not moderated well and if there is no facilitation.
That is your role.

- **Make sure that participants know the objective of the discussion** and the reason that they are in that group. Present the objective of the discussion in the beginning and make sure it is clear to everybody. Confirm the reason why they are there. For example, you can say, "Good morning everybody, thanks for coming, I invited you here to discuss together how to …and I invited you here because you are …"
- **Start the discussion** and be involved in it in the beginning, but then,
- **Encourage all participants to contribute.** Observe the room and make sure that each of the participants is contributing to the discussion. If not, try a discreet way to involve the "silent" participants, but also a discreet way to avoid parallel discussion in small groups among a subset of participants.
- **Keep an eye on the time of the session** to make sure that you reach the objective of the discussion within the allocated time.
- **Keep the focus of the discussion on the topic.** You may allow side discussions, but keep them short, and if they continue, remind the audience about the objective of the discussion.
- **At the end of the allocated time**, make sure to summarize the main points of the discussion, and if you have formulated some action points together, make sure they are clear to the group and distributed to the appointed responsible person(s).

Effective facilitation and communication tips (Slide 12)
In this slide you can see some tips that can be applied to any facilitation task that you may be involved in, whether it's a meeting you're moderating, a case study, a group discussion, or a meeting with your collaborator.

- **Active listening** is a technique that allows you to establish effective communication with another person. It relies on a trusting environment that you must build, often in a very short period of time (think of a visit to a doctor).
- To **demonstrate concern** about the topic of the discussion, you may repeat the sentence, changing the words of the other person to show understanding of the situation.
- **Non-verbal communication** is crucial: eye contact and nodding are the most common.
- **Brief verbal affirmations** such as "I see" or "I know" show interest and attention to the conversation.
- **Give each participant the opportunity to contribute.** You may miss an important contribution if one of the participants feels left out of the discussion.
- **Remain neutral** during the discussion. Your role is to moderate and facilitate the discussion and to gather the different opinions in the room, not to convince or to impose your opinion on others.

Role-play technique (Slide 13)
And now another learning technique: the role-play.

Role-play facilitation tips (Slide 14)
In order to facilitate a role-play effectively, you should:

- Present the purpose of the exercise and its ground rules at the beginning
- Arrange the room in a way that allows all participants to observe what is happening during the role-play
- Ask the participants to note their observations
- Distribute the roles to participants before you start the play, taking time to ensure that each participant understands their role-play
- Let the play start
- Observe and take notes, but avoid intervening unless needed (e.g., if participants go off the script)
- Once the play is over, allow some time to collect feedback from the actors as well as the other participants, then facilitate a brief group discussion to summarize the main points of the exercise and what has been learned

Case study technique (Slide 15)
Now we will discuss the last learning technique: the case study.

The case study is often used in the field of epidemiology to present a real case scenario and guide participants through the real investigation or experiences of the authors. There's no correct answer in a case study; rather, it is the real experience of the authors that we are learning from.

Case study facilitation tips (Slide 16)
Some tips that may increase the effectiveness of the case study as a learning technique include the following:

- Be conscious of the context in which you're using a specific case study and be prepared to adapt it to your context if needed. Use examples that "speak to your audience" and that they are familiar with already.

- When facilitating a case study, be available to answer questions and provide clarification as needed. You'll always find the "facilitators' notes" in the facilitators' version of the case study. These will help you address questions and will also provide additional clarification for the audience.
- When facilitating a case study, it is important that you guide participants through the case study without including your personal opinion.
- Make sure that all participants contribute to the discussion and observe if you have "silent" participants in the group that may require help contributing.

Demonstration (Slide 17)
Demonstration is a useful technique when you need to train a group of people to do something new, such as learn a new software or a new reporting form that they will be using in the future.

- Begin by demonstrating the new skill.
- Next, ask participants to try themselves.
- While they are attempting the skill, you can observe, take notes, and supervise. If mistakes are observed, you can intervene to correct them.
- After the practical session, make sure that you allocate some time for follow-up questions and to share your notes with the group during the debriefing.

Choosing the right technique (Slide 18)
Now that we have learned a number of new techniques, you may be wondering how to choose the right technique for your training program. The answer is, it depends on the objectives of your training.

Categories of objectives (Slide 19)
These are the three domains of learning:

- **Cognitive:** This is related mostly to the domain of the concepts and knowing more about something.
- **Skills:** This is a more practical domain, where the objective is to learn how to do something.
- **Attitudinal:** This relates more to attitudes, values, interests.

We'll see a few examples now and try to associate the right learning activity to each of them.

Training with a cognitive objective (Slide 20)
These are examples of a training program with a cognitive objective.

A learning strategy that we can use for this type of training includes the use of interactive PowerPoint lectures, something that we are very familiar with and that we have used a lot during this training.

Training with a skills objective (Slide 21)
These are examples related to the other learning categories: the skills. In other words: every time the objective is to know how to do something and it is very practical.

The most effective techniques to learn skills are:

- Demonstration
- Supervised practice and follow-up

Training with an attitudinal objective (Slide 22)
And finally, the attitudinal objective. This relates more to a change in behavior or attitude towards a common goal or concept. In the slide, you can see a few examples of attitudinal objectives.

In this case, the techniques that can help in interacting with your audience are:

- Role-play
- Brainstorming
- Group discussion

These activities need facilitation as we have seen earlier. During these activities, the facilitator has, among others, the crucial role of observing the audience and making sure that each participant contributes to the discussion.

Summary (Slide 23)
In summary:

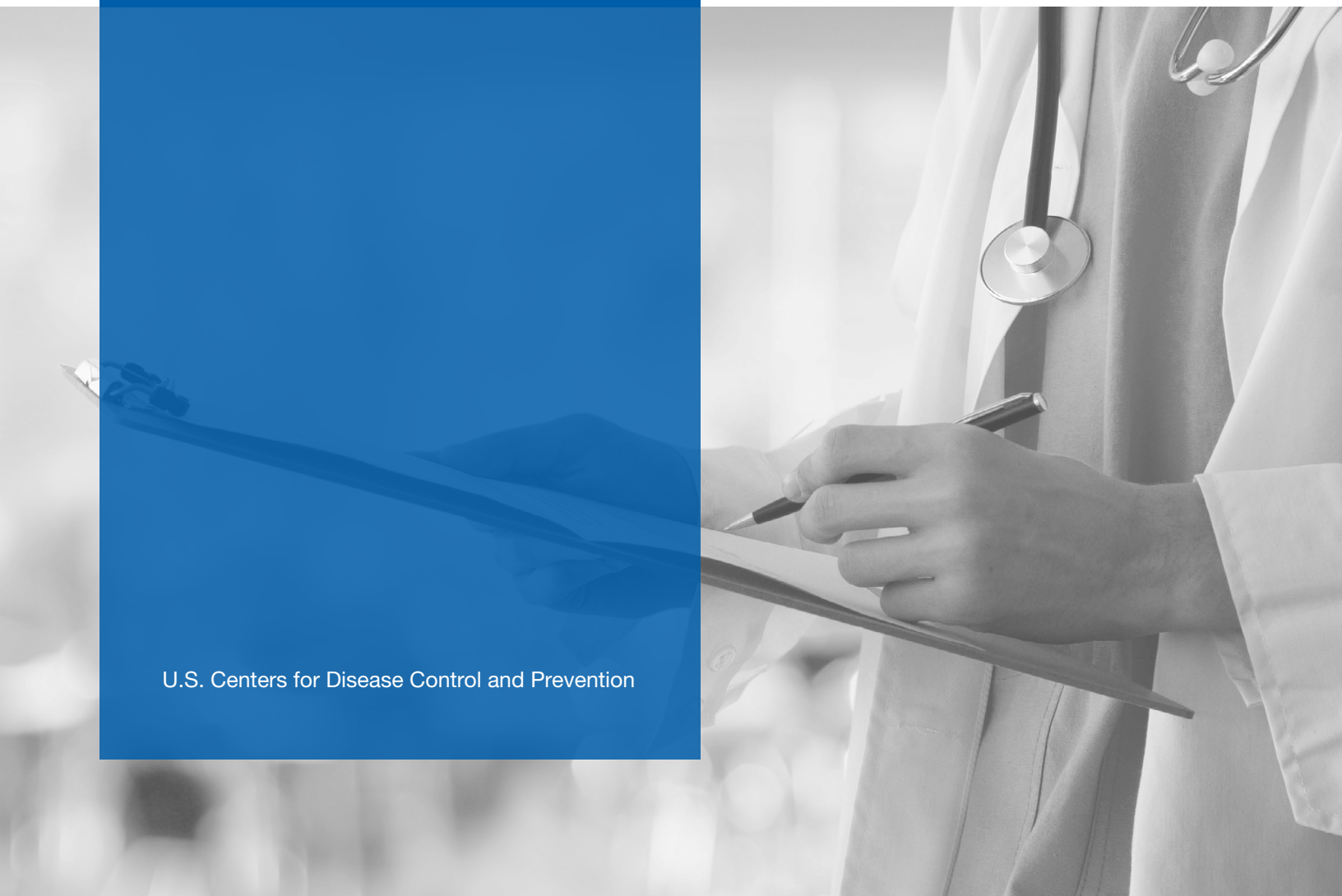
The learning strategy is only one of the components of a training, together with logistics, the facilitators, and most importantly, you, the audience.

In this session, we have learned the most commonly-used strategies for adult learning, and you have had the opportunity to practice them all. As you have experienced in other sessions in this two-day training, we have chosen different techniques according to the learning objectives that we wanted to achieve. If you now look back at the different sessions in the training, you should understand why we did not always choose to give a PowerPoint presentation, and why for certain activities, we have preferred a group discussion or a role-play.

What do you think? Now that you know most of the techniques, would you have chosen a different learning strategy or method for any of the activities in this training? If so, which activity and what other strategy would you have replaced it with?

MODULE 4

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING MODULE

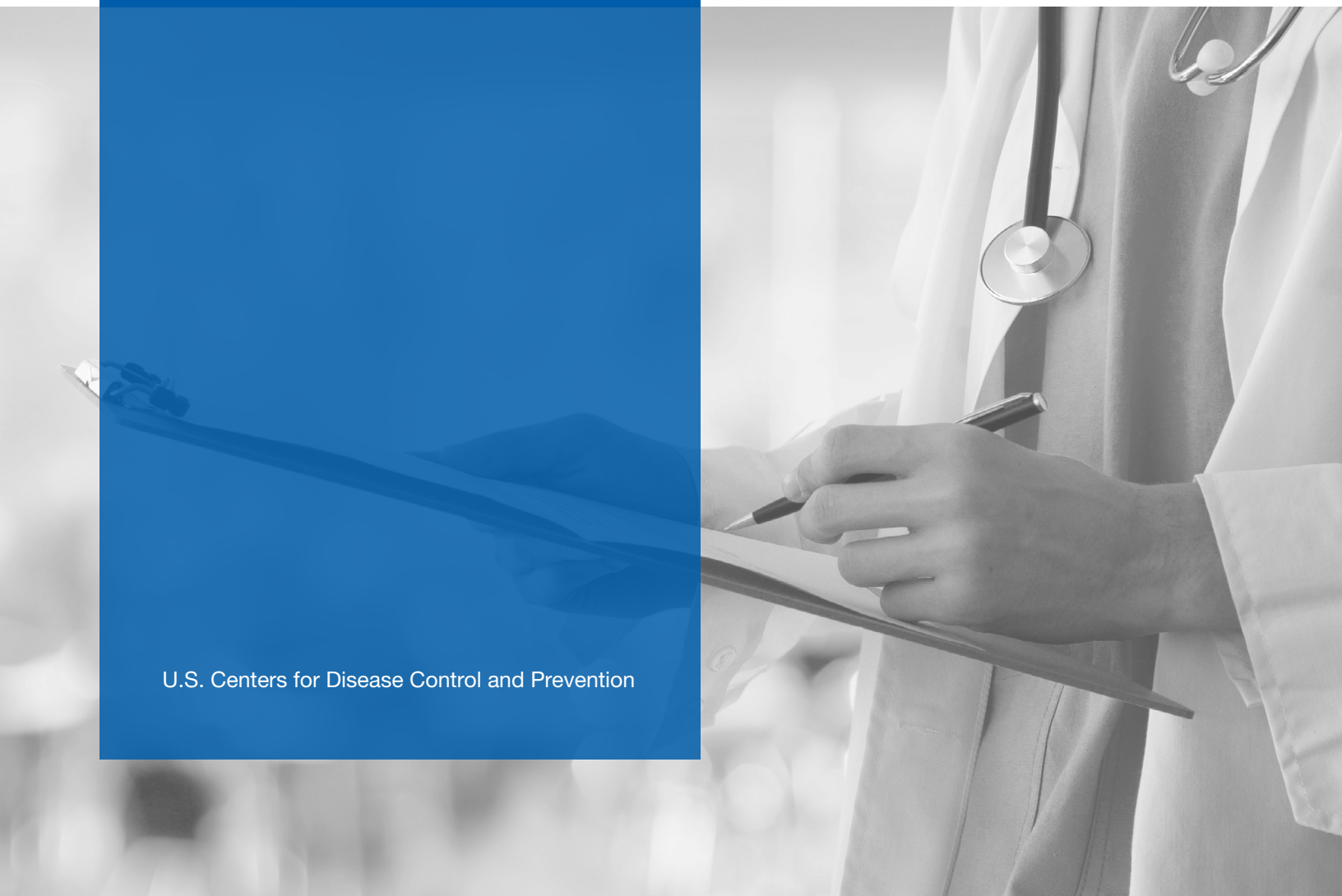


U.S. Centers for Disease Control and Prevention

MODULE 4.1

HEALTH FACILITY EVENT-BASED SURVEILLANCE TRAINING MODULE

FACILITATOR GUIDE



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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 ▶ Welcome and introductory icebreaker ▶ Training overview and agenda	Group activity 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 ▶ Signal reporting ▶ Signal reporting for HEBS	Lecture Small group exercise	35 minutes
6. Engagement of Healthcare Workers ▶ Engaging healthcare workers and other facility staff	Brainstorming group exercise	20 minutes
7. Wrap-Up and Closing ▶ Takeaways from the training ▶ Participant feedback and closing	Group discussion Group activity	20 minutes
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.*

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

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.

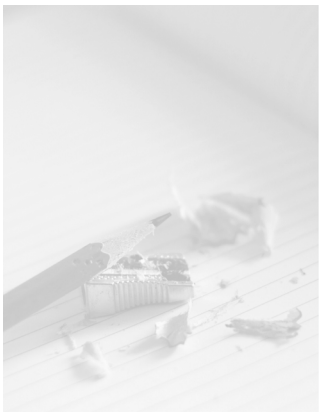
Step 2: Thank participants and close

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 ▸ Welcome and introductory icebreaker ▸ Training overview and agenda	Group activity Introductions Lecture	20 minutes
2. Overview of Surveillance ▸ EWAR, IBS, and EBS	Group discussion and lecture	30 minutes
3. HEBS 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

3

Agenda

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

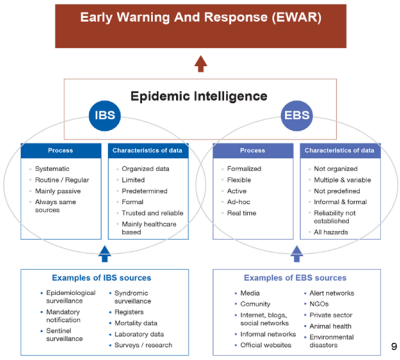
"The organized collection, monitoring, assessment and interpretation of mainly ***unstructured ad hoc information*** regarding health events or risks, which may represent an acute risk to human health"

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



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/hr/publications/WHO_HSE_GCR_LYO_2014.4/en/

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

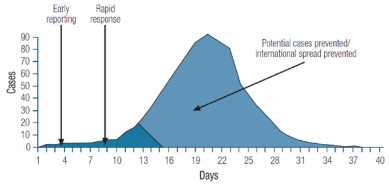
10

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

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

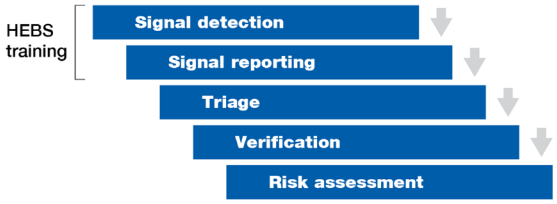
What is an event?

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

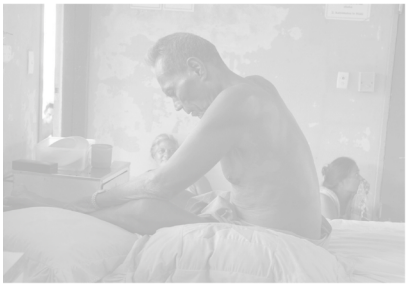
- A single case of disease in some settings
  - Notifiable diseases, e.g. cholera
  - Diseases under elimination, e.g. polio
- Clusters/outbreaks
- Unusual diseases such as drug-resistant tuberculosis

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

8

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

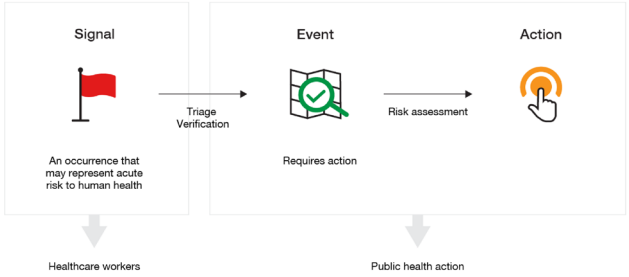
11

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	• A suspected case of MERS
• Siblings (3) are admitted with severe dehydration and profuse diarrhea	• A cluster of suspect cholera cases
• A case of typhoid fever with failure to respond to ceftriaxone treatment	• A suspected case of extensively drug-resistant (XDR) typhoid fever
• A 4-year-old child admitted with fever, rash, coughing, coryza, and conjunctivitis	• 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

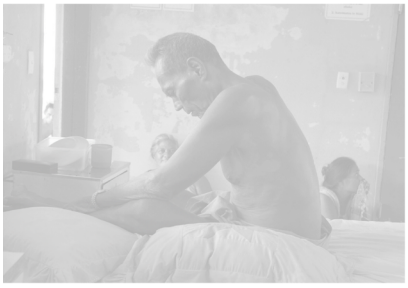
6

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.

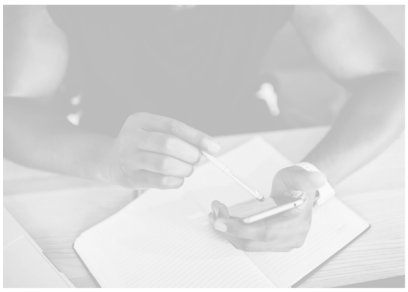
3. How important is it to report this signal?
It is very important. Cholera is a highly transmissible disease.

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

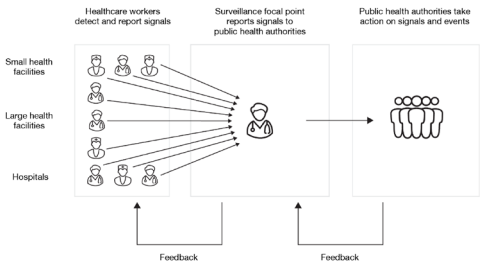
7

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

APPENDIX H

SMALL GROUP EXERCISE: SIGNAL REPORTING

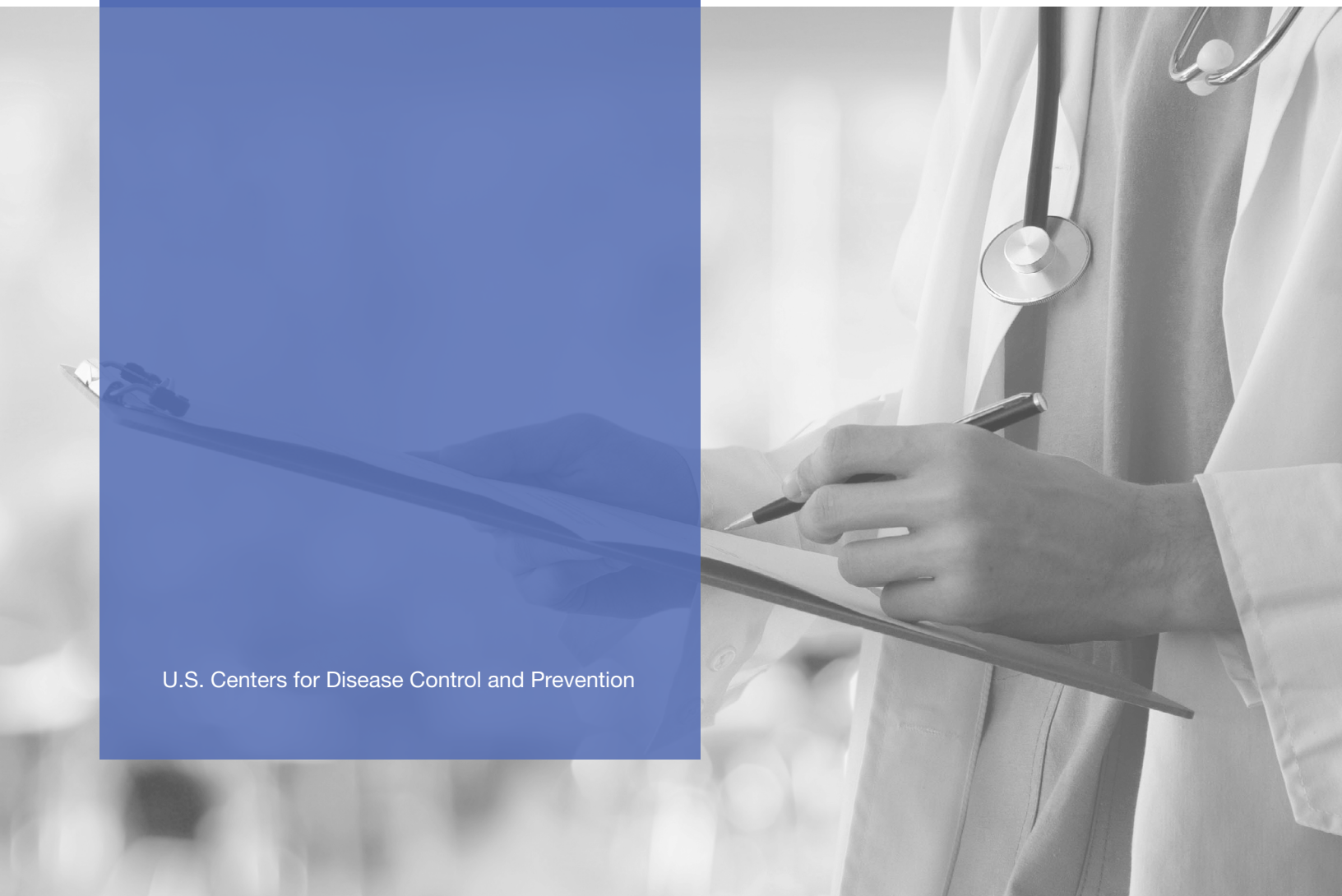
Prepared flipchart for the small group exercise:

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

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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 ▶ Welcome and introductory icebreaker ▶ Training overview and agenda	Group activity 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 ▶ Signal reporting ▶ Signal reporting for HEBS	Lecture Small group exercise	35 minutes
6. Engagement of Healthcare Workers ▶ Engaging healthcare workers and other facility staff	Brainstorming group exercise	20 minutes
7. Wrap-Up and Closing ▶ Takeaways from the training ▶ Participant feedback and closing	Group discussion Group activity	20 minutes
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)

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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"

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Event-Based Surveillance (EBS)

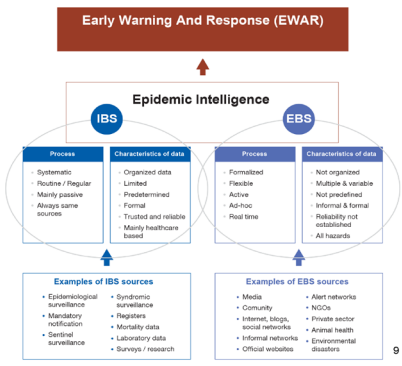
"The organized collection, monitoring, assessment and interpretation of mainly ***unstructured ad hoc information*** regarding health events or risks, which may represent an acute risk to human health"

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/ihr/publications/WHO_HSE_GCR_LYO_2014.4/en/

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

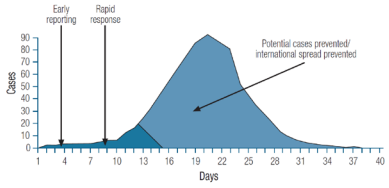
10

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

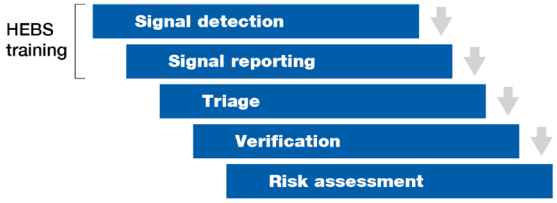
What is an event?

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

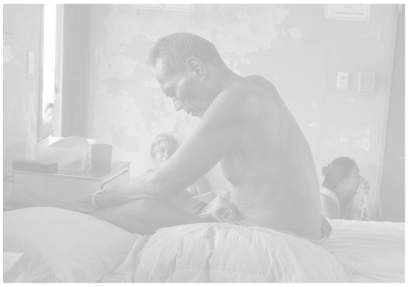
- A single case of disease in some settings
  - Notifiable diseases, e.g. cholera
  - Diseases under elimination, e.g. polio
- Clusters/outbreaks
- Unusual diseases such as drug-resistant tuberculosis

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

7

Signal Reporting

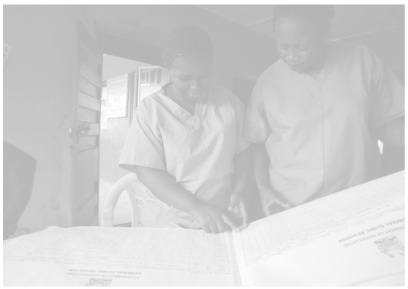
- Reporting signals means communicating this information to a public health authority
- Healthcare workers who detect a signal should report it immediately

8

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

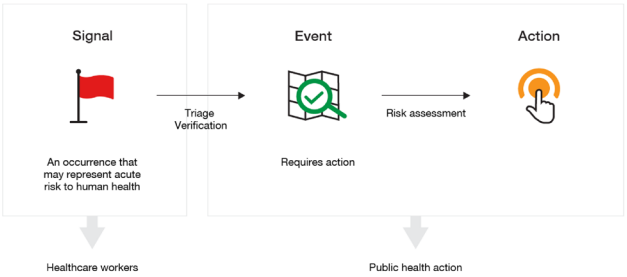
11

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



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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

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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	• A suspected case of MERS
• Siblings (3) are admitted with severe dehydration and profuse diarrhea	• A cluster of suspect cholera cases
• A case of typhoid fever with failure to respond to ceftriaxone treatment	• A suspected case of extensively drug-resistant (XDR) typhoid fever
• A 4-year-old child admitted with fever, rash, coughing, coryza, and conjunctivitis	• 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

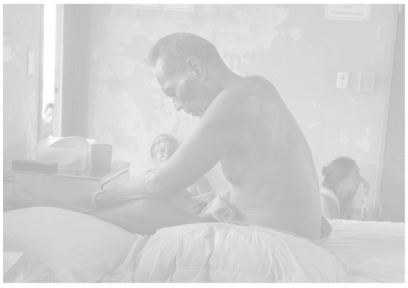
6

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 administrated. 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

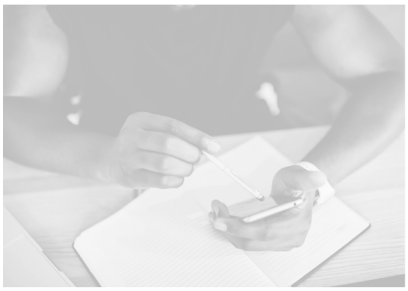
Purpose

- 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

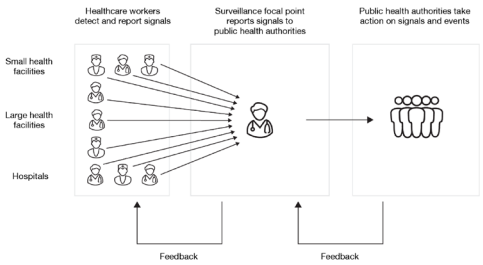
7

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



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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.

MODULE 5

COMMUNITY-BASED SURVEILLANCE TRAINING MODULE

U.S. Centers for Disease Control and Prevention

MODULE 5.1

COMMUNITY-BASED SURVEILLANCE TRAINING MODULE

FACILITATOR GUIDE

U.S. Centers for Disease Control and Prevention

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ACRONYMS

Africa CDC	Africa Centers for Disease Control and Prevention
US CDC	U.S. Centers for Disease Control and Prevention
CBS	Community-Based Surveillance
CHV	Community Health Volunteers
EBS	Event-Based Surveillance
EWAR	Early Warning and Response
IBS	Indicator-Based Surveillance
IHR	International Health Regulations
IDSR	Integrated Disease Surveillance and Response
SMS	Short Message Service
WHO	World Health Organization

GLOSSARY OF TERMS

Community-based surveillance (CBS):	CBS is the systematic detection and reporting of events of public health significance within a community, by community members. Community Health Volunteers (CHV), the public, religious leaders, civil society members, teachers, and similar groups are engaged and trained to detect and immediately report events or health risks occurring in their communities. CBS may also be known as community health surveillance, or community event-based surveillance.
Community health volunteers (CHV):	According to a WHO study group, CHVs may be members of the communities where they work, should be selected by the communities, are answerable to the communities for their activities, and should be supported by the health system but not necessarily a part of its organization. They may also be known as community health workers, among other terms.
Epidemic intelligence:	The systematic collection, analysis and communication of any information to detect, verify, assess and investigate events and health risks with an early warning objective.
Event:	The International Health Regulations (IHR) define an event as "[…] a manifestation of disease or an occurrence that creates a potential for disease; […]". This includes 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.
Indicator-based surveillance (IBS):	Defined by the 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.

Integrated Disease Surveillance and Response (IDSR):	Adopted by the WHO Regional Office for Africa (AFRO), IDSR is an approach to improve public health surveillance and response in the African region by linking community, health facility, district, and national levels.
Intermediate administrative level:	Intermediate administrative levels may be defined differently in different countries. For the purpose of this document, an intermediate level is the public health administrative level below the national-level that is responsible for conducting preliminary investigations and implementing responses to reported public health events or suspected outbreaks in a given jurisdiction. The intermediate level may otherwise be referred to as districts or counties, among others.
International Health Regulations (IHR) (2005):	An international agreement that is legally binding for 194 countries (States Parties), including all WHO Member States. The IHR define their purpose and scope as: "to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade".
Local administrative level:	Local administrative levels may be defined differently in different countries. For the purpose of this document, a local administrative level is the lowest administrative division within a country, directly above the community-level.
Local-level supervisors:	Healthcare workers or other public health staff who have received formal training on surveillance, and who operate at the local administrative level, in healthcare facilities, Ministry of Health offices, or other designated locations. Local-level supervisors are responsible for the triage and verification of signals reported to them from communities, as well as for the supervision of CBS activities and CHV in their catchment area.
Monitoring:	Refers to the routine and continuous tracking of the implementation of planned surveillance activities (monitoring the implementation of the plan of action) and of the overall performance of surveillance and response systems.
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.

	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, may also constitute an outbreak and should be reported and investigated.
Public health surveillance:	The continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice.
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 have to be adapted according to the nature of the public health risk.
Signals:	Patterns of disease or other information considered by the Early Warning and Response 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.
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 State 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 cross-checking of the validity (veracity) of the signals collected by EWAR, by contacting the original source, additional sources, or by performing field investigation. Verification requires that hoaxes, false rumors, and artefacts are eliminated from further consideration.

OVERVIEW

Purpose

The CBS Training Module will provide CHVs and local-level supervisors with the knowledge, skills, and tools necessary to effectively implement EBS at the community-level, also known as CBS.

This module is divided into two parts. The first part focuses on training CHVs on the following:

- What is surveillance and why is surveillance important in communities, and
- When and how CHVs, supported by key informants, can effectively conduct CBS activities including detecting, recording, and reporting of signals to local-level supervisors.

The second part of this module addresses the local-level supervisor's role and responsibilities in the CBS process. It discusses:

- How the process of triage and verification of reported signals works,
- Why triage and verification are important,
- When and how triaging and verification of signals are conducted,
- What information should be recorded and reported to higher-level health authorities,
- How to create and maintain a key informant network,
- How to effectively provide supportive supervision to CHVs, and
- What strategies can be used to ensure continuous community engagement in CBS implementation.

Audience

The audience that should receive training using this module includes CHVs and local-level supervisors who will be actively involved in the surveillance of events at the community level, and who may have been previously trained to carry out community health activities.

General Objectives

The Community-Based Surveillance Training Module has two general objectives:

- To build and strengthen the capacity of communities to conduct effective surveillance activities in line with the routine surveillance strategy, and
- To improve the flow of surveillance information between the community and the existing public health surveillance system.

Specific Learning Objectives

By the end of this training module, CHVs will have the skills, knowledge, and resources to:

- Detect signals emerging in the community,
- Report signals to their local-level supervisors, and
- Engage community members (key informants) to participate in CBS.

By the end of this training, local-level supervisors will have the skills, knowledge, and resources to:

- Detect signals emerging in the community,
- Describe the signal triage and verification processes,
- Determine the outcome of signal verification,
- Register and report all events to the intermediate level,
- Demonstrate the use of recommended resources for local-level supervisors for the implementation of CBS, and
- Explain strategies to engage community members (key informants and CHVs) in CBS.

To achieve the maximum benefit from using this module, it is important to consider and acknowledge the role of communities as sources of formal and informal public health surveillance information, and to provide community members not targeted with this training regular basic surveillance and awareness sensitizations.

Facilitator Guide

The Community-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 to provide effective training on CBS to CHVs and local-level supervisors. This guide contains the following sections:

- **CHV Training** – This section provides facilitators with step-by-step instructions on facilitating the training, and teaching, relevant CBS activities (signal detection, data recording, and reporting) to CHVs, while also sensitizing local-level supervisors to these activities.
- **Local-Level Supervisor Training** – This section provides facilitators with step-by-step instructions on facilitating the training- and teaching-relevant CBS activities (signal triage, signal verification, data recording, reporting, and supportive supervision) to local-level supervisors.
- **Appendices** – Basic templates for CBS resources, guidelines for exercises, and participant evaluations.

This detailed Community-Based Surveillance Training Module Facilitator Guide is for facilitators to use to conduct training at the community level using adult learning theories and principles. The guide includes the session overview, learning objectives, content overview, teaching methodology, materials, and suggested timeframe for each session and activity. The guide also includes step-by-step instructions, facilitator tips, and key messages to guide facilitators to effectively deliver the module.

Community-Based Facilitators

Training for CBS stakeholders, including CHVs and local-level supervisors, should be conducted by persons (at least two) with deep knowledge of surveillance. Facilitators should have experience with IBS in their countries, as well as knowledge of any existing community health structures, EBS, and CBS. In addition, they should have knowledge and expertise on group facilitation using adult learning theories and principles and should familiarize themselves with the training materials in advance.

Effective Facilitation and Communication Tips

When facilitating small group exercises and discussions and delivering lectures, it is essential that facilitators are mindful of adult learning principles and aware of their facilitation and communication style. Effective facilitation and communication skills for these delivery methods include:

- Preparing yourself for the facilitator role by familiarizing yourself with the training materials and facilitation techniques,
- Arranging the training space for group discussions and reading and writing activities,
- Ensuring the learning outcomes are clear by reviewing them with the group at the start of the session,
- Using lay language and everyday words during lectures and group discussions,
- Managing participation by reinforcing the importance of active participation, active listening, and role allocation to participants,

- Providing enough time for participants to achieve the exercise's learning objectives,
- Observing the mood of the room and knowing when to adjust your facilitation style and communication (e.g., when to conduct a quick energizer exercise or ask check-in questions),
- Recognizing and reinforcing supportive behaviors and responses by highlighting the participants' experiences and encouraging peer-to-peer learning, and
- Supporting the small group's success by summarizing key points, asking questions, and thanking them for their participation.

Agenda

The suggested agenda for this CBS training is a one-day training split into two workshops; a morning workshop for both CHVs and local-level supervisors, and an afternoon workshop for local-level supervisors only. The proposed agenda may be revised as needed based on EBS implementation and country context.

Materials

Each participant should receive a copy of the Community-Based Surveillance Training Module Participant Guide at the beginning of the workshop, which contains materials for their use during and after training. This Facilitator Guide also provides guidance on how best to facilitate activities if materials such as flipchart paper and markers are not available.

Preparation

All facilitators for CBS training should review the materials needed to carry out each session, found in each section of this guide. Once facilitators are familiar with the content, they should take the time to develop the materials that are required in the sessions. In particular the following materials should be prepared in advance:

- Appendix A: Training Knowledge Check Part 1 (copied for CHV + local-level supervisors x 2)
- Appendix B: Training Knowledge Check Part 2 (copied for local-level supervisors x 2)
- Appendix F: Signal Game
- Appendix I: Flipcharts

LOGISTICS AND SUPPLIES

Training Location and Space Setup

Training locations may vary, and can include community health facility compounds, health centers, hospitals, church premises, and other locations. Five to six tables with a seating capacity of six participants per table is recommended. This will facilitate group work and discussions in the plenary sessions. The facilitator(s) will also be able to move around the tables more easily to engage in discussions and answer any questions from trainees.

Assistance to the Principal Facilitator

As previously stated in Section F above, it is strongly recommended that this training be facilitated by at least two persons; a primary facilitator and a secondary facilitator who can assist with small group activities and discussions and can record and take notes during the session.

If the primary facilitator is alone, he/she should identify at least four participants who are literate and can volunteer to play the role of team (or small group) leads. Each volunteer will be responsible for reading the content and instructions for the small group exercises, role-plays, and case studies as well as reporting back to the larger group on their group's discussions and answers. Designating participants as 'team leads' builds leadership and facilitation skills among CHVs and local-level supervisors and helps mitigate any literacy concerns that participants might have.

Supplies for Participants

- Name tags and holders
- Writing pens and journals
- Copies of Community-Based Surveillance Training Module Participant Guide

Supplies for Principal Facilitator

- Flipchart, markers, tape
- Bowls or containers x 2
- Community-Based Surveillance Training Module Facilitator Guide
- Community-Based Surveillance Training Module Participant Guide

COMMUNITY HEALTH VOLUNTEERS TRAINING (1/2 DAY)

AGENDA FOR COMMUNITY HEALTH VOLUNTEER TRAINING

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions Activity	Small group formation Introductions	30 minutes
2. Training Overview, Agenda, and Pre-Training Knowledge Check	Group discussion Written or verbal pre-training questionnaire	25 minutes
3. CBS Overview ▶ What is surveillance? ▶ Why is surveillance important in our communities?	Matching exercise Small group discussions & presentation Lecture	30 minutes
4. Signals for CBS ▶ What are signals? ▶ How are signals detected? ▶ What are the signals for CBS? ▶ How do you record signals?	Group discussion Lecture Role-play Case study	60 minutes

Morning Break (15 minutes)
Opportunity to interact with colleagues and mentors

SESSION	ACTIVITIES	TIME
5. Flow of Information: What happens when you report? ▶ What do you report? ▶ Who do you report to? ▶ When do you report? ▶ How do you report signals?	Group discussion Lecture Q&A discussion Role-play	45 minutes
6. Key Informant Engagement: How to engage your communities? ▶ Who are key informants and what is their role? ▶ How do you maintain a network of key informants?	Q&A discussion Small group discussions & presentations Lecture	30 minutes
7. Community Health Volunteer Training Review, Post-training Knowledge Check, and Close	Group discussion Written or verbal post-training questionnaire Summary and participant feedback	25 minutes
CHV Training		**Total 4 hours**

SESSION 1

WELCOME AND INTRODUCTIONS

Purpose

- Help participants get to know each other and share their expectations of the CBS training,
- Get participants to interact with each other and the facilitators in a fun and non-threatening way, and
- Warm up the conversation to the topic of the training.

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
- Markers for each group

Participants

- Participant Guide: Introduction Questions (p. 07)

Total time: 30 minutes

ACTIVITY 1.1

GETTING TO KNOW EACH OTHER

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

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

Group formation

Introductions exercise

30 minutes

Step 1: Introduce yourself

Start the workshop by introducing yourself and providing some background on your experience working in surveillance and interest in facilitating the training. This should provide a non-threatening 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 introductions activity involving all participants, including yourself. This exercise helps everyone get to know each other so they feel more comfortable to interact for the remainder of the training.

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.

When all the participants are standing in their 'postcard groups', explain that they will be working in these 'work groups' throughout the workshop to do various activities.

Step 3: Call for team leads

Once everyone is in their work groups, ask for participants to volunteer to play the role of team leads. You can say something like the following to do this:

In order to successfully meet the goals and objectives of this CBS training as well as meet your expectations, we will need your help facilitating. We are aware that some of you have experience teaching, facilitating, and mentoring your peers, therefore we are asking for a volunteer from each group to help us with this training.

You will be team leads during the small group exercises, discussions, and case studies. In your role, you will:

- *Read out information and instructions for role-plays, small group exercises, and case studies found in the Participant Guide and handouts,*
- *Facilitate and guide the discussion in your group,*
- *Encourage participation from members in your group, and*
- *Record information discussed in your group and present it to the larger group during presentation and feedback activities.*

Please let us know if you are interested in taking this leadership role by standing up and introducing yourself.

You should provide each volunteer an opportunity to say their name, what community they come from, and why they want to be a team lead during this training. Make sure to thank them all for volunteering.

Step 4: Facilitate small group introductions

Now that everyone is in a group and has a team lead, give each group a piece of flipchart paper, list of introductions questions, and markers.

If materials are not available ask team leads to refer to the Welcome and Introductions section in the Participant Guide for the questions for this activity and record the answers in their journals.

Ask participants to introduce themselves by answering the following questions on the flipchart paper (if available) or in their Participant Guide (page 07):

1. What is your name and what community are you from?
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 two words best describe the people in your community?

Ask the group to choose someone who will write the answers and another who will be responsible for introducing each group member and sharing the group's answers with the larger group. If materials are not available, ask the team lead to introduce the group members and share some of the answers discussed in their group.

Each group should be given two minutes to share with the larger group. Remind participants and team leads to stick to the time limit and show respect towards each reporter by not engaging in side conversations.

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

SESSION 2

TRAINING OVERVIEW, AGENDA, AND KNOWLEDGE CHECK

Purpose

- Contextualize and create interest in the training,
- Communicate the training's two general objectives,
- Give participants a roadmap for the workshop via the agenda, and
- Assess their current CBS knowledge and skills.

Materials

Facilitator

- Facilitator Guide: Training Agenda (pp. 13-14)
- Appendix A: Training Knowledge Check Part 1 (copied for CHVs & local-level supervisors)

Participants

- Participant Guide: Training Agenda (pp. 05-06)
- Participant Guide: Purpose of CBS Training (p. 08)

Total time: 25 minutes

ACTIVITY 2.1

TRAINING OVERVIEW AND AGENDA

Communicate the training's two general objectives

Give participants a roadmap for the workshop via the agenda

Group discussion

5 minutes

Step 1: Review the training goals and agenda

Ask participants to open the Participant Guide to page page 08. Go over the purpose of the training and agenda by reading the script below:

The purpose of this training is to provide you—CHV and local-level supervisors—with the knowledge, skills, and tools necessary to effectively detect, record, and report events that may be happening in your communities. Our training today has two general objectives:

- To build and strengthen your ability to look for and report unusual occurrences in your communities, and
- To improve the flow of information between your community and the health system in this country.

Let's now review the training agenda on page pages 05-06. This one-day CBS training is divided into two parts. The first half of the day will focus on

- What surveillance is and why surveillance is important in communities, and
- How CHVs can effectively carry out surveillance in their communities.

As you can see from the agenda, we will be covering the following topics in the first workshop:

- *CBS overview*
- *Signals for CBS*
- *Flow of information: What happens when you report?*
- *Key informant engagement: How to engage your communities?*
- *Training review and post-training knowledge check*

We will have a 15-minute break at [the time 2 ¾ hours from Session 1 start time] so you can stretch your legs and use the bathroom if needed. The workshop will finish at [the time 1 ¾ hours from the end of the break].

The second half of the training is specifically for local-level supervisors. It will discuss local-level supervisors' roles and responsibilities in CBS.

Ask if there are any questions relating to the purpose of the training or the agenda.

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 introductions activity. You can use the following script:

Our goal as facilitators is to make this training as informative and interactive as possible. In order for us to successfully meet the expectations you shared during the introductions activity, we are asking for everyone's participation. We encourage you to share your work experiences and learn from each other. At the same time, we ask that we all respect the ground rules we have listed (point to the flipcharts). If you have any questions or concerns, please feel free to speak to one of us.

If this activity was conducted without flipcharts, facilitators should replace the above paragraph with the following.

Our goal as facilitators is to make this training as informative and interactive as possible. In order for us to successfully meet the expectations you shared during the introductions activity, we are asking for everyone's participation. We encourage you to share your work experiences and learn from each other. At the same time, we ask that we all respect the ground rules we have discussed and agreed upon, such as… (name a few). If you have any questions or concerns, please feel free to speak to one of us.

ACTIVITY 2.2

PRE-TRAINING KNOWLEDGE CHECK

Assess their current CBS knowledge and skills

Questionnaire

20 minutes

Step 1: Prepare participants for the knowledge check

Introduce the knowledge check by reading the script below:

Prior to starting our first session, we're going to complete a short survey on what you already know about surveillance. It doesn't matter if you don't know certain terms. Hopefully by the end of the training you will. We'll do a second check at the end of the training.

Distribute Appendix A: Training Knowledge Check Part 1 to both CHVs and local-level supervisors and read the instructions out loud as follows:

You will have 15 minutes to complete the knowledge check. You are encouraged to ask us if you have any questions or need clarification on questions asked. Please respect everyone's time by not engaging in side conversations once you have completed your own test.

Offer participants the option of taking the knowledge check with the assistance of a facilitator who will read the questions in a small group setting away from the larger group. This will allow participants who may be illiterate or have difficulty reading to feel more comfortable completing the test.

Step 2: Finalize the session

After all participants have completed the knowledge check, collect their questionnaires and let them know they will be looking at the questions again at the end of the training and going over the answers at that time.

Remember facilitators, first impressions are critical, therefore it is important to catch and hold participants' attention right from the start. This can be done by establishing your credibility, listing the objectives of the training, introducing the agenda, noting the ground rules and what to expect, and building interest and excitement.

SESSION 3

COMMUNITY-BASED SURVEILLANCE OVERVIEW

This session focuses on defining surveillance and CBS and discussing their importance in detecting and reporting diseases in the community.

Learning Objectives

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

- Define key terms and activities conducted in CBS,
- Describe how surveillance is conducted in their communities, and
- Describe the importance of surveillance at the community level.

Materials

Facilitator

- Flipchart A (prepare one for each group in advance)
- Markers for each group

Participants

- Participant Guide pages 09-14

Total time: 30 minutes

ACTIVITY 3.1

SURVEILLANCE TERMINOLOGY

Define key terms and activities conducted in CBS

Matching exercise

5 minutes

Step 1: Introduce the matching exercise

Introduce the activity to the group by explaining they are going to go over some key words used in CBS that will be used throughout the training. Ask everybody to open their Participant Guide to page 10. Explain they should spend 5 minutes going through the terms on the left and matching them with their definitions on the right.

Step 2: Consolidate terms in the Participant Guide

Ask participants to complete the matching exercise individually. Check they have the right answers by reading the terms and definitions to them. Summarize the importance of knowing these terms and ask if anyone has any questions before moving to the content overview.

Offer participants the option of completing this exercise as a small group discussion if reading and writing the answers is problematic. Team leads can read out the term and the group can discuss what they think it means. Team leads can then read out the appropriate definition.

CBS Terms Matching Exercise

Term	Definition
Community-based surveillance (CBS)	Regularly checking on how surveillance is being done, and whether it is working.
Detection	When more incidents of a disease exist than would normally be expected in a specific place and time period.
Event	Becoming aware of or noticing a signal that may not be known to health authorities.
Monitoring	To give (either verbally or in writing) an account of a signal you or someone else has heard, and/or seen to health authorities.
Outbreaks	A reaction by health authorities to a detected and confirmed health event in a community.
Recording	Keeping written notes on details and information (i.e., signals and events) reported.
Response	An unusual occurrence that may cause harm to the health of humans, animals, and/or the environment.
Reporting	Keeping watch for, detecting, and reporting signals and events.
Signals	Structured way of detecting and reporting events within a community, by community members.
Surveillance	Things one sees or hears about that are happening in the community that may lead to finding an event that may be a threat to humans, animals, and the environment.

CBS Terms Matching Exercise Answers

Term	Definition
Community-based surveillance (CBS)	Structured way of detecting and reporting events within a community, by community members.
Detection	Becoming aware of or noticing a signal that may not be known to health authorities.
Event	An unusual occurrence that may cause harm to the health of humans, animals, and/or the environment.
Monitoring	Regularly checking on how surveillance is being done, and whether it is working.
Outbreaks	When more incidents of a disease exist than would normally be expected in a specific place and time period.
Recording	Keeping written notes on details and information (i.e., signals and events) reported.
Reporting	To give either verbally or in writing an account of a signal you or someone else has heard, and/or seen to health authorities.
Response	A reaction by health authorities to a detected and confirmed health event in a community.
Signals	Things one sees or hears about that are happening in the community that may lead to finding an event that may be a threat to humans, animals, and the environment.
Surveillance	Keeping watch for, detecting, and reporting signals and events.

ACTIVITY 3.2

WHAT IS SURVEILLANCE?

Define key terms and activities conducted in CBS

Describe how surveillance is conducted in their communities

Group discussion & lecture

5 minutes

Step 1: Brainstorm the question

Ask students to go over the definition of surveillance as presented in the CBS Terms Matching Exercise. Ask them to discuss what they think this means in practical terms. Provide feedback and encouragement when groups are close to the accepted definition.

Step 2: Consolidate with accepted definition

Read the definition of surveillance as provided below. Participants can follow along in the Participant Guide (page 11). Ask participants to provide examples of surveillance from their communities and answer any questions they may have.

Accepted definition

Surveillance is **keeping watch** and **immediately reporting** signals and events in communities and/or geographic areas. It encompasses the activities described on the following page:

Look

Look and watch for unusual or unexpected occurrences.

Listen

Listen for other community members talking about unusual or unexpected occurrences.

Record

Record / write down information and details about the unusual or unexpected occurrences that you have heard about or found.

Report

Report / tell someone (i.e., your supervisor) who will be able to find out more information and verify if these signals are true events that require response actions.

ACTIVITY 3.3

WHY IS SURVEILLANCE IMPORTANT?

Describe the importance of surveillance at the community level

Small group discussions and presentations

10 minutes

Step 1: Brainstorm the question

Ask students to continue working in their groups to answer the question, 'Why is surveillance important?' Get the team lead from each group to read their group's answer. Provide feedback and encouragement where groups are close to the answer below.

Step 2: Provide the answer

Give feedback on the accepted answer to this question by reading the answer as provided below. They can read along in the Participant Guide page 11.

Why is surveillance important?

Surveillance is important because it helps to ***detect diseases early*** *and trigger a response to* ***reduce the spread of diseases, people getting sick, suffering, and deaths in our communities.*** *Events must first be detected and reported before they can be solved and gotten rid of in the community. The earlier an event is detected and reported, the faster it can be addressed, so that our friends, families, and neighbors remain safe.*

Step 3: Brainstorm ideas on how surveillance is occurring in their communities

Move on to the topic of how surveillance is occurring in their communities by looking at the questions presented in Flipchart A. They also have these questions in their Participant Guide, page 12.

Give each group a copy of Flipchart A and a marker. Ask team leads to take notes (recorder) and to select another group member to be the timekeeper and presenter when it's time to feedback to the larger group. Explain that this is a brainstorming exercise and therefore active participation from every group member is very important. Start the discussion.

Discussion questions

- Do people in your community know the purpose and importance of surveillance?

  Why? Why not?
- How do people in your community know surveillance activities are being conducted in the community?
- Who is involved in ensuring surveillance activities are happening in your community?
- What are some ways that surveillance is conducted in your community?

If materials are not available, facilitators will ask each group to refer to the 'Small Group Exercise: What is Surveillance?' section in their Participant Guide and complete the exercise by discussing and answering the four questions as a team. The team lead will take notes and present some of the answers discussed in their group during the participant presentation/feedback.

Step 4: Feedback on discussions through small group presentations

Monitor the time of the exercise. Once 15 minutes has passed, ask the groups to direct their attention to the larger group for the group presentations. Ask if there is a group that wants to present first. If no group volunteers, randomly select a group to present.

Inform the groups that they will have two minutes to present. Remind participants to stick to the time limit and show respect towards each reporter by not engaging in side conversations. Provide no more than 10 minutes to complete this discussion.

Summarize common points from the group presentations making sure to include every group's input.

ACTIVITY 3.4

WHAT IS COMMUNITY-BASED SURVEILLANCE?

Define key terms and activities conducted in CBS Describe how surveillance is conducted in their communities Describe the importance of surveillance at the community level	Lecture and concept check	10 minutes

Step 1: Define CBS

Move on to the topic of CBS using the following script and reading the definition that follows. Students can read along with you in the Participant Guide page 12.

Now that we have shared our ideas on what surveillance is, why it is important, and how it is conducted in our communities, let's identify the characteristics of CBS and its importance at the community level. Let's go over what the main goals of surveillance are.

What are the main goals of surveillance?

Surveillance aims to:

- ***Identify as early as possible** any event that puts the health of a community at risk, including its residents, animals, and the environment,*
- *Ensure that the **health system is made aware** of the health-related incident in **good time**, and*
- *Ensure that the **right information is available to respond** to the event.*

*Detecting and reporting events in communities, by community members, is known as **CBS.** This type of surveillance requires and involves community participation. This means community members look for unusual occurrences or events in humans, animals, and/or the environment which may be a risk to their communities.*

The goal of CBS is to look for signals that represent events needing an immediate response and to report them immediately to supervisors.

Step 2: Concept check

Present each of the short scenarios below without telling the participants what the suspected disease is. Discuss what events might be occurring and why they need to be responded to quickly.

Case 1

*There is a 30-year-old woman with a 2-year-old son in the neighboring village. Both have a high fever, diarrhea, stomach pain, and are vomiting blood. The woman recently prepared the body of deceased relative for their funeral. (It could be **Ebola**).*

Case 2

*A large number of chickens in your village have died overnight suddenly. (It could be **avian influenza** or another disease that could also occur in humans).*

Case 3

*A group of children from the same elementary school have yellowing skin, high fever, bleeding, vomiting, and body aches. (It could be the start of a **yellow fever outbreak**. There is a vaccine that can stop it).*

Step 3: Review and wrap-up the session

Facilitators should ask participants to share with the rest of the group one message they understood from this session. After receiving 3-5 answers, he/she should sum up the session by reading the takeaway message below.

The detecting and reporting of events, that are conducted by community members in communities is known as CBS.

The goal of CBS is to look for and report events that need to be responded to quickly.

CBS is more effective when everyone in the community takes part and informs CHVs of events that are a threat to all.

SESSION 4

SIGNALS FOR COMMUNITY-BASED SURVEILLANCE

This session defines signals and discusses how they are detected, recorded, and reported to local-level supervisors.

Objectives

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

- Define signals that may represent events,
- Explain how signals are detected in communities,
- Describe the various types of signals in their country,
- Explain the importance of recording information (data) for reporting, and
- Demonstrate how signals are recorded.

Materials

Facilitator

- Flipchart paper
- Marker
- Appendix D: Example of Community Health Volunteer Notebook

Participants

- Participant Guide pages 15-20

Total time: 60 minutes

Role-Play Exercise

The recommended way to reinforce the importance and recommended process of signal detection and recording is to have participants simulate and witness the process themselves through role-play exercises. Role-plays are an effective method for demonstrating real life experiences. A role-play enacts a situation and gives participants a chance to observe and re-examine their own or someone else's behavior. Most importantly, role-plays draw upon the experiences and knowledge of the participants and encourages them to put a particular learned theory into practice.

This session will include two role-play exercises, one between a key informant and a CHV, and the other between a CHV and a local-level supervisor. In order for these exercises to have the desired outcome it is important that all facilitators have effective facilitation and communication skills for role-playing exercises.

Effective Role-Play Facilitation Tips

Preparation and facilitation of role-play/simulation exercises includes:

- Arranging the room so that everyone can fully participate,
- Clearly explaining the purpose and the process to be used,
- Verbally choosing roles or handing out printed descriptions of the roles to the participants including the observers,
- Asking for volunteers to play the roles,
- Reassuring everyone that this will be entertaining and informative,
- Asking volunteers if they have any questions or need clarification on the instructions,
- During the role-play, only interrupting if a player is having difficulty or you want to stop the scene to ask questions,
- Conducting a feedback session that reviews and discusses what happened in the role-play,
- Preparing open-ended questions that cover both content and feelings,
- Asking participants to think about how this role-play is similar to their own experiences and what they can take from the exercise and apply to their work,
- Giving participants enough time to process the role-play, and
- Allowing enough time for participants to express their personal thoughts, feelings, and experiences.

Case Study Small Group Exercises

Case studies are written accounts or problems of real or made up situations with enough details for participants to determine the best decisions they might take. They are designed to simulate reality, draw upon participants' experiences and knowledge, and encourage the development of critical thinking and decision-making skills. The use of case studies in a training helps to actively involve participants in the learning process and forces them to apply theory to practice.

In this part of the workshop you will present a case study to the class and then ask them to work in their groups to discuss possible solutions and outcomes for the case in question. You will then discuss the case with the class as a whole and see if a collective conclusion can be reached. At the completion of the case study, participants should be able to explain how events are identified at the community level and how to record and report their occurrences.

This session will include a case study based on the first role-play scenario in this training. In order for this case study to have the desired outcome it is important that all facilitators have effective case study facilitation and communication skills. It is strongly recommended that facilitators follow the Case Study Facilitation and Communication Tips.

Case Study Facilitation and Communication Tips

To effectively prepare for and facilitate a case study you should:

- Review the training sources for each case study and adapt the details of the case to fit the participants' circumstances and that of the country and/or community they live in.
- Prior to dividing participants, explain the purpose of using case studies, read directions out loud, and provide a timeframe for completion of the activity.
- Divide the participants into groups of four to six, provide each group a copy of the case study, some flipchart paper, and a marker, and encourage the group to assign roles (lead, recorder, and reporter).
- Be available to answer questions or provide clarification if needed.
- Regroup for a whole class discussion and ask each group to present their case study and responses.

ACTIVITY 4.1

COMMUNITY-BASED SURVEILLANCE SIGNALS

Define signals that may represent events

Explain how signals are detected in communities

Group discussion and lecture

10 minutes

Step 1: Brainstorm the topic

Using **smoke** as an example, direct participants to look at the image of the forest fire on page 15 of their Participant Guide. Ask the following two questions. Make sure you give participants enough time to provide 2-3 answers before moving on to the next question.

Q1. What do you see in this picture?

Seeing smoke rising above the trees in a forest – you have to go and look to see if there's actually a fire. It could just be a cloud that someone has mistaken for smoke – a rumor that someone has heard and repeated.

Q2. What are signals and events?

Encourage 2-3 answers for this question.

Step 2: Present definitions for signals and events using smoke and fire metaphor

Provide the following definitions of signals and events as they relate to surveillance. Ask participants to fill in the missing words in their Participant Guides page 16.

Signals are like smoke *- things one sees or hears about that are happening in the community that may represent a risk to humans, animals, and the environment. In other words, signals are information which might represent an event occurring in the community.*

Events are like fires *- something that is happening in the community that can spread and cause harm; like fires, events are best handled when they are small.*

Step 3: Introduce the concept of the key informant

Signal detection is key to CBS; therefore, it is essential that facilitators stress the importance of community engagement and involvement of key informants. Facilitators will begin this part of the session by asking participants the two questions below and allowing participants to give 3-5 responses before providing the answer and moving to the next question.

Q1. How do we look for (detect) signals for possible events?

- *Ask people to tell you what they know of unusual or unexpected occurrences happening in their community.*
- *Identify community members (key informants) who will be responsible for looking for (detecting) signals in the community.*

Q2. If we are looking for key informants, what characteristics might those community members have?

- *Individuals who have strong ties and relationships with other community members.*
- *Individuals who have credibility in the community and positive influence on other community members.*

Step 4: Present characteristics of key informants and their role in signal detection

After the question and answer exercise, go over the characteristics of key informants and their role by saying the following. They can read along in their Participant Guide page 16.

How are signals detected?

Signals are most likely to be detected by CHVs and key informants because of their connections to their communities. These key informants may include traditional healers, pharmacists, school teachers, barbers and hairdressers, leaders of social groups, and religious leaders, among others. CHVs can improve signal detection from their communities by engaging key informants to help them to detect signals and report them to CHVs.

Now let the participants know that in order to better understand how signals are detected in communities they are going to participate in a role-play exercise.

ACTIVITY 4.2

HOW ARE SIGNALS DETECTED?

Explain how signals are detected in communities

Role-play

20 minutes

Note: Review the Effective Role-Play Facilitation Tips prior to facilitating this role-play.

Step 1: Prepare participants for the role-play

Introduce the role-play exercise by reading out the following instructions:

> *Working in your small groups you are going to act out a scene between a CHV and a key informant who has some information about a worrying situation in a neighboring village. Read through the scenario in your Participant Guide (page 16) then choose two people to act out the phone call between Pierre Dubois and Madame Diallo and their meeting at Pierre's house.*

Give the groups 5 minutes to work on the scene then ask for two volunteers to play the roles in front of the class.

Step 2: Conduct the role-play

Ask if the volunteers have any questions, then remind them that they are to demonstrate how the signal has been detected and how information has been provided to the CHV. Also, make sure to inform them they have 5 minutes to enact this role-play, and then with a hand motion say 'Action!' indicating for the role-play to start.

Role-Play Scenario 1: How are signals detected?

Pierre Dubois, a 65-year-old man who works and lives in Village X, has called Madame Diallo, the CHV, to let her know that he needs to see her right away about a story he heard in the market that evening. He thinks it may be an incident that needs to be checked out immediately. Madame Diallo quickly picks up her CHV Notebook and heads to Pierre Dubois's home.

Upon her arrival, Pierre tells her that in the market a friend told him that in community Y there are two children under the age of 5 who have stopped walking. Both have stomach pains and sore throats, making it difficult to eat. One has had high fevers almost every night for the past week. Their mothers, who are sister wives, believe the last wife caused the children's illnesses out of jealousy because she was unable to have children of her own. Pierre remembers from a community meeting Madame Diallo held with key informants 3 months ago, that when children experience health problems like he has described it should be reported. He just prays it is not Ebola again.

The above role-play may be amended to fit the country context.

Step 3: Feedback on role-play

Once both volunteers have completed the role-play encourage the observers to clap for them. Then facilitate the feedback discussion by asking open-ended questions of the two volunteers (Pierre and Madame Diallo) and other participants (observers). Make sure to verbally state and write down key points from the discussion on flipchart paper.

If materials are not available, ask the primary facilitator assisting you to take notes which he/she will use to summarize the exercise.

Pierre's character:

- *How did you feel about your character's actions in this role-play?*
- *What information did you think was important to give Madame Diallo about this signal you detected?*
- *Could a scenario like this happen in your community?*

Madame Diallo's character:

- *How did you feel about your character's actions in this role-play?*
- *What information did you receive? Was there any extra information you would have liked to get from Pierre but didn't?*
- *Could a scenario like this happen in your community?*

Training participants (observers):

- *Tell us how you felt about the actions of the characters in this role-play.*
- *How would you describe the signal Pierre detected and what important information was he able to provide Madame Diallo?*
- *What information should Madame Diallo have recorded in her CHV Notebook?*
- *What additional information, if any, will she need before reporting this signal to the local-level supervisor?*

Step 4: Summarize and wrap-up the role-play

Summarize and close the role-play session thanking everyone for their participation as well as reading the key points written on the flipchart (or recorded by a facilitator/team lead) that came out of the feedback discussion. Inform participants that they will now identify and discuss the priority list of signals for their country.

ACTIVITY 4.3

SIGNALS FOR COMMUNITY-BASED SURVEILLANCE

Define signals that may represent events

Describe the various types of signals in their country

Lecture

10 minutes

Step 1: Present definitions of signals for CBS

Ask participants to open their Participant Guides to the list of signals on page 17 (examples from Africa CDC EBS Framework shown below; **these should be replaced by the signals that the country has selected for CBS**).

Examples of signals for CBS

- Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week. (NB: Severe can be elaborated at the community-level as needing to seek medical care)
- A cluster of unexplained animal deaths within one week
- An illness with novel or rare symptoms (NB: Novel and rare can be explained as signs/symptoms that the community has not seen before)
- Any person with fever and rash

Ask participants to read each signal out loud. After each signal is read, ask the group:

- What do you think we are trying to detect with this signal?
- How would you describe this signal to someone in your community?

Ensure that all participants understand the signals and respond to any questions they may have. Note that not every signal will mean that a big event is happening, as some will be rumors or misunderstandings. However, it is important that CHVs quickly report the information that they detect to the local-level supervisors.

Step 2: Summarize and reinforce key messages

Recap what has been covered in the session to this point by asking participants to summarize what they have learnt about signals so far. After 3-5 participants have shared their summaries read the key takeaway message below.

A signal is information reported by a member of the community that may be an event.

It is important to remember that once a signal has been detected in a community, it should be reported immediately to the local-level supervisor.

ACTIVITY 4.4

HOW DO YOU RECORD SIGNALS?

Explain the importance of recording information (data) for reporting

Demonstrate how signals are recorded

Case study

20 minutes

Note: Review the Effective Case Study Facilitation Tips at the beginning of this session prior to facilitating this case study.

Step 1: Prepare participants for the case study

Inform participants that they will now address how CHVs should record the information (data) received from a signal that has been brought to their attention. Ask participants to get into their groups and open the Participant Guide to the case study description on page 18. Make sure each group has some flipchart paper and a marker (if available) to record their answers on. Let them know that the case study is a continuation of the situation described in the first role-play between the key informant (Pierre Dubois) and CHV (Madame Diallo). Read out the case study and instructions that follow.

Case Study Description

On October 3rd 2019, Pierre Dubois, a 65-year-old man who works and lives in Village X called Madame Diallo, the CHV, to let her know that he needed to see her right away about a story he heard in the market that morning. He thought it might be an event that needed to be checked out immediately. Madame Diallo met him the same day at his home to get more information about the signal he had detected. Pierre let Madame Diallo know that a friend had told him that two children under the age of 5 had stopped walking in a family compound less than one-mile walking distance from the market. Both children had been experiencing stomach pains and sore throats making it difficult to eat. One, the youngest, had a high fever almost every night for the past week. Their mothers, who are sister wives, believed the last wife has caused their children's illness out of jealousy, because she couldn't have children of her own. Pierre remembered from a community meeting Madame Diallo held with key informants three months ago, that when children experience health problems like the one he has described it should be reported immediately.

Madame Diallo asked Pierre if she could take him to see his friend that knew exactly where the family compound was located. Pierre agreed to take her to his friend Paul's home. The three of them then went to visit the family compound in question. There, Madame introduced herself to the head of the household, who was sitting in front of the compound, telling him she was one of the CHV responsible for looking out for and reporting any unusual occurrences or events in the community that might cause harm to other humans and animals. She then asked if she could speak with the mothers of the two children who had fallen ill in the past week. The father of the children brought her into the compound to speak to his wives. In the compound Madame Diallo made a few observations. She noticed that the homes were in close proximity to each other; children were eating outside from the same dish with their hands; the open toilet pits and showers were not too far from where the children were eating, and a child about the age of five years, was lying on a mat being fed by a teenage girl.

Once she was introduced to the man's wives, she asked them questions about their children's health. The senior wife, Fatima, and mother of the oldest child, spoke passionately about the children's condition and forcefully blamed the third wife, Tatianna for their illness stating that it wasn't until the third wife had brought her four nieces and nephews from Village Z, 10 miles away, three weeks ago, that their children had gotten sick. She complained that if Tatianna had taken her 6-year-old niece, who was already ill, to the clinic immediately, all their kids would be fine! Tatianna explained that it was not her fault the children were sick. Her nieces and nephews needed a place to stay for two weeks while her sister traveled to the city to find work. Her eldest niece only had a mild fever and fatigue when she arrived at the compound. After three days she was better. She explained that her nieces and nephews were all back in Village Z now and should not be blamed for what was happening to her sister wives' children. Madame Diallo asked to see the all the sick children including those she saw eating outside.

Now imagine you are Madame Diallo and you have received information from the family in addition to that which the key informant shared with you earlier in the day. As a group, think about what information should be recorded, and complete an entry in the CHV Notebook accordingly.

The above case study may be amended to fit the country context.

Step 2: Get participants to record an entry in their CHV notebooks

Ask participants to go to the CHV Notebook example on page 20 of their Participant Guide. Ask them to complete an entry in the CHV Notebook based on the case study you have just read to them. Give them 5 minutes to do this then go over the answers together making sure groups have recorded the correct information.

Step 3: Discuss additional questions related to the case study

When groups have completed the entry exercise, facilitate a discussion by asking open-ended questions about the case study, including what information Madame Diallo acquired, and what she should have recorded. Make sure to write down key points from the discussion on flipchart paper.

Case Study Discussion Questions

- *What information did Madame Diallo have prior to visiting the family compound?*
- *List the additional information she received during her visit that you found helpful?*
- *Based on the information Madame Diallo recorded in her CHV Notebook, what information should she communicate to the local-level supervisor?*
- *What did you learn from this case study that can help you conduct better CBS in your community?*

If materials are not available, ask another facilitator to write key points from the discussion in a notebook or on paper which will be used to summarize the case study exercise and session. If you are alone, ask a participant team lead to assist you in recording key points from the discussion questions.

Step 3: Summarize and go over key messages

End the discussion by asking participants to share one takeaway message they got from this case study with the rest of the group. After receiving 3-5 answers, summarize the session by reading the takeaway message below then thank everyone for their participation.

Immediately after receiving a signal from a key informant, a CHV will need to acquire additional information to the following key questions:

1. When did the signal begin?
2. What is the signal?
3. How many human/animal cases have been affected?

The CHV will immediately report the signal to the appropriate point of contact (local-level supervisor) for his or her community.

Morning Break
(15 Minutes)

Inform participants that this is an opportunity to get a drink, go to the bathroom, or chat with their fellow participants and facilitator.

SESSION 5

FLOW OF INFORMATION: WHAT HAPPENS WHEN YOU REPORT?

This session focuses on the importance of the reporting structure that allows information to flow from the community and local level to other health administrative levels.

Learning Objectives

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

- Identify the reporting structure for signals,
- Explain how signals are reported at the community level,
- Describe what information is reported after detection of a signal, and
- Demonstrate how to report signals using various signal reporting mechanisms.

Materials

Facilitator

- Flipchart B: Reporting Structure for Signals
- Marker

Participants

- Participant Guide pages 21-23

Total time: 45 minutes

ACTIVITY 5.1

REPORTING STRUCTURE FOR SIGNALS

Identify the reporting structure needed to report a signal

Group discussion and lecture

20 minutes

Step 1: Recap previous session & go over Session 5 learning objectives

On returning from the break, ask participants to quickly review what they learned in the session prior to the break. Next read out the purpose of Session 5 and the learning objectives.

Step 2: Introduce next steps in reporting using the case study scenario

Move on to a question and answer session of no more than 10 minutes long to tease out the structure for reporting. You can begin using the following script:

> *Let's return to our case study. Now that Madame Diallo (CHV) has recorded information regarding the detected signal she has investigated, she is ready to report her findings. What should she do?*

Ask participants the following questions and capture the answers in Flipchart B with four equally divided spaces:

- *Who should Madame Diallo report to? Why?*
- *When should she report this signal? Why?*
- *How can she report this signal?*
- *What information should she include in her report? Why?*

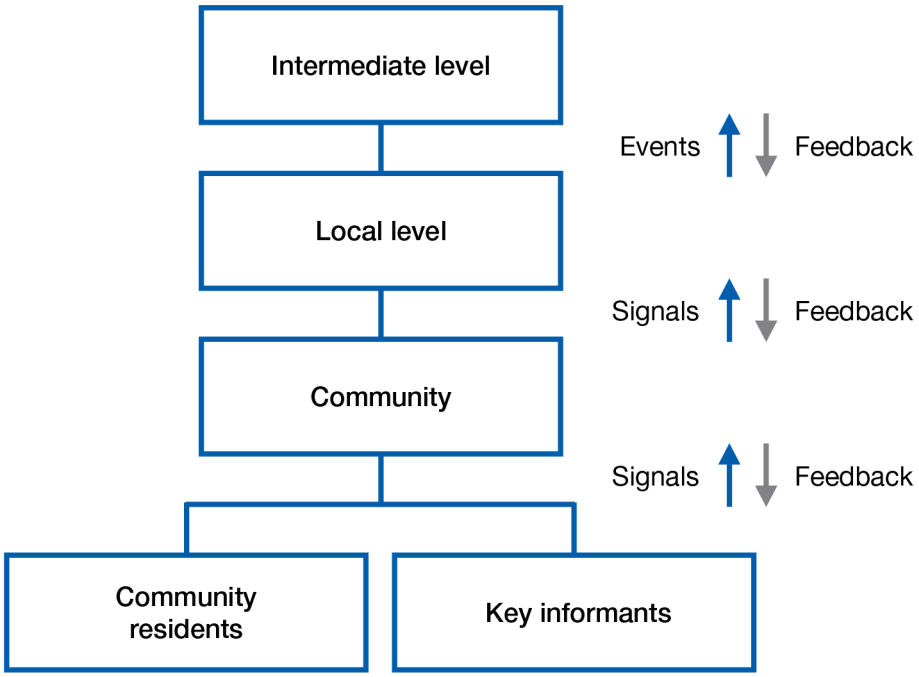
If materials are not available, ask participants to refer to the questions in their Participant Guides (page 21) and follow the discussion. Encourage participants to take notes directly in the Participant Guide.

Step 3: Give lecture on reporting structure for signals

After completing the flipchart (only if flipchart was used), place it in the room where it is visible to everyone. Then give a brief lecture (below) about the flow of information, and how it should be applied at the community and local levels when conducting CBS.

What is the reporting structure for signals? What happens when you report?

When information, or signals, are detected at the community-level they should be reported according to the information flow structure of the country in which they have been detected. The figure (found in your Participant Guide on page 22) shows how information flows up through the different levels, and how feedback flows down to you, the reporters of surveillance information.



The figure above is an example from the Africa CDC EBS Framework and should be replaced with the reporting structure designated by the country where EBS will be implemented.

As we can see:

- *Signals detected in communities by CHV, key informants, or other community residents are to be reported immediately to the local level (local-level supervisor).*
- *Local-level supervisors report events up to the intermediate level.*
- *Intermediate-level health authorities report to higher administrative levels.*

All events must be reported and investigated according to the existing national surveillance and reporting structure.

What should CHVs do after reporting?

They should collaborate with public health authorities as required to collect more information. CHVs may be asked to implement basic prevention measures such as health education, handwashing programs as needed.

Why is feedback important?

Just as timely signal reporting at each level is important, so is timely and routine feedback. Intermediate-level authorities should provide feedback about events and signals to supervisors at the local-level. Feedback on reported signals should be given to CHVs and key informants at the community level by local-level supervisors. The community needs to know how the information they shared was used so trust and mutual collaboration can be preserved.

ACTIVITY 5.2

THE WHO, WHEN, WHAT, AND HOW OF SIGNAL REPORTING

Explain how signals are reported at the community level

Describe what information is reported after detection of a signal

Demonstrate how to report signals using various signal reporting mechanisms

Q&A discussion and lecture

10 minutes

Step 1: Elicit the who, when, what and how of signal reporting using Q&A

Start this activity with a quick question and answer session on the who, when, what, and how of signal reporting. Ask participants the following questions:

Q1: ***If you are a key informant or community member, who do you report signals to?***
A1: *Key informants and community members should report signals to a CHV.*

Q2: ***Who does a CHV with information about a detected signal report to?***
A2: *CHVs should report signals they have received or detected themselves to the local-level supervisors immediately after the detection of the signal.*

Q3: ***When should CHVs report signals?***
A3: *Signals must be reported immediately.*

Q4: ***What information should be reported to local-level supervisors?***
A4: *CHVs should report signals they hear or see (detect), including basic information on when the signal was detected, where it took place, and who is affected, to their local-level supervisor. CHVs may also be asked to provide further information to their supervisors as needed.*

Q5: ***How do you report a signal?***
A5: *Community members, key informants, and CHVs can report signals using telephone, text message (SMS), or in person.*

ACTIVITY 5.3

HOW ARE SIGNALS REPORTED?

Describe what information is reported after detection of a signal

Demonstrate how to report signals using various signal reporting mechanisms

Role-play

15 minutes

Note: Review the Effective Case Study Facilitation Tips at the beginning of this session prior to facilitating this case study.

Step 1: Set up the role-play

Introduce the exercise by explaining to the group that they are going to look at how signals are reported by continuing the Madame Diallo and Pierre role-play from Session 4. Remind them that Madame Diallo is the CHV in the role-play and explain she is now reporting to her local-level supervisor, Mr. Fofana. Ask them to work in their groups to prepare the scene where Madame Diallo calls Mr. Fofana to make a report.

Ask for two volunteers to enact the scene to the class. Remind them that they are to demonstrate how a CHV reports a detected signal to his/her local-level supervisor after recording the information in their CHV Notebook. Let volunteers know they have 5 minutes to enact this role-play.

Role-play Scenario 2: How are signals reported?

Madame Diallo, the CHV in Community X, received a call this morning from Pierre, a key informant, regarding a signal he had detected that morning. Immediately after the call she traveled to see him at his home and together they visited a family compound where two children around the age of five were ill and for the past week had been experiencing high fevers, and the inability to walk or eat.

During Madam Diallo's visit to the compound to investigate the signal she made a few observations, asked questions of the children's mothers, and recorded this in her CHV Notebook. She believes this is a signal that should be taken seriously and reported immediately. She calls Mr. Fofana, her local-level supervisor to make a report; unfortunately, the weak telephone signal in the area is making it difficult to hear.

Step 2: Start the role-play

When the volunteers are ready to start the role-play, ask the group to give them their full attention then start the role-play by calling out 'Action!'

Step 3: Seek feedback on the role-play using Q&A

Once the volunteers have completed the role-play encourage the observers to clap for them. Then facilitate the feedback discussion by asking open-ended questions of the two volunteers (Madame Diallo and Mr. Fofana) and other participants (observers). Make sure to write down key points from the discussion on flipchart paper.

If materials are not available, ask another facilitator to write key points from the discussion in a notebook or on paper which will be used to summarize the role-play exercise and data reporting session. If you are alone, ask a participant team lead to assist you in recording key points from the discussion questions.

Madame Diallo's character:

- *How did you feel about your character's actions in this role-play?*
- *What information did you think was important to give Mr. Fofana about this signal you had investigated and are now reporting?*
- *Could a scenario like this happen to a CHV?*

Mr. Fofana's character:

- *How did you feel about your character's actions in this role-play?*
- *What information did you receive? Was there any extra information you would have liked to get from Madame Diallo but didn't?*
- *Could a scenario like this happen in your community?*
- *What next steps are you going to take following this report?*

Training participants (observers):

- *Tell us how you felt about the actions of the characters in this role-play.*
- *How would you describe Madame Diallo's reporting and what important information was she able to provide Mr. Fofana?*
- *Was Mr. Fofana able to acquire all the information he needs to understand whether this is an event?*
- *What additional information does he need from Madame Diallo? How can she better provide him with this information?*

Step 4: Summarize key points from the role-play and wrap up the session

Summarize and close the role-play session thanking everyone for their participation as well as reading the key points written on the flipchart paper (or facilitator's/ team lead's notes) that came out of the feedback discussion.

Wrap up this session by asking participants to briefly share what they learned or was reinforced during this session. After 3-5 participants have contributed, say:

> *Now that Madame Diallo, the CHV, has reported the signal to the local-level supervisor Mr. Fofana, the triage, and if necessary, verification process will need to start. How the local-level supervisor will complete this will be discussed in the second half of this training.*

Close the session by reading out loud the key takeaway message below.

In summary, the success of CBS depends on you, the eyes and ears of your communities, to detect early and report quickly signals that may be taking place in your communities.

- Signals detected by key informants and CHVs are to be reported immediately to the local-level supervisor.
- Key informants should report signals they hear or see (detect) to CHVs.
- CHVs should record signal information in their CHV Notebook and report this immediately to local-level supervisors.
- Key informants and CHVs can report a signal using telephone, text message (SMS), or in person.

SESSION 6

KEY INFORMANT ENGAGEMENT: HOW TO ENGAGE YOUR COMMUNITIES?

This session focuses on the role of key informants as well as strategies to engage communities in CBS.

Learning Objectives

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

- Explain why key informants are important to the success of CBS,
- Describe characteristics of key informants,
- Define the roles and responsibilities of CBS key informants, and
- List strategies to ensure communities and their key informants are engaged in CBS.

Materials

Facilitator

- Flipchart C: Key Informant Engagement (one per group)
- Markers

Participants

- Participant Guide pages 24-25

Total time: 30 minutes

ACTIVITY 6.1

CHARACTERISTICS OF KEY INFORMANTS

Describe characteristics of key informants

Q&A discussion

10 minutes

Step 1: Elicit characteristics of key informants through Q&A

Start this session with a quick question and answer discussion. Ask participants to first define who a key informant is in a community and then brainstorm types of community members that could be key informants in their communities. As participants are sharing their answers, capture them on flipchart paper.

If materials are not available, ask another facilitator to write the answers to the Q&A and brainstorming exercise. If you are alone, ask a participant team lead to assist you in recording answers.

Q1: Who is a key informant in your community?

- *A community member who detects signals*
- *An individual who volunteers to work with CHVs to protect the health of the community*

Q2: If we are looking for key informants, what characteristics might these community members have?

- *Individuals who have strong ties and relationships to other community members*
- *Individuals who have credibility in the community and a positive influence on other community members*
- *Individuals who have access to community information*

Q3: Who are key informants in your communities?

- *School teachers*
- *Traditional healers*
- *Hairdressers and barbers*
- *Religious leaders*
- *Pharmacists*
- *Leaders of social groups (women's unions, clubs, labor groups, farmer's unions, etc.)*
- *Animal health workers, farmers*

Once participants have identified these characteristics of key informants, ask them to rejoin their small groups for a small group exercise.

ACTIVITY 6.2

KEY INFORMANT ENGAGEMENT

Explain why key informants are important to the success of CBS

Define the roles and responsibilities of CBS key informants

List strategies to ensure communities and their key informants are engaged in CBS

Small group discussions and presentations

Lecture

10 minutes group work
10 minutes presentations

Step 1: Set up the small the group discussions

Introduce the small group exercise by explaining to participants that they are going to work in their groups to discuss how CHVs can identify and engage community members (key informants). Remind them that informants will be responsible for looking for (detecting) signals of events in the community. Explain that at the end of the discussion one member of each group will be asked to present what their group discussed.

Ask participants to get into their groups and give each group a copy of Flipchart C and a marker. Ask the team leads to take notes during the discussion and ask another group member to be the time keeper and presenter for their group. Explain that this is a small group exercise and therefore active participation from every group member is very important.

If materials are not available, facilitators will ask each group to refer to the questions in their Participant Guide (page 24) and complete the exercise by discussing and answering the four questions as a team. The team lead will take notes and present some of the answers discussed in their group during the participant presentation/ feedback.

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

Give the groups 10 minutes to work on answering the questions in Flipchart C. Monitor and field questions as necessary.

Step 3: Facilitate group presentations and feedback

Once 10 minutes has passed, ask the groups to direct their attention to the larger group for the group presentations. Ask if there is a group that wants to present first. If no group volunteers, randomly select a group to present. Inform the groups that they will have 2 minutes to present. Remind participants to stick to the time limit and show respect towards each reporter by not engaging in side conversations.

Summarize common points from the group presentations making sure to include every group's input. Ask participants if they have any questions or additional comments to add before moving on.

Step 4: Deliver lecture on engaging key informants in the communities

Start the lecture by referring to the fourth question on the flipchart or handout in the Participant Guide (page 24), "How can you increase key informant engagement in your community?" or strategies for maintaining a network of key informants.

How can your communities be engaged in CBS?

As previously discussed, CBS involves the entire community. Although all community members are encouraged to 'look out' for signs that may pose a health threat, asking everyone to detect signs and report them will likely cause false or duplicate signals to be reported. It is important to identify and sensitize community members who can take on the role of a key informant. Key informants are members of the community who are able to hear about possible events. They play an important part in CBS by working closely with CHVs to detect signals in their communities. Posters and pamphlets that show the signals in text and pictures, can help both CHVs and key informants to detect signals which may turn out to be events.

Once key informants have been identified, each will need to understand:

- *What the signals are,*
- *Why it is important to inform CHVs of signals they see or hear about, and*
- *When they should inform CHVs of signals they see or hear about.*

Step 5: Check participants have the key messages through Q&A

Check that participants have understood the key messages from the group discussions and lecture by asking the following questions.

Q1: Why is it important to work closely with key informants?

- *They have close relationships with community members and are aware of what is happening.*
- *They have been sensitized to the signals and understand the importance of CBS at the community level.*

Q2: How can you increase key informants' engagement?

- *Follow-up with them if they report something.*
- *Keep in regular communication with them.*
- *Inform them of the signals on an ongoing basis.*
- *Involve them in community health activities and highlight their work.*
- *Thank them for their service to the community.*

Step 6: Summarize and wrap up the session

Summarize the session by reading the key takeaway message below.

It is also essential that key informants can easily communicate with CHVs and are consistently reminded by CHVs of the importance of signal detection. Furthermore, to successfully ensure key informants are dedicated to their role they should be thanked for their service to the community.

SESSION 7

COMMUNITY HEALTH VOLUNTEER TRAINING REVIEW, KNOWLEDGE CHECK, AND CLOSE

This session will give CHVs the opportunity to review what they have learned during the training, evaluate the knowledge and skills acquired, and provide feedback to facilitators regarding their satisfaction with the training.

Purpose

- Summarize lessons learned from the training,
- Assess and evaluate participants' knowledge and skills post training, and
- Provide training feedback and evaluation.

Materials

Facilitator

- Facilitator Guide: CHV Training Agenda (page 13-14)
- Flipchart paper
- Markers
- Appendix A: Training Knowledge Check Part 1 (copied for CHVs + local-level supervisors)
- Appendix C: Training Knowledge Check Part 1 & 2 Answers

Total time: 25 minutes

ACTIVITY 7.1

REVIEW AND KNOWLEDGE CHECK

Summarize lessons learned from the training

Assess and evaluate participants' knowledge and skills post training

Group discussions and questionnaire

20 minutes

Step 1: Review the agenda and what has been learned

Ask participants to refer to their agendas and review the topics of the training. For every session, ask participants to share key takeaway points (information) discussed and learned. Write their answers on the flipchart paper (if available) and encourage participants to take notes in their journals.

If materials are not available, ask another facilitator to write participants' key takeaway points in a notebook or on paper which will be used to summarize the session. If you are alone, ask a participant team lead to assist you in recording key takeaway points.

Step 2: Facilitate the post-training knowledge check

Distribute Appendix A: Training Knowledge Check Part 1 (the second copy) and read the instructions out loud as follows:

> *We are going to revisit the questionnaire you completed at the beginning of the training. You will have 15 minutes to individually take the post-training knowledge check. You are encouraged to ask us if you have any questions or need clarification on questions asked on the questionnaire. Please respect everyone's time by not engaging in side conversations once you have completed your own* test.

Offer participants the option of taking the post-test with the assistance of a facilitator who will read the questions in a small group setting away from the larger group. This will allow participants, who may be illiterate or have difficulty reading, to feel more comfortable completing the test.

Step 3: Collect questionnaires and review answers

After all participants have completed the questionnaires, collect them and review the answers with everyone using Appendix C: Training Knowledge Check Part 1 & 2 Answers. Participants can fill in the correct answers in their Participant Guides Appendix A. Allow 5 minutes for this activity in case there are questions.

ACTIVITY 7.2

TRAINING CLOSE AND PARTICIPANT FEEDBACK

Provide training feedback and evaluation

Group discussion

5 minutes

Step 1: Ask participants for feedback on the training

Give participants the opportunity to provide feedback on the training using the available evaluation tool.

Step 2: Thank participants and close

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

> *On behalf of the CBS Training Facilitators team, I would like to thank you for attending this training and actively participating. We have learned a lot about how to conduct CBS in our communities, and we have all learned from the experiences and knowledge you brought to the training. As your colleagues and facilitators, we are encouraged by your commitment to working and supporting your communities. We hope the expectations you expressed in the introductions exercise this morning were met. We strongly encourage you to share what we have discussed and learned today with other CHVs who were not able to attend, as well as your key informants. For those of you who are staying for the second half of the training, we look forward to your participation. Once again, thank you very much.*

LOCAL-LEVEL SUPERVISORS TRAINING (1/2 DAY)

AGENDA FOR LOCAL-LEVEL SUPERVISOR TRAINING

SESSION	ACTIVITIES	TIME
Energizer Activity	Lie detector game	10 minutes
8. Triage ▶ Pre-training knowledge check ▶ Why is triage important for CBS? ▶ What is triage? ▶ How do you triage reported signals?	Questionnaire Q&A discussion Lecture Practical exercise	40 minutes
9. Verification ▶ What is verification? ▶ Why is verification important in CBS? ▶ How do you verify triaged signals?	Group discussion Lecture Signal game	40 minutes
10. Data Recording ▶ How do you record information (data) that has been reported to you? ▶ What information do you record?	Small group discussions & presentations	30 minutes
11. Data Reporting ▶ Who do you report to? ▶ What information do you report? ▶ When do you report? ▶ How do you report information (data)?	Q&A discussion Small group discussions Role-play	30 minutes

Afternoon Break (15 minutes)

Opportunity to interact with colleagues and mentors

SESSION	ACTIVITIES	TIME
12. Supportive Supervision ▶ What is supportive supervision? ▶ Why is supportive supervision important? ▶ How do you provide supportive supervision to CHVs?	Q&A discussion Lecture	20 minutes
13. Continuous Community Engagement ▶ Why is continuous community engagement important to CBS? ▶ How do you ensure community members (key informants and CHVs) are engaged in CBS?	Lecture Small group discussions & presentations	30 minutes
14. Local-Level Supervisor Training Review, Post-training Knowledge Check, and Close	Written or verbal post-training questionnaire Group discussion	25 minutes
Local-Level Supervisor Training		**Total 3.75 hours**

ENERGIZER ACTIVITY

Energizers are brief activities conducted in trainings that are intended to help increase energy in a group by engaging them in physical activity or requiring them to problem solve. These activities are meant to be fun, interactive, and bring energy to a training group encouraging participants to look forward to the rest of the training. Like icebreakers, facilitators should use effective facilitation and communication skills outlined in the introductory ice breaker session.

Get participants interacting and sharing their personal expectations for the workshop

Energize participants and get them ready to start the second half of the CBS training

Lie detector game

10 minutes

Step 1: Introduce the game and demonstrate how it's played

Introduce the energizer and provide clear instructions on how the game is played. Ask two volunteers to join you in the front of the class for the game.

Demonstrate the activity by making three statements out loud. Two statements should be true, and one should be false.

Example

I have been training for 10 years.
I skydive (jump out of a plane) every year on the 27th of September.
I have never cooked a meal.

The participants ask 'lie detector' questions to get further information, so they can determine which statement is false.

Example

Training: *Where have you conducted training? What have you taught? What year did you start?*

Skydiving: *What height have you jumped from? How many times have you jumped? What is the significance of September 27th?*

Cooking: *What do you normally eat for breakfast? Is there someone in your household who cooks?*

Participants will then vote on which statement is a lie.

Step 2: Get the volunteers to take their turns

Run the game with the two volunteers presenting their statements by turn and the participants asking the 'lie detector' questions.

Step 3: Make connections with training to come

Prior to moving to the next session, you should ask:

Why do you think we chose this energizer to start the local-level supervisor training?

Wait for participants to give 2-3 answers. If no one makes the connection with the triage and verification processes, then encourage participants to look for the connection during the triage session of the training.

SESSION 8

TRIAGE: WHY IT IS IMPORTANT, WHAT IT IS, AND HOW TO DO IT

This session starts with the pre-training knowledge check for local-level supervisors and then moves on to defining and discussing the triage process that local-level supervisors must conduct immediately after receiving a reported signal from a CHV.

Learning Objectives

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

- Assess participants' knowledge & skills pre-training,
- Define triage,
- List the two questions that must be asked during the process,
- Explain how triaging of reported signals occurs,
- Identify which signals are pertinent to CBS and are not duplicates, and
- Demonstrate how signal triage is done by a local-level supervisor.

Materials

Facilitator

- Appendix B: Training Knowledge Check Part 2
- Flipchart paper
- Markers

Participants

- Participant Guide page 29-30

Total time: 40 minutes

ACTIVITY 8.1

PRE-TRAINING KNOWLEDGE CHECK

Assess participants' knowledge & skills pre-training

Questionnaire

10 minutes

Step 1: Prepare participants for the knowledge check

Introduce the knowledge check by reading the script below:

> *Prior to starting our first activity, we are going to complete a short survey on what you already know about triage, verification, and data reporting. It doesn't matter if you don't know certain terms. Hopefully by the end of the training you will. We'll do a second check at the end of the training.*

Distribute Appendix B: Training Knowledge Check Part 2 to each of the participants and read the instructions out loud as follows:

> *You will have 10 minutes to complete the knowledge check. You are encouraged to ask us if you have any questions or need clarification on questions asked. Remind participants to respect everyone's time by not engaging in side conversations once they have completed their own test.*

Step 2: Facilitate participants completing the knowledge check

Give participants 10 minutes to complete the questionnaire. On completion, collect the questionnaires and let the participants know that you will check in again at the end of the training and go over the answers.

ACTIVITY 8.2

SIGNAL TRIAGE PROCESS

Define triage

List the two questions that must be asked during the process

Explain how triaging of reported signals occurs

Q&A discussion and lecture

15 minutes

Step 1: Prepare participants for the knowledge check

Start this session by reviewing the learning objectives and then assessing participants' previous knowledge and experience of the triage process by asking three questions. Answers should be written on flipchart paper.

If materials are not available, ask another facilitator to write answers from the Q&A exercise. If you are alone, ask a participant team lead to assist you in recording the answers.

Q1: What is triage and why is it part of CBS at the community and local level?

- Process of screening out information (data) that is not relevant for public health
- Helps to eliminate duplicate signals and corrects obvious mistakes that might have occurred
- Decreases background noise

Q2: Who is responsible for triaging reported signals?

- Local-level supervisors

Q3: What two questions should be asked during the triage process?

- Does this information represent a potential acute public health risk to humans, animals, and the environment?
- Is the signal already known to public health staff? Are there supporting reports?

Step 2: Deliver the lecture on triage

After the Q&A discussion, start the lecture part of this session. Students can follow along in their Participant Guides (page 29) and make notes in their journal.

What is triage?

Triage is the process of screening what is reported for information that is relevant for early warning (i.e., signals that if verified could be events).

Why is it important?

The triaging process determines if a signal is relevant to public health. Triaging helps with:

- *Selecting signals that may pose a risk to the public's health, and*
- *Filtering to get rid of duplicates.*

'Relevant for public health' means a signal that:

- *Could have a large public health impact in the country,*
- *Is outbreak prone and poses a major public health threat,*
- *Has previously been prevalent and might re-emerge, and*
- *Is slated for eradication or elimination.*

How do we do it?

Triage can take place in person, by text message or over the telephone. When completing the signal triage process, it is important that local level supervisors ask two important questions.

Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?

Was this signal previously reported (i.e., is this signal a duplicate)?

After triage

- If the report is not relevant or is a duplicate, then it can be discarded. If the information is to be discarded, the local-level supervisor will need to communicate this to the CHV who reported the signal.
  Local-level supervisors should encourage CHVs to continue reporting other possible signals. They should remind CHVs that it is okay that they have reported a signal that did not turn out to be an event and should encourage them to continue reporting signals immediately when *they are detected.*
- If the report is relevant and is not a duplicate, then the local-level supervisor who received the reported signal starts the verification process.

Step 3: Ask for questions

Ask if anyone has any questions, needs clarification, or wants to share their experience of the triage process.

ACTIVITY 8.3

APPLYING SIGNAL TRIAGE

Identify which signals are pertinent to CBS and are not duplicates

Demonstrate how signal triage is done by a local-level supervisor

Practical scenario exercise and discussion

15 minutes total (5 minutes for each scenario)

Step 1: Set up the practical exercise

Introduce the practical exercise and explain how the exercise is to be completed as follows:

- You will be presented with a series of short scenarios in which signals have been reported by CHVs.
- You will need to identify what questions you should ask for triage.
- I will then present you with the findings from triage and ask you if the signal should be verified or not.
- We will then go over the correct answer for each signal.

Signal #1

Scenario: A CHV has heard of a signal of foodborne illness from a family that has attended a wedding. The CHV has reported the signal to the local-level supervisor.

- *What questions should be asked for triage?*

  Answer: Is this situation relevant to public health staff?
  Has this situation previously been reported (is it a duplicate?)

- *Information collected from triage:*

  The foodborne illness was reported as a signal by another CHV 24 hours ago. Two members of this family needed to be hospitalized.

- *Correct answer: This signal is a duplicate, so it does not need to be verified separately.*

Signal #2

Scenario: A woman has reported to a CHV that her 5-year-old son has developed a fever and rash in the last three days. She is worried because her son started coughing last night. The CHV reported this signal to the local supervisor.

- *What questions should be asked for triage?*
  Answer: Is this situation relevant to public health?
  Has this situation been previously reported to public health staff (is it a duplicate?)
- *Information collected from triage:*
  The child currently has fever and rash. Her mother is reporting the situation for the first time.
- *Correct answer: This signal is relevant to early warning because it could be a case of measles. It has been reported for the first time (not a duplicate). This signal should be verified.*

Signal #3

Scenario: Farmers reported to a CHV that many sheep have died from bleeding and diarrhea during the past week. The CHV reported the signal to the local supervisor.

- *What questions should be asked for triage?*
  Answer: Is this situation relevant to early warning?
  Has this situation been previously reported to public health staff (including animal health) (is it a duplicate?)
- *Information collected from triage:*
  More than 60 sheep died last weekend. Farmers are surprised because this has never happened in the past. The CHV reported a signal related to poultry deaths two weeks ago.
- *Correct answer: This signal should be verified because it could be an animal-related event, and it has not been reported previously*

Step 2: Summarize the activity and wrap up with key message

Congratulate participants for their participation. Ask if anyone has any questions, needs clarification, or wants to comment on the exercise. Summarize the session by reading the key takeaway message below, and then inform participants that in the next session they will discuss another very important process; signal verification.

Local-level supervisors are responsible for triaging reported signals. Triaging helps answer two important questions:

- Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?
- Was the signal previously reported (i.e., is the signal a duplicate)

SESSION 9

VERIFICATION: WHY IT IS IMPORTANT, WHAT IT IS, AND HOW TO DO IT

This session will define and discuss the verification process local-level supervisors must conduct after receiving a reported signal from a CHV.

Learning Objectives

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

- Define verification,
- Explain why it is an important step to confirming a reported signal as an event, and
- Demonstrate how verification of reported signals occurs.

Materials

Facilitator

- Flipchart paper
- Markers
- Appendix E: Verification Tool
- Appendix F: Signal Game (cut up and placed into the two containers)
- Appendix G: Signal Game Answers
- Bowl/container x 2

Participants

- Participant Guide page 31-36

Total time: 40 minutes

ACTIVITY 9.1

SIGNAL VERIFICATION PROCESS

Define verification

Explain why it is an important step to confirming a reported signal as an event

Group discussion and lecture

20 minutes

Step 1: Elicit what participants know about verification already

Start this session by first reviewing the learning objectives and then assessing participants' previous knowledge and experience of the verification process by asking three questions. Answers should be written on flipchart paper.

If materials are not available, ask another facilitator to write answers from the Q&A exercise. If you are alone, ask a participant team lead to assist you in recording the answers.

Q1: What is signal verification and why is it part of CBS at the community and local level?

- *Signal verification is the determination of a signal as true (not a rumor) and reliable.*
- *It is important because reported signals cannot always be trusted or considered reliable.*

Q2: Who is responsible for verifying reported signals?

- *Local-level supervisors*

Q3: What does the verification process help to determine?

- *If the reported signal should be **discarded***
- *If the reported signal should be **confirmed** as an event*

Step 2: Deliver the lecture on verification

After the Q&A, deliver the lecture part of this session. Participants can follow along in the Participant Guide and make notes in their journals.

What is signal verification?

Signal verification is completed by local-level supervisors within 24 hours of signal detection, and can take place in person or over the telephone. All signals must be verified within 24 hours of detection. Potential sources of CBS information cannot always be trusted or considered as reliable. The standard for signal verification includes:

- *Asking questions of the CHV to ensure they have correctly understood the signal,*
- *Getting confirmation of the signal from at least two different sources, or*
- *Determining if the signal is reported by a person or place of medical authority (doctor or clinic).*

Reliable or credible sources of information can include official reports, CHV, key informants, healthcare workers, surveillance focal points, etc.

Why is signal verification important?

The verification process for community reported signals is completed by the local-level supervisors. The process helps local-level supervisors determine if the reported signal represents a threat to humans, animals, and/or the environment and requires an immediate response.

How is the signal verification process completed?

Signal verification is completed by local-level supervisors and can take place in person or over the telephone. To conduct verification, the local-level supervisor will ask questions of the CHV who has reported the signal, and possibly other people as well. This can include the patient, the family and friends of the patient, and/or other people within the community. Local-level supervisors are recommended to use the Verification Tool to complete this process. This verification process involves actively cross-checking the validity of available information and collecting additional information about the report using reliable sources as needed. The process of signal verification should answer three main questions:

- *Is the report accurate (i.e., is it true)?*
- *Has the information been reported by a reliable source or sources?*
- *Does the report meet the criteria for one or more signals?*

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet predefined signals

Confirm as an event if...

- Information is accurate and true
- Report meets one or more predefined signals
- Information has been reported by a credible source or sources (e.g., CHV, health facility focal point, or key informants)

After verification:

- *If the signal is verified to be an event by local public health authorities, it should be recorded and reported immediately to the intermediate public health authorities. Feedback should be provided to the reporter about the result of the verification process.*
- *If the signal is not considered to be an event, feedback should be provided to the reporte rabout the result of the verification process.*

What happens after signal verification?

Once a signal is verified as an event, risk assessment begins. Risk 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. To determine the overall risk and appropriate response in a timely manner, risk assessment of events must be conducted within 48 hours of initial detection as a signal.

Step 3: Ask for questions

Ask participants if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 9.2

APPLYING THE SIGNAL VERIFICATION PROCESS

Identify which signals should be confirmed as events or discarded

Demonstrate how signal verification is done by a local-level supervisor

Signal game

5 minutes set up
10 minutes game
5 minutes feedback

Step 1: Set up the game

Start by explaining that the purpose of the game is to give local-level supervisors the opportunity to demonstrate how to verify reported signals once they have been received from CHVs and triaged.

Divide participants into two equal groups and ask them to choose a representative to draw the signals from the container for the group. Give instructions for the game as follows:

- *Each group representative will come to the front of the room and draw a signal from the container. At that moment the timer will start.*
- *Each representative will quickly return to their group and discuss how and if the signal should be discarded or confirmed as an event given the information provided.*
- *After a quick discussion with their group, they have to quickly place the signal either in the discarded list or confirmed list on the flipchart posted at the front of the room.*
- *Once each representative has posted the reported signal on the flip chart, he/she will draw another from the bowl. The routine will continue until the bowl is empty and all the reported signals are either on the discarded or confirmed side of the flip chart.*
- *After 10 minutes, the race will stop. The team that has correctly placed the signals wins the game.*

Go through an example of a signal and ensure the verification process is correctly understood.

Step 2: Run the game

When the group representatives are in place, start the game by saying, 'Draw your signals!'. Start the timer. Encourage teams to cheer their group representatives on creating a competition atmosphere.

When the 10 minutes is up, go through each of the signals and ask participants which ones have been correctly discarded or confirmed. Tally up the points for each teams' correct responses. Whichever team has the most points should be declared the winner.

Step 3: Summarize and wrap up the session

Summarize the activity and encourage participants to share what they have learned. Congratulate both groups for their participation. Ask if anyone has any questions, needs clarification, or wants to comment on the game. Summarize the session by reading the key takeaway message below.

The signal verification process is an essential step in CBS, and must be conducted within 24 hours of signal detection. Verification helps determine if a reported signal represents a threat to humans, animals, and/or the environment and requires an immediate response. Local-level supervisors must complete and record this process before reporting the signal to higher level authorities.

SESSION 10

DATA RECORDING

This session focuses on the importance of recording signal information (data) in order to effectively report signals to intermediate-level public health authorities.

Learning Objectives

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

- Explain the importance of recording information (data) for reporting,
- Demonstrate how local-level supervisors can effectively record information using the Signal Register for CBS, and
- Use information (data) from previous lessons and activities to complete the Signal Register.

Materials

Facilitator

- Appendix H: Example of Signal Register for CBS
  The form that is to be used in the country should replace the example form here.

Participants

- Participant Guide page 37-40

Total time: 30 minutes

ACTIVITY 10.1

LOCAL-LEVEL SUPERVISOR DATA RECORDING

Demonstrate how local-level supervisors can effectively record information using the Signal Register for CBS

Use information (data) from previous lessons and activities to complete the Signal Register

Small group discussions and presentations

10 minutes individual work
10 minutes group work
10 minutes presentation

Step 1: Set up the exercise for individual completion

Introduce the small group exercise by explaining to participants that they are going to complete an entry in Signal Register for CBS. Ask participants to use role-plays #1 and #2, and case study descriptions from the morning CHV training to complete one entry in the Signal Register for CBS. The first half of this exercise is to be completed alone (10 minutes).

Step 2: Set up the exercise for group discussion

Once participants have completed the individual exercise, get them to get into the groups they were in for the verification game. Inform both groups that they are to share and discuss the information they recorded individually in their signal register and assist those in the team that need help completing it correctly. Give the groups 10 minutes to complete the discussion.

Step 3: Get a volunteer to present their signal register

After 10 minutes of group work, ask for a volunteer to come to the front of the room and review the signal register with everyone. Only intervene if there are questions or disagreements on how the signal register has been completed.

After the presentation, thank the volunteer by having everyone clap for him or her. Ask if there are any questions or points of clarification needed.

Step 4: Summarize and wrap up the session

Summarize the activity by restating the purpose and importance of data recording. Prior to moving to the next session, share the key takeaway message below with participants.

Local-level supervisors are responsible for triaging, verifying, and if verified as true, reporting events to the intermediate level; therefore, it is essential that their Signal Registers are completed correctly.

SESSION 11

DATA REPORTING

This session focuses on why, when a signal has been verified as an event, it is important to report the information (data) to the intermediate-level public health authorities. It also discusses the Who, When, What, and How of verified event reporting at the community and local level by local-level supervisors.

Learning Objectives

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

- Explain how local-level supervisors report confirmed signals to the intermediate-level public health authorities,
- Describe what information is reported after verification of a signal as an event, and
- Demonstrate how events are reported to higher level authorities.

Materials

Facilitator

- Flipchart paper
- Markers

Participants

- Participant Guide page 41

Total time: 30 minutes

ACTIVITY 11.1

THE WHO, WHEN, WHAT, AND HOW OF EVENT REPORTING

Explain how local-level supervisors report confirmed signals to the intermediate-level public health authorities

Describe what information is reported after verification of a signal as an event

Q&A discussion

5 minutes

Step 1: Elicit the who, when, what, and how of event reporting through Q&A

Regroup for a quick Q&A discussion to answer the **'who, when, what, and how'** of event reporting. Ask participants the following questions.

Question 1: *If you are a local-level supervisor who has triaged and verified a detected signal as an event, who do you report to?*

Answer 1: *Local-level supervisors should report to intermediate-level public health authorities.*

Question 2: *When should local-level supervisors report an event?*

Answer 2: *Local-level supervisors should report an event immediately after they have verified it.*

Question 3: *What information should be reported?*

Answer 3: *Local-level supervisors should report that an event has been detected, triaged and verified in a specific community. Details about the event (when it occurred, who and how many have been affected, where it has taken place) as well as who reported it should be provided to intermediate-level authorities.*

Question 4: *How do you report an event?*

Answer 4: *Local-level supervisors can report an event using the designated or most convenient method (e.g., telephone, text message [SMS], or in person), as long as it is done immediately.*

ACTIVITY 11.2

LOCAL-LEVEL SUPERVISOR DATA REPORTING

Demonstrate how events are reported to higher-level authorities

Small group discussion and role-play

10 minutes group work
5 minutes role-play
10 minutes discussion

The following are some methods of reporting:

Text (SMS)

Telephone

In Person

Step 1: Set up the role-play

Ask participants to imagine they are Mr. Fofana, the local-level supervisor from the morning's role-play. They have just verified Madame Diallo's reported signal from Community X as a verified health event that needs an immediate response from intermediate-level public health authorities.

Divide them into three small groups. Each group will be provided with flipchart paper and a marker (if available).

If materials are not available, inform the small group team leads that they will be responsible for writing the script in their journals or on paper that will be developed by their small group.

Ask each group to develop a script that they would use to report the event to the intermediate-level public health authority, Madame Dubois. Let them know they have 10 minutes to develop the script and write it.

Ask them to choose one or two persons who will act out the script in role-play fashion in front of the larger group using any method of reporting. Ask them to address the following questions:

- What information should the local level provide?
- Should the local level provide information about discarded signals?
- What could the response be from the intermediate level? (e.g., rapid response vs. monitoring vs. local action)

Step 2: Facilitate the role-plays

Once they have completed their scripts, randomly select a group to go first. Have them act out their scene (no more than 1 to 2-minutes). Briefly feedback on how well they addressed the questions then move on to the next group.

Step 3: Debrief and wrap up the session

After the role-plays, thank the groups by having everyone clap for each other. Debrief the role-play exercise and ask if there are any questions or points of clarification needed for this session. Summarize the activity by restating the purpose and importance of data reporting and share the key takeaway message below with participants.

Local-level supervisors should report to intermediate-level public health authorities. Reporting should be done immediately after the signal has been triaged and verified using the available and most convenient method of reporting (e.g., telephone, text message [SMS], in person, etc.).

SESSION 12

SUPPORTIVE SUPERVISION

This session focuses on the importance of supportive supervision on behalf of local-level supervisors towards CHVs. It will discuss the benefits of supportive supervision and how best to provide it to CHVs during CBS implementation.

Learning Objectives

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

- Define supportive supervision,
- Describe what it looks like in the CBS context at the community level, and
- List at least three ways to effectively provide supportive supervision to CHVs.

Materials

Facilitator

- Flipchart paper
- Markers

Participants

- Participant Guide page 42-43

Supervision monitoring visits should be conducted based on routine surveillance (information will need to be adapted by country).

Total time: 20 minutes

ACTIVITY 12.1

SUPPORTIVE SUPERVISION

Define supportive supervision

Describe what it looks like in the CBS context at the community level

Q&A discussion and lecture

20 minutes

Step 1: Elicit the characteristics of effective supervision through Q&A

Start this session by reviewing the learning objectives and then inquiring about participants' experience supervising public health professionals, specifically CHVs. Answers should be written on flipchart paper.

If materials are not available, ask another facilitator to write answers from the Q&A discussion. If you are alone, ask a participant team lead to assist you in recording the answers.

Allow participants enough time to answer these questions without interrupting them. Remember to apply the Facilitators Effective Facilitation and Communication tips during this session. These questions and this session may lead to animated discussion and complaints.

Q&A Discussion

Q1: *What are the characteristics of an effective supervisor?*

Q2: *How many of you in your role as local-level supervisors supervise a team of CHVs?*

Q3: *What has been your experience supervising CHVs?*

Q4: *What is supportive supervision?*

Q5: *If you had to name one reason why supportive supervision is important in CBS implementation, what would it be?*

Q6: *Are there any challenges to effectively providing CHVs support and supervision?*

Step 2: Deliver lecture on supportive supervision

After the Q&A discussion start the lecture part of this session.

What is supportive supervision, why is it important, and how do we do it?

What is supportive supervision?

Supportive supervision promotes mentorship, joint problem-solving and communication between supervisors and supervisees—CHVs. Supportive supervision requires a supervisor who has effective leadership characteristics, respects and values the CHVs, allowing them to feel heard, valued, and cared about.

Why is supportive supervision important?

Supportive supervision is a great approach to improving routine collection of information (data) for signal detection, recording, and reporting for CBS, especially at the community-level. When conducted successfully by local-level supervisors, it can increase CHVs capacity to detect, record, and report signals.

Supportive supervision can improve both local-level supervisor and CHVs leadership and is necessary in order to ensure that they are correctly fulfilling their responsibilities. Supportive supervision leads to positive outcomes, such as:

- *Improved support*
- *Increased commitment*
- *Reduced turnover*

How is supportive supervision conducted?

This section should be adapted to the country context based on existing national guidance for supervision of disease surveillance activities.

Local-level supervisors are required to conduct regular supervisory visits to CHVs as scheduled by national surveillance guidance (e.g., IDSR). Supervision should incorporate refresher training for CHVs on what to report, and the importance of reporting signals. Supportive supervisory visits between local-level supervisors and CHVs should be frequent and continuous. These visits are also an opportunity for local-level supervisors to provide feedback regarding reported signals.

During these visits, local-level supervisors should:

1. Engage and involve CHVs in CBS activity planning and decision-making by:

- *Asking for the opinions and ideas of CHVs and actually using them, and*
- *Encouraging them to increase their knowledge and skill-set and access growth opportunities.*

2. Show concern for them by:

- *Taking the time to get to know them personally beyond their role as a CHV,*
- *Listening to what they have to say without interrupting or inferring you know better and more, and*
- *Providing constructive feedback.*

3. *Highlight and share CHVs success and commitment with the community and higher-level health authorities.*

4. *Thank them regularly for their support and commitment to the health and safety of their community. This is very important and has proven to be beneficial, especially for CHVs who do not receive a wage for their work.*

Step 3: Wrap up session with key message

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

Supportive supervision is a great approach to improving routine collection of information (data) for signal detection, recording, and reporting for CBS. Supporting supervision visits should be frequent and continuous. Local-level supervisors should also use these visits as opportunities to strengthen the relationships he/she has with CHVs and community members.

SESSION 13

CONTINUOUS COMMUNITY ENGAGEMENT

This session focuses on the importance of ensuring continuous community engagement through local-level supervisors, and strategies on how best to engage at the community and local level.

Learning Objectives

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

- Describe the importance of community engagement in CBS implementation,
- List at least three strategies to ensure continuous community engagement,
- Describe one strategy that can be implemented immediately with CHVs and key informants after CBS training, and
- Identify the resources and support needed to implement the strategy.

Materials

Facilitator

- Flipchart paper
- Markers

Participants

- Participant Guide page 44

Total time: 30 minutes

ACTIVITY 13.1

CONTINUOUS COMMUNITY ENGAGEMENT

Describe the importance of community engagement in CBS implementation

List at least three strategies to ensure continuous community engagement

Lecture

10 minutes

Step 1: Deliver lecture on continuous community engagement

Move on to the lecture on continuous community engagement by reading the lecture following. Students can follow along in the Participant Guide and make notes in their journals.

What is community engagement, why is it important, and how do we do it?

What is community engagement?

Community engagement is "the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interests, or similar situations to address issues affecting the wellbeing of those people. It is a powerful vehicle for bringing about environmental and behavioral changes that will improve the health of the community and its members".

Why is community engagement important?

Focusing on community engagement has become important for public health initiatives including CBS as communities face reoccurring and complex health challenges due to events which are a threat to humans, animals, and the environment. It benefits health professionals and public health authorities to engage with diverse community stakeholders in ways that foster trust, demonstrate respect and build relationships.

Community engagement that is continuous and involves all community members recognizes that people are at the center of any effort to create better health and that resilient people are the foundation of resilient health systems and communities. Actions taken by engaged communities are key to controlling public health threats.

Step 2: Reinforce key message and wrap up lecture

End the lecture by saying something like, ‘Now that we have a definition for community engagement and know its importance to public health programming, we will answer the question How can local-level supervisors ensure it is conducted as part of CBS? through a small group brainstorming activity’.

ACTIVITY 13.2

APPLYING COMMUNITY ENGAGEMENT PRINCIPLES

List at least three strategies to ensure continuous community engagement

Describe one strategy that can be implemented immediately with CHVs and key informants after CBS training

Identify the resources and support needed to implement the strategy

Small group brainstorming session and presentations

10 minutes group work
10 minutes presentations

Step 1: Set up the small group brainstorming session

Introduce this activity by explaining to participants that they are going to develop strategies to increase community engagement in CBS implementation. Divide participants into two smaller groups and distribute one sheet of flipchart paper for each group.

If materials are not available, ask participant team leads to write their groups' strategies in their journal or on paper.

Ask participants to brainstorm ways (strategies) they can increase community engagement in CBS implementation. Ask them to choose one strategy from the list they feel could be implemented shortly after the training and describe the resources and support they will need. Remind the team leads to write their ideas on flipchart paper or journal and to choose another group member to present the group's strategies to the larger group.

Step 2: Group presentations and feedback

After 10 minutes of group work, ask for the groups' team leads and presenters to come together to the front of the room and present. Briefly give feedback to each group on their chosen strategy. After the presentations, thank the groups for actively participating in this activity. Ask if there are any questions or points of clarification needed.

Step 3: Summarize and wrap up the session

Summarize the activity by restating the importance of having continuous community engagement in CBS implementation. Prior to moving to the training review and close of the training, reinforce this session's key takeaway message.

Continuous community engagement benefits local-level supervisors and other health authorities to engage with diverse community stakeholders (CHVs and key informants) in ways that foster trust, demonstrate respect, and build relationships.

SESSION 14

LOCAL-LEVEL SUPERVISOR TRAINING REVIEW, KNOWLEDGE CHECK, AND CLOSE

This session will give participants the opportunity to review the learning objectives for the training, evaluate the knowledge and skills acquired, and provide feedback to facilitators regarding their satisfaction with the training.

Purpose

- Summarize lessons learned from the training,
- Assess and evaluate their knowledge and skills post-training, and
- Provide training feedback and evaluation.

Materials

Facilitator

- Facilitator Guide: Local-Level Supervisor Training Agenda (pp. 66-67)
- Flipchart paper
- Markers
- Appendix B: Training Knowledge Check Part 2
- Appendix C: Training Knowledge Check Part 1 & 2 Answers

Participants

- Participant Guide page 45

Total time: 25 minutes

ACTIVITY 14.1

REVIEW AND POST-TRAINING KNOWLEDGE CHECK

Summarize lessons learned from the training

Assess and evaluate their knowledge and skills post-training

Group discussion and questionnaire

10 minutes agenda review
10 minutes questionnaire
5 minutes questionnaire review

Step 1: Review the agenda

Ask participants to refer to their agenda to review the topics for the second half of the training. For every session, ask participants to share key takeaway messages (information) discussed and learned. Write their answers on the flipchart paper and encourage participants to take notes in their journals.

Step 2: Post-training knowledge check

Distribute Appendix B: Training Knowledge Check Part 2 to each of the participants and give them the following instruction:

> You will have 10 minutes to individually take the knowledge check. You are encouraged to ask us if you have any questions or need clarification on questions asked in the questionnaire. Please respect everyone's time by not engaging in side conversations once you have completed your own test.

Step 3: Collect the papers and review answers

After all participants have completed the questionnaires, collect them, and review the answers using Appendix C: Training Knowledge Check Part 1 & 2 Answers. Allow 5 minutes for this activity in case there are questions. They can mark the correct answers in the Participant Guide Appendix A.

ACTIVITY 14.2

PARTICIPANT FEEDBACK AND TRAINING CLOSE

Ask participants for feedback on the day's training using the available evaluation tool.

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

> *On behalf of the CBS Training Facilitators' team, I would like to thank you for attending this training and actively participating. This morning we reviewed and discussed how to conduct CBS in our communities with our CHV counterparts. In addition, this afternoon we learned the importance of both supportive supervision and continuous community engagement and how to effectively incorporate this in the work we do as local-level supervisors. As your colleagues and facilitators, we are encouraged by your commitment to CBS and we are eager to work with you and support you in your efforts. We hope the expectations you expressed in the introductions session this morning were met. We strongly encourage you to share what we have discussed and learned today with other local-level supervisors who were not able to attend as well as CHVs in your catchment area. Once again, thank you, and we wish you a safe journey home.*

APPENDICES

APPENDIX A

TRAINING KNOWLEDGE CHECK PART 1

The purpose of this questionnaire is to assess your knowledge, understanding, and application of CBS. On your own, please circle the best answer.

1. Surveillance is important because it can be used to help reduce the spread of diseases, people getting sick, suffering and deaths.

a) True **b)** False

2. CBS is an active process of community participation in _____ signals in the community.

a) detecting **b)** reporting **c)** monitoring **d)** all of the above

3. Signals are information you hear from the community that might lead you to find outbreaks that are a threat to public health.

a) True **b)** False

4. A Community Health Volunteer's (CHV) role is to _____

a) detect signals **b)** record signals **c)** report signals **d)** all of the above

5. Key informants are members of the community and are in a position to detect signals that might represent outbreaks or serious diseases.

a) True **b)** False

6. All detected signals must be reported immediately.

a) True **b)** False

7. The chickens owned by a member of the community start to die at an unusual rate. Should the CHV consider this a signal and visit the farmer?

a) Yes, the CHV should consider this situation as a signal and try to visit the farmer.

b) No, it's common for large numbers of chickens to die together.

8. All detected signals by key informants are events and should be reported to local-level supervisors by CHVs.

a) True **b)** False

9. Name three (#3) ways CHVs can report a signal to the local-level supervisor. Write the answers below.

a) _____ **b)** _____ **c)** _____

10. Key informant engagement is important for the success of CBS at the community level and should be conducted by both CHV and local-level supervisors.

a) True **b)** False

APPENDIX B

TRAINING KNOWLEDGE CHECK PART 2

The purpose of this questionnaire is to assess your knowledge, understanding, and application of triage, verification, and data reporting. On your own, please circle the best answer.

1. Local-level supervisors are responsible for triaging and verifying all signals to determine whether they are events.

a) True, it is a key function of their role.

b) No, triage and verification of events is the responsibility of the intermediate-level authorities.

2. A CHV has reported that several people in a neighborhood have developed severe illness at about the same time. Is this an event?

a) Not necessarily. Triage and verification need to take place first before it can be confirmed as an event.

b) Yes, it is an event because the people affected can die.

3. You conducted a triage of a signal reported by a CHV about several people getting seriously ill after attending a wedding. You considered the signal as relevant to public health and confirmed that it has not been reported to any public health staff before:

a) You have to report the signal as an event immediately.

b) You have to verify if the signal has truly occurred and matches with predefined signals.

4. All verified events by local supervisors should be reported to intermediate-level authorities immediately.

a) True **b)** False

5. You conducted a triage of a signal reported by a CHV about several people becoming seriously ill after attending a wedding. You considered the signal as relevant to public health and confirmed that it has not been reported to any public health staff before. Then you verified that there was only one person affected with mild diarrhea. Should you report the signal as an event?

a) Yes, I should report the signal as an event.

b) No, I should discard the signal as an event and should not report it to the intermediate-level authorities.

APPENDIX C

TRAINING KNOWLEDGE CHECK PART 1 & 2 ANSWERS

Part 1 - Answers in bold

1. Surveillance is important because it can be used to help reduce the spread of diseases, people getting sick, suffering and deaths.

a) True **b)** False

2. CBS is an active process of community participation in _____ signals in the community.

a) detecting **b)** reporting **c)** monitoring **d) all of the above**

3. Signals are information you hear from the community that might lead you to find outbreaks that are a threat to public health.

a) True **b)** False

4. A Community Health Volunteer's (CHV) role is to _____

a) detect signals **b)** record signals **c)** report signals **d) all of the above**

5. Key informants are members of the community and are in a position to detect signals that might represent outbreaks or serious diseases.

a) True **b)** False

6. All detected signals must be reported immediately.

a) True **b)** False

7. The chickens owned by a member of the community start to die at an unusual rate. Should the CHV consider this a signal and visit the farmer?

a) Yes, the CHV should consider this situation as a signal and try to visit the farmer.

b) No, it's common for large numbers of chickens to die together.

8. All detected signals by key informants are events and should be reported to local-level supervisors by CHVs.

a) True **b) False**

9. Name three (#3) ways CHVs can report a signal to the local-level supervisor. Write the answers below.

a) In person **b) By telephone call** **c) By SMS**

10. Key informant engagement is important for the success of CBS at the community level and should be conducted by both CHV and local-level supervisors.

a) True **b)** False

APPENDIX C

TRAINING KNOWLEDGE CHECK PART 1 & 2 ANSWERS

Part 2 - Answers in bold

1. Local-level supervisors are responsible for triaging and verifying all signals to determine whether they are events.

   a) True, it is a key function of their role.

   b) No, triage and verification of events is the responsibility of the intermediate-level authorities.

2. A CHV has reported that several people in a neighborhood have developed severe illness at about the same time. Is this an event?

   a) Not necessarily. Triage and verification need to take place first before it can be confirmed as an event.

   b) Yes, it is an event because the people affected can die.

3. You conducted a triage of a signal reported by a CHV about several people getting seriously ill after attending a wedding. You considered the signal as relevant to public health and confirmed that it has not been reported to any public health staff before:

   a) You have to report the signal as an event immediately.

   b) You have to verify if the signal has truly occurred and matches with predefined signals.

4. All verified events by local supervisors should be reported to intermediate-level authorities immediately.

   a) True **b)** False

5. You conducted a triage of a signal reported by a CHV about several people becoming seriously ill after attending a wedding. You considered the signal as relevant to public health and confirmed that it has not been reported to any public health staff before. Then you verified that there was only one person affected with mild diarrhea. Should you report the signal as an event?

   a) Yes, I should report the signal as an event.

   b) No, I should discard the signal as an event and should not report it to the intermediate-level authorities.

APPENDIX D

EXAMPLE OF COMMUNITY HEALTH VOLUNTEER NOTEBOOK

General Information

Name: _____

Telephone: _____

Name of CBS Supervisor: _____

Telephone: _____

Instructions

When you detect one or more signals in your community, please report immediately to your CBS Supervisor. Use this notebook to record the following information and communicate it to the CBS Supervisor:

- Date the signal began
- Date/time the signal was detected
- Description of the signal, including number of people/animals affected
- Location of the signal

Signals to be reported (examples)	Image
Two or more persons presenting with similar signs/ symptoms from the same community, school, or workplace, within one week	Pictures or images of the signals can be included on the front page to assist in detection at the community-level.
A cluster of unexplained deaths of animals within one week	
Any person presenting with new or rare signs/symptoms	
Any person with fever and rash	

APPENDIX E

VERIFICATION TOOL

As EBS is highly sensitive, it is essential to verify the authenticity of a reported signal and its characteristics. This process of verification involves actively cross-checking the validity of available information, and collecting additional information about the report using reliable sources as needed. The process of signal verification must be conducted within 24 hours of signal detection, and should answer three main questions:

- Is the report accurate (i.e., true)?
- Has the information been reported by a reliable source or sources?
- Does the report meet the criteria for one or more signals?

The graphic shown below can be used to determine the outcome of signal verification, once sufficient information has been collected and validated.

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal criteria

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, health facility focal point, or key informants)

The examples on the following pages demonstrate the process of signal verification using specific signals that may be utilized in CBS.

Two or more persons presenting with similar severe illnesses in the same setting (e.g., household, workplace, school, street) within one week

Discard if...

- There is only one person presenting with illness
- The persons present with dissimilar signs and symptoms
- There is no temporal association, and >1 week separates the patients' illness
- The persons presenting with similar symptoms reside in different settings that are physically well-separated

Confirm as an event if...

- There are two or more persons presenting with similar signs and symptoms who live or work in the same setting
- The ill persons had an opportunity for exposure or close contact with one another
- The persons' illness requires hospitalization
- One or more persons has died
- There is a common source of exposure

Unexpected large number of deaths of poultry or other domestic animals

Discard if...

- The number of animal deaths is what is normally expected
- There is a reasonable explanation for the animal deaths

Confirm as an event if...

- The number of animal deaths is not what is usually expected
- There are multiple clusters/groups of animal deaths
- There is no explanation for the animal deaths

APPENDIX F

SIGNAL GAME

Cut out the signals below and place one set in one bowl and the other set in another bowl.

Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week

A cluster of unexplained animal deaths within one week.

An illness with novel or rare symptoms

Any person with fever and rash

Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week

A cluster of unexplained animal deaths within one week

An illness with novel or rare symptoms

Any person with fever and rash

APPENDIX G

SIGNAL GAME ANSWERS

Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week.

1. Findings from verification:
   - There is only one person, a 95-year-old man with diabetes, presenting with a heart attack
   - The person affected required hospitalization but died 15 minutes ago

2. Decision tree for this type of signal (findings from verification highlighted in blue):

Discard if...

- **There is only one person presenting with illness**
- The persons present with dissimilar signs and symptoms
- There is no temporal association, and >1 week separates the patients' illness
- The persons presenting with similar symptoms reside in different settings that are physically well-separated

Confirm as an event if...

- There are two or more persons presenting with similar signs and symptoms who live or work in the same setting
- The ill persons had an opportunity for exposure or close contact with one another
- **The persons' illness requires hospitalization**
- **One or more persons has died**
- There is a common source of exposure

3. Correct answer: **Discard the signal**

A cluster of unexplained animal deaths within one week.

1. Findings from verification:
   - Around 25 lamb deaths from 1-5 October

- In the last 10 years there have not been more than 5 lamb deaths between September and October
- Unexplained deaths

2. Decision tree for this type of signal (findings from verification highlighted in blue):

Discard if…

- The number of animal deaths is what is normally expected
- There is a reasonable explanation for the animal deaths

Confirm as an event if…

- **The number of animal deaths is not what is usually expected**
- There are multiple clusters/groups of animal deaths
- **There is no explanation for the animal deaths**

3. Correct answer: **Confirmed as an event**

An illness with novel or rare symptoms

1. Findings from verification:
   - A previously healthy young woman suddenly developed coughing, fever, and bleeding and needed to be hospitalized 48 hours after developing symptoms
   - A CHV referred the patient to the hospital

2. Decision tree for this type of signal (findings from verification highlighted in blue):

Discard if…

- The illness is very common in the community
- Information has been reported by an unreliable source (e.g., by word of mouth)

Confirm as an event if…

- **The illness is rare in the community**
- **Information has been reported by a credible source or sources (e.g., CHV, hospital focal point, or key informants)**

3. Correct answer: **Confirmed as an event**

Any person with fever and rash

1. Findings from verification:
   - A 15-year-old girl has developed a rash after playing outdoors
   - She has a history of allergic reactions to some foods and medication

2. Decision tree for this type of signal (findings from verification highlighted in blue):

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- **Report does not meet signal criteria**

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., CHV, health facility focal point, or key informants)

3. Correct answer: **Discard the signal**

APPENDIX H

EXAMPLE OF SIGNAL REGISTER FOR COMMUNITY-BASED SURVEILLANCE

This Signal Register may be completed by local-level supervisor upon receiving reports of signals detected at the community-level.

TABLE INFORMATION KEY

- 'Date identified' is the date that the person reporting became aware that a person (or persons) showed signs/symptoms of one or more of the signals. Please enter date in the DD-MM-YYYY format.
- 'Date reported' is the date that the reporter informed a local-level supervisor about the signal. Please enter date in the DD-MM-YYYY format.
- 'Source of report' is the individual reporting to the local-level supervisor. A source may be: a CHV, school teacher, traditional healer, community resident, healthcare professional, among others.
- Please state the location of the patient's home, hospital, or place where the incident is occurring, as precisely and exactly as possible. If an address is available, please record it. If an address is not available, please describe the relationship between the patient's location and a landmark. If necessary, please describe the appearance of the setting. For example, a patient's home might be the brown house with a red door that is four buildings away from a specific church.
- '# of people affected' is the number of individuals who show signs of the signal being reported. Any deaths should be included in this value.
- 'Reported by multiple sources?' asks the local-level supervisor to state whether the signal has been reported by other individuals at any level of the health system.
- 'Any recent travel history?' asks the local-level supervisor to state whether the person(s) affected by the signal have travelled to or are visiting from another community, sub-national jurisdiction, or country in the 21 days preceding identification of the signal.
- 'If travel history, where?' asks the local-level supervisor to state the location of travel of person(s) affected by the reported signal. More than one location may be stated here.
- 'Signal Verification' asks the local-level supervisor to authenticate the report and record the date of report authentication. If the information has been reported by a credible source in the community (e.g., CHV, village leader, etc.), and/or by multiple sources, and also meets the signal criteria, it is an event. If the report does not meet these criteria, it is false. All events must be communicated immediately to the sub-national jurisdiction.
- 'Date signal verified' is the date that the local-level supervisor verified the signal. Please enter date in the DD-MM-YYYY format.
- 'Date event reported' is the date that the local-level supervisor communicated events (i.e., signals verified as true) to the local level. Please enter date in the DD-MM-YYYY format.

Please use the following codes to show the type of signal that is reported:

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

SIGNAL REGISTER

YEAR: 20__ Name of Local-Level Supervisor: _____

Health Facility (if applicable): _____ Sub-National Jurisdiction: _____

#	Date identified[1]	Date reported[2]	Name of person reporting	Source of report[3]	Phone number of person reporting	Location of signal[4]	Signal Code[5]	# of people affected[6]	Any recent travel history?[8] (Y/N)	If travel history, where?[9]	Signal Verification[10]		Date signal verified[11]	Date event reported[1]
											Fasle	True		

APPENDIX I

FLIPCHARTS

Flipchart A: Surveillance Group Discussion (one per group)

Q1: Do people in your community know the purpose and importance of surveillance? Yes. Why? No. Why not?	**Q2:** How do people in your community know surveillance activities are being conducted in the community?
Q3: Who is involved in ensuring surveillance activities are happening in your communities?	**Q4:** What are some ways that surveillance is conducted in your comunities?

Flipchart B: Reporting Structure for Signals (one only)

Q1: Who should Madame Diallo report to? Why?	**Q2:** When should she report this signal? Why?
Q3: How can she report this signal?	**Q4:** What information should she include in her report? Why?

Flipchart C: Key Informant Engagement (one per group)

Q1: Why are key informants important for the success of CBS?	**Q2:** What characteristics should key informants have?
Q3: What are key informants' roles and responsibilities?	**Q4:** How can you increase key informant engagement in your community?
Q5: How can you secure the trust and support of key informants in your communities?	

MODULE 5.2

COMMUNITY-BASED SURVEILLANCE TRAINING MODULE

PARTICIPANT GUIDE

U.S. Centers for Disease Control and Prevention

4 STEPS TO COMMUNITY-BASED SURVEILLANCE

SURVEILLANCE SAVES LIVES

Step 1. Educate

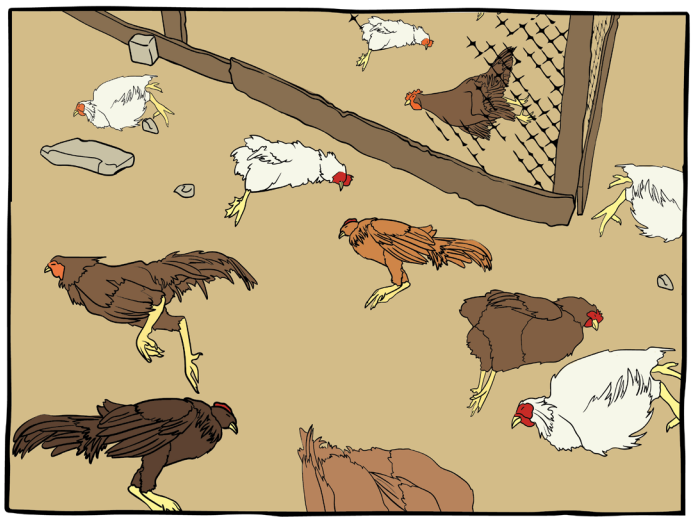
Step 2. Keep watch and listen

Step 3. Record

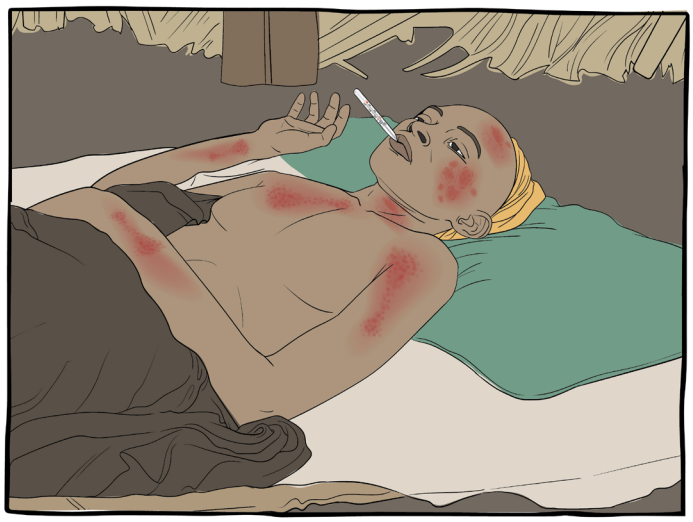
Step 4. Report

KNOW THE SIGNALS FOR YOUR COUNTRY

EXAMPLES OF SIGNALS FOR COMMUNITY-BASED SURVEILLANCE



A cluster of unexplained animal deaths within one week



Any person with fever and rash

An illness with novel or rare symptoms (signs/symptoms that the community has not seen before)

Two or more people presenting with similar severe signs/symptoms (i.e., needing to seek medical care) from the same community, school, or workplace within one week

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COMMUNITY HEALTH VOLUNTEERS TRAINING (1/2 DAY)

AGENDA FOR COMMUNITY HEALTH VOLUNTEER TRAINING

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions Activity	Small group formation Introductions	30 minutes
2. Training Overview, Agenda, and Pre-Training Knowledge Check	Group discussion Written or verbal pre-training questionnaire	25 minutes
3. Community-Based Surveillance Overview ▶ What is surveillance? ▶ Why is surveillance important in our communities?	Matching exercise Small group discussions & presentation Lecture	30 minutes
4. Signals for Community-Based Surveillance ▶ What are signals? ▶ How are signals detected? ▶ What are the signals for community-based surveillance? ▶ How do you record signals?	Group discussion Lecture Role-play Case study	60 minutes

Morning Break (15 minutes)

Opportunity to interact with colleagues and mentors

SESSION	ACTIVITIES	TIME
5. Flow of Information: What happens when you report? ▶ What do you report? ▶ Who do you report to? ▶ When do you report? ▶ How do you report signals?	Group discussion Lecture Q&A discussion Role-play	45 minutes
6. Key Informant Engagement: How to engage your communities? ▶ Who are key informants and what is their role? ▶ How do you maintain a network of key informants?	Q&A discussion Small group discussions and presentations Lecture	30 minutes
7. Community Health Volunteer Training Review, Post-Training Knowledge Check, and Close	Group discussion Written or verbal post-training questionnaire Summary and participant feedback	25 minutes
Community Health Volunteer Training		**Total 4 hours**

SESSION 1

WELCOME AND INTRODUCTIONS

Purpose

- Getting to know each other
- Group formation

Total time: 30 minutes

Introductions questions

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

1. What is your name and what community are you from?	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 in your community?	

SESSION 2

TRAINING OVERVIEW, AGENDA, PRE-TRAINING KNOWLEDGE CHECK

Purpose

- Training overview & purpose
- Agenda for the day
- Pre-training questionnaire

Total time: 25 minutes

Purpose of community-based surveillance training

The purpose of this training is to provide you—community health volunteers (CHVs) and local-level supervisors—with the knowledge, skills, and tools necessary to effectively detect, record, and report events that may be happening in your communities. Our training today has two general objectives:

- To build and strengthen your ability to look for and report unusual occurrences in your communities, and
- To improve the flow of information between your community and the health system in this country.

This one-day community-based surveillance (CBS) training is divided into two parts. The first half of the day will focus on:

- What surveillance is and why surveillance is important in communities, and
- How CHVs can effectively carry out surveillance in their communities.

The second half of the training is specifically for local-level supervisors. It will discuss local-level supervisors' roles and responsibilities in CBS.

Pre-training knowledge check

The purpose of the pre-training knowledge check is to assess your knowledge, understanding, and application of CBS. Your facilitator will distribute the questionnaire to you to complete.

SESSION 3

COMMUNITY-BASED SURVEILLANCE OVERVIEW

Purpose

- Define key terms and activities conducted in CBS
- Describe how surveillance is conducted in your communities
- Describe the importance of surveillance at the community level

Total time: 30 minutes

CBS terms matching exercise

Match the term on the left with its definition on the right.

Term	Definition
Community-based surveillance (CBS)	Regularly checking on how surveillance is being done, and whether it is working.
Detection	When more incidents of a disease exist than would normally be expected in a specific place and time period.
Event	Becoming aware of or noticing a signal that may not be known to health authorities.
Monitoring	To give (either verbally or in writing) an account of a signal you or someone else has heard, and/or seen to health authorities.
Outbreaks	A reaction by health authorities to a detected and confirmed health event in a community.
Recording	Keeping written notes on details and information (i.e., signals and events) reported.
Reporting	An unusual occurrence that may cause harm to the health of humans, animals, and/or the environment.
Response	Keeping watch for, detecting, and reporting signals and events.
Signals	Structured way of detecting and reporting events within a community, by community members.
Surveillance	Things one sees or hears about that are happening in the community that may lead to finding an event that may be a threat to humans, animals, and/or the environment.

What is surveillance?

Surveillance is **keeping watch** and **immediately reporting** signals and events in communities and/or geographic areas. It encompasses the following activities:

Look

Look and watch for unusual or unexpected occurrences.

Listen

Listen for other community members talking about unusual or unexpected occurrences.

Record

Record / write down information and details about the unusual or unexpected occurrences that you have heard about or found.

Report

Report / tell someone (i.e., your supervisor) who will be able to find out more information and verify if these signals are true events that require response actions.

Why is surveillance important?

Surveillance is important because it helps to **detect diseases early** and trigger a response to **reduce the spread of diseases, people getting sick or suffering, and deaths in our communities.** Events must first be detected and reported before they can be solved and eliminated in the community. The earlier an event is detected and reported, the faster it can be addressed, so that our friends, families, and neighbors remain safe.

Surveillance in your communities

Q1: Do people in your community know the purpose and importance of surveillance? Yes. Why? No. Why not?	**Q2:** How do people in your community know surveillance activities are being conducted in their community?
Q3: Who is involved in ensuring surveillance activities are happening in your communities?	**Q4:** What are some ways that surveillance is conducted in your communities?

What are the main goals of surveillance?

Surveillance aims to:

- Identify as early as possible any event that puts the health of a community at risk, including its residents, animals, and the environment,
- Ensure that the health system is made aware of the health-related incident in good time, and
- Ensure that the right information is available for residents to respond to the event.

Detecting and reporting events in communities, by community members, is known as CBS. This type of surveillance requires and involves community participation. This means community members look for unusual occurrences or events in humans, animals, and/or the environment which may be a risk to their communities.

The goal of CBS is to look for signals that represent events needing an immediate response and to report them immediately to supervisors.

Look at the following cases. What events might be occurring and why do they need to be responded to quickly?

Case 1

There is a 30-year-old woman with a 2-year-old son in the neighboring village. Both have a high fever, diarrhea, stomach pain, and are vomiting blood. The woman recently prepared the body of a deceased relative for their funeral.

Case 2

A large number of chickens in your village have died overnight suddenly.

Case 3

A group of children from the same elementary school have yellowing skin, high fever, bleeding, vomiting, and body aches.

The detecting and reporting of events that are conducted by community members in communities is known as **CBS.**

The **goal** of CBS is to look for and report events that need to be responded to quickly.

CBS is **more effective** when **everyone** in the community takes part and informs community health volunteers of **events that are a threat to all.**

SESSION 4

SIGNALS FOR COMMUNITY-BASED SURVEILLANCE

Purpose

- Define signals that may represent events
- Explain how signals are detected in communities
- Describe the various types of signals in your country
- Explain the importance of recording information (data) for reporting
- Demonstrate how signals are recorded

Total time: 60 minutes

What are signals?

Look at the picture. What do you see?

Fill in the blanks:

Signals are like _____ —things one sees or hears about that are happening in the community that may represent a risk to humans, animals, and the environment. In other words, signals are information which might represent an event occurring in the community.

Events are like _____ —something that is happening in the community that can spread and cause harm; like fires, events are best handled when they are small.

How are signals detected?

Signals are most likely to be detected by CHVs and key informants because of their connections to their communities. These key informants may include traditional healers, pharmacists, school teachers, barbers and hairdressers, leaders of social groups, and religious leaders, among others. CHVs can improve signal detection from their communities by engaging key informants to help them to detect signals and report them to CHVs.

Role-play

Role-Play Scenario 1: How are signals detected?

Pierre Dubois, a 65-year-old man who works and lives in Village X, has called Madame Diallo, the CHV, to let her know that he needs to see her right away about a story he heard in the market that evening. He thinks it may be an incident that needs to be checked out immediately. Madame Diallo quickly picks up her CHV Notebook and heads to Pierre Dubois's home.

Upon her arrival, Pierre tells her that in the market a friend told him that in Community Y there are two children under the age of 5 who have stopped walking. Both have stomach pains and sore throats, making it difficult to eat. One has had high fevers almost every night for the past week. Their mothers, who are sister wives, believe the last wife caused the children's illnesses out of jealousy because she was unable to have children of her own. Pierre remembers from a community meeting Madame Diallo held with key informants three months ago, that when children experience health problems like he has described it should be reported. He just prays it is not Ebola again.

What are the signals in our country?

Examples of signals for CBS

- Two or more people presenting with similar severe signs/symptoms (i.e., needing to seek medical care) from the same community, school, or workplace within one week.

- A cluster of unexplained animal deaths within one week

- An illness with novel or rare symptoms (signs/symptoms that the community has not seen before)

- Any person with fever and rash

Not every signal will mean that a big event is happening, as some will be rumors or misunderstandings. However, it is important that CHVs quickly report the information that they detect to their local-level supervisors.

A signal is information reported by a member of the community that may be an event.

It is important to remember that once a signal has been detected in a community, it should be reported immediately to the local-level supervisor.

How do you record signals?

Case study description

On October 3rd, 2019, Pierre Dubois, a 65-year-old man who works and lives in Village X, called Madame Diallo, the CHV, to let her know that he needed to see her right away about a story he heard in the market that morning. He thought it might be an event that needed to be checked out immediately. Madame Diallo met him the same day at his home to get more information about the signal he had detected.

Pierre let Madame Diallo know that a friend had told him that two children under the age of five had stopped walking in a family compound less than one-mile walking distance from the market. Both children had been experiencing stomach pains and sore throats, making it difficult to eat. One, the youngest, had a high fever almost every night for the past week. Their mothers, who are sister wives, believed the last wife had caused their children's illnesses out of jealousy, because she couldn't have children of her own. Pierre remembered from a community meeting Madame Diallo held with key informants three months ago that when children experience health problems like the ones he had described, it should be reported immediately.

Madame Diallo asked Pierre if she could take him to see his friend who knew exactly where the family compound was located. Pierre agreed to take her to his friend Paul's home. The three of them then went to visit the family compound in question. There, Madame Diallo introduced herself to the head of the household, who was sitting in front of the compound, telling him she was one of the community health volunteers responsible for looking out for and reporting any unusual occurrences or events in the community that might cause harm to other humans and animals. She then asked if she could speak with the mothers of the two children who had fallen ill in the past week. The father of the children brought her into the compound to speak to his wives. In the compound Madame Diallo made a few observations. She noticed that the homes were in close proximity to each other; children were eating outside from the same dish with their hands; the open toilet pits and showers were not too far from where the children were eating; and a child about the age of five years was lying on a mat being fed by a teenage girl.

Once she was introduced to the man's wives, she asked them questions about their children's health. Fatima, the senior wife and mother of the oldest child, spoke passionately about the children's condition and forcefully blamed the third wife, Tatianna, for their illness. She said that it wasn't until the third wife had brought her four nieces and nephews from Village Z, 10 miles away, three weeks ago, that their children had gotten sick. She complained that if Tatianna had taken her 6-year-old niece, who was already ill, to the clinic immediately, all their kids would be fine! Tatianna explained that it was not her fault the children were sick. Her nieces and nephews needed a place to stay for two weeks while her sister traveled to the city to find work. Her eldest niece only had a mild fever and fatigue when she arrived at the compound. After three days she was better.

She explained that her nieces and nephews were all back in Village Z now and should not be blamed for what was happening to her sister wives' children. Madame Diallo asked to see all the sick children, including those she saw eating outside.

Now imagine you are Madame Diallo and you have received information from the family, in addition to that which the key informant shared with you earlier in the day. As a group, think about what information should be recorded, and complete an entry in the CHV Notebook accordingly.

General Information

Name: _____

Telephone: _____

Name of CBS Supervisor: _____

Telephone: _____

Instructions

When you detect one or more signals in your community, please report immediately to your CBS Supervisor. Use this notebook to record the following information and communicate it to the CBS Supervisor:

- Date the signal began
- Date/time the signal was detected
- Description of the signal, including number of people/animals affected
- Location of the signal

Signals to be reported (examples)	Image
Two or more persons presenting with similar signs/ symptoms from the same community, school, or workplace, within one week	Pictures or images of the signals can be included on the front page to assist in detection at the community-level.
A cluster of unexplained deaths of animals within one week	
Any person presenting with new or rare signs/symptoms	
Any person with fever and rash	

SESSION 5

FLOW OF INFORMATION: WHAT HAPPENS WHEN YOU REPORT?

Purpose

- Identify the reporting structure for signals
- Explain how signals are reported at the community level
- Describe what information is reported after detection of a signal
- Demonstrate how to report signals using various signal reporting mechanisms

Total time: 45 minutes

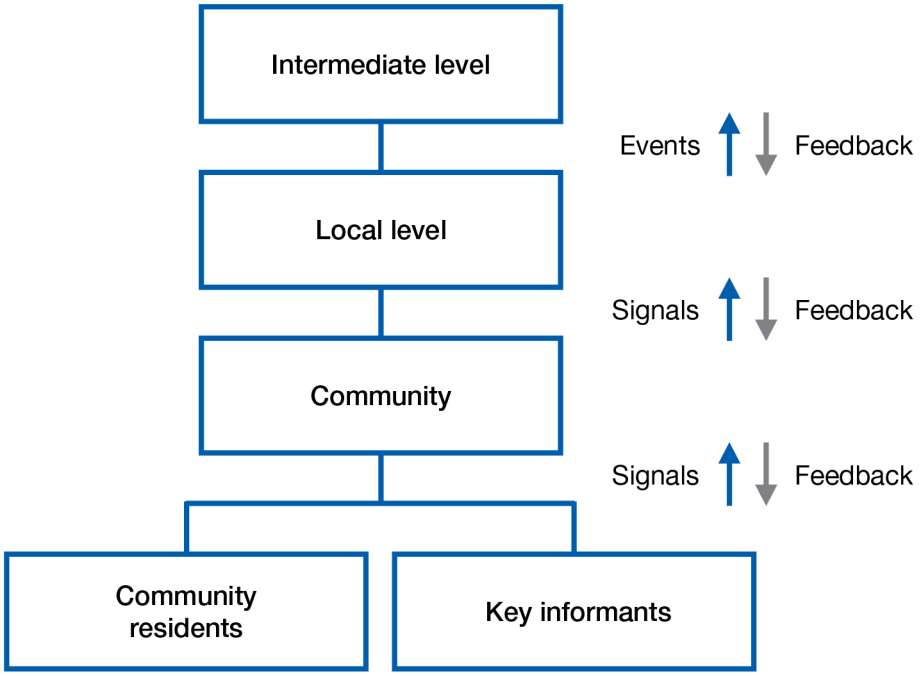
Structure for reporting signals

Participants should follow the discussion led by the facilitator and complete the following questions related to the case study.

Q1: Who should Madame Diallo report to? Why?	**Q2:** When should she report this signal? Why?
Q3: How can she report this signal?	**Q4:** What information should she include in her report? Why?

What is the reporting structure for signals? What happens when you report?

When information, or signals, are detected at the community-level, they should be reported according to the information flow structure of the country in which they have been detected. The figure below shows how information flows up through the different levels, and how feedback flows down to you, the reporters of surveillance information.



As we can see:

- Signals detected in communities by CHVs, key informants, or other community residents are to be reported immediately to the local level (local-level supervisor).
- Local-level supervisors report events up to the intermediate level.
- Intermediate-level health authorities report to higher administrative levels.

All events must be reported and investigated according to the existing national surveillance and reporting structure.

What should CHVs do after reporting?

They should collaborate with public health authorities as required to collect more information. CHVs may be asked to implement basic prevention measures such as health education and handwashing programs as needed.

Why is feedback important?

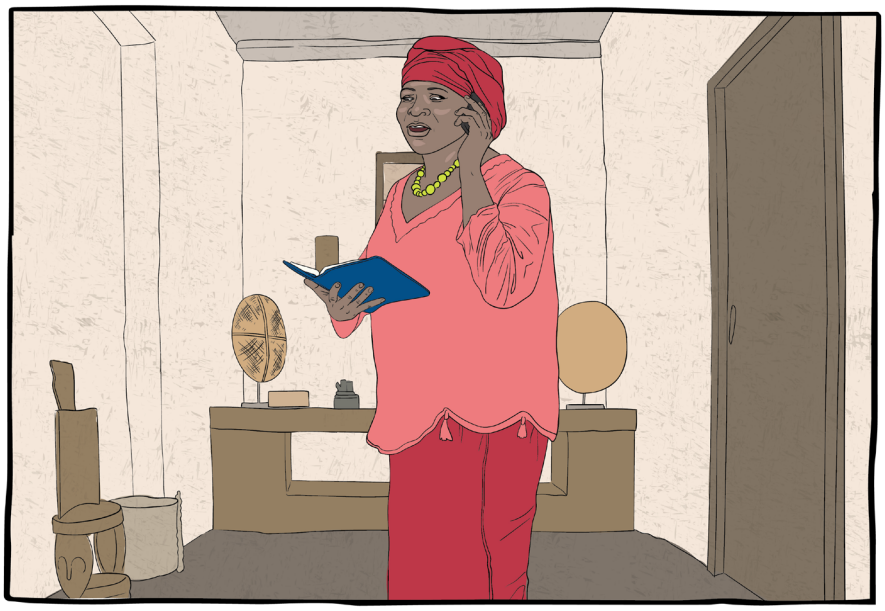
Just as timely signal reporting at each level is important, so is timely and routine feedback. Intermediate-level authorities should provide feedback about events and signals to supervisors at the local-level. Feedback on reported signals should be given to CHVs and key informants at the community level by local-level supervisors. The community needs to know how the information they shared was used so trust and mutual collaboration can be preserved.

How are signals reported?

Role-Play Scenario 2: How are signals reported?

Madame Diallo, the CHV in Village X, received a call this morning from Pierre, a key informant, regarding a signal he had detected that morning. Immediately after the call, she traveled to see him at his home and together they visited a family compound where two children around the age of five were ill and for the past week had been experiencing high fevers and the inability to walk or eat.

During Madam Diallo's visit to the compound to investigate the signal, she made a few observations, asked questions of the children's mothers, and recorded this in her CHV Notebook. She believed the situation was a signal that should be taken seriously and reported immediately. She called Mr. Fofana, her local-level supervisor, to make a report; unfortunately, the weak telephone signal in the area made it difficult to hear.



In summary, the success of CBS depends on you, the eyes and ears of your communities, to detect early and report quickly signals that may be taking place in your communities.

- Signals detected by key informants and CHVs are to be reported immediately to the local-level supervisor.
- Key informants should report signals they hear or see (detect) to CHVs.
- CHVs should record signal information in their CHV Notebook and report this immediately to local-level supervisors.
- Key informants and CHVs can report a signal using telephone, text message (SMS), or in person.

SESSION 6

KEY INFORMANT ENGAGEMENT: HOW TO ENGAGE YOUR COMMUNITIES?

Purpose

- Explain why key informants are important to the success of CBS
- Describe characteristics of key informants
- Define the roles and responsibilities of CBS key informants
- List strategies to ensure communities and their key informants are engaged in CBS

Total time: 30 minutes

Key informant engagement

In your groups discuss and answer the following questions.

Q1: Why are key informants important for the success of CBS?	**Q2:** What characteristics should key informants have?
Q3: What are key informants' roles and responsibilities?	**Q4:** How can you increase key informant engagement in your community?
Q5: How can you secure the trust and support of key informants in your communities?	

How can your communities be engaged in CBS?

As previously discussed, CBS involves the entire community. Although all community members are encouraged to 'look out' for signs that may pose a health threat, asking everyone to detect signs and report them will likely cause false or duplicate signals to be reported. It is important to identify and sensitize community members who can take on the role of a key informant. Key informants are members of the community who are able to hear about possible events. They play an important part in CBS by working closely with CHVs to detect signals in their communities. Posters and pamphlets that show the signals in text and pictures can help both CHVs and key informants to detect signals which may turn out to be events.

Once key informants have been identified, each will need to understand:

- What the signals are,
- Why it is important to inform CHVs of signals they see or hear about, and
- When they should inform CHVs of signals they see or hear about.

It is also essential that key informants can easily communicate with CHVs and are consistently reminded by CHVs of the importance of signal detection. Furthermore, to successfully ensure key informants are dedicated to their role, they should be thanked for their service to the community.

SESSION 7

COMMUNITY HEALTH VOLUNTEER TRAINING REVIEW, POST-TRAINING KNOWLEDGE CHECK, AND CLOSE

Purpose

- Summarize lessons learned from the training
- Assess and evaluate your knowledge and skills post training
- Provide training feedback and evaluation

Total time: 25 minutes

Post-training knowledge check

The purpose of the post-training knowledge check is to assess your knowledge, understanding, and application of CBS now that you have finished the training. Your facilitator will distribute the questionnaire to you to complete.

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 the expectations you expressed in the introductions exercise this morning were met. We strongly encourage you to share what we have discussed and learned today with other CHVs who were not able to attend, as well as your key informants.

LOCAL-LEVEL SUPERVISORS TRAINING (1/2 DAY)

AGENDA FOR LOCAL-LEVEL SUPERVISOR TRAINING

SESSION	ACTIVITIES	TIME
Energizer Activity	Lie detector game	10 minutes
8. Triage ▶ Pre-training knowledge check ▶ Why is triage important for community-based surveillance? ▶ What is triage? ▶ How do you triage reported signals?	Questionnaire Q&A discussion Lecture Practical exercise	40 minutes
9. Verification ▶ What is verification? ▶ Why is verification important in community-based surveillance? ▶ How do you verify triaged signals?	Group discussion Lecture Signal game	40 minutes
10. Data Recording ▶ How do you record information (data) that has been reported to you? ▶ What information do you record?	Small group discussions and presentations	30 minutes
11. Data Reporting ▶ Who do you report to? ▶ What information do you report? ▶ When do you report? ▶ How do you report information (data)?	Q&A discussion Small group discussions Role-play	30 minutes

Afternoon Break (15 minutes)

Opportunity to interact with colleagues and mentors

SESSION	ACTIVITIES	TIME
12. Supportive Supervision ▶ What is supportive supervision? ▶ Why is supportive supervision important? ▶ How do you provide supportive supervision to community health volunteers?	Q&A discussion Lecture	20 minutes
13. Continuous Community Engagement ▶ Why is continuous community engagement important to community-based surveillance? ▶ How do you ensure community members (key informants and community health volunteers) are engaged in community-based surveillance?	Lecture Small group discussions and presentations	30 minutes
14. Local-Level Supervisor Training Review, Post-Training Knowledge Check, and Close	Written or verbal post-training questionnaire Group discussion	25 minutes
Local-Level Supervisor Training		**Total 3.75 hours**

SESSION 8

TRIAGE: WHAT IT IS, WHY IT IS IMPORTANT, AND HOW TO DO IT

Purpose

- Assess your knowledge & skills pre-training
- Define triage
- List the two questions that must be asked during the process
- Explain how triaging of reported signals occurs
- Identify which signals are pertinent to CBS and are not duplicates
- Demonstrate how signal triage is done by a local-level supervisor

Total time: 40 minutes

Pre-training knowledge check

The purpose of the pre-training knowledge check is to assess your knowledge, understanding, and application of CBS prior to completing the training. Your facilitator will distribute the questionnaire to you to complete.

What is triage?

Triage is the process of screening what is reported for information that is relevant for early warning (i.e., signals that if verified could be events).

Why is it important?

The triaging process determines if a signal is relevant to public health. Triaging helps with:

- Selecting signals that may pose a risk to the public's health, and
- Filtering to get rid of duplicates.

'Relevant to public health' means that the signal fits one or more of the following descriptions:

- Could have a large public health impact in the country,
- Is outbreak-prone and poses a major public health threat,
- Has previously been prevalent and might re-emerge, and
- Is slated for eradication or elimination.

How do we do it?

Triage can take place in person, by text message, or over the telephone. When completing the signal triage process, it is important that local level supervisors ask two important questions.

Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?

Was this signal previosly reported (i.e., is this signal a duplicate)?

After triage

- If the report is not relevant or is a duplicate, then it can be discarded. If the information is to be discarded, the local-level supervisor will need to communicate this to the CHV who reported the signal. Local-level supervisors should encourage CHVs to continue reporting other possible signals. They should remind CHVs that it is okay that they have reported a signal that did not turn out to be an event and should encourage them to continue reporting signals immediately when they are detected.
- If the report is relevant and is not a duplicate, then the local-level supervisor who received the reported signal starts the verification process.

Local-level supervisors are responsible for triaging reported signals. Triaging helps answer two important questions:

- Is the reported information relevant to early warning (i.e., could this signal be a genuine public health event)?
- Was the signal previously reported (i.e., is the signal a duplicate)?

SESSION 9

VERIFICATION: WHAT IT IS, WHY IT IS IMPORTANT, AND HOW TO DO IT

Purpose

- Define verification
- Explain why it is an important step to confirming a reported signal as an event
- Demonstrate how verification of reported signals occurs

Total time: 40 minutes

What is verification, why is it important, and how do we do it?

What is signal verification?

Signal verification is completed by local-level supervisors within 24 hours of signal detection, and can take place in person or over the telephone. All signals must be verified within 24 hours of detection. Potential sources of CBS information cannot always be trusted or considered as reliable. The standard for signal verification includes:

- Asking questions of the CHV to ensure they have correctly understood the signal,
- Getting confirmation of the signal from at least two different sources, or
- Determining if the signal is reported by a person or place of medical authority (doctor or clinic).

Reliable or credible sources of information can include official reports, CHVs, key informants, healthcare workers, surveillance focal points, etc.

Why is signal verification important?

The verification process for community reported signals is completed by the local-level supervisors. The process helps local-level supervisors determine if the reported signal represents a threat to humans, animals, and/or the environment and requires an immediate response.

How is the signal verification process completed?

Signal verification is completed by local-level supervisors and can take place in-person or over the telephone. To conduct verification, the local-level supervisor will ask questions of the CHV who has reported the signal, and possibly other people as well. This can include the person affected, the family and friends of the patient, and/or other people within the community. It is recommended that local-level supervisors use the Verification Tool to complete this process. The process of signal verification must be conducted within 24 hours of signal detection, and should answer three main questions:

- Is the report accurate (i.e., is it true)?
- Has the information been reported by a reliable source or sources?
- Does the report meet the criteria for one or more signals?

Verification Tool

The graphic shown below can be used to determine the outcome of signal verification, once sufficient information has been collected and validated.

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet predefined signals

Confirm as an event if...

- Information is accurate and true
- Report meets one or more predefined signals
- Information has been reported by a credible source or sources (e.g., community health volunteer, health facility focal point, or key informants)

After verification:

- If the signal is verified to be an event by local public health authorities, it should be recorded and reported immediately to the intermediate public health authorities. Feedback should be provided to the reporter about the result of the verification process.
- If the signal is not considered to be an event, feedback should be provided to the reporter about the result of the verification process.

What happens after signal verification?

Once a signal is verified as an event, risk assessment begins. Risk 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. To determine the overall risk and appropriate response in a timely manner, risk assessment of events must be conducted within 48 hours of initial detection as a signal.

The following page provides examples of the verification process for specific signals.

Two or more persons presenting with similar severe illnesses in the same setting (e.g., household, workplace, school, street) within one week

Discard if...

- There is only one person presenting with illness
- The persons present with dissimilar signs and symptoms
- There is no temporal association, and >1 week separates the patients' illness
- The persons presenting with similar symptoms reside in different settings that are physically well-separated

Confirm as an event if...

- There are two or more persons presenting with similar signs and symptoms who live or work in the same setting
- The ill persons had an opportunity for exposure or close contact with one another
- The persons' illness requires hospitalization
- One or more persons has died
- There is a common source of exposure

A cluster of unexplained animal deaths within one week

Discard if...

- The number of animal deaths is what is normally expected
- There is a reasonable explanation for the animal deaths
-

Confirm as an event if...

- The number of animal deaths is not what is usually expected
- There are multiple clusters/groups of animal deaths
- There is no explanation for the animal deaths

An illness with novel or rare symptoms

Discard if...

- The illness is very common in the community
- Information has been reported by an unreliable source (e.g., by word of mouth)

Confirm as an event if...

- The illness is rare in the community
- Information has been reported by a credible source or sources (e.g., community health volunteer, hospital focal point, or key informants)

Any person with fever and rash

Discard if...

- Report is a hoax or a false rumour
- Information has been reported by an unreliable source (e.g., by word of mouth)
- Report does not meet signal criteria

Confirm as an event if...

- Information is accurate and true
- Report meets criteria for one or more signals
- Information has been reported by a credible source or sources (e.g., community health volunteer, health facility focal point, or key informants)

Applying the signal verification process

Discuss whether the following signals should be verified or discarded based on the information you have.

Two or more cases of people presenting with similar severe signs/symptoms from the same community, school, or workplace within one week

1. Findings from verification:

- One man, 95-years-old with diabetes, has presented with a heart attack.
- The man required hospitalization but died 15 minutes ago.

2. Should this signal be discarded or verified as an event? Why?

A cluster of unexplained animal deaths within one week

1. Findings from verification:

- Around 25 young lambs have died from 1-5 October.
- In the last 10 years there has never been more than 5 lamb deaths between September and October.
- The deaths are unexplained.

2. Should this signal be discarded or verified as an event? Why?

An illness with novel or rare symptoms

1. Findings from verification:

   - A previously healthy young woman suddenly developed coughing, fever, and bleeding and needed to be hospitalized 48 hours after developing symptoms.
   - A CHV referred the patient to the hospital.

2. Should this signal be discarded or verified as an event? Why?

Any person with fever and rash

1. Findings from verification:

   - A 15-year-old girl has developed a rash after playing outdoors.
   - She has a history of allergic reactions to some foods and medication.

2. Should this signal be discarded or verified as an event? Why?

The signal verification process is an essential step in CBS, and must be conducted within 24 hours of signal detection. Local-level supervisors are responsible for verifying reported signals. Verification helps determine if a reported signal represents a threat to humans, animals, and/or the environment and requires an immediate response. Local-level supervisors must complete and record this process before reporting the signal immediately to higher level authorities.

SESSION 10

DATA RECORDING

Purpose

- Explain the importance of recording information (data) for reporting
- Demonstrate how local-level supervisors can effectively record information using the Signal Register for CBS
- Demonstrate how verification of reported signals occurs

Total time: 30 minutes

Local-level supervisor data recording

Use the role-play and case study descriptions from the morning CHV training to complete one entry in the Signal Register for CBS.

EXAMPLE OF SIGNAL REGISTER FOR COMMUNITY-BASED SURVEILLANCE

This Signal Register may be completed by local-level supervisors upon receiving reports of signals detected at the community level.

TABLE INFORMATION KEY

- 'Date identified' is the date that the person reporting became aware that a person (or persons) showed signs/symptoms of one or more of the signals. Please enter date in the DD-MM-YYYY format.
- 'Date reported' is the date that the reporter informed a local-level supervisor about the signal. Please enter date in the DD-MM-YYYY format.
- 'Source of report' is the individual reporting to the local-level supervisor. A source may be: a community health volunteer (CHV), school teacher, traditional healer, community resident, or healthcare professional, among others.
- Please state the location of the patient's home, hospital, or place where the incident is occurring, as precisely and exactly as possible. If an address is available, please record it. If an address is not available, please describe the relationship between the patient's location and a landmark. If necessary, please describe the appearance of the setting. For example, a patient's home might be the brown house with a red door that is four buildings away from a specific church.

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

Please use the following codes to show the type of signal that is reported:

- '# of people affected' is the number of individuals who show signs of the signal being reported. Any deaths should be included in this value.
- 'Reported by multiple sources?' asks the local-level supervisor to state whether the signal has been reported by other individuals at any level of the health system.
- 'Any recent travel history?' asks the local-level supervisor to state whether the person(s) affected by the signal have travelled to or are visiting from another community, sub-national jurisdiction, or country in the 21 days preceding identification of the signal.
- 'If travel history, where?' asks the local-level supervisor to state the location of travel of person(s) affected by the reported signal. More than one location may be stated here.
- 'Signal Verification' asks the local-level supervisor to authenticate the report and record the date of report authentication. If the information has been reported by a credible source in the community (e.g., CHV, village leader, etc.), and/or by multiple sources, and also meets the signal criteria, it is an event. If the report does not meet these criteria, it is false. All events must be communicated immediately to the sub-national jurisdiction.
- 'Date signal verified' is the date that the local-level supervisor verified the signal. Please enter date in the DD-MM-YYYY format.
- 'Date event reported' is the date that the local-level supervisor communicated events (i.e., signals verified as true) to the local level. Please enter date in the DD-MM-YYYY format.

SIGNAL REGISTER

YEAR: 20__ Name of local-level supervisor: _____

Health Facility (if applicable): _____ Sub-National Jurisdiction: _____

#	Date identified	Date reported	Name of person reporting	Source of report	Phone number of person reporting	Location of signal	Signal Code	# of people affected	Any recent travel history? (Y/N)	If travel history, where?	Signal Verification		Date signal verified	Date event reported
											False	True		

Local-level supervisors are responsible for triaging, verifying, and, if verified as true, reporting events to the intermediate level; therefore, it is essential that their Signal Registers are completed correctly.

SESSION 11

DATA REPORTING

Purpose

- Explain how local-level supervisors report confirmed signals to the intermediate-level public health authorities
- Describe what information is reported after verification of a signal as an event
- Demonstrate how events are reported to higher level authorities

Total time: 30 minutes

The Who, When, What and How of event reporting

Question 1: If you are a local-level supervisor who has triaged and verified a detected signal as an event, who do you report to?

Question 2: When should local-level supervisors report an event?

Question 3: What information should be reported?

Question 4: How do you report an event?

Local-level supervisors should report to intermediate-level public health authorities. Reporting should be done immediately after the signal has been triaged and verified using the available and most convenient method of reporting (e.g., telephone, text message [SMS], in person, etc.).

SESSION 12

SUPPORTIVE SUPERVISION

Purpose

- Define supportive supervision
- Describe what it looks like in the CBS context at the community level
- List at least three ways to effectively provide supportive supervision to CHVs

Total time: 20 minutes

What is supportive supervision?

Supportive supervision promotes mentorship, joint problem-solving and communication between supervisors and supervisees—CHVs. Supportive supervision requires a supervisor who has effective leadership characteristics, and respects and values the CHVs, allowing them to feel heard, valued, and cared about.

Why is supportive supervision important?

Supportive supervision is a great approach to improving routine collection of information (data) for signal detection, recording, and reporting for CBS, especially at the community-level. When conducted successfully by local-level supervisors, it can increase CHVs capacity to detect, record, and report signals.

Supportive supervision can improve both local-level supervisor and CHV leadership and is necessary in order to ensure that they are correctly fulfilling their responsibilities. Supportive supervision leads to positive outcomes, such as:

- Improved support
- Increased commitment
- Reduced turnover

How is supportive supervision conducted?

Local-level supervisors are required to conduct regular supervisory visits to CHVs as scheduled by national surveillance guidance (e.g., IDSR). Supervision should incorporate refresher training for CHVs on what to report, and the importance of reporting signals. Supportive supervisory visits between local-level supervisors and CHVs should be frequent and continuous. These visits are also an opportunity for local-level supervisors to provide feedback regarding reported signals.

During these visits, local-level supervisors should:

1. Engage and involve CHVs in CBS activity planning and decision-making by:

   - Asking for the opinions and ideas of CHVs and actually using them, and
   - Encouraging them to increase their knowledge and skill sets and access growth opportunities.

2. Show concern for CHVs by:

   - Taking the time to get to know them personally beyond their role as a CHV,
   - Listening to what CHVs have to say without interrupting or implying that supervisors know better, and
   - Providing constructive feedback.

3. Highlight and share CHVs success and commitment with the community and higher-level health authorities.

4. Thank CHVs regularly for their support and commitment to the health and safety of their community. This is very important and has proven to be beneficial, especially for CHV who do not receive a wage for their work.

Supportive supervision is a great approach to improving routine collection of information (data) for signal detection, recording, and reporting for CBS. Supportive supervisory visits should be frequent and continuous. Local-level supervisors should also use these visits as opportunities to strengthen the relationships he/she has with CHVs and community members.

SESSION 13

CONTINUOUS COMMUNITY ENGAGEMENT

Purpose

- Describe the importance of community engagement in CBS implementation
- List at least three strategies to ensure continuous community engagement
- Describe one strategy that can be implemented immediately with CHVs and key informants after CBS training
- Identify the resources and support needed to implement the strategy

Total time: 30 minutes

What is community engagement, why is it important, and how do we do it?

What is community engagement?

Community engagement is "the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interests, or similar situations to address issues affecting the wellbeing of those people. It is a powerful vehicle for bringing about environmental and behavioral changes that will improve the health of the community and its members".

Why is community engagement important?

Focusing on community engagement has become important for public health initiatives including CBS as communities face reoccurring and complex health challenges due to events which are a threat to humans, animals, and the environment. It benefits health professionals and public health authorities to engage with diverse community stakeholders in ways that foster trust, demonstrate respect, and build relationships.

Community engagement that is continuous and involves all community members recognizes that people are at the center of any effort to create better health and that resilient people are the foundation of resilient health systems and communities. Actions taken by engaged communities are key to controlling public health threats.

"Continuous community engagement benefits local-level supervisors and other health authorities by encouraging engagement with diverse community stakeholders (CHVs and key informants) in ways that foster trust, demonstrate respect, and build relationships.

SESSION 14

LOCAL-LEVEL SUPERVISOR TRAINING REVIEW, POST-TRAINING KNOWLEDGE CHECK, AND CLOSE

Purpose

- Summarize lessons learned from the training
- Assess and evaluate their knowledge and skills post-training
- Provide training feedback and evaluation

Total time: 25 minutes

Post-training knowledge check

The purpose of the post-training knowledge check is to assess your knowledge, understanding, and application of triage, verification, and data reporting now that you have finished the training. Your facilitator will distribute the questionnaire to you to complete.

Many thanks for your participation!

Many thanks for your participation today! We are encouraged by your commitment to working with and supporting your communities. We hope the expectations you expressed in the introductions exercise this morning were met. We strongly encourage you to share what we have discussed and learned today with other local-level supervisors who were not able to attend, as well as your key informants.

APPENDIX A

TRAINING KNOWLEDGE CHECK PART 1

The purpose of this questionnaire is to assess your knowledge, understanding, and application of CBS. On your own, please circle the best answer.

1. Surveillance is important because it can be used to help reduce the spread of diseases, people getting sick, suffering and deaths.

a) True **b)** False

2. CBS is an active process of community participation in _____ signals in the community.

a) detecting **b)** reporting **c)** monitoring **d)** all of the above

3. Signals are information you hear from the community that might lead you to find outbreaks that are a threat to public health.

a) True **b)** False

4. A Community Health Volunteer's (CHV) role is to _____

a) detect signals **b)** record signals **c)** report signals **d)** all of the above

5. Key informants are members of the community and are in a position to detect signals that might represent outbreaks or serious diseases.

a) True **b)** False

6. All detected signals must be reported immediately.

a) True **b)** False

7. The chickens owned by a member of the community start to die at an unusual rate. Should the CHV consider this a signal and visit the farmer?

a) Yes, the CHV should consider this situation as a signal and try to visit the farmer.

b) No, it's common for large numbers of chickens to die together.

8. All signals detected by key informants are events and should be reported to local-level supervisors by CHVs.

a) True **b)** False

9. Name three (3) ways CHVs can report a signal to the local-level supervisor. Write the answers below.

a) _____ **b)** _____ **c)** _____

10. Key informant engagement is important for the success of CBS at the community level and should be conducted by both CHV and local-level supervisors.

a) True **b)** False

TRAINING KNOWLEDGE CHECK PART 2

On your own, please circle the best answer.

The purpose of this questionnaire is to assess your knowledge, understanding, and application of triage, verification, and data reporting. On your own, please circle the best answer.

1. Local-level supervisors are responsible for triaging and verifying all signals to determine whether they are events.

a) True, it is a key function of their role.
b) No, triage and verification of events is the responsibility of the intermediate-level authorities.

2. A CHV has reported that several people in a neighborhood have developed severe illness at about the same time. Is this an event?

a) Not necessarily. Triage and verification need to take place first before it can be confirmed as an event.

b) Yes, it is an event because the people affected can die.

3. You conducted a triage of a signal reported by a CHV about several people getting seriously ill after attending a wedding. You considered the signal as relevant to public health and confirmed that it has not been reported to any public health staff before:

a) You have to report the signal as an event immediately.

b) You have to verify if the signal has truly occurred and matches with predefined signals.

4. All verified events by local supervisors should be reported to intermediate-level authorities immediately.

a) True **b)** False

5. You conducted a triage of a signal reported by a CHV about several people becoming seriously ill after attending a wedding. You considered the signal as relevant to public health and confirmed that it has not been reported to any public health staff before. Then you verified that there was only one person affected with mild diarrhea. Should you report the signal as an event?

a) Yes, I should report the signal as an event.

b) No, I should discard the signal as an event and should not report it to the intermediate-level authorities.

APPENDIX B

COMMUNITY-BASED SURVEILLANCE TERMS

Term	Definition
Community-based surveillance (CBS)	Structured way of detecting and reporting events within a community, by community members.
Detection	Becoming aware of or noticing a signal that may not be known to health authorities.
Event	An unusual occurrence that may cause harm to the health of humans, animals, and/or the environment.
Monitoring	Regularly checking on how surveillance is being done, and whether it is working.
Outbreaks	When more incidents of a disease exist than would normally be expected in a specific place and time period.
Recording	Keeping written notes on details and information (i.e., signals and events) reported.
Reporting	To give either verbally or in writing an account of a signal you or someone else has heard, and/or seen to health authorities.
Response	A reaction by health authorities to a detected and confirmed health event in a community.
Signals	Things one sees or hears about that are happening in the community that may lead to finding an event that may be a threat to humans, animals, and/or the environment.
Surveillance	Keeping watch for, detecting, and reporting signals and events.

MODULE 6

INTERNET EVENT-BASED SURVEILLANCE TRAINING MODULE

U.S. Centers for Disease Control and Prevention

MODULE 6.1

INTERNET EVENT-BASED SURVEILLANCE TRAINING MODULE

FACILITATOR GUIDE

U.S. Centers for Disease Control and Prevention

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ACRONYMS

US CDC	U.S. Centers for Disease Control and Prevention
CBS	Community-Based Surveillance
CHV	Community Health Volunteers
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
IEBS	Internet Event-Based Surveillance
IHR	International Health Regulations (2005)
MOH	Ministry of Health
MS	Member States
NGO	Non-Governmental Organization
WHO	World Health Organization

GLOSSARY OF TERMS

Community-based surveillance (CBS):

CBS is the systematic detection and reporting of events of public health significance within a community, by community members. Community Health Volunteers (CHV), the public, religious leaders, civil society members, teachers, and similar groups are engaged and trained to detect and immediately report events or health risks occurring in their communities. CBS may also be known as community health surveillance, or community event-based surveillance.

Community health volunteers (CHV):

According to a WHO study group, CHVs may be members of the communities where they work, should be selected by the communities, are answerable to the communities for their activities, and should be supported by the health system but not necessarily a part of its organization. They may also be known as community health workers, among other terms.

Event:

The International Health Regulations (IHR) define an event as "[…] a manifestation of disease or an occurrence that creates a potential for disease; […]". This includes 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.

Geographic Scope:

The observed geographic distribution and rapidity of spread for public health event and is categorized as follows:

High: Events affecting several multi-national regions or continuing spread beyond national borders;

Moderate: Events affecting a multi-national region or continuing spread within national borders;

Low: Events limited to sub-national areas.

Health Event of International Importance:

A verified outbreak or a health threat that meets one of the following criteria, modeled after Annex 2 of the International Health Regulations: Is one of the following: SARS, polio (wild-type), smallpox, or a new subtype of influenza; Presents a serious threat to public health; is unusual or unexpected; poses a significant risk for international spread that potentially requires international intervention; or potentially causes restrictions of trade or travel.

Health Event Under Investigation:	An outbreak or a health threat that potentially meets one of the above criteria, but is not yet verified.
Health Event for Information:	A description of a verified health event that does not meet one of the above criteria but is of interest to the public health community because it poses a potential public health risk.
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 either the 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.
Information Credibility Scale:	Combines 1) the credibility of the source with 2) the validity of the information and is categorized as: **High:** evidence from public health agencies, in-country laboratories; not confirmed, but logical and consistent with event information; **Moderate:** Public health agency staff with in-country information without approved laboratory support, but not without some doubt of authenticity, trustworthiness. *Note: that this scale only applies to events categorized as Health Event Under Investigation*
Intermediate administrative level:	Intermediate administrative levels may be defined differently in different countries. For the purpose of this document, an intermediate level is the public health administrative level below the national level that is responsible for conducting preliminary investigations and implementing responses to reported public health events or suspected outbreaks in a given jurisdiction. The intermediate level may otherwise be referred to as districts or counties, among other terms.
Internet event-based surveillance (IEBS):	Internet event-based public health surveillance looks at reports, stories, rumors, and other information about health events that could be a serious risk to public health; such information may be described as unstructured information because the information obtained is non-standardized or subjective. WHO: Implementation of Early Warning and Response with a focus on Event-Based Surveillance, Interim Version

Local administrative level:	Local administrative levels may be defined differently in different countries. For the purpose of this document, a local administrative level is the lowest administrative division within a country, directly above the community level.
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. 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, may also constitute an outbreak and should be reported and investigated.
Public Health Impact:	Refers to actual or potential severity of illness, ease of transmission, public fear, or economic effects and is categorized as follows: **High:** highly pathogenic, highly transmittable, new or emerging, or has significant potential to disrupt travel or trade; **Moderate:** the potential to cause morbidity /mortality, transmit efficiently, or to disrupt travel or trade.
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 have to 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.
Risk characterization:	According to WHO, once a risk assessment team has carried out hazard, exposure, and context assessments of an event, a level of risk should be assigned. This process is called risk characterization.
Signals:	Patterns of disease or other information considered by the Early Warning and Response 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:	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.
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 State 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 cross-checking of the validity (veracity) of the signals collected by Early Warning and Response, by contacting the original source, additional sources, or by performing field investigation. Verification requires that hoaxes, false rumors, and artefacts are eliminated from further consideration.

INTRODUCTION

Many countries lack the essential resources required to meet the revised International Health Regulations (IHR 2005) requirements to effectively monitor, report, and respond to any disease or other public health threat with the potential to harm the public's health.

The revised IHR is the international agreement designed to help contain or prevent serious risks to public health and discourage unnecessary or excessive restrictions on travel or trade entered into force in 2007. The revised Regulations acknowledge that public health events can pose threats beyond national borders and that Member States have a responsibility to the global community to identify, report, and when possible, contain public health threats before they become "public health emergencies of international concern". While public health burden is assessed by analyses of quantitative data collected via traditional surveillance methods, an estimate of public health can be gleaned via event-based surveillance (EBS) data.

Countries that lack resources could have inadequate health service infrastructures, poorly trained staff, inadequate diagnostic lab capacities, or weak reporting mechanisms. Furthermore, many governments could be reluctant to report public health events to the international community. Both situations - if countries cannot or will not report - are ideal for EBS. EBS is a system of organized and rapid capture of information about potential public health threats that pose a risk to public health.

These are defined at:
WHO: Implementation of Early Warning and Response with a focus on Event-Based Surveillance, Interim Version

An EBS unit includes a director and staff ("Analysts") with expertise in infectious and non-infectious disease, human and veterinary medicine, medical microbiology, epidemiology, and information technology who are responsible for:

- Detection and verification of public health threats,
- Tracking and identifying "mysterious illnesses" for the which etiology is unknown,
- Establishing a subject matter network to assist with threat verification, and
- Partnering with local, regional, and international public health organizations to disseminate information.

This module describes the daily responsibilities of an EBS unit positioned at the central, or federal, level and addresses resources that should be used and applied to successfully conduct EBS.

Background

The mission of an EBS unit should be to provide a single source of reliable, comprehensive, and confirmed information on international disease outbreaks and other public health threats by systematically collecting and analyzing international health event data, conducting risk assessments, classifying the health risks associated with these events, and disseminating health threat information.

This system of risk assessment is particularly effective in detecting public health threats in countries that have weak surveillance and reporting. Sources of data include existing channels of established formal and routine reporting systems, and informal open channels, using internet-based media, social media, and non-governmental organizations.

Analysts in an EBS unit provide prompt, expert analysis and projected impact of public health threats. Data collected from disparate sources are reviewed and verified through refined methodologies and protocols, including the use of sophisticated text-mining and multilingual translating systems.

Events should be triaged and entered into a software application, creating a database of analyzed public health threats. Such a database should ideally be used to create reports to disseminate to shareholders and partner organizations, with reporting frequency determined by the EBS unit and shareholders.

Analysts in an EBS unit should be knowledgeable with regard to the International Health Regulations (IHR). The IHR is an international legal instrument that is binding in 194 countries, including all the Member States of the World Health Organization (WHO). The IHR initially came into being in 1969 and remained relatively unchanged until a revision was completed in 2005.

The aim of the IHR (2005) is to:

- Ensure the international community can prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide,
- Provide a legal framework for the prevention, detection and containment of public health risks at source, before they spread across borders, through the collaborative actions of States Parties and WHO, and
- Be inclusive in respect of the public health events under consideration.

All Member States are required to notify WHO for all "events that may constitute a public health emergency of international concern" under the IHR. In this regard, the broad new definitions of "event", "disease" and "public health risk" in the IHR are the building blocks of the surveillance obligations for States Parties and WHO. Within the IHR they define a Public Health Emergency of International Concern (PHEIC) as "an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response." Events of potential international concern require States Parties to notify WHO and may extend beyond communicable diseases and arise from any origin or source.

The IHR document itself and information on it can be found here: http://www.who.int/ihr/en/.

Internet event-based surveillance (IEBS)

An EBS unit conducts event-based surveillance, as opposed to indicator or case-based surveillance.

EBS is the organized and rapid capture of information about events that are a potential risk to public health:

- It is designed for early warning and rapid response,
- There is a systematic monitoring of events, event assessment and verification, and data dissemination,
- The collection and collation of information is processed in real time, and
- There is no designated timeline or predefined structure for reporting.

EBS has several advantages over case-based surveillance, because case-based surveillance:

- Produces credible information, but reporting is often delayed,
- Is designed for known diseases; diseases are often not reported until the etiology is known,

- Is not well-established in all countries, and
- Is limited to the health sector, whereas media and other types of open-source reports often originate from highly-motivated entities, such as journalists, which can promptly provide information to open sources

EBS is primarily conducted using the internet: information, or "epidemic intelligence" is collected from formal and informal sources, including media reports, to detect potential public health events to verify and take action on, if necessary. Public health events that include notable human or animal illnesses or deaths, for example, will likely be covered by local media sources which will undoubtedly be posted on the internet, before they are detected, confirmed, and reported by a local public health agency.

Staffing of an EBS unit

A highly trained staff with diverse backgrounds is imperative to the function of an EBS unit.

Director, reports to public health agency leadership

- Leads in a proactive, customer-responsive manner consistent with stakeholders: ascertains needs/ requirements, solicits feedback, and makes appropriate adjustments,
- Ensures a high level of standard and quality of the services and products provided by the EBS unit,
- Identifies the priority and strategy for the EBS unit and plans, organizes, and assigns work,
- Responsible for prudent management of financial resources provided to the EBS unit, and for reporting expenditures,
- Recruits and selects staff,
- Establishes employee performance plans, and completes required reviews and ratings, and
- Leads a daily epidemic intelligence meeting and contributes technical and global health expertise and knowledge.

Analysts, report to EBS Unit Director

- Conducts EBS, including detection, verification and risk assessment of public health events,
- Identifies, collects, and consolidates public health event data,
- Liaises with other units within the agency, and with external public health agencies,
- Prepares and submits reports and other products related to the EBS unit, as well as manuscripts, presentations, journal articles and publications based on scientific findings,
- Supervises interns, students, and guest researchers, and
- Develops new concepts, methods and strategies for conducting EBS.

Analysts should possess specialized training, including medical officers, veterinary medical officers, and doctoral epidemiologists.

Medical officers

- Provides technical expertise on scientific planning, implementation and analysis of medical aspects of scientific research studies,
- Provides agency wide leadership for medical, epidemiologic, and scientific activities, and
- Serves as an expert on clinical human medicine.

Veterinary medical officers

- Provides expert veterinary medical consultation services,
- Provides international zoonotic disease surveillance and epidemiology,
- Provides knowledge of prevention and control of zoonotic disease,
- Integrates veterinary and public health research and practice,
- Coordinates veterinary medical technical assistance on scientific features of zoonotic disease,
- Monitors global human and animal health systems,
- Establishes and maintains channels of information gathering and sharing on animal populations, existing animal surveillance systems, databases and veterinary government contact points, and
- Develops plans for using epidemiologic methods to reduce public health risks associated with the handling, exhibition, production and consumption of animals and their products/by-products.

Medical officers

- Develops policy and objectives, appraising programs and initiating requirements for epidemiologic studies,
- Evaluates data collection, quality control and data utilization methods to study epidemiologic problems,
- Coordinates analytical and data visualization projects, and
- Develops training curricula on core concepts in EBS and leads EBS workshops/mentorships.

OVERVIEW

Purpose

The *Internet Event-Based Surveillance Training Module* will provide public health professionals with the knowledge, skills, and tools necessary to effectively implement EBS using the internet as a primary source of information. The module will additionally help public health professionals to plan, organize and establish an EBS unit in their jurisdiction.

This module is divided into eight sessions, including a case study and post-test to check participant progress after the training.

Audience

This training is targeted to public health professionals, epidemiologists, and scientists who are working at the federal level in their country.

Specific Learning Objectives

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

- Supervise and conduct effective EBS activities in health facilities and communities that are in line with routine surveillance strategies,
- Contribute to the flow of surveillance-related information between the community level and the existing public health surveillance system, and
- Establish an EBS unit positioned at the central or federal level.

Facilitator's Training Guide

The *Internet Event-Based Surveillance Training Module* is comprised of a *Participant Guide*, as well as a 'how to conduct the training' *Facilitator Guide*. This component, the *Facilitator Guide*, is to be used by facilitators to provide effective training to federal level public health authorities on EBS implementation using the internet as a primary source of information.

This guide contains content, training materials, and the appendices including the presentations and basic templates.

Agenda

The suggested agenda for this training is a two-day training, split into eight sessions. The proposed agenda may be revised as needed based on EBS implementation and country context.

Materials

Participants should receive a copy of the *Internet Event-Based Surveillance Training Module Participant Guide* at the beginning of the workshop. The *Participant Guide* contains materials for their use both during and after training.

Preparation

All facilitators delivering this training in person should review the content and materials needed to carry out each session, found in each section of this guide. Once facilitators are familiar with the content, they should take the time to develop the prepared flipcharts that are required in the sessions.

LOGISTICS AND SUPPLIES

In-person training

Training location and space setup

Training locations may vary, and can include office spaces, health centers, hospitals, church premises, or others. Five to six tables with a seating capacity of five to six participants per table are 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) should also be able to move around the tables easily to get close to participants. Arrange the seats so that everybody can see the front and set up one flipchart and several markers for each group.

Preparation checklist

TASK	✓
Obtain an adequate number of flipchart packages, including stands, paper, and markers (one for every team of participants)	
Obtain an adequate supply of sticky notes, pens, and paper	
Verify that the training room is set up with grouped tables with 5-8 chairs at each table	
Make plans to conduct case study on the last day of training	
Make sufficient copies of the *Internet Event-Based Surveillance Training Module Facilitator Guide* for co-facilitators	
Make one copy per-participant of the *Internet Event-Based Surveillance Training Module Participant Guide*	
Make one copy per-participant of the *Internet Event-Based Surveillance Post-Training Evaluation* survey	

Virtual training

Setup

If training is being conducted virtually, the in-person logistical steps here and throughout the *Facilitator Guide* can be disregarded. Trainers should ensure that participants are able to actively participate via the internet using the platform most appropriate for their location and number of participants (e.g., Zoom, Microsoft Teams). Ensure that participants have been sent the *Participant Guide* in advance of the virtual session. The PDF is fillable using Acrobat Reader or can be printed. Group exercises can be run as whole group discussions or individual exercises that participants complete in their *Participant Guides*. Knowledge checks can be delivered via a mobile, online platform such as Poll Everywhere (https://www.polleverywhere.com).

Class preparation checklist

TASK	✓
Send participants the *Participant Guide* ahead of the virtual session	
Send invitation to join the session via the chosen platform (e.g., Zoom, Microsoft Teams)	
Ensure co-facilitators have a copy of the *Internet Event-Based Surveillance Training Module Facilitator Guide*	
If conducting knowledge checks with mobile, online platform such as Poll Everywhere, set up in advance	

INTERNET EVENT-BASED SURVEILLANCE TRAINING AGENDA

DAY 1

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Icebreaker	15 minutes
2. Training Objectives and Agenda	Agenda	10 minutes
3. Introduction to Key Concepts in Epidemic Intelligence	Lecture Small group exercise	45 minutes
4. Identifying Signals for Priority Diseases	Lecture Group discussion	1 hour
5. Signal Verification and Rapid Event Assessment	Lecture	1 hour
Internet Event-Based Surveillance Training Day 1		**Total: 3 hours 10 minutes**

DAY 2

SESSION	ACTIVITIES	TIME
6. Registration and Reporting of Events	Lecture Small group exercise Group discussion	1 hour 15 minutes
7. Establishing an EBS Unit	Lecture	45 minutes
8. Training Review, Case Study and Close	Case Study	30 minutes
Internet Event-Based Surveillance Training Day 2		**Total: 2 hours 30 minutes**

SESSION 1

WELCOME AND INTRODUCTIONS

This session introduces the training and any necessary logistics announcements that should be made. In addition, an icebreaker activity is conducted to allow participants to introduce themselves and get to know each other.

Purpose

- Get participants to introduce themselves and get to know each other, and
- Warm up the conversation to the topic of the training.

Materials

Facilitator

- Flipchart paper and markers for each group

Participants

- *Participant Guide*: Introduction questions page 5

Total time: 15 minutes

ACTIVITY 1.1

WELCOME AND INTRODUCTORY ICEBREAKER

Get participants to introduce themselves and get to know each other

Warm up the conversation to the topic of the training

Group formation

15 minutes

Step 1: Introduce yourself

Begin the training module with a warm welcome and some background on your experience working in surveillance and interest in facilitating the training. This should provide a friendly 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

After introducing yourself, ask participants to form groups of four. Ask them to try to join groups with different team members than previous event-based surveillance (EBS) training events where possible.

If you are delivering the training online, conduct this exercise as a whole group discussion. Ask participants to record their answers to the questions on page 15 of their *Participant Guide*, then invite them to take turns introducing themselves and sharing their responses.

Step 3: Facilitate small group introductions

Ask participants to introduce themselves by answering the following questions on the flipchart paper (if available) or on page 15 of their *Participant Guide*:

- *What is your name and which organization or agency do you work for?*
- *What is one thing you enjoy about working in public health?*
- *What two words best describe the people your work with in your organization?*
- *Have you taken any previous trainings or workshops related to event-based surveillance?*
- *What is one expectation you have for this training?*

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.

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

Finish the activity by establishing the expectations for group participation and respect for the ground rules that have been brought up in the Introductions activity.

SESSION 2

TRAINING OBJECTIVES AND AGENDA

This session focuses on reviewing the training objectives, content and agenda.

Purpose

- Contextualize and create interest in the training,
- Communicate the training's general objectives, and
- Give participants a roadmap for the workshop via the agenda, logistics, and materials.

Materials

Facilitator

- Facilitator Guide: Training Agenda pages 16-17

Participants

- Participant Guide: Training Agenda pages 13-14

Total time: 10 minutes

ACTIVITY 2.1

TRAINING OBJECTIVES AND AGENDA

Contextualize and create interest in the training

Communicate the training's general objectives

Give participant's a roadmap for the workshop via the agenda, logistics, and materials

Group discussion

10 minutes

Step 1: Review the training goals and agenda

Ask participants to open their *Participant Guides* to page 16. Go over the purpose of the training and agenda by reading the script below:

The purpose of this training is to provide you—public health professionals—with the knowledge, skills, and tools necessary to conduct event-based surveillance, also known as EBS, in your countries. This training aims to develop your ability to:

- *Supervise and conduct effective EBS activities in health facilities and communities that are in line with routine surveillance strategies,*
- *Contribute to the flow of surveillance-related information between the community level and the existing public health surveillance system, and*
- *Establish an EBS unit positioned at the central or federal level.*

Let's now review the training agenda on pages 13-14. This two-day EBS training is divided into two parts. The first day will focus on:

- Key concepts in epidemic intelligence,
- How to identify signals for priority diseases, and
- Signal verification and rapid event assessment.

The second day will focus on:

- *Registration and reporting of events,*
- *Establishing an EBS unit, and*
- *Training review and post-test.*

On both days, we will have a 15-minute break midway through the training so you can stretch your legs and use the bathroom if needed. The workshop will finish at [time].

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 introductions activity. You can use the following script:

Our goal as facilitators is to make this training as informative and interactive as possible. In order for us to successfully meet the expectations you shared during the Introductions activity, we are asking for everyone's participation. We encourage you to share your work experiences and learn from each other. At the same time, we ask that we all respect the ground rules we have discussed (point to the flipcharts if you are using them). If you have any questions or concerns, please feel free to speak to one of us.

Step 3: Ask for questions

Ask participants if they have any questions regarding the content. Clarify and answer any questions before moving on to the next activity.

SESSION 3

INTRODUCTION TO KEY CONCEPTS IN EPIDEMIC INTELLIGENCE

This session focuses on the importance of Internet Event-Based Surveillance (IEBS), including key terms, relevant guiding documents, and the roles of indicator-based surveillance (IBS) and EBS in epidemic intelligence.

Learning Objectives

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

- Define key terms connected with epidemic intelligence,
- Identify the guiding documents for public health surveillance,
- Describe the roles of IBS and EBS in epidemic intelligence,
- Identify key differences in IBS and EBS in epidemic intelligence, and
- Describe the signal detection process.

Materials

Facilitator

- Prepared flipchart: Key terms in public health surveillance (Appendix 1 of this guide)
- Prepared flipchart: How EBS and IBS contribute to epidemic intelligence (Appendix 2 of this guide)
- Prepared flipchart: EBS and IBS in your community (Appendix 3 of this guide)
- Rwanda case study (Appendix 4 of this guide – for online delivery only)
- Additional blank flipchart paper and markers

Participants

- *Participant Guide* pages 7-24

Total time: 45 minutes

ACTIVITY 3.1

INTRODUCING PUBLIC HEALTH SURVEILLANCE

Define key terms connected with epidemic intelligence

Identify the guiding documents for public health surveillance

Interactive lecture

10 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver the interactive lecture on public health surveillance

Open the session by explaining to participants that this activity will be delivered as an interactive lecture, with periodic check points where participants can work in groups to answer a question or brainstorm a definition.

If you are delivering the training online, students can work on this activity individually (recording their responses in their *Participant Guide*), or collectively, as a whole group discussion.

Ask participants to return to the same groups of four that were formed during the introductory icebreaker activity. Distribute the prepared flipchart *Key terms in public health surveillance* (Appendix 1 of this guide) and ask participants to locate the questions on page 17 of their *Participant Guides*.

Each team should select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter). Participants should remain in their groups for both the lecture and discussion parts of this activity.

Read the following statement, then allow 2-3 minutes for groups to make notes on each question. After this time, ask for one volunteer to answer the question, writing the correct answers on a blank flipchart at the front of the room. Once the correct answer has been given, move on to the next block of lecture content and question(s).

We will open this session by going over some key words and concepts used in public health surveillance. Working in your same groups of four, write down your answers for each of the questions that follow.

Q1: What is public health surveillance?

Model answer: *Public health surveillance is the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice.*

The global context for public health surveillance - International Health Regulations
The IHR represent an international legal instrument that is binding in 196 countries, including all the Member States of the World Health Organization (WHO).

The revised IHR acknowledge that public health incidents can pose threats beyond national borders and that Member States bear a responsibility to the global community to identify, report, and when possible, contain public health threats before they become "public health emergencies of international concern".

What is a public health emergency of international concern?
The IHR define a public health emergency of international concern as an extraordinary event which is determined to constitute a public health risk to other states through the international spread of disease and to potentially require a coordinated international response.

Now let's consider how early warning and response (EWAR) fits in. Let's start by considering how this term is defined. In your same groups, write the definition of EWAR.

Q2: What is EWAR?

Model answer: *The organized mechanisms used by countries to achieve country-specific objectives for the early detection of public health events requiring rapid investigation and response are referred to as EWAR.*

Q3: What do you see as the goal of EWAR?

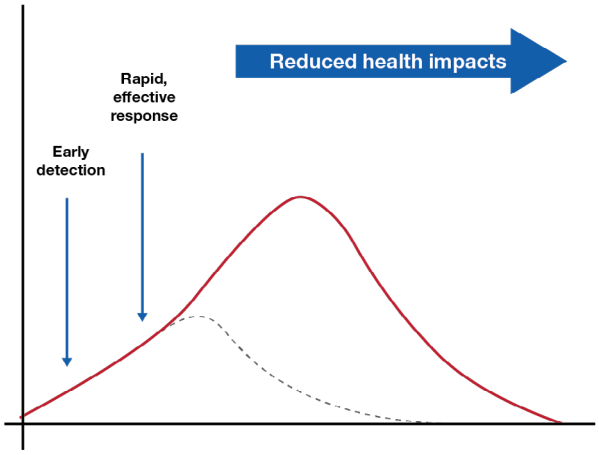
Model answer: *The general objective of EWAR is to rapidly detect and control acute public health events of any origin, with particular attention to nationally prioritized health risks. EWAR aims to increase sensitivity of detection, quality of risk assessment, timeliness, and effectiveness of the response to acute public health risks in order to minimize the negative health consequences to the affected population.*

Flattening the curve

Ask participants to locate figure 1 in their *Participant Guides*.

Flattening the curve is something we've all heard a lot lately…
It means taking action quickly to change an epidemic curve from the red line…to the dotted gray line, reducing the number of cases and the overall impact of the health event.

"flatten the curve..."

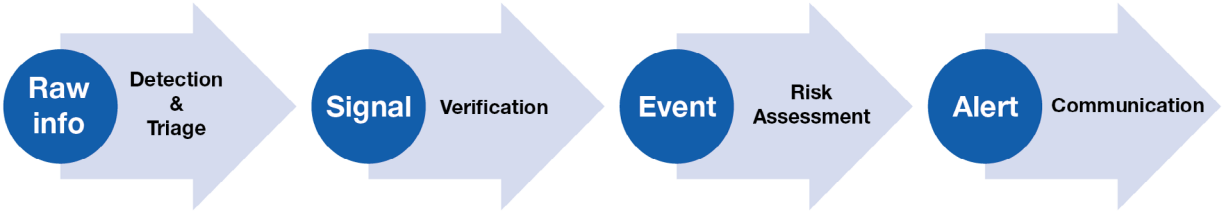


Make sure that the main takeaway is clear – the two lines represent hypothetical epi-curves for an outbreak. The grey dotted line represents the reduced health impacts enabled through early detection and rapid, effective response made possible by knowing sooner.

Q4: What is epidemic intelligence?

Model answer: *Epidemic intelligence is the systematic collection, analysis and communication of any information to detect, verify, assess, and investigate events and health risks with an early warning objective.*

Let's take a look at the figure on page 19 of your Participant Guide.



*As you can see, at each phase, the material/information is moved through different classifications starting with the **raw information** that needs to be reviewed and triaged. Once that data has been screened and triaged, or organized by its importance to public health, those pieces of information that are relevant are classified as **signals**, which require further verification.*

*The relevance of information will vary, depending on the scope of epidemic intelligence prioritized by an organization or community. If a verified signal is then classified as an **event**, a formal risk assessment may be conducted, and if appropriate, an **alert** is issued to trigger communication with affected partners.*

Epidemic intelligence is really a process that integrates information from all sources of public health surveillance.

Step 3: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 3.2

INDICATOR-BASED SURVEILLANCE AND EVENT-BASED SURVEILLANCE IN EPIDEMIC INTELLIGENCE

Describe the roles of IBS and EBS in epidemic intelligence

Identify key differences in IBS and EBS in epidemic intelligence

Lecture and small group exercise

15 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver lecture on IBS and EBS in epidemic intelligence

IBS and EBS in epidemic intelligence

IBS and EBS are complementary sources of information, and both contribute to the early warning function and epidemic intelligence process critical for a prompt and proportioned response.

The two are not necessarily separate surveillance systems. Both IBS and EBS present intrinsic characteristics in terms of processes and the types 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 routinely (i.e. passively).*
- *Conversely, in most instances, both the content and format of the information collected by **EBS** is not initially designed for this use (that is, it is unstructured information). Some data might have been initially collected in a structured manner, but for a different audience, often with a non-human-health objective. One example might be veterinary data collected for an animal health purpose only.*

IHR and related guidance suggest that countries build capacities for early warning functions through the integration of systems for IBS and EBS.

EWAR can be thought of as the national-level strategy for collecting, processing, and analyzing information from diverse sources to support the rapid detection of public health events. IBS and EBS are the primary tools for achieving EWAR.

Step 3: Set up the small group discussion

Introduce the small group exercise by referring to the flipchart *Small group exercise: how EBS and IBS contribute to epidemic intelligence* (Appendix 2 in this guide, and page 20 of the *Participant Guides*).

Ask participants to join the same groups of four and provide each group with a flipchart and a marker. Each team should select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter). Allow 10 minutes for participants to discuss and record responses to each of the questions below.

Read the following script then ask participants to capture their answers on the prepared flipchart:

Thinking about the differences between IBS and EBS, write down a few key points for each of the following topics:

- The ***processes*** by which IBS/EBS contribute to EI
- The characteristics of IBS/EBS ***data***
- Examples of IBS/EBS ***sources***

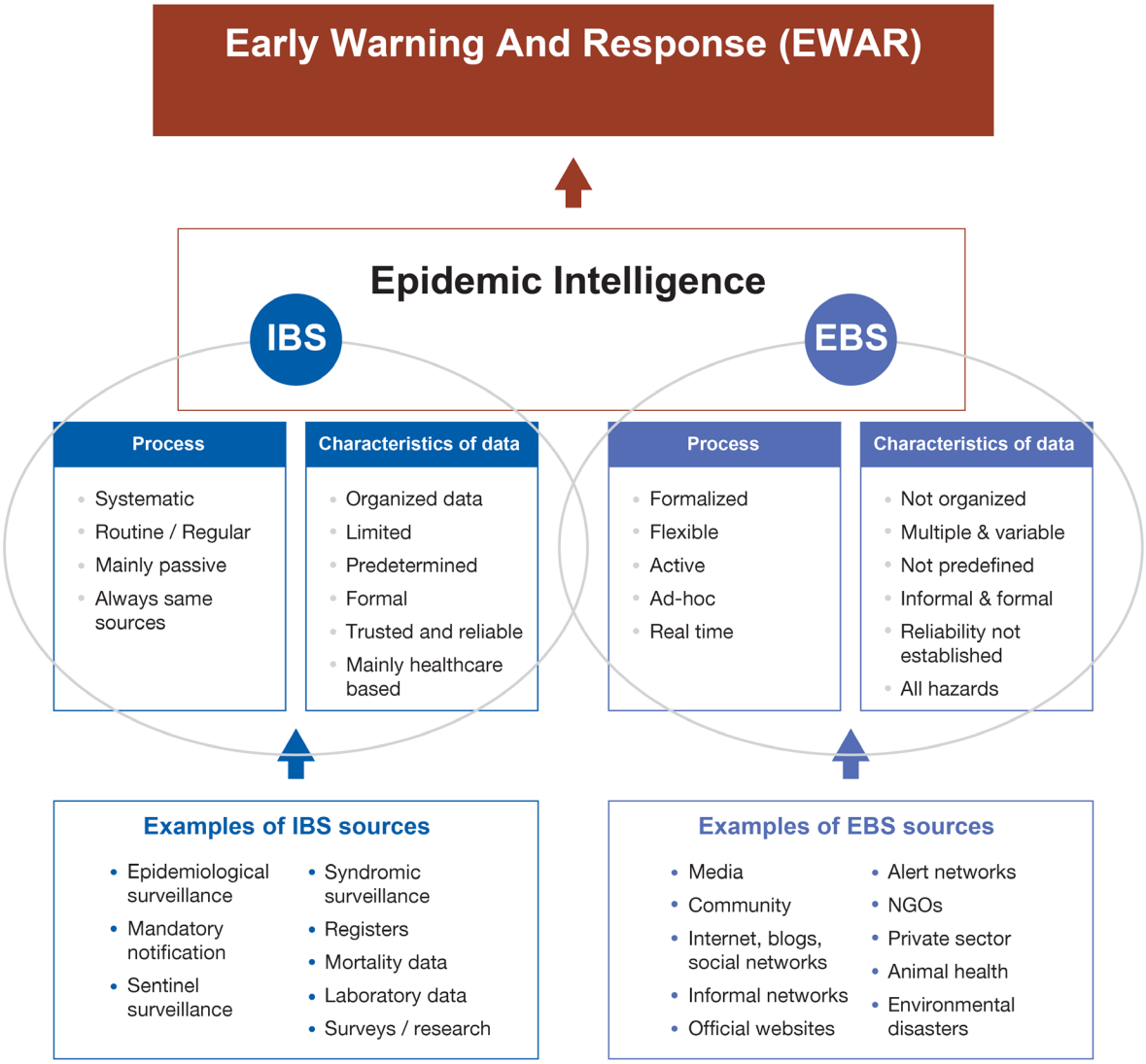
If you are delivering the training online, students can work on this activity individually (recording their responses in their *Participant Guide*), or collectively, as a whole group discussion.

Step 4: Facilitate group discussion

Monitor the timing of the exercise. After 10 minutes, ask the groups to direct their attention to the blank flipchart at the front of the room. Inform participants that they will now work collectively to populate the flipchart with their responses to the questions above.

Ask if there is a group that wants to present first. If no group volunteers, randomly select a group to start. Each group should present three to four points each. Once all groups have contributed, ask the broader group if there are any points missing, and add these to the flipchart.

Refer to the figure below to ensure key points for each flipchart section are covered.



Step 5: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 3.3

EPIDEMIC INTELLIGENCE IN EARLY WARNING AND RESPONSE

Describe the roles of IBS and EBS in epidemic intelligence Describe the signal detection process Identify key differences in IBS and EBS in epidemic intelligence	Lecture	10 minutes

Step 1: Review the content of this activity

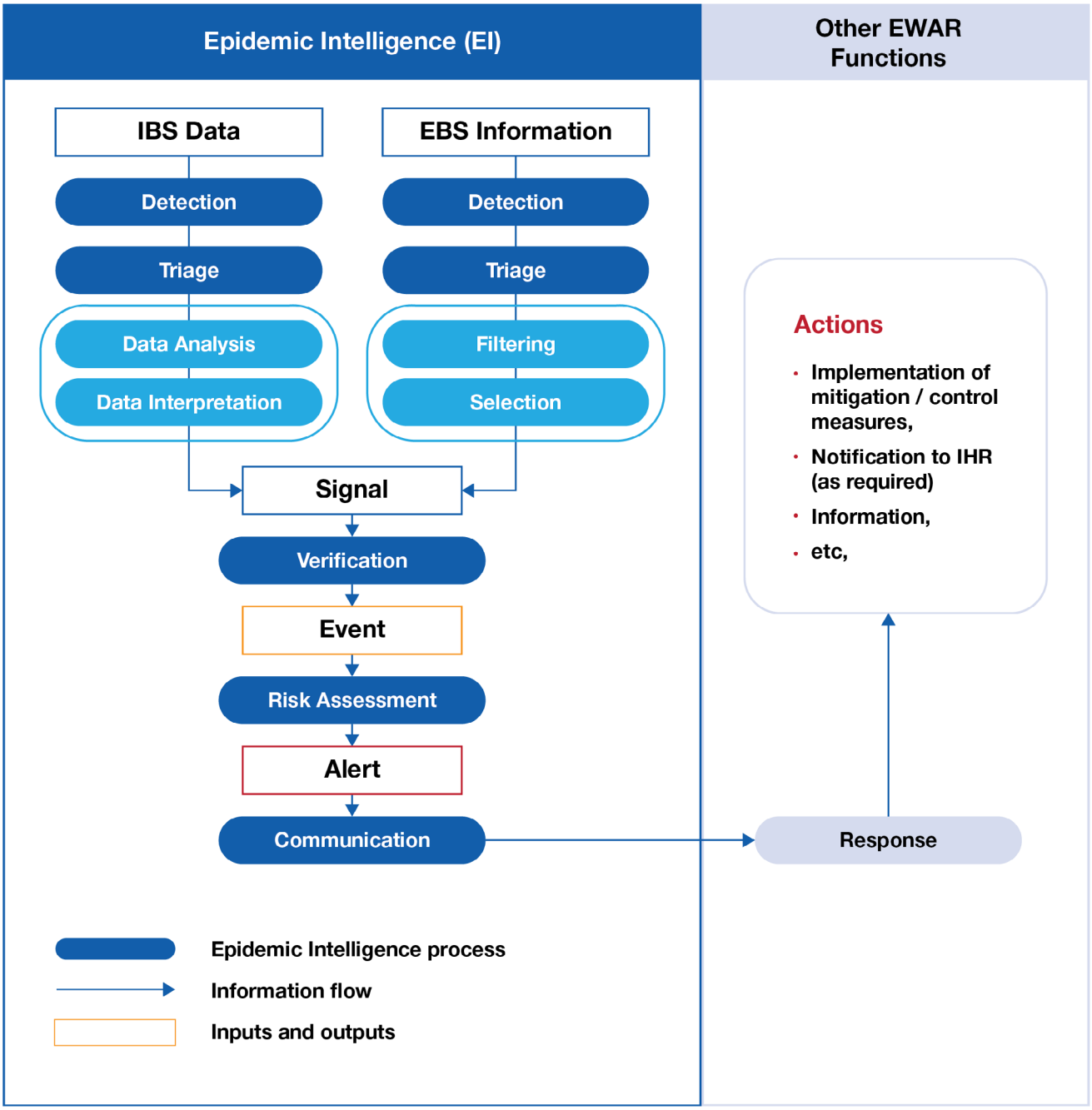
Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Introduce epidemic intelligence in EWAR

Read the description of epidemic intelligence in EWAR, below. Participants can follow along by viewing the corresponding figure on page 21 of their *Participant Guides*.

Epidemic intelligence within EWAR

Within EWAR, the collection of data (IBS and EBS) with the aim of detecting emerging health threats is part of a single process called epidemic intelligence. This process should be able to monitor all prioritized health events and acute public health risks within a given country, as well as events reported from other countries that have the potential to affect the country.


Epidemic Intelligence (EI)
Other EWAR Functions
IBS Data
EBS Information
Detection
Detection
Triage
Triage
Data Analysis
Data Interpretation
Filtering
Selection
Signal
Verification
Event
Risk Assessment
Alert
Communication
Response
Actions
Implementation of mitigation / control measures,
Notification to IHR (as required)
Information,
etc,
Epidemic Intelligence process
Information flow
Inputs and outputs

Step 3: Deliver lecture on signal detection

Signal detection within epidemic intelligence

Signals are composed of data and/or information considered by the EWAR system as representing a potential acute risk to human health.

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.

Signal detection process

Signals can be detected through any potential source (health or non-health, informal or official) including the media. Raw data and information (i.e., untreated and unverified) are first detected and triaged in order to retain only the information pertinent to early detection purposes (i.e., the signals). Once identified, signals must be verified. Once verified, a signal becomes an "event."

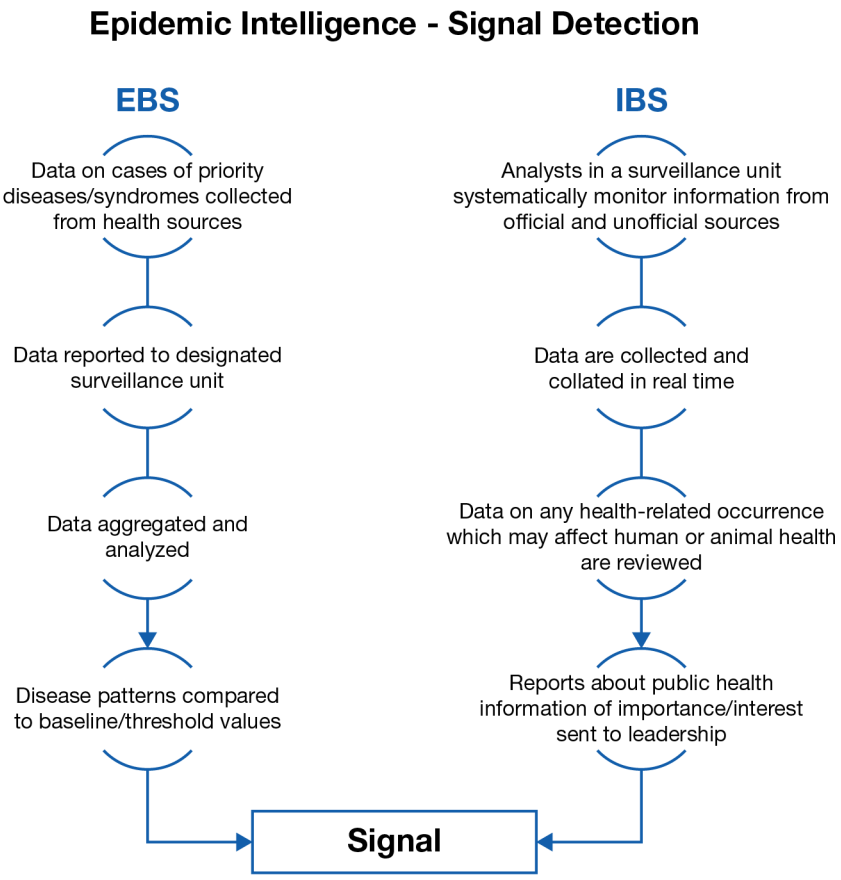
Differences in IBS and EBS signal detection

The steps in evaluating information depends on whether the source is IBS data or EBS information.

- For ***IBS***, the detection phase will consist of defining the type and the modality (such as format of collection or mode and frequency of transmission) of the surveillance data to be collected for early warning purposes.
- For ***EBS***, raw information is generally made up of information originating from formal and informal sources that have been collected by a number of mechanisms (i.e., direct communication, internet-based devices, hotlines and literature reviews) that will be defined according to a country's needs.

Ask participants to locate figure 4 in their *Participant Guides*.

The collection of data (IBS and EBS) with the aim of detecting emerging health threats is part of a single process called epidemic intelligence. This process should be able to monitor all prioritized health events and acute public health risks within a given country, as well as events reported from other countries and which have the potential to affect the country.



Characteristics of IBS 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.*

Data are analyzed in comparison with baseline values and thresholds to determine unusual disease patterns. IBS sources of information are mainly health-based (i.e., health-care structures, health professionals, laboratories), but may also include structured non-human health sources such as animal health data (e.g., for zoonoses), meteorological data, or entomological data when these are regularly collected and organized for human health purposes.

Characteristics of EBS data

In contrast, EBS is a system of organized and rapid information capture about potential disease events that pose a risk to public health. This system of risk assessment is particularly effective in detecting disease occurrences in countries that have weak surveillance and reporting.

Advantages of EBS over case-based surveillance

EBS has several advantages over case-based surveillance, because case-based surveillance:

- *Produces credible information but reporting is often delayed,*

- *Is designed for known diseases and diseases are often not reported until the etiology is known,*
- *Is not well-established in all countries, and*
- *Is limited to the health sector, whereas media and other types of open-source reports often originate from highly motivated entities, such as journalists, which can promptly provide information to open sources.*

Unlike IBS, EBS is not based on the routine monitoring of indicators and automated thresholds for action, but rather on the screening of all available information to detect any event happening in the community. These include:

- *Unusual diseases or deaths in humans or animals, and*
- *Unusual or clustering of cases or events/conditions in the community (including environmental conditions).*

Step 4: Wrap up the activity with key message

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

EBS and IBS are components of EWAR and epidemic intelligence, incorporated into the Integrated Disease Surveillance and Response strategy. EBS and IBS complement each other, albeit with separate roles and purposes.

ACTIVITY 3.4

HOW CAN EBS AND IBS BE USED IN YOUR COMMUNITY?

Describe the roles of IBS and EBS in epidemic intelligence

Small group exercise

15 minutes

Step 1: Set up the small group exercise

Introduce the small group exercise by referring to the prepared flipchart *Small group exercise - EBS and IBS in your community* (Appendix 3 of this guide) and ask participants to locate the corresponding handout on page 23 of 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 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 their answers in the prepared flipchart with four equally divided spaces:

- What is the purpose and importance of EBS?
- How could EBS be used in your community?
- What is the purpose and importance of IBS?
- How could IBS be used in your community?

Explain that this is a brainstorming exercise and active participation from every group member is 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 each have two minutes to present. Ask if there is a group that wants to present first. If no group volunteers, randomly select a group to start.

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 on the flipchart.

Step 4: Wrap up session with key message

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

Now that we have some ideas about what EBS and IBS are, why they are important, and how they can be applied to your community, we will discuss how to identify signals for priority diseases in Session 4

SESSION 4

IDENTIFYING SIGNALS FOR PRIORITY DISEASES

This session describes information sources for signal detection, methods for filtering and selecting information, and the national context for prioritization of disease types for EBS.

Learning Objectives

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

- Describe different types of information sources that can be used for signal detection,
- Explain the data collection and verification process,
- Distinguish formal from informal sources of EBS information, and
- Describe methods for filtering and selecting information.

Materials

Facilitator

- Blank flipchart
- Markers

Participants

- *Participant Guide* pages 25-32

Total time: 60 minutes

ACTIVITY 4.1

SOURCES OF EBS INFORMATION

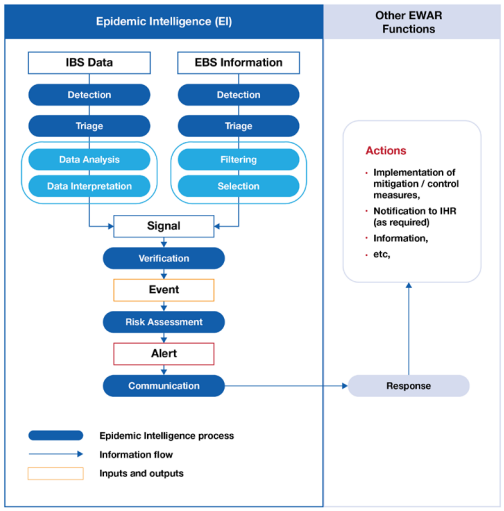
Describe different types of information sources that can be used for signal detection Explain the data collection and verification process	Lecture and group discussion	20 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Introduce the context for signal detection

Before we begin this session, let's review the EWAR diagram. If you recall, this diagram depicts the collection of IBS and EBS data with the aim of detecting emerging health threats through a process called epidemic intelligence.



Signals are composed of data and/or information considered by the EWAR system as representing a potential acute risk to human health. When a signal has been verified, a signal becomes an "event."

In this topic we will be discussing the detection of signals for priority diseases.

Step 3: Engage participants to define signals and signal detection

On a blank flipchart, write the following two headings across the top and separate with a line down the middle:

What do signals consist of?	How are signals detected?

Ask for a volunteer to answer each question. Write their answers on the prepared flipchart, then ask the group if they have anything else to add. Fill in any gaps based on the correct answers below:

What do signals consist of?	How are signals detected?
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.*	*Signals can be detected through any potential source (health or non-health, informal or official) including the media.* *Raw data and information (i.e., untreated and unverified) are first detected and triaged in order to retain only the data pertinent to early detection purposes (i.e. the signals).*

If you are delivering the training online, facilitate a whole group discussion to obtain the answers to the two questions above.

Step 4: Deliver lecture on sources of EBS information

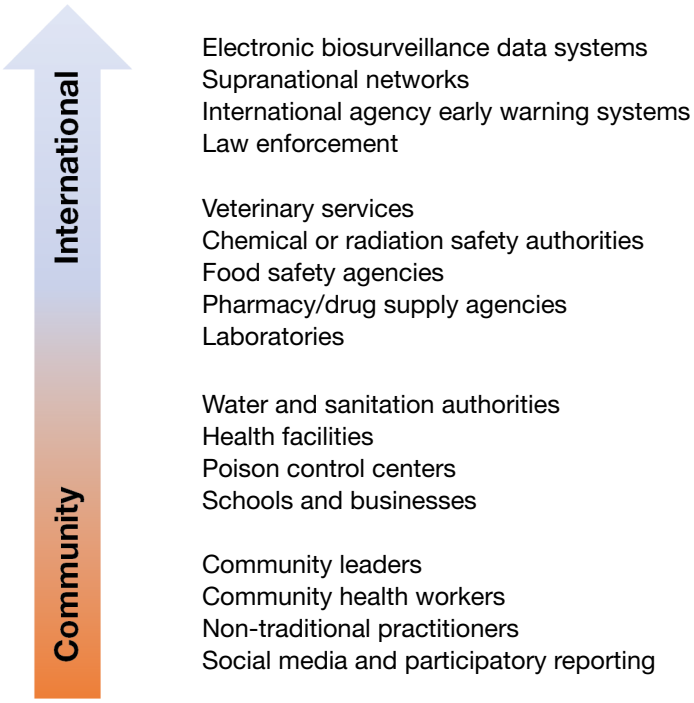
Where does EBS information come from?

Read the following script, then ask participants to answer the two questions that follow. Ask for a few examples for each question, and fill in any remaining gaps verbally based on the sources listed in the graphic that follows.

EBS requires a multisectoral approach and should rely on sources of information beyond traditional health system sources. While these may be directly linked to human health, data can also be provided by the non-human health sector, local communities, media, and international sources. EBS information may come from numerous sources across sectors and levels.

Thinking of your own work, can you think of any examples of EBS sources:

- At the national level?
- What about at the international level?

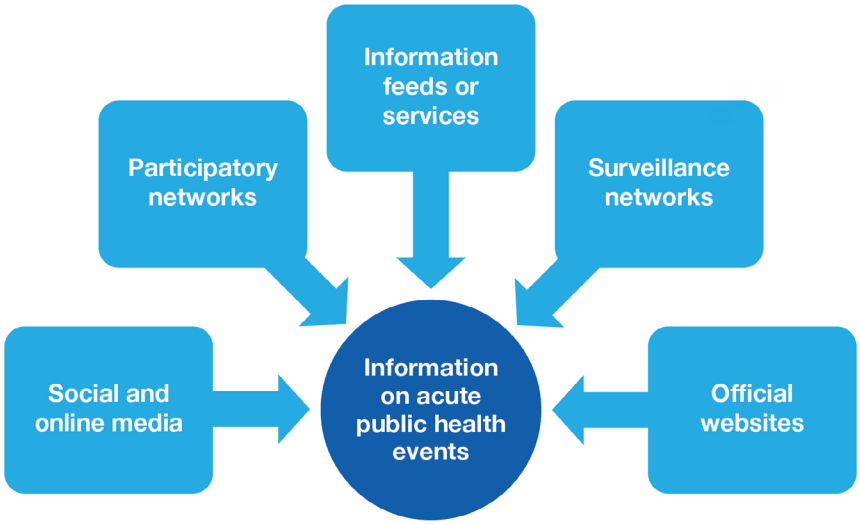


Ask participants to locate figure 5 in their *Participant Guides*.

This figure depicts examples of these sources, from those closest to the community level, at the base of the arrow, to examples of international sources, at the top of the arrow.

Online sources of information for EBS

Various types of electronic or online sources can provide information for EBS:



The increasing interconnection of individual networks operated by government, industry, academia, and private parties, accompanied by the increasing share of the world's population who access the internet, has given rise to a growing number of online outlets that can be used as sources of information for EBS.

Types of electronic or online information that may serve as sources of EBS signals include:

- *Official websites,*
- *Surveillance networks,*
- *Information feeds or services,*
- *Participatory networks, and*
- *Social and online media.*

Data collection and verification process

The nature of data to be collected will influence the process of collection and verification. For example, the arrangement for collecting information from the local press is likely to be very different from that used to collect information from local community or from other ministries. It will also be influenced by the resources available in the countries. For example, attempting to monitor local press via the internet in a country where access to the internet is limited will be of little use. Both the quality and the quantity of information available online must be considered in developing the national strategy for EWAR, and for prioritizing sources for EBS.

Step 5: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 4.2

FORMAL AND INFORMAL SOURCES OF EBS INFORMATION

Distinguish formal from informal sources of EBS information

Group discussion and lecture

20 minutes

Step 1: Introduce the context for the exercise

Potential sources of EBS signals include both official and unofficial sources:

- ***Official** (or formal) sources are any governmental, subnational, national or international institution accredited to provide information, and*
- ***Unofficial** (or informal) sources are those that are directly involved in an event as either service providers or members of the affected population making inquiries or sharing information via unstructured channels.*

We will now consider examples of both official and unofficial sources.

Step 2: Reflect on the sources of EBS information

Ask participants to individually consider the following questions and capture their answers on page 28 of their *Participant Guides*. Explain that participants should spend 10 minutes (2-3 minutes for each question) brainstorming and writing down their answers.

- *Q1: What are some examples of formal sources of EBS information?*
- *Q2: What are some examples of informal sources of EBS information?*
- *Q3: Can informal sources be useful? Why?*

While participants are answering the questions, write the questions on a blank piece of flipchart paper.

Once the time has elapsed, ask for volunteers to answer the questions. Ask for one volunteer for each question, and once all questions have been answered, ask if any participants would like to add to the answers. Write the answers down on the flipchart as they are presented.

If you are delivering the training online, present the activity as directed but rather than flipchart, this knowledge check could be delivered via a moblile, online platform such as Poll Everywhere. After all questions have been addressed, present a quick snapshot of key points back to the students before moving on to the next section.

Step 3: Present the model answers

Q1: Model answer: What are some examples of official or formal sources of EBS information?

Ask participants to locate figure 7 in their Participant Guides.

Examples of ***non-human health sources*** *found within the country might include: veterinary services, food safety agencies, environmental surveillance (such as water supply companies and sanitation, or meteorological and air quality agencies), chemical and radiation safety authorities, and police, custom and fraud control.*

International sources *include WHO, the Food and Agriculture Organization of the United Nations, the World Organization for Animal Health (OIE), and the International Atomic Energy Agency (IAEA), all of which disseminate information to Member States via a mix of open and closed electronic platforms.*

Example of a formal source of EBS information – WHO Disease Outbreak News

Ask participants to locate figure 7 in their Participant Guides.

This example from WHO's Disease Outbreak News (DON) shows the types of information and format typical of WHO official website reports. The reports include a description of the event, measures taken to date, and WHO's risk assessment.

World Health Organization

Health Topics | Countries | Newsroom | Emergencies

Home / Disease Outbreak News / Item / Novel Coronavirus – Japan

COVID-19 - Japan - (ex-China)

16 January 2020

The Japanese Ministry of Health, Labour and Welfare, today informed the World Health Organization (WHO) of a confirmed case of a novel coronavirus (2019-nCoV) in a person who travelled to Wuhan, China. This is the second confirmed case of 2019-nCoV that has been detected outside of China, following confirmation of a case in Thailand on 13 January. Considering global travel patterns, additional cases in other countries are likely.

Coronaviruses are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome. 2019-nCoV is a new strain that has not been previously identified in humans.

Much remains to be understood about the new coronavirus, which was first identified in China earlier this month. Not enough is known about 2019-nCoV to draw definitive conclusions about how it is transmitted, clinical features of disease, or the extent to which it has spread. The source also remains unknown.

Q2: Model answer: What are some examples of unofficial or informal sources of EBS information?

Ask participants to locate figure 8 in their Participant Guides.

This graphic illustrates a range of informal sources of EBS information.

Informal sources also include the communications channels – social media (such as Facebook, Twitter, Weibo, Instagram), traditional media (newspapers and radio), and even privately mediated electronic data networks – that collect, amplify, and circulate information from the local to the international levels.

Q3: Model answer: Can informal sources of EBS information be useful?

The usefulness of unofficial and informal sources may vary. Rumors may be unfounded, duplicative, or too vague to be analyzed for purposes of early warning, but unofficial and informal sources may also provide an early alert of acute public health events before they are detected by official surveillance activities.

Step 4: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 4.3

HOW DO YOU RECORD SIGNALS?

Describe methods for filtering and selecting information

Group discussion and lecture

20 minutes

Step 1: Review the content of the activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Group discussion on triage in EBS

Open the lecture by engaging participants in a discussion on triage in EBS. Ask participants to again refer to their EWAR diagram on page 21. Read the following statement, then give participants ten minutes to answer the questions in their workbooks. At the end of ten minutes, ask for volunteers to offer the answer to each question before providing the model answers.

> *We will now consider the two steps that EBS information triage can be divided into: filtering and selection. Open your Participant Guides to page 30 and answer the questions in the space provided. In ten minutes, we will review your answers as a group.*

Q1: What is the goal of information triage?

- ***Model answer:*** *The goal of information triage is to minimize the work burden created by unnecessary verification and investigation of irrelevant signals, and to ensure that genuine events will elicit an effective response.*

Q2: In the context of triage for EBS, how would you define filtering?

- ***Model answer:*** *Filtering is the process of screening out duplicates and information which is not relevant for EWAR. It includes identifying and removing duplicates of the same event by the same source, and identifying and discarding information not relevant to EWAR, such as a generic review of a disease.*

Q3: In the context of triage for EBS, how would you define selection?

- ***Model answer:*** *Selection is the process of sorting out information according to national priority criteria. It involves selecting information that is relevant for early warning, which will depend on the objectives of that EBS unit.*

Emphasize the key point: *Triage of EBS raw inputs helps reduce information that requires follow-up.*

Step 3: Present lecture on filtering and selection

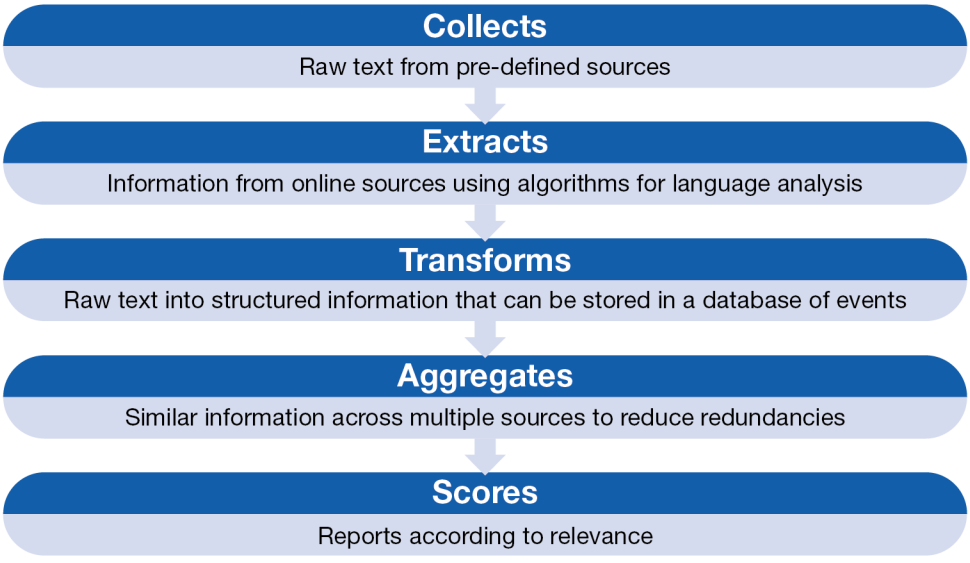
After the question-and-answer exercise, go over the characteristics of filtering and selection in greater detail by presenting the lecture below. Inform participants that they can follow along in their *Participant Guides* (page 31), where they can view figures that help visualize the lecture content.

Filtering

As discussed, filtering refers to screening out duplicates and irrelevant information. Filtering should be designed to ensure adequate sensitivity; in case of doubt, the signal should be sent to the next step (selection).

One example of filtering consists of training secretarial staff to read local and national news and to select relevant health-related articles. These articles will then be sent to the next step, where persons trained in epidemiology can proceed with selection.

The general process of automated analysis using scrapers and aggregators is depicted in figure 10 of your Participant Guide. Most aggregators use similar sources, including other news aggregators and ProMED-Mail. A Source List template with selected examples of media aggregators can be found in Appendix 4 of your Participant Guide.



Ask participants to locate figure 11 in their *Participant Guides*.

Figure 11 shows some examples of IEBS systems.

System Name		Country	No. Languages	Moderated
EIOS		Global	>50	No
GPHIN		Canada	9	Yes
HealthMap		US	7	No
MedISys		EU	26	No
ProMED		US	4	Yes

The process of selection: the national context of priority public health events for EBS

Now let's consider the process of selection. The national EWAR surveillance objectives will depend on the characteristics of the disease or hazard, such as:

- Diseases (e.g. measles),
- Syndromes (e.g. hemorrhagic fevers),
- Hazards (e.g. contamination of drinking water source), and
- Unexpected/unusual events (e.g. unexplained mortality).

The definition of priority events for EBS should take place in the context of a larger national planning process for EWAR, IBS and EBS, and should take into consideration country specificities, the international context, the characteristics of health care, the characteristics of the surveillance systems, and its performances.

The objectives will also depend on the characteristics of the disease or hazard, such as:

- Attack rate,
- Morbidity and mortality,
- Environment,
- Mode of transmission, including but not limited to:
  - Person-to-person,
  - Point source,
  - Toxin exposure, and
  - Public health interventions required to mitigate spread.

For each selected health risk, EWAR's surveillance objectives need to be specified based on the country's context and subsequent signal selection.

Step 4: Wrap up session with key message

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

No country, regardless of resources, can monitor every potential source of information for signals of public health events. Therefore, a country-specific list of priority diseases for EBS should be established.

SESSION 5

SIGNAL VERIFICATION AND RAPID EVENT ASSESSMENT

In this session, we will review key steps in the verification process as well as critical outbreak characteristics to consider while conducting a rapid event assessment.

Learning Objectives

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

- Describe under what conditions verification is required,
- Describe the key steps associated with the verification process,
- Explain the role of SMEs and social media in EBS,
- Explain the IHR Annex 2 and international reporting requirements, and
- Describe how EBS analysts can conduct high-level rapid event assessments.

Materials

Facilitator

- Blank flipchart paper
- Markers

Participants

- *Participant Guide* pages 33-39

Total time: 60 minutes

ACTIVITY 5.1

SIGNAL VERIFICATION

Describe under what conditions verification is required

Describe the key steps associated with the verification process

Explain the role of SMEs and social media in EBS

Interactive lecture

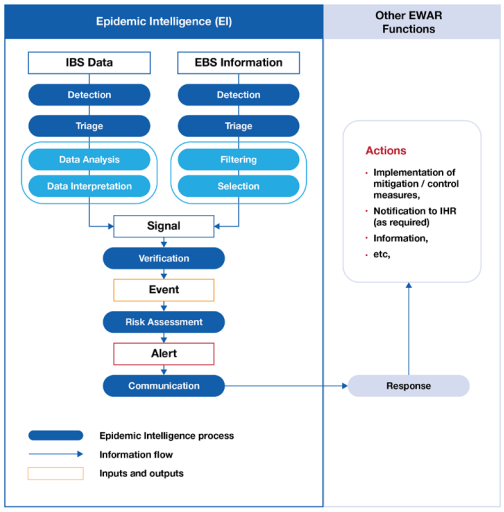
30 minutes

Step 1: Review the content of this activity

Review the content for the interactive lecture prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Introduce verification and risk assessment

Ask participants to locate figure 12 in their *Participant Guides*.



Once again, we return to our EWAR diagram. As you now know, this diagram depicts the collection of data (IBS and EBS) with the aim of detecting emerging health threats. This is part of a single process called epidemic intelligence. As covered in the last topic, we now know that signals are composed of data and/or information considered by the EWAR system as representing a ***potential*** *acute risk to human health.*

In this session, we will discuss the next steps along the epidemic intelligence cascade – verification and risk assessment. Once signals have been identified, the information must then be verified. Once a signal is verified it becomes an "event." Events must continuously be assessed to determine if the epidemiological situation is worsening or improving in order to inform appropriate response measures. In this topic, we will review key steps in the verification process as well as critical outbreak characteristics to consider while conducting a rapid event assessment.

Step 3: Present the interactive lecture on the verification process

Ask participants to go back to the same groups that were formed during the introductory icebreaker activity. Give each group a few pieces of blank flipchart paper and a marker. Each team should select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter).

Read the following statement, then ask participants to write their answers on the blank paper provided. Allow five minutes for groups to make notes, then engage participants in a discussion on the steps in the verification process. Ask for one volunteer for each step, and write the correct answers on a blank flipchart at the front of the room.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After five minutes, ask for one volunteer for each step and discuss their answers and the model answer as a group.

Verification is an essential step of the epidemic intelligence process that consists of confirming the reality (authenticity and conformity) of the signal and its characteristics. What are the four steps that should actively be taken in the verification process?

Model answer: The key steps in the verification process are as follows.

- First determine the official or unofficial source of the information.
- Next, search for and collect additional corroborating information if possible.
- Third, actively cross-check the validity of the information using reliable sources, with input from SMEs.
- Finally, analyze the factors that could affect the spread of the disease, individual severity, diagnostic characteristics, and treatment options in order to determine the signal's public health importance.

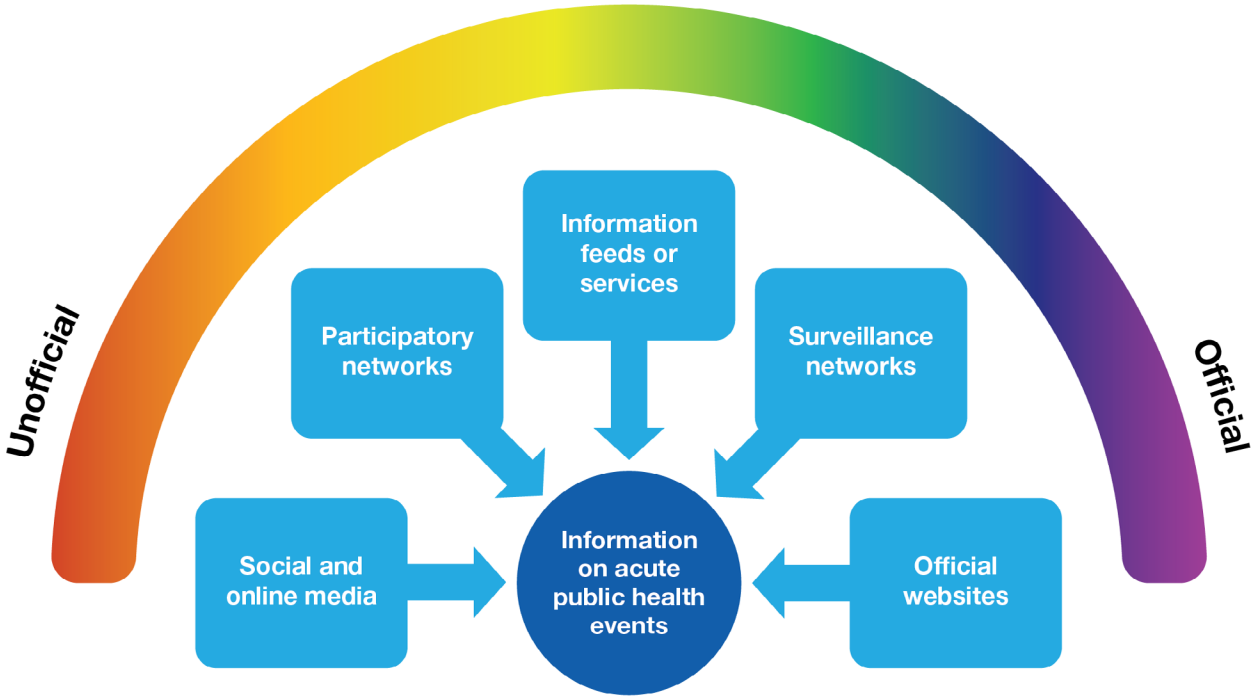
Once you have gone over the steps in the verification process above, ask participants to remain in their groups while you present the interactive lecture on each of these steps. Inform them that they will continue to brainstorm within their groups throughout this activity. Ask participants to select a new group member to take notes (recorder) and another to present the group's responses to the audience (presenter) for each question.

Verification process steps

Now let's look at each of these steps in greater detail.

First, consider the information source

Ask participants to locate figure 13 in their *Participant Guides.*



The information collected for EBS is diverse in nature and originates from multiple, often not-predetermined sources both official and unofficial, including rumors reported by the media or ad hoc reports from informal networks. The information collection process is mainly active and carried out through a systematic framework specifically established for EBS purposes.

Challenges with social media

Read the following statement, then ask participants to write their answers on the blank paper provided. Allow five minutes for groups to make notes, then engage participants in a discussion on the challenges with using social media to identify disease signals. Ask for one answer from each group, and write the correct answers (as per the model answer, below) on a blank flipchart at the front of the room. Discuss any incorrect answers and fill in any gaps as you go.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After five minutes, ask for volunteers to share one answer each until all of the points have been covered. Discuss their answers and the model answer as a group and fill in any gaps as you go.

Let's now consider the role of social media in identifying disease signals. Can you think of any challenges or issues with using social media to identify disease signals?

Model answer: *There are several issues with using social media to identify disease signals.*

- *Social media can generate a large number of* ***false positives and false negatives*** *due to the low ratio of signal to noise during an event, as demonstrated during the 2014 Ebola virus disease outbreak in West Africa.*
- *Short articles and social media posts may* ***lack sufficient contextual information*** *to understand the scope and relevance of the event being captured.*
- *The penetration of internet infrastructure and access of the population to smart phones affect the ability of internet searches to capture relevant information. This is known as representativeness.* ***Where access is low, signals may not be represented accurately.***
- *While monitoring of social media helped identify an outbreak in a new area of Nigeria ahead of official announcements, repeated tweeting and re-tweeting, along with* ***social "chatter,"*** *made identifying signals of concern difficult.*

Second, search for and collect additional corroborating information

Read the following statement, then ask participants to write their answers on the blank paper provided. Allow five minutes for groups to make notes, then engage participants in a discussion on searching for and collecting additional corroborating information. Ask for one answer from each group, and write the correct answers (as per the model answer, below) on a blank flipchart at the front of the room. Discuss any incorrect answers and fill in any gaps as you go.

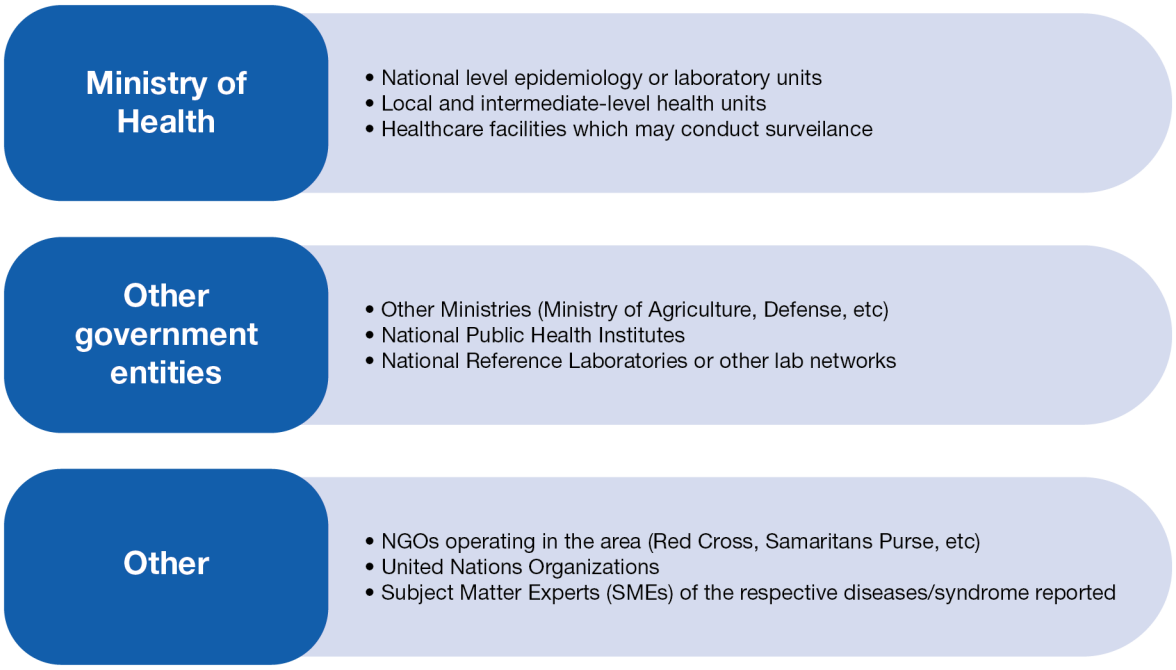
If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After five minutes, ask for volunteers to share one answer each until all of the points have been covered. Discuss their answers and the model answer as a group and fill in any gaps as you go.

Model answer: *The second step of the verification process involves searching for and collecting corroborating information. This can be done by:*

- *Contacting the original source(s) of information,*
- *Contacting the local authorities,*
- *Reviewing other unofficial sources,*
- *Viewing social media channels,*
- *Viewing blog posts, and*
- *Other tips that have come through call centers/hotlines.*

Third, cross-check information with other official sources/experts

Ask participants to locate figure 14 in their *Participant Guides.*



The EBS unit should develop a list of official points of contact for event verification and to characterize overlapping sources of information, which is also useful for collecting additional information in order to corroborate an event. These contacts can include individuals from the Ministry of Health, other Ministries and government entities, or NGOs, UN organizations, or subject matter experts (SMEs).

The EBS Unit should ask partners across sectors and levels to identify technical resource persons or SMEs who will serve as main points of contact for EWAR on a 24/7 basis.

Name of designated office	Name of responsible individual	Email address Phone numbers Fax numbers

SMEs

Read the following statement, then ask participants to write their answers in the blank space on page 36 of their *Participant Guides*. Allow five minutes for groups to make notes, then engage participants in a discussion on the challenges of using social media to identify disease signals. Ask for one answer from each group, and write the correct answers (as per the model answer, below) on a blank flipchart at the front of the room. Discuss any incorrect answers and fill in any gaps as you go.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After five minutes, ask for volunteers to share one answer each until all of the points have been covered. Discuss their answers and the model answer as a group and fill in any gaps as you go.

SMEs have an important role in EBS and are necessary for a number of reasons. In your same small groups, write a list of areas that SMEs can assist with EBS.

Model answer: *Some of the areas that SME's can be involved in EBS, including:*

- *Assisting in the interpretation of reports concerning outbreaks,*
- *Assisting in the interpretation of new findings during an outbreak,*
- *Assisting in providing historical context with regard to a pathogen, outbreak, or country,*
- *Assisting in the confirmation of a diagnosis,*
- *Participating in outbreak-related conference calls related to the area of the SME,*
- *Assisting in clearing products written by EBS analysts, and*
- *Participating in field responses at request for assistance in outbreaks.*

Reporting information

Practical information for contacting EWAR officers and reporting information on a 24/7 basis should be widely distributed among all partners. This should include a list of phone numbers, fax, email, or other means used for communication with EWAR officers at each level.

Similarly, EWAR should ask each partner at the national and intermediate level, within and outside the Ministry of Health (MoH), to identify technical resource persons as the main point of contact for EWAR. These resource persons are likely to be epidemiologists in charge of surveillance, officers in charge of specific control programs, microbiologists from the public health laboratories, and veterinarians from the Ministry of Agriculture (MoA).

Fourth, begin to characterize the potential event with the information known

Oftentimes, media reports may describe "mystery diseases" or "unknown illnesses" at the onset of the outbreak. As more information is learned, it is important to continuously assess the situation to determine if the event is improving or worsening.

Step 4: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 5.2

RISK ASSESSMENT

Describe the key steps associated with the verification process

Explain the IHR Annex 2 and international reporting requirements

Describe how EBS analysts can conduct high-level rapid event assessments

Lecture

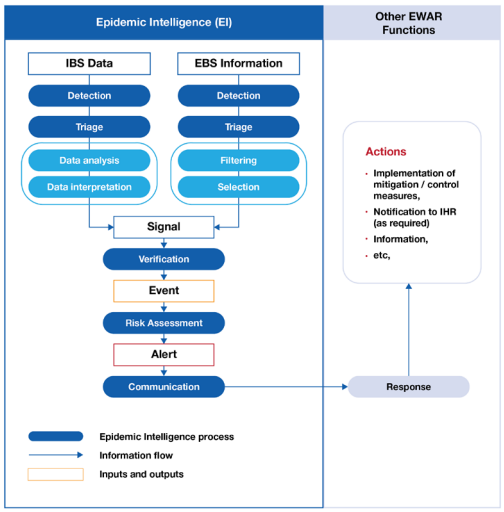
20 minutes

Step 1: Review the content of this activity

Start this activity with a quick question and answer session on the who, when, what, and how of signal reporting. Ask participants the following questions:

Step 2: Deliver lecture on the risk assessment process

Ask participants to locate figure 15 in their *Participant Guides.* Point out the position of the risk assessment step, which you will now be introducing.



Risk assessment is not just a single step in the context of epidemic intelligence, but a process that is continually repeated from the first detection of a signal through to the response to a public health event.

The level of risk, as well as the information that is available, may change over time. WHO has recommended that the initial risk assessment be carried out within 48 hours of detection of a signal, and then repeated as new information becomes available.

By continuously updating the risk assessment, decision makers can focus resources on learning more about the event, alerting stakeholders in all relevant sectors, implementing appropriate prevention and control measures, and developing a communications strategy for partners and for the public.

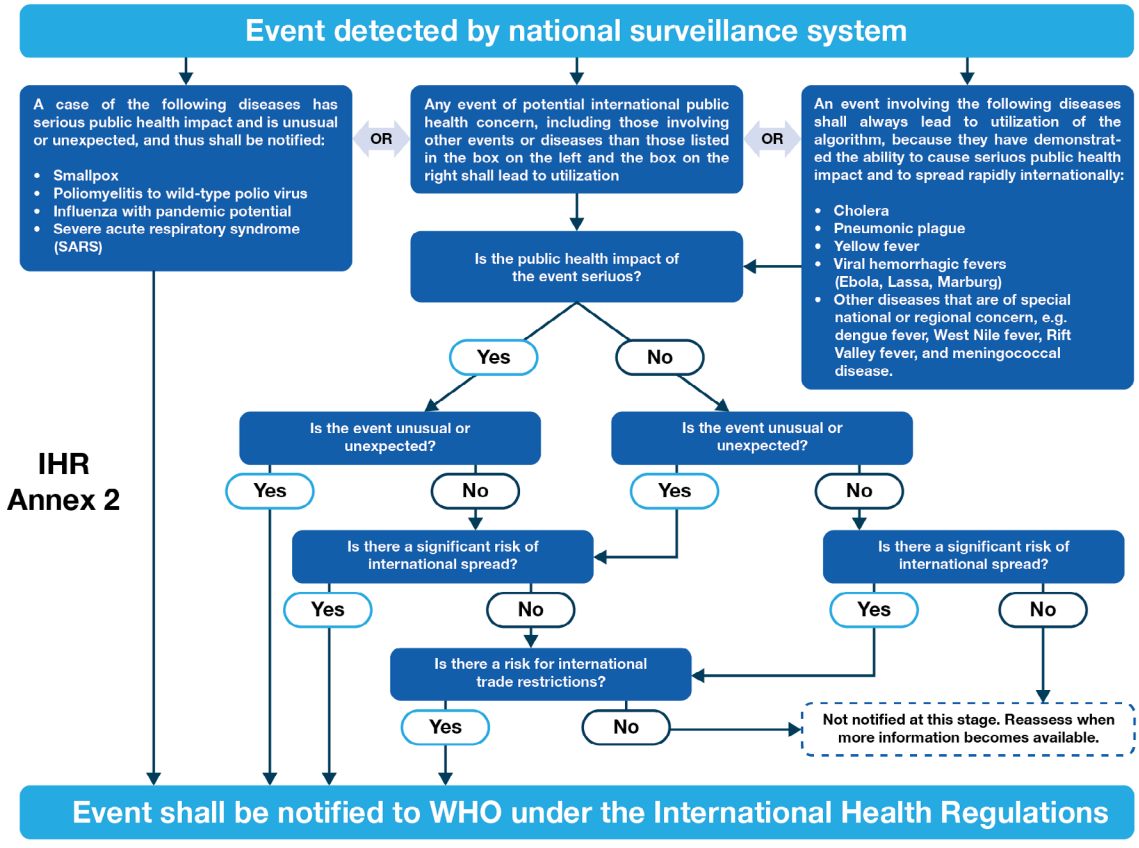
Defining risk assessment

Ask for a volunteer to read out loud the definition of risk assessment from page 37 of their Participant Guide.

***Risk assessment** is an essential element of EBS for EWAR. Risk assessment in this context is defined by WHO as the systematic and continuous process of assessing and documenting information to provide the basis for taking action to manage and reduce the negative consequences of an acute public health event.*

Defining risk assessment

Ask for a volunteer to read out loud the definition of risk assessment from page 37 of their *Participant Guide.*



Just as the IHR define the general obligations for surveillance, the IHR provide a timeline for verification of rumors that reach the national level and may indicate a potential public health emergency of international concern (PHEIC). Any rumor that reaches the surveillance officer and is indicative of a public health emergency of international concern must be verified within 24 hours of its notification, according to the IHR decision matrix in Annex 2.

Characterizing the type of event

Health events can be organized into three categories:

*1) A **Health Event of International Importance** is a verified disease outbreak or a health threat that meets one of the following criteria (IHR Annex 2):*

- *Is one of the following: SARS, polio (wild-type), smallpox or a new subtype of influenza,*
- *Presents a serious threat to the public health,*
- *Is an unusual or unexpected event,*
- *Poses a significant risk for international spread that potentially requires international intervention, or*
- *Potentially causes restrictions of trade or travel.*

*2) A **Health Event Under Investigation** is a disease outbreak or a health threat that potentially meets one of the above criteria, but currently is not yet verified.*

*3) A **Health Event for Information** is a description of a verified health event that does not meet one of the above criteria but is of interest to the public health community.*

Assessing risk level of the event: Geoscope and public health impact

There are two ways to assess the risk level of an event.

*1) **Geographic scope** refers to the observed geographic distribution and rapidity of spread for an outbreak and is categorized as follows:*

- ***High events** affecting several multi-national regions with evidence of continuing spread,*
- ***Moderate events** affecting a national, or bordering multi-national region, with evidence of continuing spread, and*
- ***Low events** limited to sub-national, local areas.*

*2) **Public health impact** refers to the actual or potential severity of an illness, ease of transmission, public fear, or economic affects and is categorized as follows:*

- ***High agent** that is (or potentially is) highly pathogenic, highly transmittable, new or emerging, or has significant potential to disrupt travel/trade, and*
- ***Moderate agent** that has low to moderate potential to cause morbidity /mortality, transmit efficiently, or to disrupt travel or trade.*

Risk assessment: a team effort

Risk assessment is performed by the EBS unit with input from SMEs. The process of risk assessment on behalf of EBS analysts is:

- *routine, oftentimes daily,*
- *well-coordinated with internal and external input, and*
- *consistent in its methodology.*

Step 3: Wrap up session with key message

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

WHO recommends that the EBS/EWAR analyst team (with assistance from SMEs where needed) organize daily briefings to examine new signals and new information on ongoing events. Through these daily meetings, the team can use incoming information to conduct risk assessments, and coordinate decisions on reporting and recommendations for the management of acute public health events. The risk assessment should be updated as needed (which may be daily).

SESSION 6

REGISTRATION AND REPORTING OF EVENTS

This session focuses on the next step along the epidemic intelligence cascade – communication.

Learning Objectives

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

- Define the objectives and process of event registration,
- Identify health events that require immediate reporting,
- Differentiate between information for early warning vs information for health communications purposes,
- Describe key reporting products, and
- Define key data elements and outbreak metrics to be captured by EBS event management systems.

Materials

Facilitator

- Small group exercise – Differentiating information: EBS or public health? (Appendix 5 of this guide)
- Individual exercise: frequency of reporting (Appendix 6 of this guide)
- Individual exercise: EBS reports (Appendix 7 of this guide)
- Blank flipchart paper
- Markers

Participants

- *Participant Guide* pages 40-50

Total time: 75 minutes

ACTIVITY 6.1

PULSE CHECK

Recap first day of training

Group discussion

5 minutes

Step 1: Facilitate group discussion

Open the first session of the day by asking students the four questions, below. The aim of this activity is to provide a friendly start to the second day of training, and to create an opportunity to answer any questions around the content from the first day of training.

Ask the questions consecutively, and allow a few volunteers to answer each question before moving on.

- *How are you feeling today?*
- *What is one interesting thing that you learned yesterday?*
- *What topics from yesterday would you like to learn more about?*
- *What are you looking forward to learning about today?*

If you are delivering the training online, conduct this exercise as a whole group discussion, as described.

ACTIVITY 6.2

KEY INFORMANT ENGAGEMENT

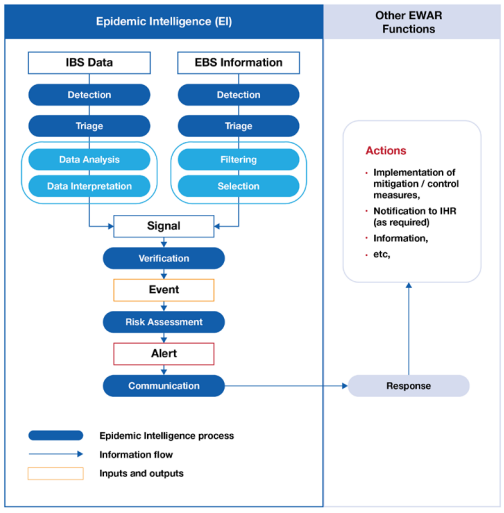
Differentiate between information for early warning vs information for health communications purposes	Lecture and small group exercise	15 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver lecture on the role of communication in EBS

Ask participants to locate figure 17 in their *Participant Guides*.



Here again, we return to our EWAR diagram. As you now know, this diagram depicts the collection of data (IBS and EBS) with the aim of detecting emerging health threats which is part of a single process called epidemic intelligence. As covered in the last two topics, we now know that signals are composed of data and/or information considered by the EWAR system as representing a ***potential*** *acute risk to human health.*

In the previous section, we reviewed the process of verification and risk assessment. Remember that once signals have been identified, the information must then be verified. Once a signal is verified it becomes an "event." In the last topic we reviewed key steps in the verification process as well as critical outbreak characteristics to consider while conducting a rapid event assessment.

In this topic, we will discuss the next steps along the epidemic intelligence cascade - communication. It is essential for EBS analysts to document, or register, event information so that events can be effectively tracked over time. It is also essential to communicate outbreak information to key stakeholders to keep them informed of the public health event as it evolves. In this topic we will discuss key data elements to capture when registering events. We will also discuss the importance of an event management system for storing event information. Finally, we will review different formats for epidemic intelligence reporting, including key EBS products such as daily situation reports, maps, dashboards, and other data visualizations.

Step 3: Set up the small group exercise

Part A: Differentiating information for EBS from information for public health/ risk communication

Introduce the small group exercise by reading the following statement.

It is critical to define what will qualify as an "EBS event" to be targeted and captured as part of the EBS process. Working in the same groups as the previous activities, complete the matching activity on page 41 of your Participant Guide.

For each item, discuss with your peers whether the information should be viewed as early warning information (for EBS), or information for public health and risk communication. Circle A for items that meet the criteria for early warning information, and circle B for items that meet the criteria for public health/ risk communication information.

You will have 10 minutes to discuss before we go through the answers as a group.

If you are delivering the training online, introduce the small group exercise by reading the following statement.

It is critical to define what will qualify as an "EBS event" to be targeted and captured as part of the EBS process. Open your *Participant Guide* to page 41 and complete the matching activity on different types of information.

For each item, consider whether the information should be viewed as early warning information (for EBS), or information for public health and risk communication. Circle A for items that meet the criteria for early warning information, and circle B for items that meet the criteria for public health/ risk communication information.

You will have 10 minutes to complete this exercise before we go through the answers as a group.

Allow participants to discuss among their groups for 10 minutes, then go through each item as one group. Read each item off the list below and ask for a volunteer to suggest the correct answer (underlined).

- *A / **B** - Growing public health sentiment or discord*
- ***A** / B - Clusters of an unknown disease*
- ***A** / B - Unusual or excess deaths occurring in a community*
- *A / **B** - Circulating public health misinformation*
- *A / **B** - New public health laws or regulations passed*
- ***A** / B - Unusual die-off of animals*
- *A / **B** - Annual/routine reports of morbidity and mortality*
- *A / **B** - Drug/vaccine developments*
- ***A** / B - Unexpected occurrence of a disease not previously reported from an area*
- *A / **B** - New public health/ministry of health leadership*
- *A / **B** - Chronic or noninfectious disease reports*
- ***A** / B - Accidental or deliberate pathogen release*
- ***A** / B - Toxic chemical releases*
- *A / **B** - Reports on occupational health*
- ***A** / B - Radio-nuclear releases*
- *A / **B** - New motor vehicle or other travel related safety measures*

Part B: Differentiating media headlines for early warning (EBS) from information for public health / risk communication

Introduce the second part of the matching activity by reading the following statement:

> *Working in the same groups, complete the second matching activity by considering the following examples of media headlines. Circle A for headlines that meet the criteria for early warning information, and circle B for headlines that meet the criteria for public health/risk communication information.*
>
> *You will have 10 minutes to complete this exercise before we go through the answers as a group.*

Allow participants to discuss among their groups for 10 minutes, then go through each item as one group. Read each item off the list below and ask for a volunteer to suggest the correct answer (underlined).

- ***A** / B - "50 unexplained deaths"*
- *A / **B** - "A major AIDS awareness campaign launched"*
- ***A** / B - "New bleeding syndrome reported"*
- *A / **B** - "A new Minister of Health elected"*
- *A / **B** - "Crime rates up by 40%"*
- ***A** / B - "High absenteeism at local school"*

- ***A*** / B - *"Farmer reports entire flock die off in Northern province"*
- A / ***B*** - *"New airbag safety measures mandated"*
- A / ***B*** - *"Flooding in Southern province"*
- ***A*** / B - *"Cholera reported for the first time"*
- A / ***B*** - *"Miner killed on the job"*

Step 4: Summarize and wrap-up the activity

Summarize the activity by reading the following:

As you have seen in this activity, information of interest is not the same as information for action. Public health events that are of interest to specific stakeholders may provide information for situational awareness, while public health events requiring investigation and control measures may provide information for EWAR.

The collection, analysis, and reporting of EBS information requires staff time and resources. Collecting all information that is of potential interest but that is not actionable can result in an enormous amount of effort but very low impact on actual preparedness and response actions.

When classifying events according to EBS Unit criteria, think about who will use the information, and how: is the information for situational awareness (i.e., events that are happening, but require no immediate action), or is the information important for mobilizing a rapid and effective response?

The majority of the EBS Unit's effort will typically be focused on identifying information that is actionable, and that can be used by leadership to determine the most appropriate actions. Information for situational awareness can be published in ad hoc reports, with no specific schedule, while more urgent information is reported on a daily basis.

Step 5: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the exercise. Clarify and answer any questions before moving to the next activity.

ACTIVITY 6.3

KEY INFORMANT ENGAGEMENT

Define the objectives and process of event registration

Identify health events that require immediate reporting

Lecture and group discussion

30 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver lecture on recording events

Registration of events

Registration of events is the process by which health events are recorded in a standardized way with regular entries of items or details. Let's take a look at an example of an epidemic intelligence product.

Ask participants to locate figure 18 in their *Participant Guides.*

Type of report	*Frequency*
EBS daily report ▶ *Time-sensitive bullet points to leadership* ▶ *Critical Information requirement type, or "flash" report*	*Daily*
EBS map *(if applicable)*	*Daily*
Weekly summaries for immediate leadership *(if applicable)*	*Weekly (on Thursdays)*
Monthly bulletin for organizational leadership *(if applicable)*	*Monthly*

Different types of reports can be useful to different audiences, and for different purposes. This table presents examples of types of reports that might be used for sharing EBS information for EWAR. The EBS Unit staff and health leadership in each country should work collaboratively to identify how reports will be used (the purpose) and who will use them (the audience) to help develop a set of standard procedures for formatting and transmitting the data collected through EBS.

Once established, the procedures for data transmission (type of data, frequency, and modality of transmission) from local, intermediate, national and international levels should be formalized and correspond to the urgency of responding to various threats (refer participants to figure x in their Participant Guides). These procedures should be widely communicated, practiced and implemented at all levels.

In some cases, IBS will be the source of information for early warning – for example, IBS may provide alerts of priority syndromes even before the diseases are confirmed and reported through standard channels. Deciding ahead of time what types of information will be included in daily reports will help establish a plan and process for data selection and publication.

EWAR ensures the early detection of health events only if data are reported in a timely way. However, EWAR is not restricted to immediate or real-time notification systems. The frequency of transmission should take into consideration the nature of the disease and the urgency of the implementation of the control measures. According to the diseases or syndrome, immediate, daily and weekly reporting can be appropriate and equally contribute to effective responses.

Step 3: Discuss reporting frequencies as a group

Read the following statement, then ask participants to individually write their answers on page 43 of their *Participant Guides* (Appendix 6 of this guide). Allow five minutes for participants to make notes, then engage the group in a discussion on the situations that warrant less or more frequent reporting of events. Read the heading for each model answer, then ask for volunteers to contribute one or two points each. Write the correct answers (as per the model answer, below) on a blank flipchart at the front of the room. Discuss any incorrect answers and fill in any gaps as you go.

If you are delivering the training online, present the activity as directed but rather than using flipchart paper, record responses on a notepad. After all questions have been addressed, present a quick snapshot of key points back to the students before moving on to the next section.

Reporting frequencies should strike a balance between timeliness and accuracy of information, and will depend on the nature of the disease/syndromes to be detected. Take a moment now to consider the types of health events requiring an immediate response compared to health events that should prioritize accuracy over timeliness. Write a few bullet points for each question on page 43 of your Participant Guide.

Q1: *List a few examples of health events that require immediate reporting.*

Model answer*: Health events requiring immediate reporting include:*

- *rare epidemic-prone diseases notified using individual data*
- *diseases posing an immediate threat to the community*
- *unusual clusters of disease*
- *diseases targeted for eradication*
- *non-health events posing an acute threat to health such as earthquakes, floods and industrial accidents.*

Q2: *List a few examples of health events for which accuracy should be prioritized.*

Model answer: *Health events for which accuracy should be considered in determining timeliness of notification include:*

- *Common diseases, and*
- *Endemic diseases subject to seasonal variations including non-bloody diarrhea or flu-like illness. In this case, data may be anonymized and aggregated.*

Step 4: Deliver lecture on how information can be shared, classified and communicated

Information must be shared with key partners

The information collected and analyzed for EWAR must be shared with key partners.

The development and maintenance of effective communication procedures with partners, relying on tools adapted to the context, are critical to ensure that events detected at the periphery are verified, assessed and responded to in a timely fashion, and that information collected and analyzed by EWAR is shared with its partners and the public as required.

Information should be classified by type of access

Information collected by EWAR should be systematically classified by type of access.

Information-sharing is key to EWAR objectives. However, the need to balance timeliness and accuracy creates tensions for reporting. Waiting until an event is verified and assessed comprehensively might introduce delays in alerting decision makers about potential threats, but disseminating incomplete information widely could prompt unnecessary mobilization of resources or generate substantial unfounded risk perception that could result in serious public health damages, such as groundless concerns regarding vaccine safety that result in low immunization coverage.

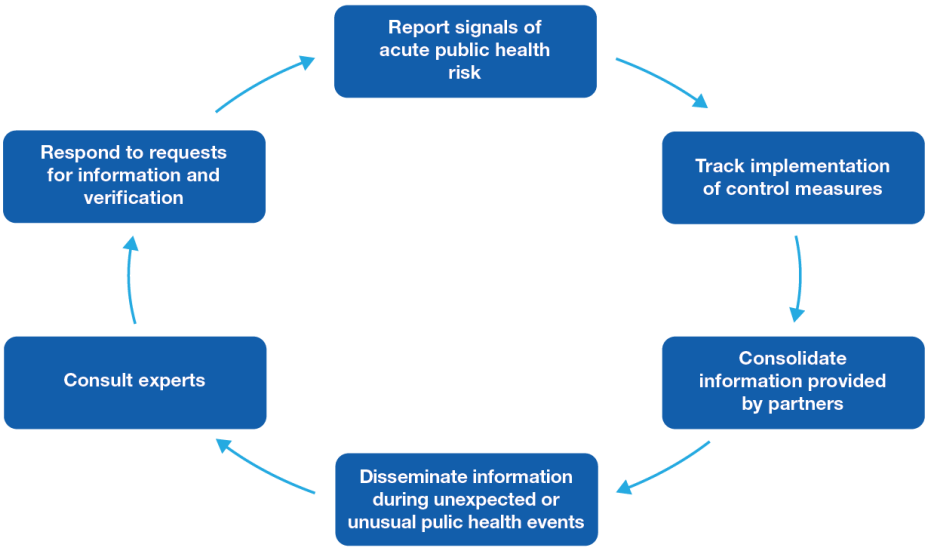
Before any decision is made about its sharing, any information collected by EWAR should be systematically classified as confidential, restricted or public:

- ***Confidential** or operational information is only shared among staff of the EBS unit (e.g. not yet verified information);*
- ***Restricted** information may only be shared among specific groups such as the national and provincial partners, and recipients are requested to avoid further dissemination of the information provided; and*
- ***Public** information is, by definition, shared with everybody and may be disseminated on the website, or in the form of press releases, scientific publications, etc.*

Information classified under each type should be disseminated according to pre-defined mechanisms and distribution lists. On a practical basis, a report can be prepared as confidential (for example, on an unfolding event) for distribution internally, and then edited as necessary to produce a version that can be circulated to partners.

Established channels should be used for bidirectional communications with partners

Ask participants to locate figure 19 in their Participant Guides. Direct them to the text at the top of the figure, and invite them to follow along (arrows to the right) as you review the cyclical nature of communication to partners.



Established channels of communication with partners are used to:

- ***Report*** *to EWAR all signals which may constitute an acute public health risk,*
- ***Track*** *any measure implemented in response - a continuous communication should be maintained,*
- ***Consolidate*** *the information available through data provided by partners to analyze the public health event and associated risk,*
- ***Disseminate*** *information during unexpected or unusual public health events to the IHR NFP and to relevant partners, including those responsible for surveillance and reporting, points of entry, public health services, clinics and hospitals and other MOH departments,*
- ***Consult*** *experts and other relevant information sources on appropriate health measures, and*
- ***Respond*** *to EWAR requests for information and verification.*

Step 5: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 6.4

PREPARING AN EBS REPORT

Define key data elements and outbreak metrics to be captured by EBS event management systems

Describe key reporting products

Lecture and group discussion

25 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver lecture on recording events

Preparing a daily EBS report

We will now discuss some requirements in preparing a daily EBS report. EBS reports should:

- *Adhere to a standardized template for content,*
- *Follow consistent approaches to epidemiological writing,*
- *Be published at the same time each day, and*
- *Be distributed to a consistent (but ever evolving) recipient list and using a consistent dissemination mechanism.*

You can see an example of a prepared EBS report by turning to page 45 of your Participant Guides.

**** Global Disease Detection Operations Center (GDDOC) Daily Report for 07-16-2019 ****

****** FOR INTERNAL CDC USE ONLY ******

At A Glance:

Of International Importance[1]

- Measles (Rubeola) in Jordan (NEW): **23 cases reported in 7 clusters**
- Cholera in Cameroon (NEW): **OCV campaign planned**
- Ebola in The Democratic Republic of the Congo (Update): **Outbreak surpasses 2,500 cases and 700 recoveries**
- Leishmaniasis (Visceral) in Kenya (Update): **New county affected**

FOR INTERNAL CDC USE ONLY

Global Disease Detection Operations Center
U.S. Centers for Disease Control and Prevention
Daily Report for 7/16/2019
Contact: Ray Arthur, PhD
Mobile: (404) 431-6630
gddoutbreak@cdc.gov
EOC: (770) 488-7100 (24 hours / 7 days a week) Contents At A Glance
INTERNATIONAL IMPORTANCE

- Measles (Rubeola) in Jordan (NEW): **23 cases reported in 7 clusters**
- Cholera in Cameroon (NEW): **OCV campaign planned**
- Ebola in The Democratic Republic of the Congo (Update): **Outbreak surpasses 2,500 cases and 700 recoveries**
- Leishmaniasis (Visceral) in Kenya (Update): **New county affected**

PUBLIC HEALTH EVENT OF INTERNATIONAL IMPORTANCE	
Geographic Scope	Public Health Impact Risk
Medium	Medium

The importance of event management systems

The purpose of an event management system (EMS) is to provide a secure focal point for tracking public health data on international health threats detected. This data is analyzed by the CDC's Global Disease Detection Operations Center (GDDOC) and has an 'all-hazard,' One Health-based approach which includes radiological, nuclear, chemical, and environmental threats.

An EMS allows you to input the findings of EBS to prepare CDC to respond to acute, public health emergencies with information captured in a Daily Report.

The GDDOC has an EMS called the Event Analysis Management System (EAMS) and is used by GDDOC to collect international public health event data that focuses on emerging and re-emerging infectious diseases which threatens populations.

Global commitment to standardizing outbreak documentation

In 2018, Ending Pandemics convened representatives from 26 organizations, including national and international public health agencies, NGOs, universities, and foundations, to revise outbreak milestones based on expert knowledge and lessons learned.

This meeting resulted in the establishment of a set of eight outbreak milestones, displayed on page 46 of your Participant Guide, for use by public health agencies and other interested organizations. However, even with clear and precise definitions for outbreak metrics, obtaining the relevant data points remains challenging.

Outbreak Milestones	Definition
Outbreak Start	*Date of symptom onset in the primary case or earliest epidemiologically linked case*
Outbreak Detection	*Date that the outbreak or disease-related event is first recorded by any source or in any system*
Outbreak Notification	*Date the outbreak is first reported to a public health authority*
Outbreak Verification	*Earliest date of outbreak verification through a reliable verification mechanism*
Laboratory Confirmation	*Earliest date of laboratory confirmation in an epidemiologically-linked case*
Outbreak Intervention	*Earliest date of any public health intervention to control the outbreak*
Public Communication	*Date of first official release of information to the public from the responsible authority*
Outbreak End	*Date that outbreak is declared over by responsible authorities*

In June 2019, the WHO convened an EBS coordination group meeting at The World Organization for Animal Health (OIE) in Paris, France, whereby the need for the development of a low maintenance yet high performing event management system to effectively track these milestones among others was vehemently underscored.

International partners are now looking to EBS technical experts, including US CDC's GDDOC, to guide the development of an EMS in order to support countries across low resourced, low bandwidth settings in attaining higher standards for EBS so as to enhance IHR compliance, Joint External Evaluation (JEE) performance, and activities surrounding the Global Health Security Agenda (GHSA).

Defining and capturing timeliness metrics

A set of standardized outbreak milestones allow countries or organizations to define and calculate relevant timeliness metrics to address their own needs.

A timeliness metric is measured as the time interval between two relevant outbreak milestones. Some countries or partners may not have the capacity or intent to measure all the outbreak milestones, and therefore may not measure every possible time interval. While timeliness metrics may be defined differently by countries and organizations, maintaining consistent definitions over time will allow for valid comparisons to capture trends.

Ask participants to locate figure 20 in their *Participant Guides*.

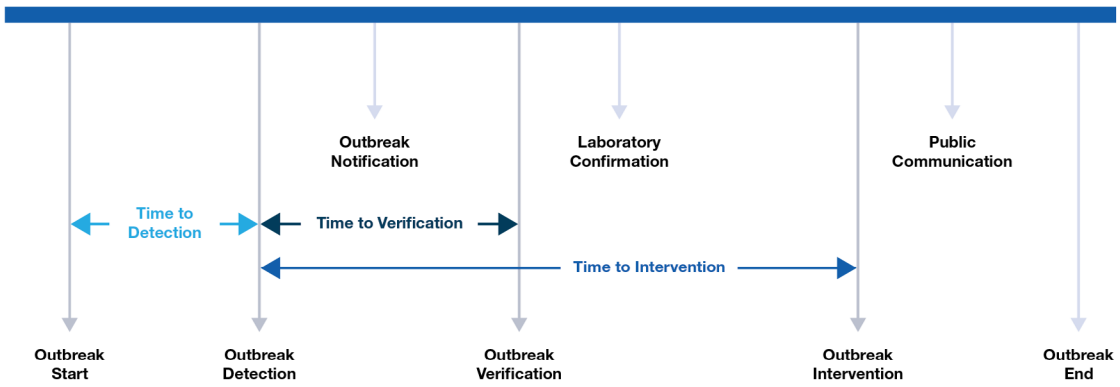


Figure 20. The eight outbreak milestones shown in the above figure are for illustrative purposes only as the actual sequencing may vary. For example, laboratory confirmation may occur simultaneous to outbreak verification. In another case, public communication may be the first outbreak intervention. As an example, Ending Pandemics' timeliness metrics are shown as the intervals between the relevant outbreak milestones.

As a case in point, Ending Pandemics is using four outbreak milestones to define timeliness metrics relevant to monitoring the impact of our work.

- *We define time to detection as the time interval between outbreak start and outbreak detection.*
- *Time to verification is defined as the time interval between outbreak detection and outbreak verification.*
- *And finally, time to intervention is defined as the time interval between outbreak detection and outbreak intervention.*

Step 3: Set up the activity on identifying the key elements of an EBS report

Inform participants that they will now do two short activities in their *Participant Guides* (see Appendix 7 of this guide). Ask participants to turn to page 47 in their *Participant Guides* and complete both questions. Inform them that they will have five minutes to complete each task, and may work individually or with a peer.

Start the activity by asking participants to write a bulleted list of information that should be included in an EBS report (Q1). After five minutes, ask for volunteers to contribute one or two points each. Write the correct answers (as per the model answer, below) on a blank flipchart at the front of the room. Discuss any incorrect answers and fill in any gaps as you go.

If you are delivering the training online, present the activity as directed but rather than flipchart, record responses on a notepad. After all questions have been addressed, present a quick snapshot of key points back to the students before moving on to the next section.

Q1: *What information should be included in an EBS report?*

Model Answer: *Basic information needed for an EBS report:*

- *New or updated report?*
- *Who provided the information?*
- *When did they provide it?*
- *What is the event about, including key outbreak milestones?*
  - *Outbreak Start*
  - *Outbreak Detection*
  - *Outbreak Notification*
  - *Outbreak Verification*
  - *Laboratory Confirmation*
  - *Outbreak Intervention*
  - *Public Communication*
  - *Outbreak End*
  - *Who/How many are affected? Cases/deaths*
  - *Where are they located?*
  - *What is being done about it and by whom?*
- *Background information*
- *Will there be future reports on this event?*
- *Source documentation*

Now ask participants to turn to page 47 in their *Participant Guide*, then read the following statement:

Let us now take a look at an example taken from the GDDOC daily report of a measles outbreak in Romania. Underline what you think are the key elements that should be included in every EBS report.

Give participants five minutes to complete this task. Once the time is elapsed, ask for a different volunteer to read out each statement and identify what they see as the key elements. Go through the correct answers (underlined below) as a group.

Q2: *Identify the key elements in this sample CDC EBS report.*

- *The Global Disease Detection Operations Center (GDDOC) has learned of an outbreak of measles in Romania.*
- *On 21 September 2016 the Romanian Ministry of Health (MOH) reported that in the first eight months of this year, they have recorded 675 confirmed cases of measles in 23 counties, with two deaths. A third suspected measles death was reported but is undergoing final confirmation. The two confirmed and one suspected death all occurred in children younger than one year, which is under the age of routine measles vaccination. The MOH attributes the resurgence of measles to failure of some parents to adhere to the routine vaccination schedule.*

- *The National Institute of Public Health recommends vaccinating children in the affected areas of the country at the age of seven months with resumption of the normal vaccination schedule at one year of age.*
- *In 2015 Romania reported only seven confirmed cases of measles and no deaths. Measles vaccination coverage has gradually declined from a high of 98% in 2000 - 2002, to 86% in 2016. Officials report that there is no shortage of MMR vaccine in the country.*
- *GDDOC will continue to follow this outbreak and report updates as they become available.*

Step 3: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving on to the next activity.

ACTIVITY 6.5

RECORDING EVENTS

Describe key reporting products

Lecture

15 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver lecture on key reporting products

Weekly review of active events

Let's now consider an example of what a weekly review of active events in the EMS might look like.

- *If an active event is ongoing, and no updated information is available,* ***inquire****. Reach out to SMEs, field teams, or local staff to gather more information.*
- *Continue to* ***monitor*** *for new information in an ongoing outbreak.*
- ***Respond*** *by supporting field investigations or control measure to interrupt transmission.*
- ***Close*** *when the outbreak is finished (or at least dropped to baseline) and no further monitoring is needed.*

Business Intelligence (BI) tools to assess EBS performance

Business intelligence (BI) loosely refers to tools that retrieve, analyze, and transform data into meaningful information that helps businesses make more intelligent decisions. BI tools cover a range of technologies, including Tableau and Microsoft Power BI.

Example of a CDC EBS product – the Daily Map

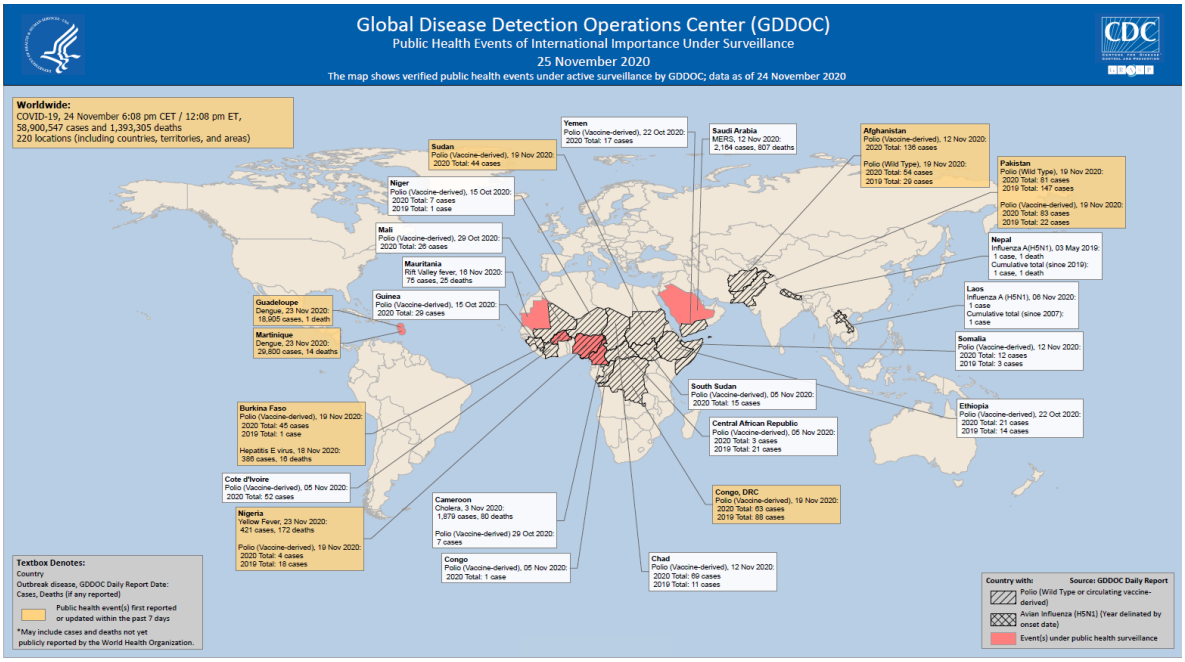
Ask participants to locate figure 21 in their *Participant Guides*. Read the following statement and ask the question that follows.

Let us now consider a CDC EBS product, the Daily Map. This global map shows active (verified) events that are under surveillance. It includes events reported in the past seven days, the location, the disease, the date of the most current report, and epidemiologic data such as counts. GIS experts compile the map daily using lists of data, and the map is viewed by CDC program leadership, SMEs and select HHS leaders.

How do you see this map being used?

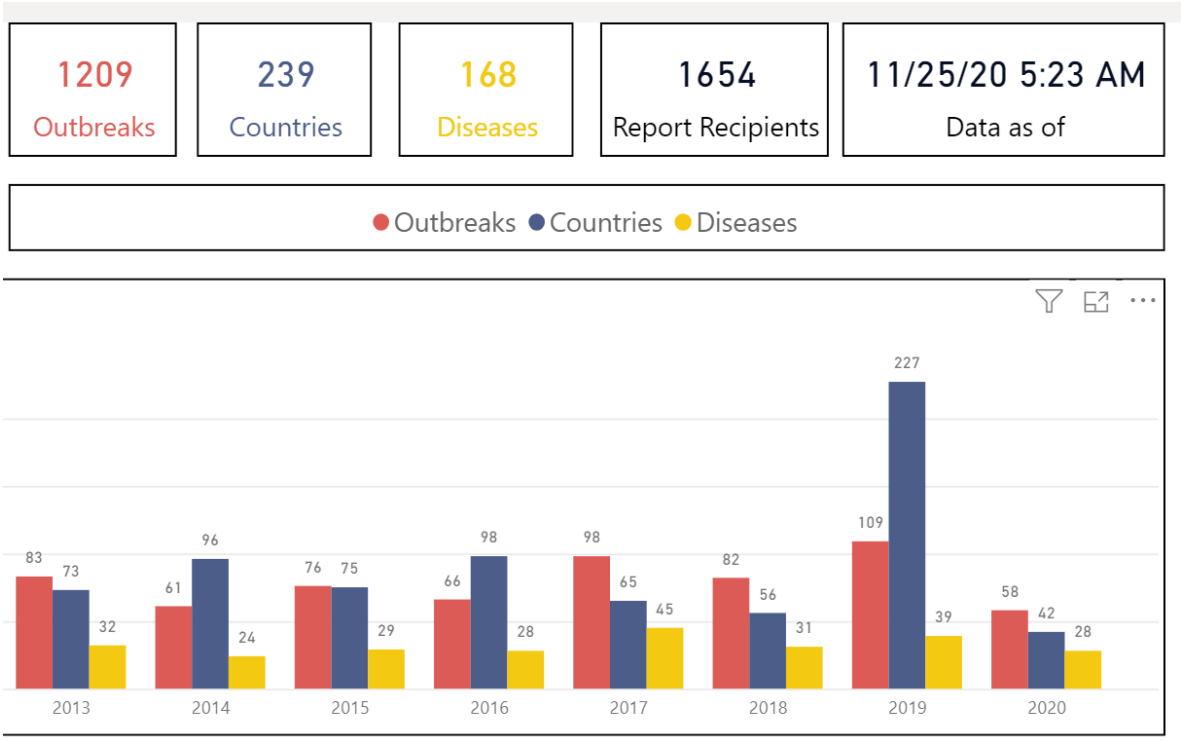
Accepted answer: *The map can be used as:*

- *An analytical tool,*
- *An internal communications tool in the CDC,*
- *A public relations tool (presented by leadership, SMEs, etc), and*
- *A pictorial/cartographic depiction of our work.*



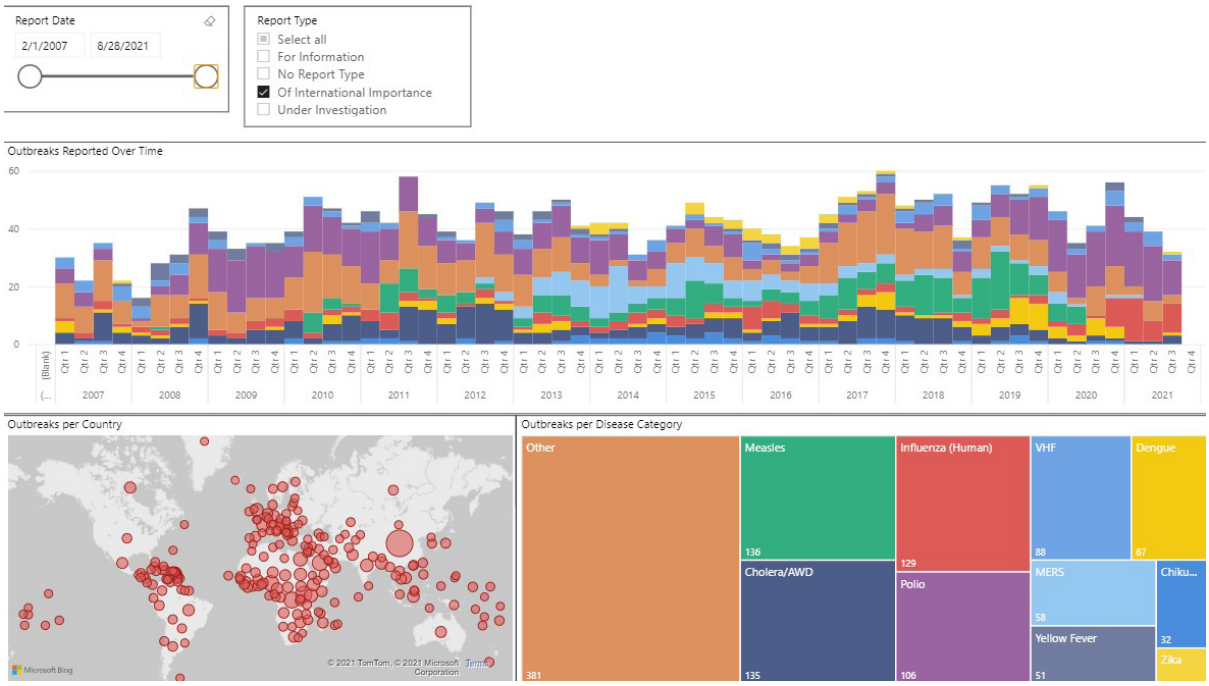
Ask participants to locate figure 22 in their *Participant Guides.*

Looking at figure 22, you can see that from January 1, 2008 to November 25, 2019, the GDDOC monitored ***1,209 outbreaks*** *of* ***168 diseases*** *in* ***239 countries.***



Ask participants to locate figure 22 in their *Participant Guides*.

Now let's take a look at the outbreaks monitored by the US CDC GDD Operations Center over several years.



Ask participants to locate figure 24 in their *Participant Guides*.

Health Security
Volume 15, Number 5, 2017 Mary Ann Liebert, Inc.
DOI: 10.1089/hs.2017.0004

What We Are Watching—Top Global Infectious Disease Threats, 2013-2016: An Update from CDC's Global Disease Detection Operations Center

Kira A. Christian, A. Danielle Iuliano, Timothy M. Uyeki, Eric D. Mintz, Stuart T. Nichol, Pierre Rollin, J. Erin Staples, and Ray R. Arthur

Here is another helpful resource you can refer to that looks back at EBS detection from 2012-2016. It also discusses GDDOC and the Global Health Security Agenda more broadly, and includes highlights of some of the top threats monitored during that period including: avian influenza, cholera, Ebola virus disease, yellow fever, chikungunya, Zika, MERS, and polio.

Step 3: Wrap up session with key message

End the discussion by reviewing the definition of EBS, below.

EBS is defined as the organized collection, monitoring, assessment, and interpretation of unstructured information regarding public health events that may represent an acute risk to human health. Conducting EBS includes establishing an EBS unit to better track public health events of concern.

SESSION 7

ESTABLISHING AN EVENT-BASED SURVEILLANCE UNIT

This session focuses on the process of putting theory into practice by considering how an EBS unit is operationalized. The goal of the EBS unit is to provide leadership, a skilled workforce, and consistent guidance to promote structured and systematic data collection.

Learning Objectives

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

- Describe the daily workflow of an EBS unit,
- Identify the core competencies and specialized skillsets required to conduct EBS,
- Define the key resources and tools necessary for an EBS unit,
- Describe "mystery" diseases and how to assess their risk, and
- Describe the role of SMEs and SME lists in EBS.

Materials

Facilitator

- Markers

Participants

- *Participant Guide* pages 51-59

Total time: 45 minutes

ACTIVITY 7.1

INTRODUCTION TO THE EBS UNIT

Describe the daily workflow of an EBS Unit

Identify the core competencies and specialized skillsets required to conduct EBS

Group activity

5 minutes

Step 1: Introduce the activity

Open the session by reading the following statement, then ask participants to brainstorm their responses in the space provided in their *Participant Guides*. After a few minutes, ask for volunteers to contribute one or two points each. Record the correct responses on a blank piece of flipchart paper and wrap up the exercise by reading the model answer.

> *The **mission of an EBS unit** is to provide a single source of reliable, comprehensive, and high-quality information on international disease outbreaks and other health threats. How do they accomplish this? List a few ways that EBS units fulfil their objective.*
>
> ***Model answer: An EBS unit provides reliable, high-quality information by:***
>
> - *Systematically collecting and analyzing international health event data for early detection,*
> - *Classifying the health risks associated with these events,*
> - *Disseminating event information,*
> - *Facilitating appropriate and rapid interventions, and*
> - *Leveraging existing expertise in-country via formal and informal networks, within the context of an overall surveillance system, to include EBS.*

Regardless of the mode of acquisition of information, not all information, even information collected primarily by IBS, corresponds to genuine acute public health events. Some information might correspond to mild diseases or hazards for which no control measure is available, or to the modification of long-term trends for endemic diseases that would require further investigation.

Step 2: Deliver lecture on EBS Unit resources

Staff are the most important resource

Staff of an EBS unit are the most important resources, who efficiently and effectively use the rest of the resources to fulfill mission objectives. Well-coordinated teamwork, work sharing, transparency, and flexibility within a structured work plan allow for an environment of efficiency to make effective use of all resources.

The EBS Unit staff bring technical backgrounds to EBS functions, which require a combination of skills and core competencies. These include technical competencies such as data collection, and analysis; these can be thought of as "hard" skills that can be measured and improved continuously through formal training. Other competencies depend on context that is specific to the EBS Unit and to the country setting; these can be thought of as "soft" skills gained primarily through on-the-job training and hands-on demonstrations.

EBS Unit staff typically comprise an EBS director or team lead, EBS analysts with diverse backgrounds, and emergency response coordinators and/or administrative assistants.

Other resources

In addition to staff, an EBS Unit should also include:

- *Information sources, such as SMEs, public health agencies, WHO and WHO Regional Offices, partner country Ministries of Health, Agriculture, or other relevant Ministries, and non-governmental organizations,*
- *Communication tools, and*
- *Information technology tools.*

Step 3: Set up small group brainstorming activity

Instruct participants to form the same groups of four as earlier exercises and provide each group with a flipchart and marker. Each team should select a group member to take notes (recorder) and another to present the group's responses to the audience (presenter). Allow 10 minutes for participants to discuss and record responses to each of the questions below (and on page 52 of their *Participant Guides*).

After this time, ask for one volunteer from each group to offer a few points to either question, writing these on the prepared flipchart. Once all groups have contributed, review the complete list and add any other missing points from the model answer below.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After 10 minutes, ask for volunteers to share one answer each until all of the points have been covered. Discuss their answers and the model answer as a group and fill in any gaps as you go.

Read the questions out loud before participants start the activity:

- ***Q1:*** *What are the required skills of an ideal EBS Unit analyst?*
- ***Q2:*** *What are the desired skills and attributes of an ideal EBS Unit analyst?*

Model answer

Required skills	***Additional desirable skills and attributes***
Advanced epidemiology/public health training and related analytical skills *General public health expertise* *Previous experience in infectious disease surveillance or environmental health* *Good knowledge of the national public health structure and mechanisms* *Good knowledge of international public health and mechanisms (when applicable)* *Good written and verbal communication skills for preparing and presenting reports* *Interpersonal skills to interact with different stakeholders including SMEs* *Good knowledge of data management and of existing IT tools, particularly internet searches*	*Good knowledge of infectious diseases, particularly zoonotic diseases* *Flexibility & adaptability to cope with a wide range of health events and tasks* *Ability to work under time pressure* *Well organized and able to handle high volume of information* *Good knowledge of geographic medicine (when applicable)* *Curious and always eager to learn*

The EBS team

Practical applications can help the EBS team function as one unit. These include shared electronic resources, such as:

- *A shared email account,*
- *A shared mechanism, such as a resource portal or network drive, for research and reference documents, and*
- *An outbreak database accessible to all for logging, managing, and reporting events.*

Step 4: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 7.2

EBS UNIT ANALYST RESPONSIBILITIES

Describe the daily workflow of an EBS unit

Identify the core competencies and specialized skillsets required to conduct EBS

Describe "mystery" diseases and how to assess their risk

Lecture and group discussion

10 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Deliver lecture on the daily responsibilities of analysts

Create, review, and revise EBS Unit Standard Operating Procedures

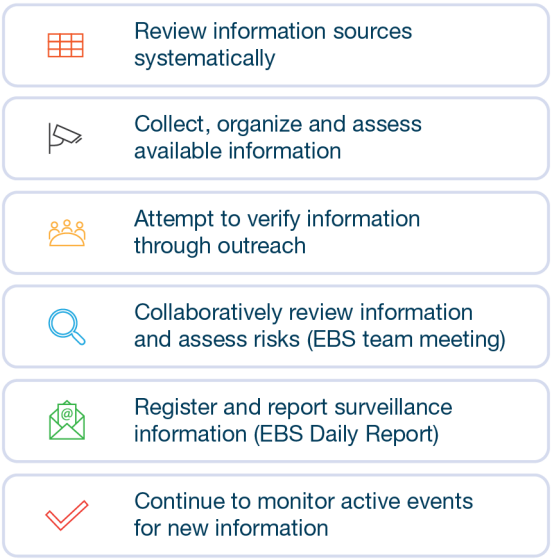
Standard Operating Procedures (SOPs) should be written, reviewed, and followed by the EBS unit, and updated at a frequency determined by the Director (e.g., annually). One analyst should be the lead on the development and annual review of the SOPs.

Daily general workflow of an EBS Unit

Although the sources of information and the priority diseases and events will vary according to country-specific needs, the actual processes of data collection, analysis, and reporting can be standardized in a daily workflow plan that promotes teamwork and consistent, systematic analysis. Please see Appendix 2 of your Participant Guide for a sample daily report.

Ask participants to locate figure 25 in their *Participant Guides.*

This schematic outlines the sets of tasks that the EBS unit staff use routinely to identify, verify, and communicate with key stakeholders about acute public health events. We will now go over each of these in turn.



Review information sources systematically

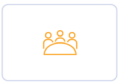
Analysts begin the workday by screening multiple sources to see if there is a new public health event of interest or an update to a previously identified event. Most importantly, all analysts will verify events and conduct risk assessments for the specific events they are following as well as identify and verify new signals as they are found. These signals must be verified through reliable sources as described in Module 4.

Collect, organize and assess available information

Once an EBS analyst has detected a signal, the analyst should follow the appropriate steps to contextualize this information:

- *Check additional sources for corroborating reports,*
- *Check baseline disease epidemiologic data to determine if this information is unusual or unexpected (consider geographic locations, seasonality, etc.),*
- *Determine whether an event meets reporting criteria, and*
- *Determine whether an event requires alert and response actions (including EBS unit coordination).*

Most importantly, all analysts will verify events and conduct risk assessments for the specific events they are following as well as identify/verify new signals as they are found.



Attempt to verify information through outreach

Verification is an essential step of the epidemic intelligence process that consists of confirming the reality (authenticity and conformity) of a possible public health threat. This is done by actively cross-checking the validity of the information using reliable sources, or verifying pertinence in order to confirm and, when possible, to characterize the nature of the event.

Collaboratively review information and assess risks in the EBS team meetings

The daily meeting is the heart of the collaborative, coordinated process of analyzing EBS data as a cohesive team. Once per week, during the EBS Unit Daily Meeting, analysts meet to determine whether each event warrants continued active surveillance and "inactivate" (cease to monitor) events that do not warrant continued active surveillance. These include events with few or no new cases reported or where no additional information is available.

During the mid-day EBS Unit Daily Meeting, analysts share and discuss unverified signals or verified events discovered over the past 24 hours to decide if reporting or updating is warranted. An algorithm should be developed for monitoring of frequently reported diseases (for example, one week after the last case).

Larger or notable events should have a lead analyst assigned who has primary responsibilities for conducting surveillance for that event to keep appropriate Ministry units apprised of developments, and also for reporting purposes. Information is shared with all analysts so that another can step in and serve as lead when the assigned lead is not available.

These meetings are also used to identify information to be conveyed in the daily report, discuss policy, logistics, administrative, or other issues, and discuss and characterize a high-level risk assessment based on all available information and contextualized data.

Register and report surveillance information

After the Daily Meeting, analysts continue their routine duties as necessary (including continuing surveillance activities throughout the rest of the day) and develop and share their reports according to the EBS Unit's reporting strategy. Analysts should record information in an outbreak database, according to the criteria of the EBS unit. While compiling the daily report, analysts should solicit and compile comments and feedbacks from SME colleagues before publishing the Daily Report, if warranted (for example, if a particular report is overly technical and requires such a review).

Continuous monitoring of events for new information

Events should be continuously monitored for new information. This includes following-up on information sources and feedback until the event is "closed" or no longer actively being followed; regularly checking websites for updates; continuously checking email (EBS group mailbox) or other communications from reliable sources to verify event information; continuing to share updated information in daily EBS team meetings; and providing updates on the EBS Daily Report.

Step 3: Deliver lecture on the "mystery" diseases

Start the lecture on "mystery diseases" by reading the content below, then ask participants to brainstorm the answer to the question that follows in their same groups of four. Instruct participants to make notes on page 55 of their *Participant Guides*.

After a few minutes, ask for volunteers to contribute one or two points each. Record the correct responses on a blank piece of flipchart paper and wrap up the exercise by reading the model answer.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After a few minutes, ask for volunteers to share one answer each until all of the points have been covered. Discuss their answers and the model answer as a group and fill in any gaps as you go.

Conduct risk assessments for undiagnosed "mystery" diseases

Some reports describing outbreaks will not have an etiology. These reports may refer to the outbreak as "mystery", "unknown", or "unidentified" outbreaks. Analysts should take steps to assess these reports in order to verify and determine a diagnosis.

If the source is verified *(e.g., WHO, UN Organizations, MOH/MOA):*

- *Confirm case and death numbers,*
- *Confirm whether laboratory testing was conducted and results obtained or pending, and*
- *Inquire whether there has been a public health response.*

If the source is unverified *(e.g., media, blog, or social media), search other sources to seek corroborating media reports ("triangulating" multiple media reports).*

If additional media reports confirm information contained in the original media report, you should verify that the additional media reports are original publications and not just redistributions of the first report through media recycling.

Q1: What should you do if the "mystery" disease etiology remains unconfirmed?

Model answer: *If the "mystery disease" etiology remains unconfirmed:*
Discuss the possible etiologies based on case and death counts, location, ecology, and clinical signs or symptoms described in media reports with team members. From this information, identify the appropriate SMEs to consult then coordinate a conference call with all stakeholders to discuss the outbreak and narrow the possible etiologies.

If you are unable to determine the "mystery" disease etiology, continue to actively monitor the original source and others for additional information. If no further reports are identified, discontinue active surveillance.

Step 4: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 7.3

THE ROLE OF SUBJECT MATTER EXPERTS

Describe the role of SMEs and SME lists in EBS

Interactive lecture

10 minutes

Step 1: Open lecture with small group discussion on SMEs

Open the lecture by explaining to participants that this activity will be delivered as an interactive lecture, with periodic check points where participants can work in groups to brainstorm the answer to a question.

For each of the following questions, start the activity by reading the question statement, then asking participants to work in their same groups of four to brainstorm an answer. After a few minutes, ask for volunteers to contribute one or two points each. Record the correct responses on a blank piece of flipchart paper and wrap up the exercise by reading the model answer.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After a few minutes, ask for volunteers to share one answer each until all of the points have been covered. Discuss their answers and the model answer as a group and fill in any gaps as you go.

An SME is a person who is considered to be highly trained in a particular subject or disease or has obtained significant experience in a particular country or region of the world. The information provided by SMEs greatly contributes to risk assessments, and SMEs have an important role in EBS

In your small groups, brainstorm some of the ways that SMEs can contribute to EBS. Record your answers in the space provided on page 55 of your Participant Guides.

Model answer: *SMEs contribute to many different areas in EBS, including:*

- *Assisting in the interpretation of reports concerning outbreaks,*
- *Assisting in the interpretation of new findings during an outbreak,*
- *Assisting in providing historical context with regard to a pathogen, outbreak, or country,*
- *Assisting in the confirmation of a diagnosis,*
- *Participating in outbreak-related conference calls related to the area of the SME,*
- *Assisting in clearing products written by EBS analysts, and*
- *Participating in field responses at request for assistance in outbreaks.*

SME list

All EBS analysts should develop and maintain SME lists that can be used to quickly identify and find contact information for SMEs that can be consulted for assistance during an event.

SME lists can be maintained in a straightforward manner using programs such as Microsoft Excel, or on a shared network drive. The list should be updated at regularly defined intervals. An SME list template can be found in Appendix 3 of your Participant Guide.

This list should be used by all analysts to identify and find contact information quickly for SMEs who can be consulted for assistance during an event. Key information that should be gathered on an SME include:

- *Disease/area of expertise,*
- *Contact name,*
- *Organization/unit, and*
- *Contact information (office phone, mobile phone, email).*

Anthropologic expertise

Now read the following statement, then ask participants to work in their same groups to brainstorm the answer in the space provided on page 56 of their Participant Guides.

If you are delivering the training online, instruct students to record their responses in their *Participant Guides*.

When analysts are investigating a public health threat such as a disease outbreak in specific ethnic groups, an EBS unit would benefit from the advice of a medical anthropologist or social behaviorist on the cultural practices of that specific group. Why do you think this is important?

Model answer: *Including medical anthropologists or social behaviorists is important in this context because:*

- *It aids in understanding community practices that could promote the transmission of pathogens,*
- *It assists in developing appropriate public health messages based on the community's belief system and culture, and*
- *It gains community acceptance of messages and promotes appropriate action.*

Note that a medical anthropologist or social behaviorist should be considered an SME and included on an SME list.

Step 2: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 7.4

SOURCE LISTS

Define the key resources and tools necessary for an EBS unit

Interactive lecture

10 minutes

Step 1: Open lecture with small group discussion on source lists

Open the lecture by explaining to participants that this activity will be delivered as an interactive lecture, with periodic check points where participants can work in groups to brainstorm the answer to a question.

For each of the following questions, start the activity by reading the question statement, then ask participants to work in their same groups of four to brainstorm an answer. After a few minutes, ask for volunteers to contribute one or two points each. Record the correct responses on a blank piece of flipchart paper and wrap up the exercise by reading the model answer.

If you are delivering the training online, ask participants to record their answers in their *Participant Guides*. After a few minutes, ask for volunteers to contribute a few points each, then discuss their answers and the model answers as a group.

Source lists

All analysts will begin the workday by conducting EBS via systematic screening of multiple sources to see if there is a new public health event of interest or an update to a previously identified event. To facilitate this systematic review, analysts should use a "Source List" to save a source list of website names including URLs and corresponding passwords. These can be stored in a password-protected database such as an MS Excel spreadsheet if required.

Source lists should be maintained in two separate databases: one to include primary sources which include information originating from that source or agency, and another to include sites that are considered to be "media aggregators". These are designed by users using keywords to collect posts from targeted websites and display collectively on one portal. Source lists should be shared among all analysts, and should be accessed frequently each day by analysts to conduct EBS.

A source list with selected examples of primary sources can be found in Appendix 1 of your Participant Guides.

Now read the following three questions, then ask participants to work in their same groups to brainstorm the answers in the space provided on page 56 of their *Participant Guides*. After 10 minutes, ask for volunteers to contribute one or two points each. Record the correct responses on a blank piece of flipchart paper and wrap up the exercise by reading the model answer.

Q1: What are some formal, or official verified sources that provide verified information?

Model answer:

- *National level, Institutions of Public health and related fields,*
- *Provincial or State Departments of Health,*
- *MoH or State affiliate Institutions at the State level,*
- *Ministry of Health of neighboring countries,*
- *MoH affiliate Institutions in the neighboring countries, and*
- *WHO (country and regional office).*

Q2: What are some informal sources that provide information?

Model answer:

- *Online media sources (make a list of key domestic and international media sources),*
- *Online contributor-based sources such as ProMED or participatory networks,*
- *Online information services or data aggregators,*
- *National or international surveillance networks,*
- *Twitter or other social media, and*
- *Personal communications.*

Q3: What information should be included in a password-protected database or spreadsheet?

Model answer:

- *Name of organization of source,*
- *Report name,*
- *URL or hyperlink of source,*
- *Log In information,*
- *Username,*

- *Password, and*
- *Update passwords as they expire or are updated.*

The process for identifying potential online sources is described in Module 3.

Step 2: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

ACTIVITY 7.5

UNIT TOOLS AND RESOURCES

Describe key tools and resources used by the EBS Unit

Lecture

10 minutes

Step 1: Review the content of this activity

Review the content for this activity prior to conducting the presentation. Ask participants to make notes in their *Participant Guides* as they listen to the lecture.

Step 2: Present lecture on other resources that can be used by an EBS Unit

EBS team group email

An EBS unit should establish a shared email address to serve as a secure point of communication with all EBS unit staff. All staff should receive copies of emails that are sent to a secure, shared inbox, and this mailbox should be carbon copied on all electronic communication between analysts and other Ministry programs. This allows for transparency and knowledge amongst the EBS team and ensures a prompt response to every email or query that the EBS unit receives in a timely, accurate and appropriate manner.

Working in your same small groups, consider when a shared email box should be used to communicate between analysts and colleagues. In the space provided on page 57 of your Participant Guides, brainstorm the types of issues that should be communicated through a shared email address.

Model answer: *A shared email address should be used to communicate about:*

- *verification of outbreaks,*
- *updates to outbreak information,*
- *context surrounding outbreaks,*
- *subject matter expertise (pathogen, epidemiology, laboratory),*
- *epidemiologically-related outbreaks (temporal, geographic, population), and*
- *any coordinated response activities including logistics, travel, and funding.*

Using the shared email account for surveillance

The shared EBS email mailbox should be copied on all EBS unit-related communications, including communications on outbreaks, deployments of response teams, context on disease epidemiology, and background information on a particular pathogen or illness.

The analysts can then use email containing information related to outbreaks to conduct surveillance. Emails include information on public health events which are being followed ("active" events) or had been actively followed in the past (now "inactive" events). If the shared email box is copied on all communications, it can be used as a tool to assist in surveillance by searching through archived and stored data contained within email.

Respond to queries from partners

Email serves as the easiest and fastest way to respond to other public health agencies and partners, and email monitoring should be conducted constantly. Analysts responding to email should take note of the sensitivity of the information and when in doubt, clarify with the EBS Unit Director. Responses to queries sent by email should always include a copy to the group mailbox for the EBS Unit's situational awareness. Finally, responses should be accurate and rapid.

Shared resource portal for research and reference

An EBS Unit should establish an electronic portal, such as a network drive or cloud storage, for research and reference purposes, which is populated by analysts for shared use. For example, EBS analysts in countries with access to Microsoft SharePoint can search within the portal by country, disease and global epidemiological concerns.

Items can be tagged by disease, country, WHO region, laboratory, etc. Additional tags could include pathogen information, epidemiologic results, laboratory findings, email communications saved as documents, publications, documents concerning funding, and other supporting documents. EBS analysts should update the site on an ad hoc basis and consider whether to make the portal available to other Ministry programs.

An alternative to a shared resource portal is a shared network drive for analysts to share, edit, store, and archive documents such as schedules, active outbreaks, SME lists, presentations, key management updates, maps, spreadsheets, archived reports, disease-specific reports and summaries, and any other documents related to EBS. Permission should be granted to gain access to such a drive to ensure the information stored there is secure.

List of priority public health events

A list of priority public health events to be put under surveillance should be established. The process for developing this list is described in detail in a previous module. The list may contain:

- *Diseases (e.g. measles),*
- *Syndromes (e.g. hemorrhagic fevers),*
- *Hazards (e.g. contamination of drinking water source), and*
- *Unexpected/unusual events (e.g. unexplained mortality).*

Reporting templates

EBS analysts should develop and use templates for drafting reports for leadership and key stakeholders. When developing daily reports, an analyst should consider the audience, purpose, timeline, and template defined for daily, summary (weekly/monthly), ad hoc, and urgent reports.

Reporting templates should include the following essential information:

- *Event description,*
- *Timelines,*
- *Public health impact,*
- *Geographic scope and risk of spread,*
- *Ongoing or planned activities, and*
- *Additional context.*

EBS ensures the early detection of health events only if data are reported in a timely way. However, EBS is not restricted to immediate or real-time notification systems. The frequency of transmission should take into consideration the nature of the disease and the urgency of the implementation of the control measures. According to the diseases or syndrome, immediate, daily and weekly reporting can be appropriate and equally contribute to early warning.

A previous module describes the process of writing reports in detail.

Media aggregators for automating online searching

EBS Units should utilize leading media aggregators for automating internet-based searching for EBS. EBS units should customize such systems to best fit the geo-scope of the EBS unit's "reach" as well as the priority disease categories as determined by the country

Infectious disease databases

Baseline disease epidemiologic data should be checked to assess compatibility with known scientific information. Doing so can help determine whether the event meets EBS Unit reporting criteria, and requires alert and response actions, including EBS Unit coordination and reporting.

One infectious disease and microbiology database that can be used by clinicians and epidemiologists is The Global Infectious Diseases and Epidemiology Network (GIDEON). GIDEON is accessible via the web with a subscription; an EBS unit's username and password should be saved in the Source List.

An EBS Unit should use GIDEON to understand the epidemiology of diseases and can conduct searches on the website by country, place, time, etc. This is especially useful when context is needed about past outbreaks or to determine baseline disease burden, which is helpful for understanding whether a public health threat is unusual or unexpected.

Event Management Systems

A database should be designed and implemented for logging, managing and reporting events that meet the criteria to be entered into the system. This includes IHR Annex 2 and other significant events to the country. Ideally, this is a web-based application, called an Event Management System (EMS), that is only accessible to EBS analysts and has an application through which quantitative and qualitative data can be analyzed for publication. Ideally, this includes a reporting function such that reports are able to be generating directly from the database.

The outbreak database should contain all public health events that are currently actively being followed by the EBS unit, an "Active List". Analysts should review the Active List on a weekly basis to keep list updated and current.

Commercial products are available; however, Microsoft (MS) Office products can be utilized to create an EMS for a new EBS unit in a low-resource environment. For example, MS Excel can be used for logging and managing data, while MS Office can be used for reporting. An EMS' utility can also be expanded to use one or more business intelligence and data visualization products such as Power BI or Tableau.

Develop and use Line Lists

A Line List is an organized, detailed table that summarizes key information about each case in an outbreak. Line Lists could be helpful when tracking an outbreak to determine trends in the outbreak over time. Line Lists can be built and added to over time in an MS Excel spreadsheet. An EBS unit should use Line Lists to:

- *Maintain all the relevant verified information regarding key outbreaks,*
- *Undertake epidemiologic analyses to contribute to discussions in the relevant forum and contribute to broader epidemiologic investigations,*
- *Share key information during ad hoc presentations (e.g., constructing epidemic curves for use in slide presentations),*
- *Assist in communications with SMEs, and*
- *Track information found in media-reported or otherwise unverified cases.*

In a Line List database, variables recorded for each case could include:

- *Sex,*
- *Age,*
- *Jurisdiction,*
- *Date of symptom onset,*
- *Chronology of events from exposure to onset to list of symptoms,*
- *Date of hospitalization, and date of discharge (if applicable),*
- *Date of laboratory confirmation,*

- *Outcome (alive, fatal - with date of death, and unknown),*
- *Date of discharge,*
- *Lab confirmation (yes/no), and*
- *Other important qualitative information, e.g. laboratory name/source of confirmation; cluster information; web links or source of information; exposure information (e.g., bird exposure in human avian influenza infections).*

Make sure to save the spreadsheet in the Line List folder in the cloud or other shared drive. You can view a sample Line List in Appendix 5 of your Participant Guide.

Step 3: Thank participants and ask for questions

Wrap up the activity by thanking participants for their active involvement, and asking if they have any questions regarding the lecture. Clarify and answer any questions before moving to the next activity.

SESSION 8

TRAINING REVIEW AND POST-TEST

This session focuses on wrapping up the training and presenting the Rwanda Case Study which tests how well concepts have been understood and are able to be applied.

Materials

Facilitator

- Training agenda
- Case study presented in Appendix 4

Participants

- *Participant Guide* pages 60-74
- Case study presented in Appendix 6 of *Participant Guide*

Total time: 30 minutes

ACTIVITY 8.1

POST-TRAINING KNOWLEDGE CHECK

Review training

Administer the case study

Training review and case study

30 minutes

Step 1: Review the agenda and what has been learned

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

Step 2: Facilitate the Rwanda case study

The case study (Appendix 4) is used to test how well participants have understood key concepts and are able to apply them in a real-world context. Appendix 6 in their Participant Guides and give them time to work through the case study on their own. You can use the following script:

> *Turn to Appendix 6 in your Participant Guide and work through the case study presented there. This case study brings together the key concepts from the training and asks you to apply them to a real-world context. You will have 15 minutes to complete the case study. You are encouraged to ask us, the facilitators, if you have any questions or need clarification on questions asked in the case study.*

Remind participants to respect everyone's time by not engaging in side conversations once they have completed their case study.

Step 3: Review the case study as a group

After all participants have completed the ase study go over the answers and ask them to make corrections as needed. Ask for any clarification questions or final feedback that participants would like to provide. Thank participants for attending the training and actively participating.

APPENDICES

APPENDIX 1

SMALL GROUP EXERCISE - KEY TERMS IN PUBLIC HEALTH SURVEILLANCE

Q1: What is public health surveillance?

Q2: What is EWAR?

Q3: What do you see as the goal of EWAR?

Q4: What is epidemic intelligence?

APPENDIX 2

SMALL GROUP EXERCISE - HOW EBS AND IBS CONTRIBUTE TO EPIDEMIC INTELLIGENCE

	IBS	EBS
Process		
Characteristics of data		
Example of sources		

APPENDIX 3

SMALL GROUP EXERCISE – EBS AND IBS IN YOUR COMMUNITY

Q1: What is the purpose and importance of EBS?	**Q2:** How could EBS be used in your community?
Q3: What is the purpose and importance of IBS?	**Q4:** How could IBS be used in your community?

APPENDIX 4

RWANDA CASE STUDY

It's 10:30 am on 17 July in the Command Center. You are an EBS analyst performing a media scan on EIOS and you find the following article:

EIOS EPIDEMIC INTELLIGENCE FROM OPEN SOURCES

Monitoring | Communities and Teams | Documents | Dashboards

Uganda reports Rift Valley fever outbreak

Filed Under: **Rift Valley Fever**; **VHF**

Lisa Schnirring | News Editor | CIDRAP News | Jul 17, 2018

Share Tweet LinkedIn Email Print & PDF

Uganda's health ministry has reported a Rift Valley fever outbreak involving two of its districts, and Rwanda is reporting the disease in animals along with suspected human cases, events that are occurring alongside an ongoing outbreak in Kenya, the World Health Organization (WHO) African regional office said yesterday in its latest weekly outbreak report.

The outbreaks pose a threat to other countries in the region, especially East Africa, which is experiencing heavy rains, according to the WHO.

Livestock contract the virus from mosquitoes, and though humans can be infected by mosquitoes, the virus is more commonly passed by contact with blood or organs of infected animals or drinking milk from sick ones.

Rod Waddington / Flickr cc

Uganda cases in 'cattle corridor'

In Uganda, two unrelated cases were confirmed on Jun 28 in two separate districts in the western part of the country. Both involve men who had exposure to animals. One patient is a 47-year-old butcher who got sick on Jun 20 and died at home the following evening. Health officials collected a postmortem sample and sent it to the Uganda Virus Research Institute (UVRI).

The second patient is a laborer and herder whose symptoms began on Jun 25. He was hospitalized and isolated the following day because of suspected viral hemorrhagic fever. Samples were collected during hospitalization and sent to the UVRI. The man died on Jun 30, and a safe burial was performed, the WHO said.

Another confirmed case has been reported from a third district, but the WHO said it is awaiting more information about the illness. Two other suspected cases are under investigation, and animal samples have been collected from the farm where one of the patients worked and from the slaughterhouse where the other worked.

Uganda's government has deployed a rapid response team to the affected districts, established an isolation unit at Mbarara Regional Hospital as the main treatment center, and prepared district hospitals to handle cases.

The WHO said the affected districts are in the "cattle corridor" that stretches from the southwest to the northeast regions of the country.

The article describes the following:

- Two cases in humans (one death), in separate districts in the Western part of the country,
- The cases were reported by WHO AFRO,
- Another confirmed case from a third district, but more information is needed,
- Two other suspected cases are under investigation,
- Animal samples have been collected, and
- Information on a concurrent outbreak of Rift Valley fever in Kenya.

Considering what you have learnt so far, answer the following questions.

Q1: Is the source reporting the outbreak of RVF in Uganda an official source or an unofficial source?

Q2: Based on the source type, is verification required to confirm the RVF outbreak in Uganda?

Q3: Would you consider Rift Valley fever to be a priority disease for Rwanda? If so, why?

You continue to scan media of this event and you come across the following twitter feed:

You start seeing rumors on Twitter describing abortions and deaths in animals in northern Rwanda near the border with Uganda.

Considering what you have learnt so far, answer the following questions.

Q5: What verification activities would you perform at this time?

Q6: Would you contact someone for cross-checking the information known? If so, who?

It's 8:30 am on 6 August in the Command Center and you receive notice that the MOA and Animal Resources issued a situation update noting:

- 154 cows have died from RVF
- 257,900 cattle have been vaccinated against RVF
- An estimated 316,445 cows have been treated with ParmaPy Plus – a drug to kill ticks, flies, and mosquitoes that transmit RVF

Now that the outbreak has been confirmed you and your colleagues draft a notification about the RVF outbreak in cattle in Rwanda.

Q7: With whom do you share an RVF notification?

Q8: What is some of the information you would include in the notification?

Q9: How do you support outbreak response activities?

Public notification of RVF outbreak

Rwanda's EBS teams has contacted AFRO to report the available information according to the MOA and Animal Resources' investigation: "Rwanda is experiencing an epizootic, with suspected human cases."

AFRO has published in its weekly bulletin information on this multi-country RVF outbreak, based on information received by Uganda's PHEOC, Rwanda's RBC and Kenya's MOH.

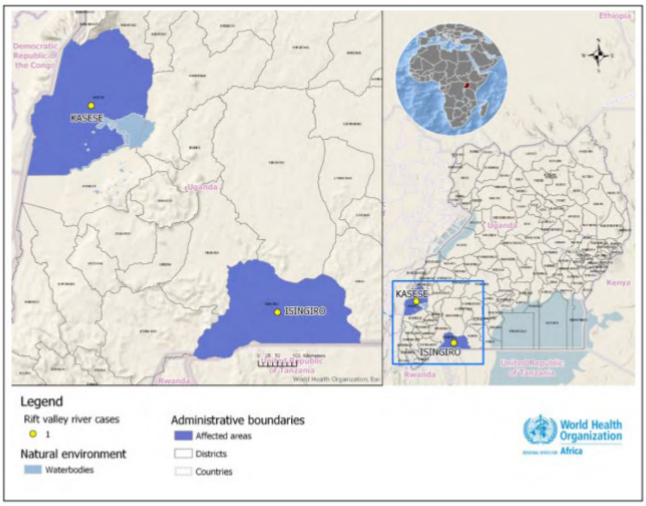
Rift Valley fever | **Uganda** | 2 **Cases** | 2 **Deaths** | 100% **CFR**

EVENT DESCRIPTION

On 29 June 2018, the Uganda Ministry of Health notified WHO of an outbreak of Rift Valley fever (RVF) in Isingiro and Kasese districts, all located in the western region of the country. Two unrelated simultaneous cases were confirmed on 28 June 2018, one in each district. The first case-patient was a 47-year-old male from Kanyatsi village in Munkunyu sub-county, Kasese District, whose main occupation was as a butcher. He fell ill on 20 June 2018 with symptoms of fever and headache, and self-administered antimalarial treatment. The case-patient died at home on the evening of 21 June 2018, with the body oozing blood from multiple orifices. The district health authority collected a nasal swab (posthumous) on notification of the death and the specimen was sent to the Uganda Virus Research Institute (UVRI) on 25 June 2018. The test result released on 28 June 2018 was positive for RVF by reverse transcriptase-polymerase chain reaction (RT-PCR).

The second case-patient was a 35-year-old male casual labourer and herdsman from Kabare village in Isingiro town council, Isingiro District. The village is located near Lake Nakivale and borders Lake Mburo National park. On 25 June 2018, he developed fever, headache, and anorexia, which was followed by epistaxis. He presented to the local health facility the same day, but was immediately referred to the regional referral hospital because of the severity of his illness and suspicion of a viral haemorrhagic disease. The case-patient was admitted in the isolation unit. A blood specimen was obtained and shipped to UVRI on 26 June 2018. The test result released by UVRI on 28 June 2018 was positive for RVF on RT-PCR. The case-patient died on 30 June 2018 and a supervised burial was carried out.

Geographical distribution of Rift Valley fever cases in Uganda, 20 - 30 June 2018



There is a report of another confirmed RVF case in Ibanda District, on which more information is being sought. Two other suspected cases are reportedly being investigated in Mbarara (1) and Kasese (1) districts. Additionally, 55 animal specimens were collected from the farm where one of the confirmed cases worked and in Isingiro town council abattoir. A further update will be provided on the evolution of this event.

Report writing activity

We're going to practice logging the RVF outbreak into a mock EMS as an EBS analyst would.

Review the GDDOC examples below, then log the RVF outbreak in the template that follows. Remember to consider criteria for EBS reporting, outbreak timeliness metrics, and EBS report components.

GDDOC example of an first report in Uganda

Country: Uganda
Agent/Disease: Rift Valley Fever
Event ID: 2235-B92.4-2018
First reported to GDDOC: 6/29/2018
Location: Kanese, Insingiro
Source: CDC Programs
Geographic scope: medium
Public health risk impact: high

Event description

The GDD Operation Center (GDDOC) has learned of two human cases of Rift Valley fever (RVF) reported in Uganda. The first case, which was fatal, was in a 49-year-old man from Kasese district who worked as a meat trader, and who had possibly also consumed meat, in Kiruhura district. He was initially suspected of being infected with anthrax, however, preliminary laboratory results at Uganda Virus Research Institute (UVRI) on 27 June indicate infection with RVF.

The second case, also fatal, was in a 35-year-old man from Insingiro district who worked as a herdsman; he also has a history of slaughtering and consuming meat from an ill cow. The patient was hospitalized on 26 June with fulminant viral haemorrhagic fever (VHF), and later died. Preliminary laboratory tests at UVRI on 27 June also indicate infection with RVF.

The UVRI VHF team is in the field conducting animal and human investigations in both locations, serving as the Ministry of Health's Rapid Response Team.

The GDDOC last reported RVF in Uganda in February 2018, at which time nine human cases with five deaths were reported from the districts of Kiboga, Mityana, Kyankwanzi, Kiruhura, Buikwe, and Arua.

The GDDOC will report additional information as it becomes available.

GDDOC example of information on RVF in Rwanda

Country: Rwanda
Agent/Disease: Rift Valley Fever
Event ID: 2248-B92.4-2018
First reported to GDDOC: 6/7/2018
Location: Eastern Province
Source: CDC Programs
Geographic scope: medium
Public health risk impact: high

Event description

The OIE has reported outbreaks of Rift Valley fever (RVF) among cattle in Eastern Province, Rwanda. Eight outbreaks were reported in Kirehe district (three outbreaks) and Ngoma district (five outbreaks). Of 33 susceptible cattle, there were 26 cases with two deaths. The cases were all in dairy cows and calves.

Laboratory testing was conducted at the National Veterinary Laboratory, samples tested positive by serology on 6 and 29 June. In response to the outbreak, the Ministry of Agriculture and Animal Resources (MINAGRI) implemented quarantine measures including banning the movement of livestock and livestock products in the districts of Kirehe, Ngoma, and Kayonza. Further, a vaccination campaign among livestock was conducted in 18 districts, which included 237,386 cattle, 22,727 goats, and 17,872 sheep, representing a coverage of 84.6%, according to OIE.

To prevent cases among humans, a community sensitization campaign using the media is underway, educating the public with regard to mosquito control and avoiding meat from livestock that appear ill. MINAGRI has also advised reporting of suspected cases among livestock to veterinarians.

The GDD Operations Center will provide updates as they become available.

GDDOC example of an update to a report in Uganda

Country: Uganda
Agent/Disease: Rift Valley Fever
Event ID: 2235-B92.4-2018
First reported to GDDOC: 6/29/2018
Location: Western Uganda
Source: CDC Programs
Geographic scope: medium
Public health risk impact: high

Event description

This is an update to the cases of Rift Valley Fever (RVF) in Uganda, last reported by the GDD Operations Center (GDDOC) on 3 August 2018.

To date, there have been a total of 25 cases in humans with 13 deaths (case-fatality proportion=52.0%) attributable to RVF reported from Uganda during 2018. Cases have been reported from the districts of Insingiro (11 cases, 4 deaths), Mbarara (2 fatal cases), Kasese (1 fatal case), Sheema (1 fatal case), Ibanda (1 case), Lwengo (1 case), exported from Mubende (1 case), Sembabule (1 case), Iganga (1 fatal case), Kiruhura (2 cases, 1 death), Rakai (1 fatal case), Buikwe (1 fatal case), and Yumbe (1 fatal case).

All cases have been confirmed positive from RVF by polymerase chain reactions (PCR) at the Uganda Virus Research Institute (UVRI). The index case, which was fatal, was in a 35-year-old herdsman from Isingiro district who had illness onset on 22 June. Most cases have been reported in people who work as herdsman, butchers, or farmers.

Ongoing outbreaks of RVF affecting both humans and animals have been reported in the neighbouring countries of Kenya, Rwanda, and South Sudan. Reoccurrences of RVF have become common in Uganda in recent years. The last documented outbreak ended in January 2018 and affected several districts including Arua, Buikwe, Kiboga, Kiruhura, Kiynkwanzi, and Mityana. The rainy season, flooding, and confirmed outbreaks in neighboring Kenya, Rwanda and South Sudan all increase the risk of RVF transmission in Uganda. The affected districts are located in the cattle corridor, and uncontrolled movement of livestock can propagate the risk of spread of RVF to new areas. The RVF epizootic causes agricultural impact and economic losses to communities because of high mortality and abortion rates among infected livestock. WHO recommends strengthening the multisectoral One Health approach to mitigate this RVF outbreak in Uganda and neighboring countries.

The GDDOC will report additional information as it becomes available.

Now it's your turn. Fill in the logging template with details of the RVF outbreak described throughout this case study.

Country:
Agent/Disease:
Event ID:
First reported to GDDOC:
Location:
Source:
Geographic scope:
Public health risk impact:

Event description

APPENDIX 5

SMALL GROUP EXERCISE

Q1: Differentiating information: EBS or public health?

Complete the matching activity on different types of information. Circle **A** for items that meet the criteria for early warning information. Circle **B** for items that meet the criteria for public health/risk communication information.

- A / B - Growing public health sentiment or discord
- A / B - Clusters of an unknown disease
- A / B - Unusual or excess deaths occurring in a community
- A / B - Circulating public health misinformation
- A / B - New public health laws or regulations passed
- A / B - Unusual die-off of animals
- A / B - Annual/routine reports of morbidity and mortality
- A / B - Drug/vaccine developments
- A / B - Unexpected occurrence of a disease not previously reported from an area
- A / B - New public health/ ministry of health leadership
- A / B - Chronic or noninfectious disease reports
- A / B - Accidental or deliberate pathogen release
- A / B - Toxic chemical releases
- A / B - Reports on occupational health
- A / B - Radio-nuclear releases
- A / B - New motor vehicle or other travel related safety measures

Q2: Differentiating media headlines for EBS from information for public health/risk communication)

Consider the following examples of media headlines to complete the matching activity. Circle **A** for headlines that meet the criteria for early warning information, and circle **B** for headlines that meet the criteria for public health/ risk communication information.

- A / B - “50 unexplained deaths”
- A / B - “A major AIDS awareness campaign launched”
- A / B - “New bleeding syndrome reported”
- A / B - “A new Minister of Health elected”
- A / B - “Crime rates up by 40%”
- A / B - “High absenteeism at local school”
- A / B - “Farmer reports entire flock die off in Northern province”
- A / B - “New airbag safety measures mandated”
- A / B - “Flooding in Southern province”
- A / B - “Cholera reported for the first time”
- A / B - “Miner killed on the job”

APPENDIX 6

INDIVIDUAL EXERCISE: FREQUENCY OF REPORTING

Q1: List a few examples of health events that require immediate reporting.

Q2: List a few examples of health events for which accuracy should be prioritized.

APPENDIX 7

INDIVIDUAL EXERCISE: EBS REPORTS

Part A) What information should be included in an EBS report?

Part B) Identifying the key elements in a sample CDC EBS report

- The Global Disease Detection Operations Center (GDDOC) has learned of an outbreak of measles in Romania.
- On 21 September 2016 the Romanian Ministry of Health (MOH) reported that in the first eight months of this year, they have recorded 675 confirmed cases of measles in 23 counties, with two deaths. A third suspected measles death was reported but is undergoing final confirmation. The two confirmed and one suspected deaths all occurred in children younger than one year, which is under the age of routine measles vaccination. The MOH attributes the resurgence of measles to failure of some parents to adhere to the routine vaccination schedule.
- The National Institute of Public Health recommends vaccinating children in the affected areas of the country at the age of seven months with resumption of the normal vaccination schedule at one year of age.
- In 2015 Romania reported only seven confirmed cases of measles and no deaths. Measles vaccination coverage has gradually declined from a high of 98% in 2000 - 2002, to 86% in 2016. Officials report that there is no shortage of MMR vaccine in the country.
- GDDOC will continue to follow this outbreak and report updates as they become available.

MODULE 6.2

INTERNET EVENT-BASED SURVEILLANCE TRAINING MODULE

PARTICIPANT GUIDE

U.S. Centers for Disease Control and Prevention

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ACRONYMS

US CDC	U.S. Centers for Disease Control and Prevention
CBS	Community-Based Surveillance
CHV	Community Health Volunteers
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
IEBS	Internet Event-Based Surveillance
IHR	International Health Regulations (2005)
MOH	Ministry of Health
MS	Member States
NGO	Non-Governmental Organization
WHO	World Health Organization

GLOSSARY OF TERMS

Community-based surveillance (CBS):

CBS is the systematic detection and reporting of events of public health significance within a community, by community members. Community Health Volunteers (CHV), the public, religious leaders, civil society members, teachers, and similar groups are engaged and trained to detect and immediately report events or health risks occurring in their communities. CBS may also be known as community health surveillance, or community event-based surveillance.

Community health volunteers (CHV):

According to a WHO study group, CHVs may be members of the communities where they work, should be selected by the communities, are answerable to the communities for their activities, and should be supported by the health system but not necessarily a part of its organization. They may also be known as community health workers, among other terms.

Event:

The International Health Regulations (IHR) define an event as "[…] a manifestation of disease or an occurrence that creates a potential for disease; […]". This includes 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.

Geographic Scope:

The observed geographic distribution and rapidity of spread for public health event and is categorized as follows:

High: Events affecting several multi-national regions or continuing spread beyond national borders;

Moderate: Events affecting a multi-national region or continuing spread within national borders;

Low: Events limited to sub-national areas.

Health Event of International Importance:

A verified outbreak or a health threat that meets one of the following criteria, modeled after Annex 2 of the International Health Regulations: Is one of the following: SARS, polio (wild-type), smallpox, or a new subtype of influenza; Presents a serious threat to public health; is unusual or unexpected; poses a significant risk for international spread that potentially requires international intervention; or potentially causes restrictions of trade or travel.

Health Event Under Investigation:	An outbreak or a health threat that potentially meets one of the above criteria, but is not yet verified.
Health Event for Information:	A description of a verified health event that does not meet one of the above criteria but is of interest to the public health community because it poses a potential public health risk.
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 either the 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.
Information Credibility Scale:	Combines 1) the credibility of the source with 2) the validity of the information and is categorized as: **High:** evidence from public health agencies, in-country laboratories; not confirmed, but logical and consistent with event information; **Moderate:** Public health agency staff with in-country information without approved laboratory support, but not without some doubt of authenticity, trustworthiness. *Note: that this scale only applies to events categorized as Health Event Under Investigation*
Intermediate administrative level:	Intermediate administrative levels may be defined differently in different countries. For the purpose of this document, an intermediate level is the public health administrative level below the national level that is responsible for conducting preliminary investigations and implementing responses to reported public health events or suspected outbreaks in a given jurisdiction. The intermediate level may otherwise be referred to as districts or counties, among other terms.
Internet event-based surveillance (IEBS):	Internet event-based public health surveillance looks at reports, stories, rumors, and other information about health events that could be a serious risk to public health; such information may be described as unstructured information because the information obtained is non-standardized or subjective. WHO: Implementation of Early Warning and Response with a focus on Event-Based Surveillance, Interim Version

Local administrative level:	Local administrative levels may be defined differently in different countries. For the purpose of this document, a local administrative level is the lowest administrative division within a country, directly above the community level.
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. 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, may also constitute an outbreak and should be reported and investigated.
Public Health Impact:	Refers to actual or potential severity of illness, ease of transmission, public fear, or economic effects and is categorized as follows: **High:** highly pathogenic, highly transmittable, new or emerging, or has significant potential to disrupt travel or trade; **Moderate:** the potential to cause morbidity /mortality, transmit efficiently, or to disrupt travel or trade.
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 have to 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.
Risk characterization:	According to WHO, once a risk assessment team has carried out hazard, exposure, and context assessments of an event, a level of risk should be assigned. This process is called risk characterization.
Signals:	Patterns of disease or other information considered by the Early Warning and Response 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:	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.
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 State 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 cross-checking of the validity (veracity) of the signals collected by Early Warning and Response, by contacting the original source, additional sources, or by performing field investigation. Verification requires that hoaxes, false rumors, and artefacts are eliminated from further consideration.

INTRODUCTION

Many countries lack the essential resources required to meet the revised International Health Regulations (IHR 2005) requirements to effectively monitor, report, and respond to any disease or other public health threat with the potential to harm the public's health.

The revised IHR is the international agreement designed to help contain or prevent serious risks to public health and discourage unnecessary or excessive restrictions on travel or trade entered into force in 2007. The revised Regulations acknowledge that public health events can pose threats beyond national borders and that Member States have a responsibility to the global community to identify, report, and when possible, contain public health threats before they become "public health emergencies of international concern". While public health burden is assessed by analyses of quantitative data collected via traditional surveillance methods, an estimate of public health can be gleaned via event-based surveillance (EBS) data.

Countries that lack resources could have inadequate health service infrastructures, poorly trained staff, inadequate diagnostic lab capacities, or weak reporting mechanisms. Furthermore, many governments could be reluctant to report public health events to the international community. Both situations - if countries cannot or will not report - are ideal for EBS. EBS is a system of organized and rapid capture of information about potential public health threats that pose a risk to public health.

These are defined at:
WHO: Implementation of Early Warning and Response with a focus on Event-Based Surveillance, Interim Version

An EBS unit includes a director and staff ("Analysts") with expertise in infectious and non-infectious disease, human and veterinary medicine, medical microbiology, epidemiology, and information technology who are responsible for:

- Detection and verification of public health threats,
- Tracking and identifying "mysterious illnesses" for the which etiology is unknown,
- Establishing a subject matter network to assist with threat verification, and
- Partnering with local, regional, and international public health organizations to disseminate information.

This module describes the daily responsibilities of an EBS unit positioned at the central, or federal, level and addresses resources that should be used and applied to successfully conduct EBS.

Background

The mission of an EBS unit should be to provide a single source of reliable, comprehensive, and confirmed information on international disease outbreaks and other public health threats by systematically collecting and analyzing international health event data, conducting risk assessments, classifying the health risks associated with these events, and disseminating health threat information.

This system of risk assessment is particularly effective in detecting public health threats in countries that have weak surveillance and reporting. Sources of data include existing channels of established formal and routine reporting systems, and informal open channels, using internet-based media, social media, and non-governmental organizations.

Analysts in an EBS unit provide prompt, expert analysis and projected impact of public health threats. Data collected from disparate sources are reviewed and verified through refined methodologies and protocols, including the use of sophisticated text-mining and multilingual translating systems.

Events should be triaged and entered into a software application, creating a database of analyzed public health threats. Such a database should ideally be used to create reports to disseminate to shareholders and partner organizations, with reporting frequency determined by the EBS unit and shareholders.

Analysts in an EBS unit should be knowledgeable with regard to the International Health Regulations (IHR). The IHR is an international legal instrument that is binding in 194 countries, including all the Member States of the World Health Organization (WHO). The IHR initially came into being in 1969 and remained relatively unchanged until a revision was completed in 2005.

The aim of the IHR (2005) is to:

- Ensure the international community can prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide,
- Provide a legal framework for the prevention, detection and containment of public health risks at source, before they spread across borders, through the collaborative actions of States Parties and WHO, and
- Be inclusive in respect of the public health events under consideration.

All Member States are required to notify WHO for all "events that may constitute a public health emergency of international concern" under the IHR. In this regard, the broad new definitions of "event", "disease" and "public health risk" in the IHR are the building blocks of the surveillance obligations for States Parties and WHO. Within the IHR they define a Public Health Emergency of International Concern (PHEIC) as "an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response." Events of potential international concern require States Parties to notify WHO and may extend beyond communicable diseases and arise from any origin or source.

The IHR document itself and information on it can be found here: http://www.who.int/ihr/en/.

Internet event-based surveillance (IEBS)

An EBS unit conducts event-based surveillance, as opposed to indicator or case-based surveillance.

EBS is the organized and rapid capture of information about events that are a potential risk to public health:

- It is designed for early warning and rapid response,
- There is a systematic monitoring of events, event assessment and verification, and data dissemination,
- The collection and collation of information is processed in real time, and
- There is no designated timeline or predefined structure for reporting.

EBS has several advantages over case-based surveillance, because case-based surveillance:

- Produces credible information, but reporting is often delayed,
- Is designed for known diseases; diseases are often not reported until the etiology is known,

- Is not well-established in all countries, and
- Is limited to the health sector, whereas media and other types of open-source reports often originate from highly-motivated entities, such as journalists, which can promptly provide information to open sources

EBS is primarily conducted using the internet: information, or "epidemic intelligence" is collected from formal and informal sources, including media reports, to detect potential public health events to verify and take action on, if necessary. Public health events that include notable human or animal illnesses or deaths, for example, will likely be covered by local media sources which will undoubtedly be posted on the internet, before they are detected, confirmed, and reported by a local public health agency.

Staffing of an EBS unit

A highly trained staff with diverse backgrounds is imperative to the function of an EBS unit.

Director, reports to public health agency leadership

- Leads in a proactive, customer-responsive manner consistent with stakeholders: ascertains needs/ requirements, solicits feedback, and makes appropriate adjustments,
- Ensures a high level of standard and quality of the services and products provided by the EBS unit,
- Identifies the priority and strategy for the EBS unit and plans, organizes, and assigns work,
- Responsible for prudent management of financial resources provided to the EBS unit, and for reporting expenditures,
- Recruits and selects staff,
- Establishes employee performance plans, and completes required reviews and ratings, and
- Leads a daily epidemic intelligence meeting and contributes technical and global health expertise and knowledge.

Analysts, report to EBS Unit Director

- Conducts EBS, including detection, verification and risk assessment of public health events,
- Identifies, collects, and consolidates public health event data,
- Liaises with other units within the agency, and with external public health agencies,
- Prepares and submits reports and other products related to the EBS unit, as well as manuscripts, presentations, journal articles and publications based on scientific findings,
- Supervises interns, students, and guest researchers, and
- Develops new concepts, methods and strategies for conducting EBS.

Analysts should possess specialized training, including medical officers, veterinary medical officers, and doctoral epidemiologists.

Medical officers

- Provides technical expertise on scientific planning, implementation and analysis of medical aspects of scientific research studies,
- Provides agency wide leadership for medical, epidemiologic, and scientific activities, and
- Serves as an expert on clinical human medicine.

Veterinary medical officers

- Provides expert veterinary medical consultation services,
- Provides international zoonotic disease surveillance and epidemiology,
- Provides knowledge of prevention and control of zoonotic disease,
- Integrates veterinary and public health research and practice,
- Coordinates veterinary medical technical assistance on scientific features of zoonotic disease,
- Monitors global human and animal health systems,
- Establishes and maintains channels of information gathering and sharing on animal populations, existing animal surveillance systems, databases and veterinary government contact points, and
- Develops plans for using epidemiologic methods to reduce public health risks associated with the handling, exhibition, production and consumption of animals and their products/by-products.

Medical officers

- Develops policy and objectives, appraising programs and initiating requirements for epidemiologic studies,
- Evaluates data collection, quality control and data utilization methods to study epidemiologic problems,
- Coordinates analytical and data visualization projects, and
- Develops training curricula on core concepts in EBS and leads EBS workshops/mentorships.

OVERVIEW

Purpose

The *Internet Event-Based Surveillance Training Module* will provide public health professionals with the knowledge, skills, and tools necessary to effectively implement EBS using the internet as a primary source of information. The module will additionally help public health professionals to plan, organize and establish an EBS unit in their jurisdiction.

This module is divided into eight sessions, including a case study and post-test to check participant progress after the training.

General Objectives

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

- Supervise and conduct effective EBS activities in health facilities and communities that are in line with routine surveillance strategies,
- Contribute to the flow of surveillance-related information between the community level and the existing public health surveillance system, and
- Establish an EBS unit positioned at the central or federal level.

INTERNET EVENT-BASED SURVEILLANCE TRAINING AGENDA

DAY 1

SESSION	ACTIVITIES	TIME
1. Welcome and Introductions	Icebreaker	15 minutes
2. Training Objectives and Agenda	Agenda	10 minutes
3. Introduction to Key Concepts in Epidemic Intelligence	Lecture Small group exercise	45 minutes
4. Identifying Signals for Priority Diseases	Lecture Group discussion	1 hour
5. Signal Verification and Rapid Event Assessment	Lecture	60 minutes
Internet Event-Based Surveillance Training Day 1		**Total: 3 hours 10 minutes**

DAY 2

SESSION	ACTIVITIES	TIME
6. Registration and Reporting of Events	Lecture Small group exercise Group discussion	1 hour 15 minutes
7. Establishing an EBS Unit	Lecture	45 minutes
8. Training Review, Case Study and Close	Post-test	30 minutes
Internet Event-Based Surveillance Training Day 2		**Total: 2 hours 30 minutes**

SESSION 1

WELCOME AND INTRODUCTIONS

Purpose

- Getting to know each other
- Group formation

Total time: 15 minutes

Introductions questions

Q1: What is your name and which organization or agency do you work for?	**Q2:** What is one thing you enjoy about working in public health?
Q3: What two words best describe the people your work with in your organization?	**Q4:** Have you taken any previous trainings or workshops related to event-based surveillance?
Q5: What is one expectation you have for this training?	

SESSION 2

TRAINING OBJECTIVES AND AGENDA

Purpose

- Training overview and purpose
- Agenda for the day

Total time: 10 minutes

Purpose of internet event-based surveillance training

The purpose of this training is to provide you—public health professionals—with the knowledge, skills, and tools necessary to conduct event-based surveillance (EBS) in your countries. This training aims to develop your ability to:

- Supervise and conduct effective EBS activities in health facilities and communities that are in line with routine surveillance strategies,
- Contribute to the flow of surveillance-related information between the community level and the existing public health surveillance system, and
- Establish an EBS unit positioned at the central or federal level.

This two-day EBS training is divided into two parts. The first day will focus on:

- Key concepts in epidemic intelligence,
- How to identify signals for priority diseases, and
- Signal verification and rapid event assessment.

The second day will focus on:

- Registration and reporting of events,
- Establishing an EBS unit, and
- Training review and post-test.

SESSION 3

INTRODUCTION TO KEY CONCEPTS IN EPIDEMIC INTELLIGENCE

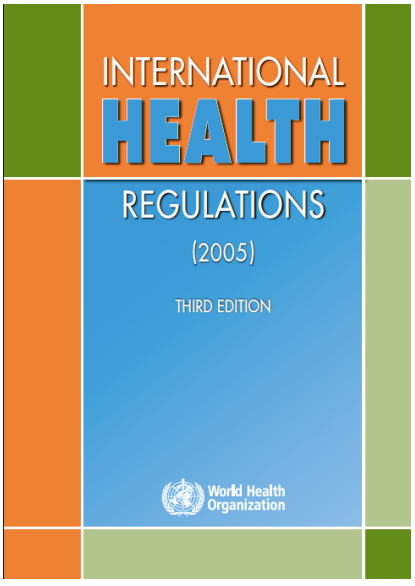
Purpose

- Define key terms connected with epidemic intelligence
- Identify guiding documents for public health surveillance
- Describe the roles of IBS and EBS in epidemic intelligence
- Identify key differences in IBS and EBS in epidemic intelligence
- Describe the signal detection process

Total time: 45 minutes

Q1: What is public health surveillance?

International Health Regulations (IHR)



The revised IHR is an international framework for strengthening and maintaining capacities for early detection and response. The IHR:

- Is a binding legal agreement,
- Defines the obligations of Member States and the WHO,
- Meets the minimum requirements to detect, assess, report, and respond to public health events, and
- Can be accessed via: http://www.who.int/topics/international_health_regulations/en/

What is a public health emergency of international concern?

The IHR define a public health emergency of international concern as an extraordinary event which is determined to constitute a public health risk to other states through the international spread of disease that potentially requires a coordinated international response.

Q2: What is early warning and response (EWAR)?

Q3: What do you see as the goal of EWAR?

Flattening the curve

Flattening the curve means taking action quickly to change an epidemic curve from the red line to the dotted gray line, reducing the number of cases and the overall impact of the health event.

"flatten the curve..."

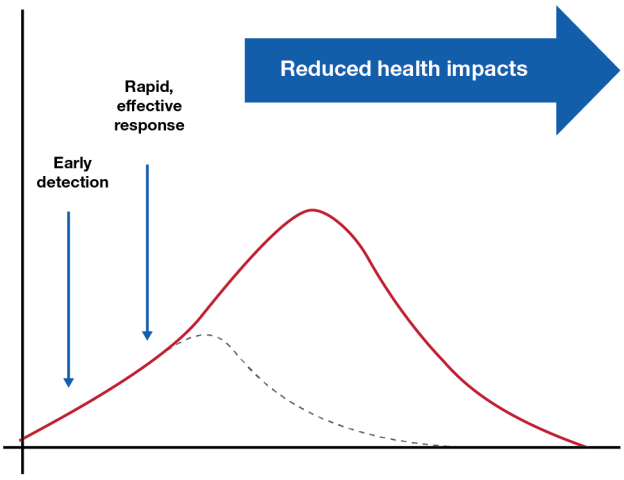


Figure 1. The Objective of EWAR: Flatten the Curve

Q4: What is epidemic intelligence?

At each phase, the material/information is moved through different classifications starting with the **raw information** that needs to be reviewed and triaged. Once that data has been screened and triaged, or organized by its importance to public health, those pieces of information that are relevant are classified as **signals**, which require further verification.

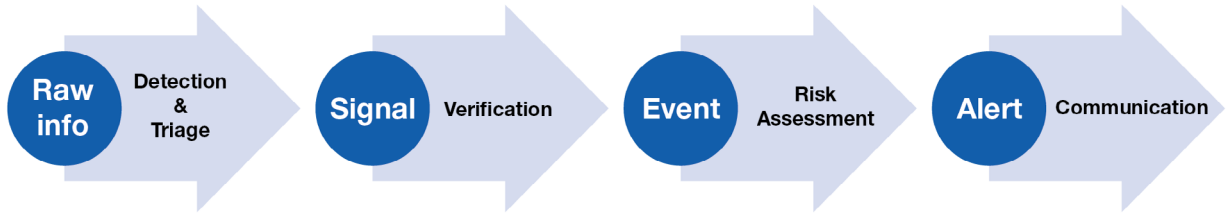


Figure 2. Epidemic Intelligence Overview

Indicator-based surveillance and EBS in epidemic intelligence

Indicator-based surveillance (IBS) and EBS are complementary sources.
IHR and related guidance suggest that countries build capacities for early warning functions through the integration of systems for IBS and EBS.

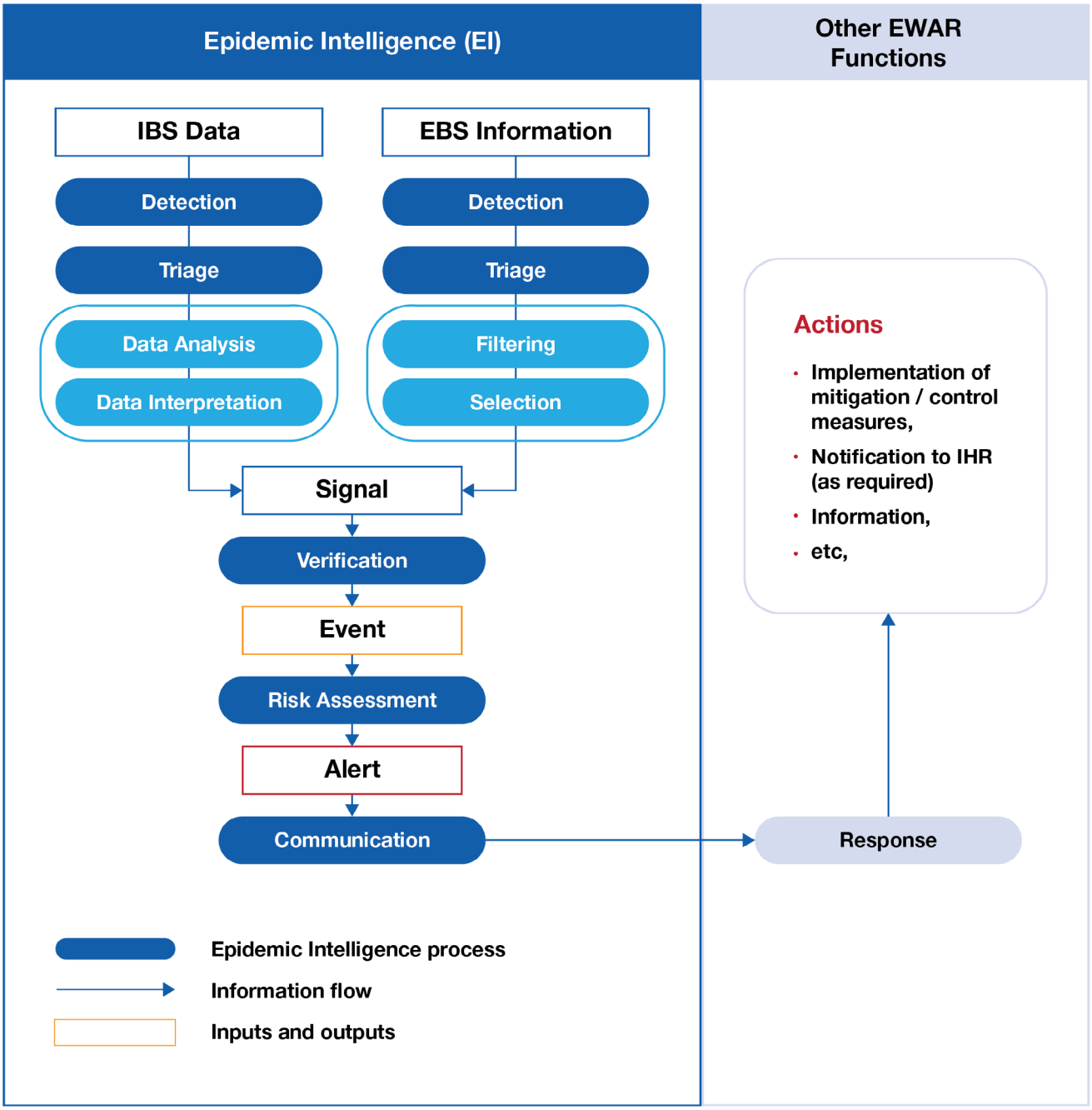
How EBS and IBS contribute to epidemic intelligence

Thinking about the differences between IBS and EBS, write down a few key points for each of the following topics:

	IBS	EBS
Process		
Characteristics of data		
Example of sources		

This diagram below depicts the collection of data (IBS and EBS) with the aim of detecting emerging health threats through a process called epidemic intelligence.

Figure 3. Early Warning and Response Diagram



Signal detection within epidemic intelligence

Signals are composed of data and/or information considered by the EWAR system as representing a potential acute risk to human health.

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.

Signal detection process

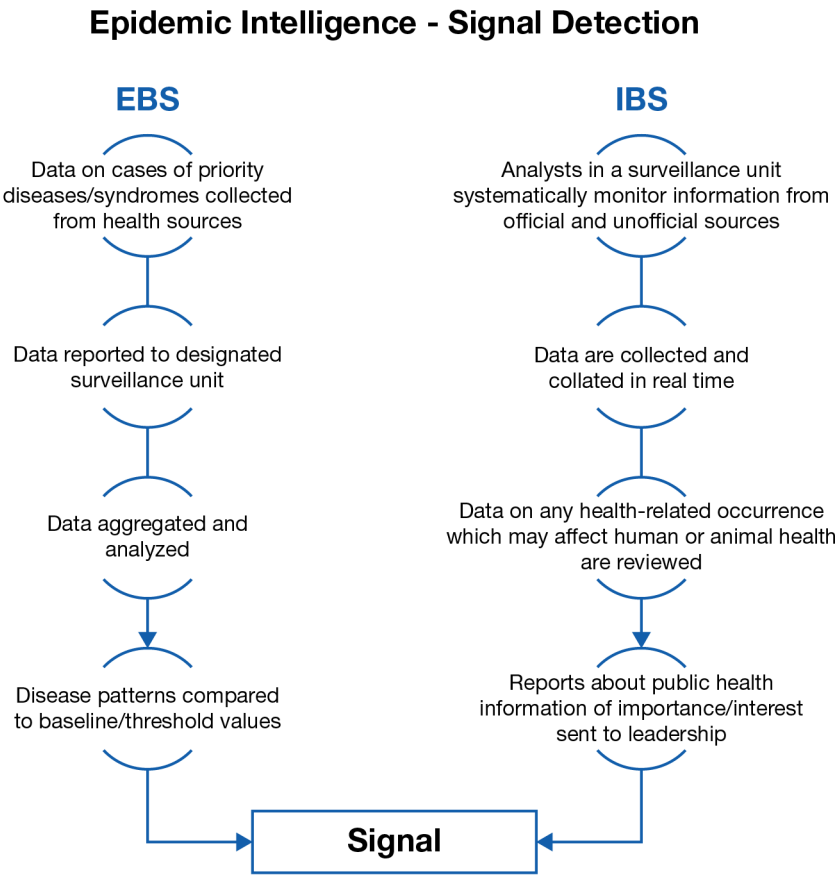


Figure 4. Signal Detection Process

EBS and IBS work hand-in-hand for epidemic intelligence

EBS and IBS are components of EWAR and epidemic intelligence, incorporated into the IDSR strategy. EBS and IBS complement each other, although with separate roles and purposes.

Unlike IBS, EBS is not based on the routine monitoring of indicators and automated thresholds for action, but rather on the screening of all available information to detect any event happening in the community.

Traditional disease reporting mechanisms:

- Produce credible information but reporting is often delayed (while media monitoring systems are gathering information 24/7),
- Are designed for known diseases and often do not report cases until the etiology is known,
- Are not well established in all countries, and
- Are limited to the health sector, whereas media reports come from reporters who are highly motivated to report disease events or health threats and have a way to promptly provide the information to the public.

Q1: What is the purpose and importance of EBS?	**Q2:** How could EBS be used in your community?
Q3: What is the purpose and importance of IBS?	**Q4:** How could IBS be used in your community?

Now that we have some ideas on what EBS and IBS are, why they are important, and how they can be applied to your community, we will start Session Four focused on how to identify signals for priority diseases.

SESSION 4

IDENTIFYING SIGNALS FOR PRIORITY DISEASES

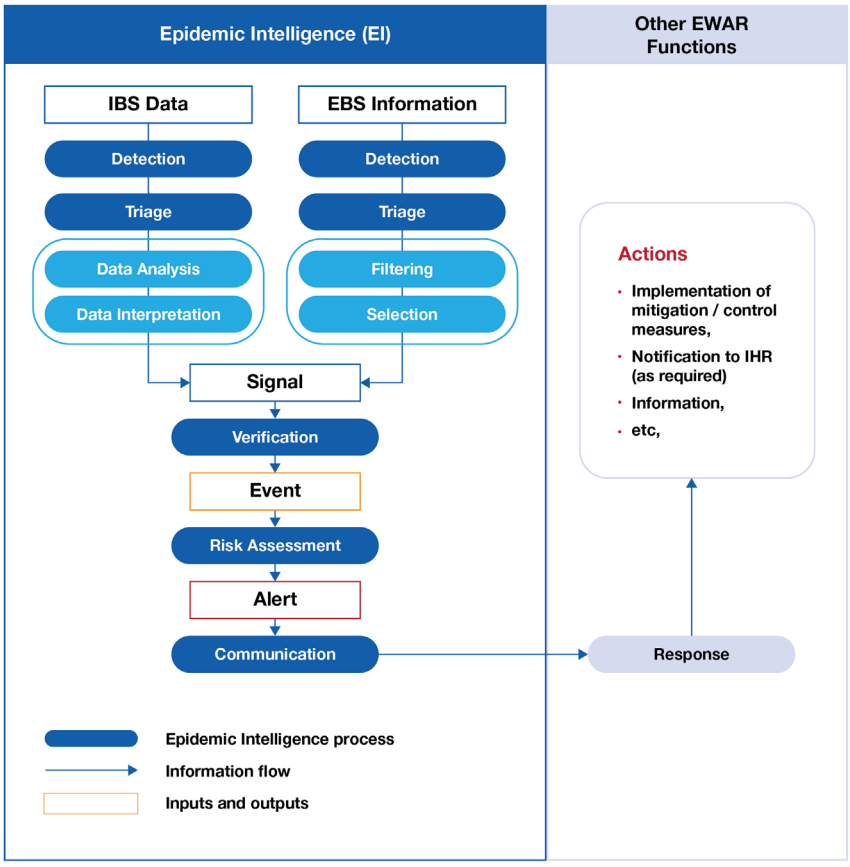
Purpose

- Describe different types of information sources that can be used for signal detection
- Explain the data collection and verification process
- Distinguish formal from informal sources of EBS information
- Describe methods for filtering and selecting information

Total time: 60 minutes

The context for signal detection

The EWAR diagram depicts the collection of IBS and EBS data with the aim of detecting emerging health threats through a process called epidemic intelligence.



Defining signals and signal detection

Q1: What do signals consist of?	**Q2:** How are signals detected?

Where does EBS information come from?

EBS information may come from numerous sources across sectors and levels. Thinking of your own work, can you think of any examples of EBS sources?

Q1: At the national level?	**Q2:** What about at the international level?

This graphic depicts examples of these sources, from those closest to the community level (at the base of the arrow) to examples of international sources at the top of the figure.

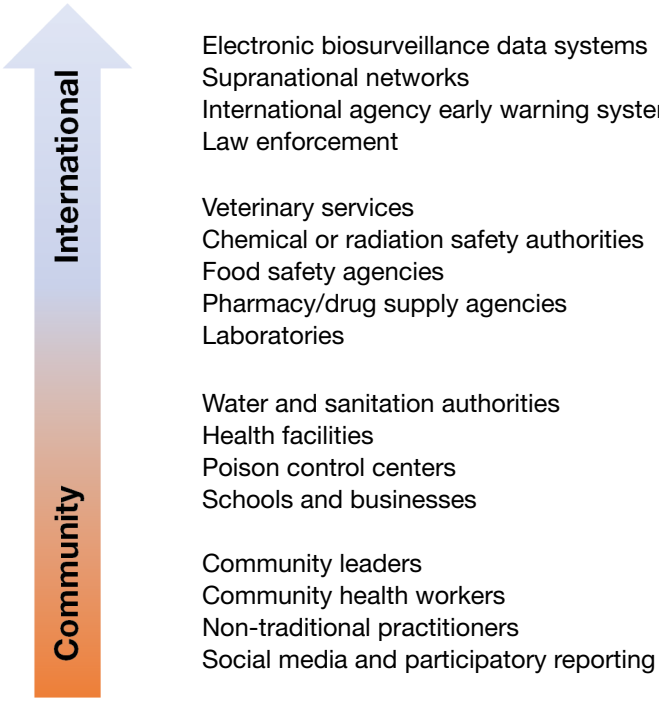


Figure 5. Sources of EBS Information

Online sources of information for EBS

Various types of electronic or online sources can provide information for EBS:

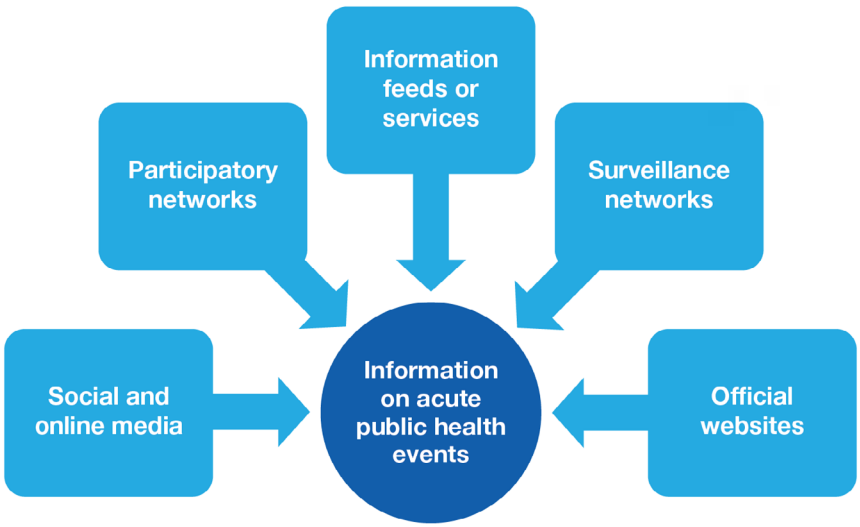


Figure 6. Online sources of information for EBS

Types of electronic or online information that may serve as sources of EBS signals include:

- Official websites
- Surveillance networks
- Information feeds or services
- Participatory networks
- Social and online media

Sources of EBS signals

Potential sources of EBS signals include both official and unofficial sources:

- **Official** (or formal) sources are any governmental, subnational, national or international institution accredited to provide information, and
- **Unofficial** (or informal) sources are those that are directly involved in an event as either service providers or members of the affected population making inquiries or sharing information via unstructured channels.

Sources of EBS information

Answer these questions before turning the page to view the model answers.

Q1: What are some examples of formal sources of EBS information?	**Q2:** What are some examples of informal sources of EBS information?
Q3: Can informal sources be useful? Why?	

Example of a formal source of EBS information – WHO Disease Outbreak News

Figure 7. WHO Disease Outbreak News

Examples of informal sources of EBS information

Figure 8. Informal sources of EBS information

Triage of raw EBS inputs

Q1: What is the goal of information triage?

Q2: In the context of triage for EBS, how would you define filtering?

Q3: In the context of triage for EBS, how would you define selection?

Filtering

Filtering refers to the screening out of duplicates and irrelevant information.

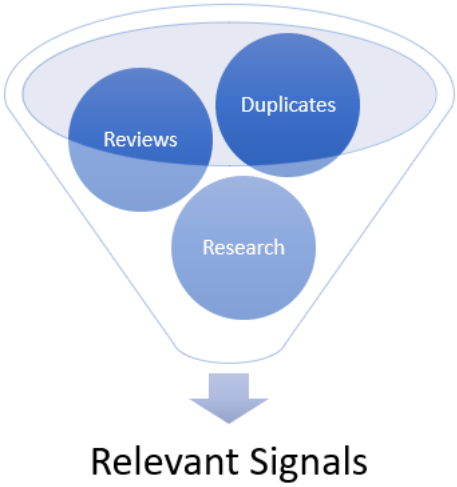


Figure 9. Filtering for Relevant Signals

The general process of automated analysis using scrapers and aggregators is depicted in the figure below.

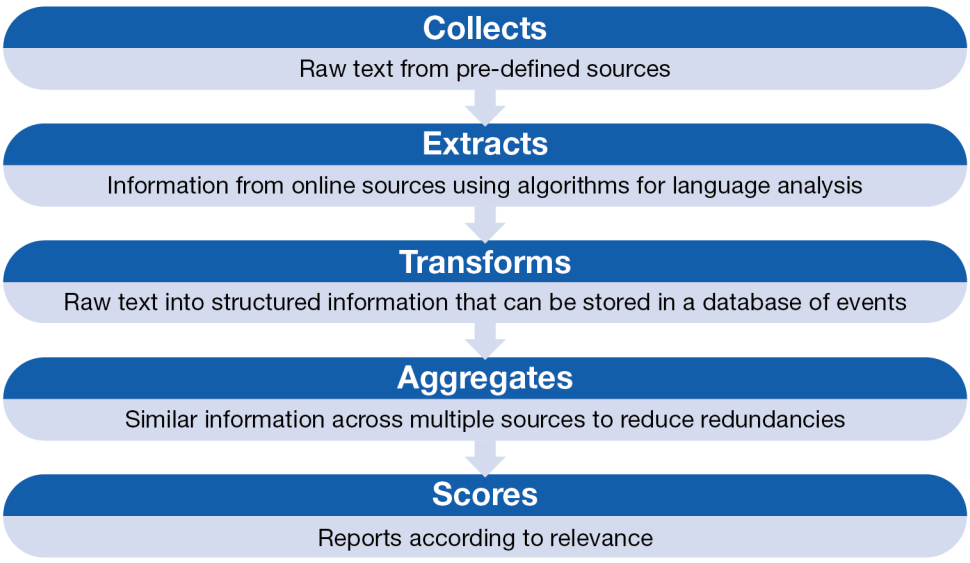


Figure 10. Automated Analysis Using Scrapers and Aggregators

The figure below shows some examples of IEBS systems:

System Name		Country	No. Languages	Moderated
EIOS		Global	>50	No
GPHIN		Canada	9	Yes
HealthMap		US	7	No
MedISys		EU	26	No
ProMED		US	4	Yes

Figure 11. Examples of Media Aggregators for IEBS

The selection process

The national EWAR surveillance objectives will depend on the characteristics of the disease or hazard, such as:

- Diseases (e.g. measles),
- Syndromes (e.g. hemorrhagic fevers),
- Hazards (e.g. contamination of drinking water source), and
- Unexpected/unusual events (e.g. unexplained mortality).

The objectives depend on the characteristics of the disease or hazard, such as:

- Attack rate,
- Morbidity and mortality,
- Environment,
- Mode of transmission, including but not limited to:
  - Person-to-person,
  - Point source,
  - Toxin exposure, and
  - Public health interventions required to mitigate spread.

Considerations for developing a list of priority diseases for EBS

- Ensure sensitivity and adequate disease coverage of an EBS program; don't forget to look for what you don't yet know about!
- Ensure sustainability of the EBS program (human resource bandwidth).
- Consider how easily the defined surveillance program can be maintained over time without undermining other public health programs.

No country, regardless of resources, can monitor every potential source of information for signals of public health events. Therefore, a country-specific list of priority diseases for EBS should be established.

SESSION 5

SIGNAL VERIFICATION AND RAPID EVENT ASSESSMENT

Purpose

- Describe under what conditions verification is required
- Describe the key steps associated with the verification process
- Explain the role of SMEs and social media in EBS
- Explain the IHR Annex 2 and international reporting requirements
- Describe how EBS analysts can conduct high-level rapid event assessments

Total time: 60 minutes

The EWAR diagram

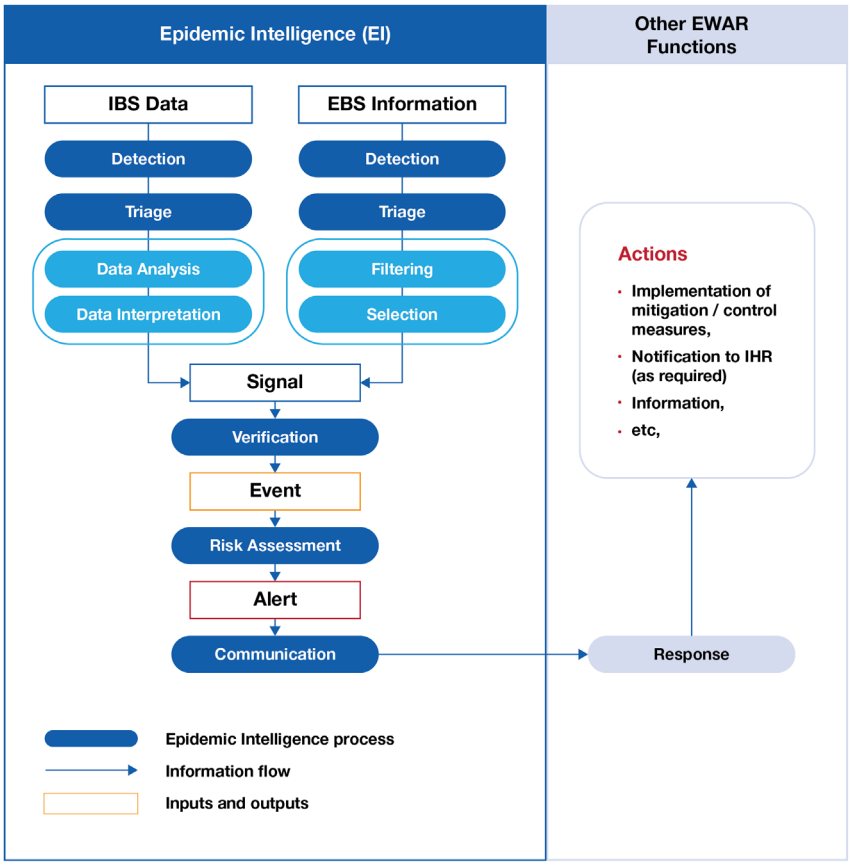


Figure 12. Early Warning and Response Diagram

The verification process

Q1: What are the four steps that should actively be taken in the verification process?

Step 1: Consider the information source

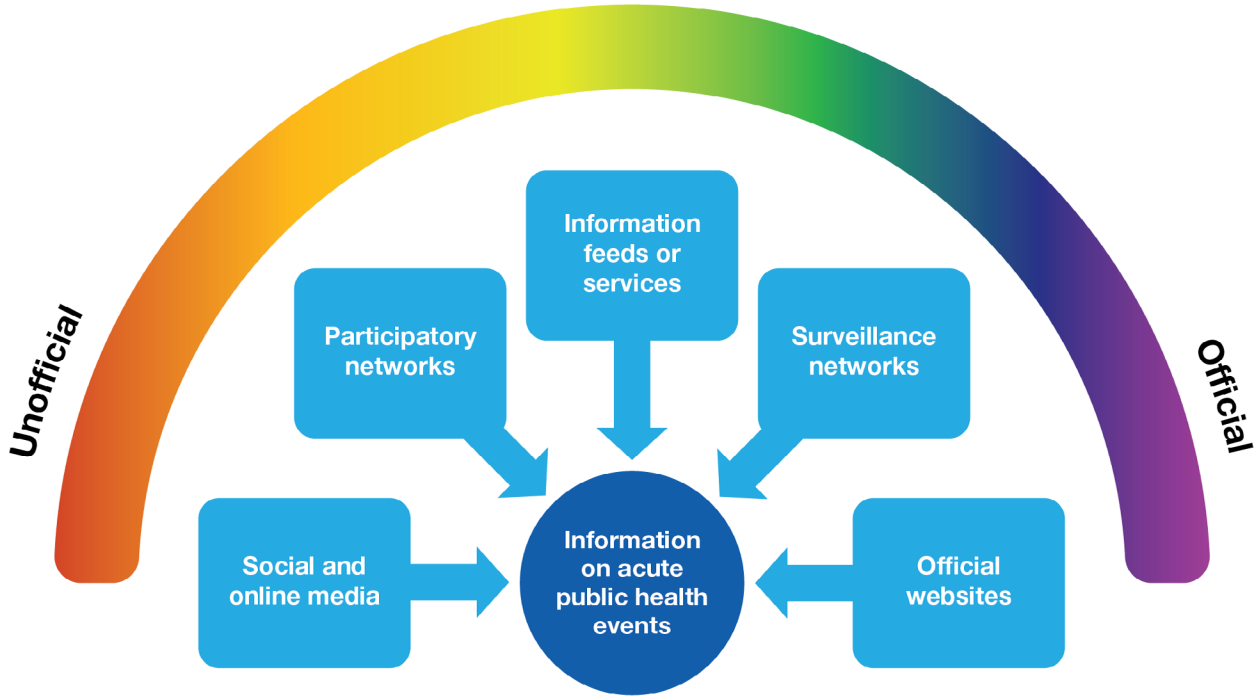


Figure 13. Information Sources

Challenges with social media

Q1: What are some challenges or issues with using social media to identify disease signals?

Step 2: Collecting corroborating information

Q2: The second step of the verification process involves searching for and collecting corroborating information. What are some ways that this can be done?

Step 3: Cross-checking information with other official sources/experts

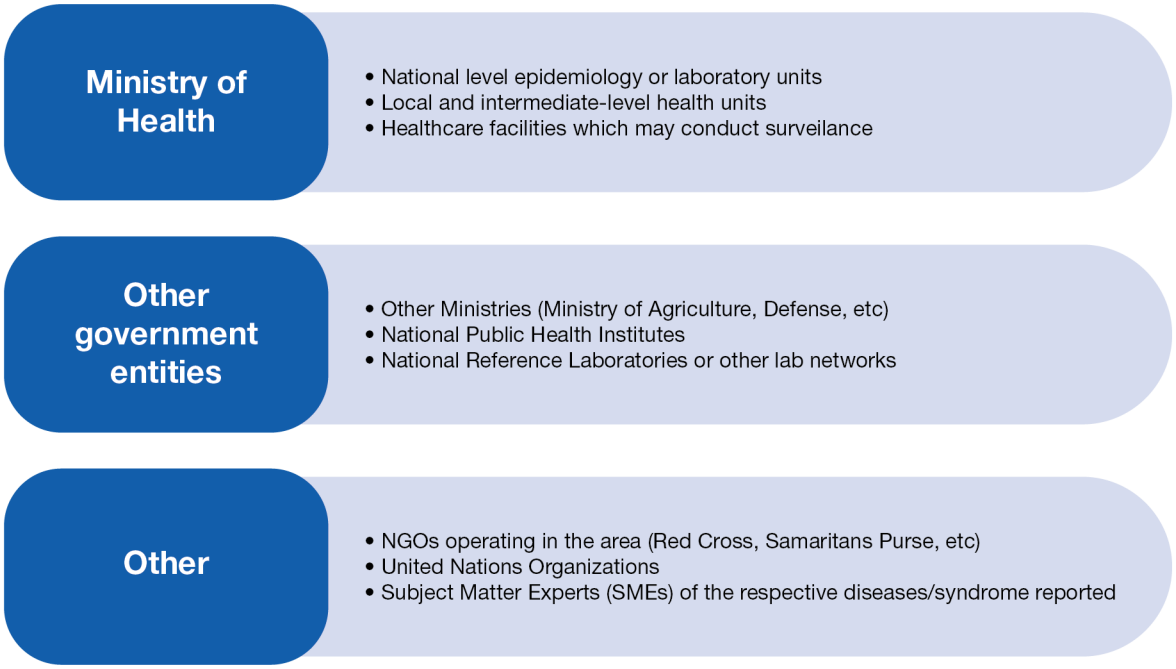


Figure 14. Cross-Checking Sources for Verification

The EBS Unit should ask partners across sectors and levels to identify technical resource persons or subject matter experts (SMEs) who will serve as main points of contact for EWAR on a 24/7 basis.

The following details should be recorded:

Name of designated office	Name of responsible individual	Email address Phone numbers Fax numbers

Subject matter experts

SMEs have an important role in EBS and are necessary for a number of reasons.

Q1: In the space below, write a list of areas that SMEs can assist with EBS.

Step 4: Begin to characterize the potential event with known information

Oftentimes, media reports may describe “mystery diseases” or “unknown illnesses” at the onset of the outbreak. As more information is learned, it is important to continuously assess the situation to determine if the event is improving or worsening.

The risk assessment process

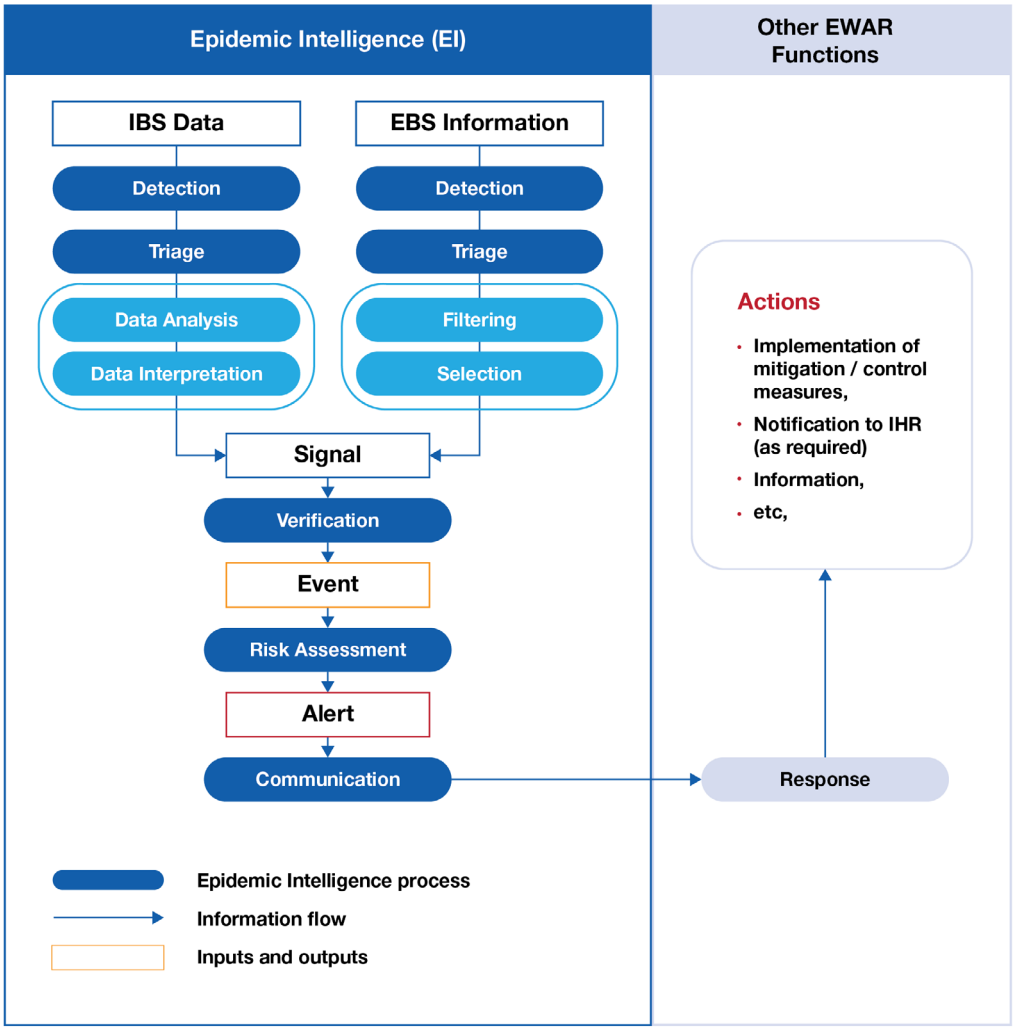


Figure 15. Early Warning and Response Diagram

Defining risk assessment

Risk assessment is the systematic and continuous process of assessing and documenting information to provide the basis for taking action to manage and reduce the negative consequences of an acute public health event.

The IHR timeline for verification

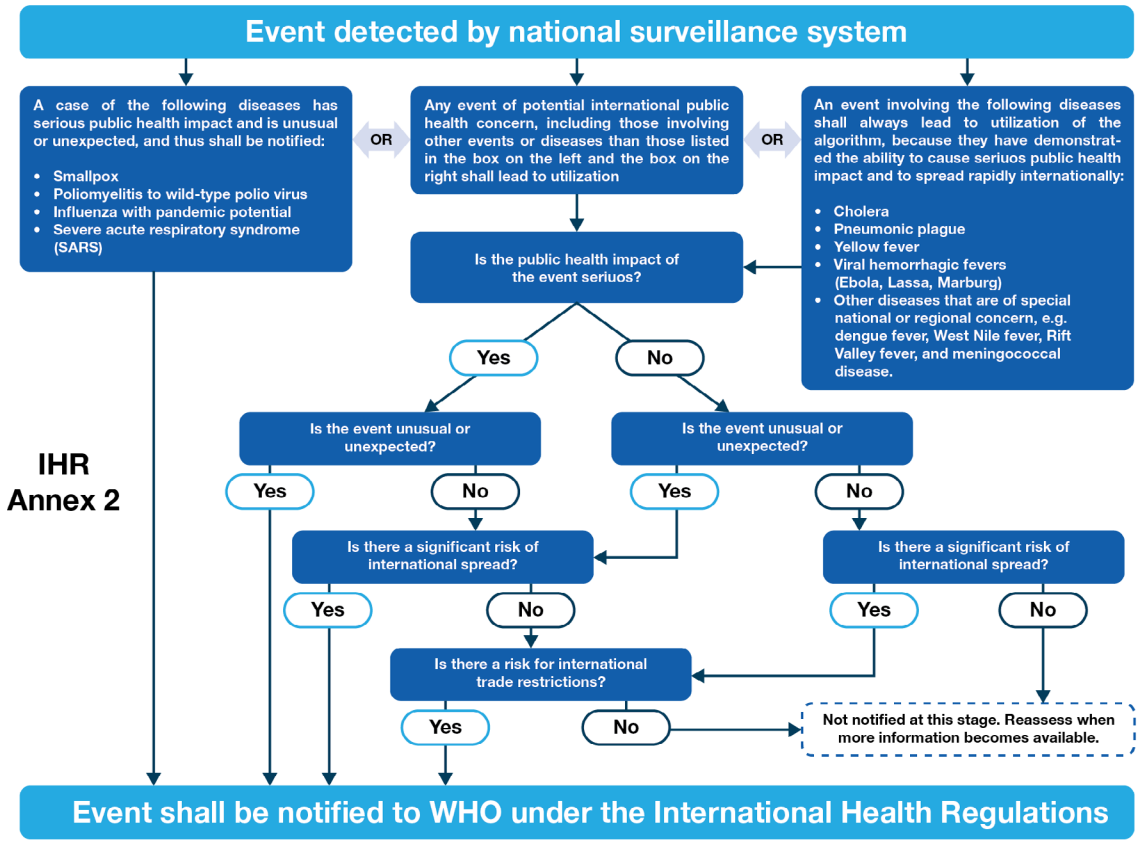


Figure 16. IHR Annex 2

Characterizing the type of event

Health events can be organized into three categories:

1) A **Health Event of International Importance** is a verified disease outbreak or a health threat that meets one of the following criteria (IHR Annex 2):
   - Is one of the following: SARS, polio (wild-type), smallpox or a new subtype of influenza,
   - Presents a serious threat to the public health,
   - Is an unusual or unexpected event,
   - Poses a significant risk for international spread that potentially requires international intervention, or
   - Potentially causes restrictions of trade or travel.

2) A **Health Event Under Investigation** is a disease outbreak or a health threat that potentially meets one of the above criteria, but currently is not yet verified.

3) A **Health Event for Information** is a description of a verified health event that does not meet one of the above criteria but is of interest to the public health community.

Assessing risk level of the event: Geoscope and public health impact

There are two ways to assess the risk level of an event.

1) **Geographic scope** refers to the observed geographic distribution and rapidity of spread for an outbreak and is categorized as follows:
   - High events affecting several multi-national regions with evidence of continuing spread,
   - Moderate events affecting a national, or bordering multi-national region, with evidence of continuing spread, and
   - Low events limited to sub-national, local areas.

2) **Public health impact** refers to actual or potential severity of illness, ease of transmission, public fear, or economic affects and is categorized as follows:
   - High agent that is or potentially: highly pathogenic, highly transmittable, new or emerging, or has significant potential to disrupt travel/trade, and
   - Moderate agent that has low to moderate potential to cause morbidity /mortality, transmit efficiently, or to disrupt travel or trade.

Risk assessment: a team effort

Risk assessment is performed by the EBS unit with input from SMEs. The process of risk assessment on behalf of EBS analysts is:

- Routine, oftentimes daily,
- Well-coordinated with internal and external input, and
- Consistent in its methodology.

The EBS/EWAR analyst team should organize daily briefings to examine new signals and new information on ongoing events.

SESSION 6

REGISTRATION AND REPORTING OF EVENTS

Purpose

- Define the objectives and process of event registration
- Identify health events that require immediate reporting
- Differentiate between information for early warning vs information for health communications purposes
- Describe key reporting products
- Define key data elements and outbreak metrics to be captured by EBS event management systems

Total time: 75 minutes

The role of communication in EBS

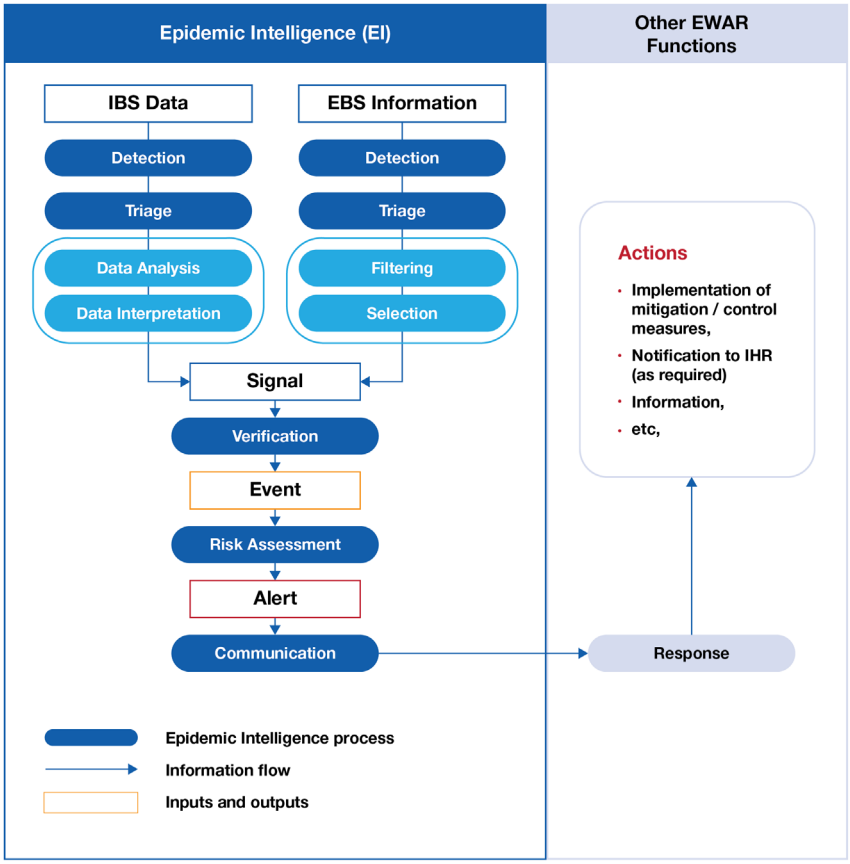


Figure 17. Early Warning and Response Diagram

Defining an EBS event

What criteria will define an “EBS event” to be targeted and captured?

Differentiating information for EBS from information for public health/ risk communication

Complete the matching activity on different types of information. Circle **A** for items that meet the criteria for early warning information. Circle **B** for items that meet the criteria for public health/ risk communication information.

- A / B - Growing public health sentiment or discord
- A / B -Clusters of an unknown disease
- A / B -Unusual or excess deaths occurring in a community
- A / B -Circulating public health misinformation
- A / B -New public health laws or regulations passed
- A / B -Unusual die-off of animals
- A / B -Annual/routine reports of morbidity and mortality
- A / B -Drug/vaccine developments
- A / B -Unexpected occurrence of a disease not previously reported from an area
- A / B - New public health/ministry of health leadership
- A / B -Chronic or noninfectious disease reports
- A / B -Accidental or deliberate pathogen release
- A / B -Toxic chemical releases
- A / B -Reports on occupational health
- A / B -Radio-nuclear releases
- A / B -New motor vehicle or other travel related safety measures

Differentiating media headlines for early warning (EBS) from information for public health/risk communication

Consider the following examples of media headlines to complete the matching activity. Circle A for headlines that meet the criteria for early warning information, and circle B for headlines that meet the criteria for public health/risk communication information.

- A / B - “50 unexplained deaths”
- A / B - “A major AIDS awareness campaign launched”
- A / B - “New bleeding syndrome reported”
- A / B - “A new Minister of Health elected”
- A / B - “Crime rates up by 40%”
- A / B - “High absenteeism at local school”
- A / B - “Farmer reports entire flock die off in Northern province”
- A / B - “New airbag safety measures mandated”
- A / B - “Flooding in Southern province”
- A / B - “Cholera reported for the first time”
- A / B - “Miner killed on the job”

Information of interest is not the same as information for action

Registration of events

Registration of events is the process by which health events are recorded in a standardized way with regular entries of items or details.

Epidemic intelligence products

Type of report	*Frequency*
EBS daily report ▶ *Time-sensitive bullet points to leadership* ▶ *Critical Information requirement type, or "flash" report*	*Daily*
EBS map *(if applicable)*	*Daily*
Weekly summaries for immediate leadership *(if applicable)*	*Weekly (on Thursdays)*
Monthly bulletin for organizational leadership *(if applicable)*	*Monthly*

Figure 18. Examples of EBS Reporting Products

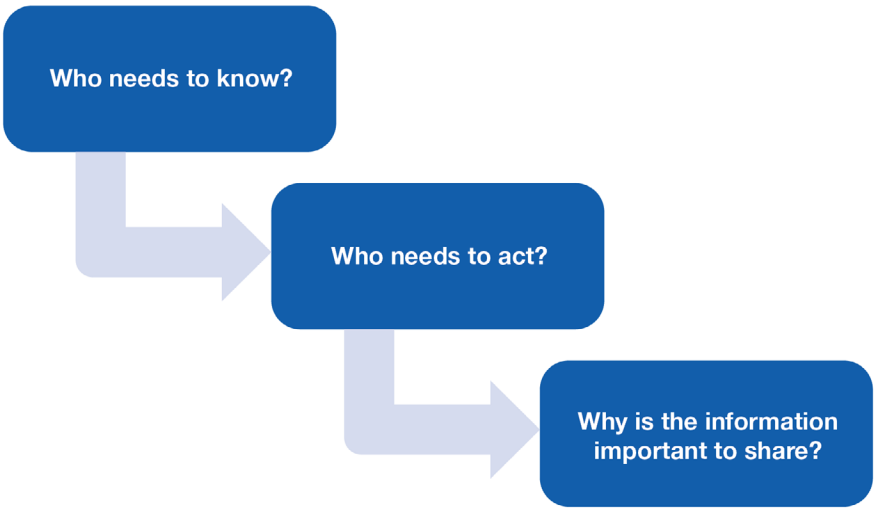
Reporting frequencies

Reporting frequencies should strike a balance between timeliness and accuracy of information, and will depend on the nature of the disease/syndromes to be detected.

Take a moment now to consider the types of health events requiring an immediate response compared to health events that should prioritize accuracy over timeliness. Write a few bullet points for each question below.

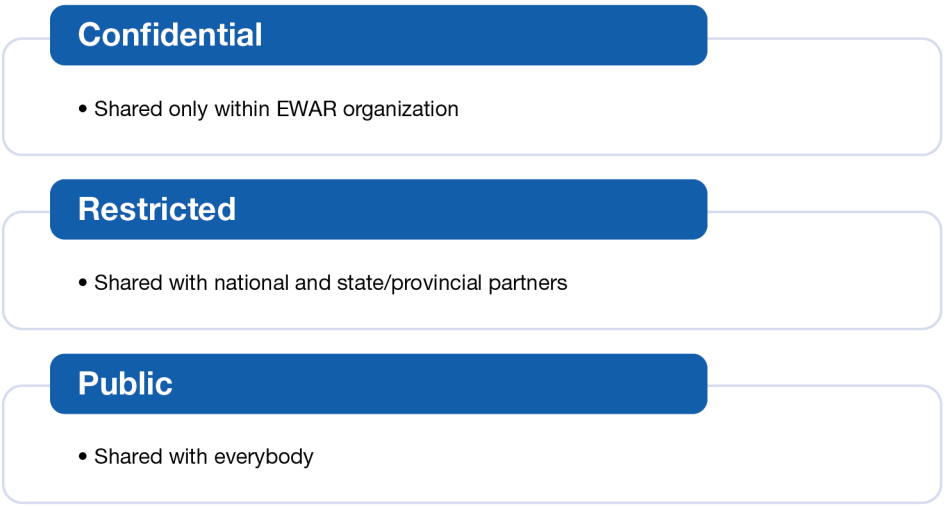
Q1: List a few examples of health events that require immediate reporting.	**Q2:** List a few examples of health events for which accuracy should be prioritized.

Epidemic intelligence products



Information should be classified by type of access

Information collected by EWAR should be systematically classified by type of access.



Any information collected by EWAR should be systematically classified as confidential, restricted or public:

- **Confidential** or operational information is only shared among staff of the EBS unit (e.g. not yet verified information);
- **Restricted** information may only be shared among specific groups such as the national and provincial partners, and recipients are requested to avoid further dissemination of the information provided; and
- **Public** information is, by definition, shared with everybody and may be disseminated on the website, or in the form of press releases, scientific publications, etc.

Using established channels

Established channels should be used for bidirectional communications with partners.

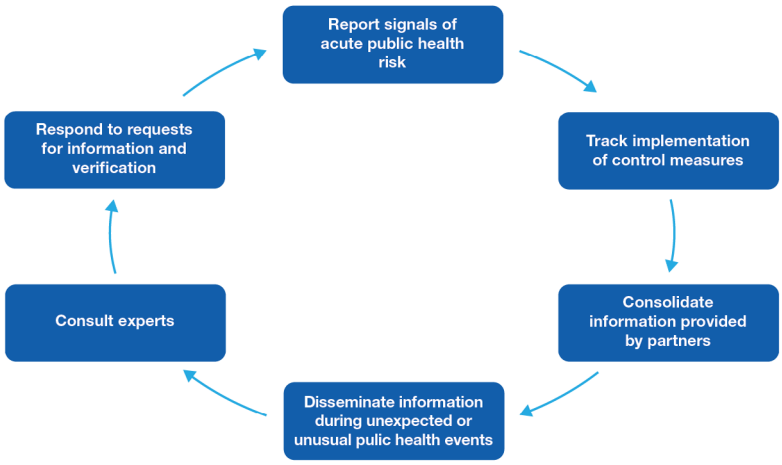


Figure 19. Communicating with Partners

Preparing a daily EBS report

EBS reports should:

- Adhere to a standardized template for content,
- Follow consistent approaches to epidemiological writing,
- Be published at the same time each day, and
- Be distributed to a consistent (but ever evolving) recipient list and using a consistent dissemination mechanism.

The figure below shows an example of a prepared EBS report.

**** Global Disease Detection Operations Center (GDDOC) Daily Report for 07-16-2019 ****

****** **FOR INTERNAL CDC USE ONLY** ******

At A Glance:

Of International Importance[1]

- Measles (Rubeola) in Jordan (NEW): **23 cases reported in 7 clusters**
- Cholera in Cameroon (NEW): **OCV campaign planned**
- Ebola in The Democratic Republic of the Congo (Update): **Outbreak surpasses 2,500 cases and 700 recoveries**
- Leishmaniasis (Visceral) in Kenya (Update): **New county affected**

FOR INTERNAL CDC USE ONLY

Global Disease Detection Operations Center
U.S. Centers for Disease Control and Prevention
Daily Report for 7/16/2019
Contact: Ray Arthur, PhD
Mobile: (404) 431-6630
gddoutbreak@cdc.gov
EOC: (770) 488-7100 (24 hours / 7 days a week) Contents At A Glance
INTERNATIONAL IMPORTANCE

- Measles (Rubeola) in Jordan (NEW): **23 cases reported in 7 clusters**
- Cholera in Cameroon (NEW): **OCV campaign planned**
- Ebola in The Democratic Republic of the Congo (Update): **Outbreak surpasses 2,500 cases and 700 recoveries**
- Leishmaniasis (Visceral) in Kenya (Update): **New county affected**

PUBLIC HEALTH EVENT OF INTERNATIONAL IMPORTANCE	
Geographic Scope	Public Health Impact Risk
Medium	Medium

The importance of event management systems

The purpose of an event management system (EMS) is to provide a secure focal point for tracking public health data on international health threats detected. This data is analyzed by the CDC's Global Disease Detection Operations Center (GDDOC) and has an 'all-hazard,' One Health-based approach which includes radiological, nuclear, chemical, and environmental threats.

An EMS allows you to input the findings of EBS to prepare CDC to respond to acute, public health emergencies with information captured in a Daily Report.

See Appendix 2 of your Participant Guide for a sample daily report.

Outbreak milestones

Outbreak Milestones	Definition
Outbreak Start	Date of symptom onset in the primary case or earliest epidemiologically linked case
Outbreak Detection	Date that the outbreak or disease-related event is first recorded by any source or in any system
Outbreak Notification	Date the outbreak is first reported to a public health authority
Outbreak Verification	Earliest date of outbreak verification through a reliable verification mechanism
Laboratory Confirmation	Earliest date of laboratory confirmation in an epidemiologically-linked case
Outbreak Intervention	Earliest date of any public health intervention to control the outbreak
Public Communication	Date of first official release of information to the public from the responsible authority
Outbreak End	Date that outbreak is declared over by responsible authorities

Defining and capturing timeliness metrics

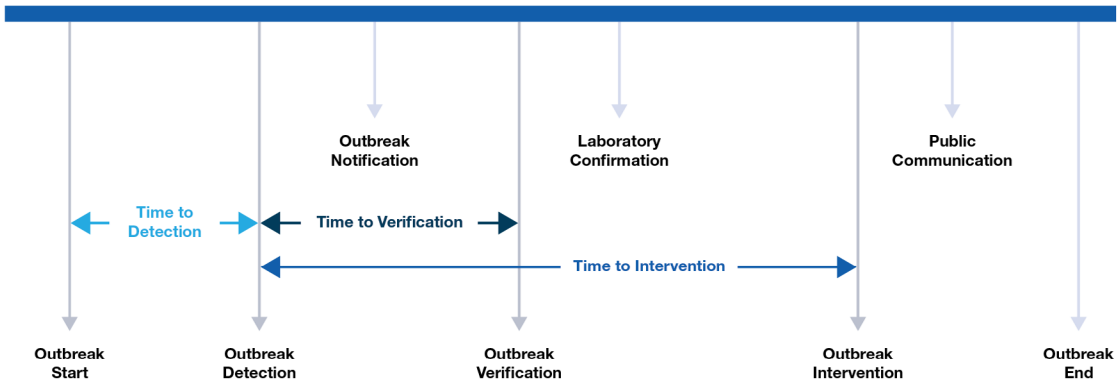


Figure 20. The eight outbreak milestones shown in the above figure are for illustrative purposes only as the actual sequencing may vary. For example, laboratory confirmation may occur simultaneous to outbreak verification. In another case, public communication may be the first outbreak intervention. As an example, Ending Pandemics' timeliness metrics are shown as the intervals between the relevant outbreak milestones.

Q1: What information should be included in an EBS report?

Q2: What are the key elements in this sample CDC EBS report of a measles outbreak in Romania? Underline what you think are the key elements that should be included in every EBS report.

- The Global Disease Detection Operations Center (GDDOC) has learned of an outbreak of measles in Romania.
- On 21 September 2016 the Romanian Ministry of Health (MOH) reported that in the first eight months of this year, they have recorded 675 confirmed cases of measles in 23 counties, with two deaths. A third suspected measles death was reported but is undergoing final confirmation. The two confirmed and one suspected death all occurred in children younger than one year, which is under the age of routine measles vaccination. The MOH attributes the resurgence of measles to failure of some parents to adhere to the routine vaccination schedule.
- The National Institute of Public Health recommends vaccinating children in the affected areas of the country at the age of seven months with resumption of the normal vaccination schedule at one year of age.
- In 2015 Romania reported only seven confirmed cases of measles and no deaths. Measles vaccination coverage has gradually declined from a high of 98% in 2000 - 2002, to 86% in 2016. Officials report that there is no shortage of MMR vaccine in the country.
- GDDOC will continue to follow this outbreak and report updates as they become available.

Weekly review of active events

Inquire	Monitor	Respond	Close
Outbreak is ongoing, response may be underway. Information reported is up to date. Continue to watch for new information.	No updated information available. Reach out to SMEs, field teams, or local staff to gather more information.	Support field investigations or control measures to interrupt transmission.	Outbreak is concluded or at least dropped to baseline. No further monitoring needed.

Business Intelligence (BI) tools to assess EBS performance

Business intelligence (BI) loosely refers to tools that retrieve, analyze, and transform data into meaningful information that helps businesses make more intelligent decisions. BI tools cover a range of technologies, including Tableau and Microsoft Power BI.

Example of a CDC EBS product – The Daily Map

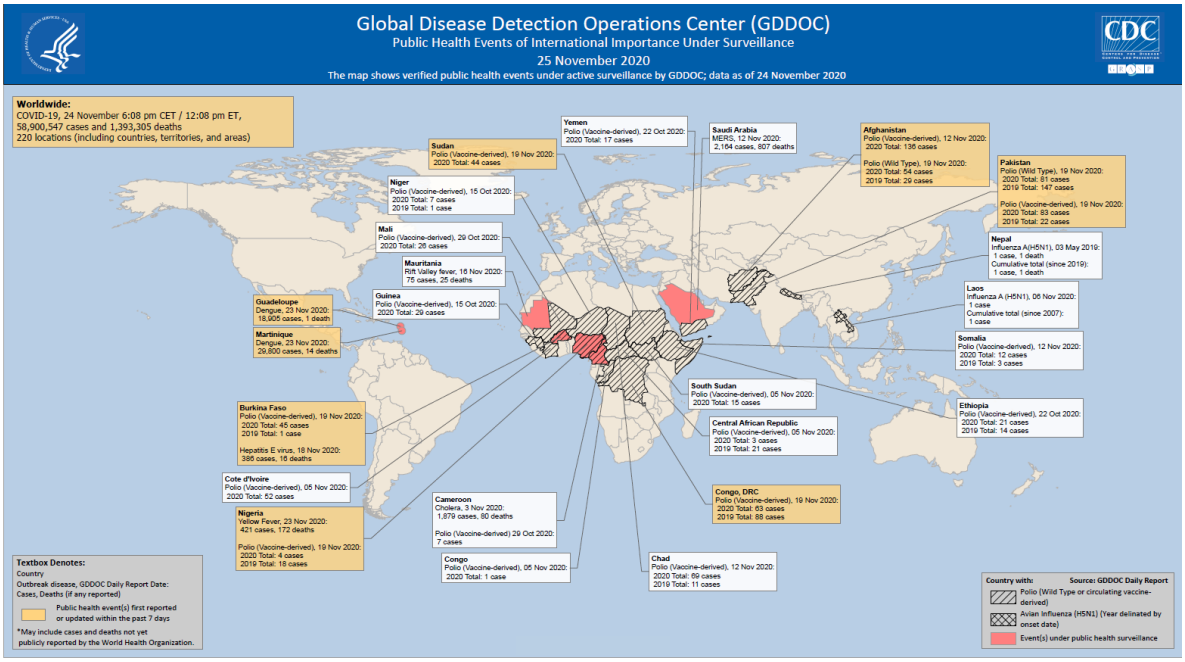


Figure 21. The Daily Map

Q1: How do you see this map being used?

This figure shows you that from January 1, 2008 to November 25, 2019, the GDDOC monitored **1,209 outbreaks** of **168 diseases** in **239 countries.**

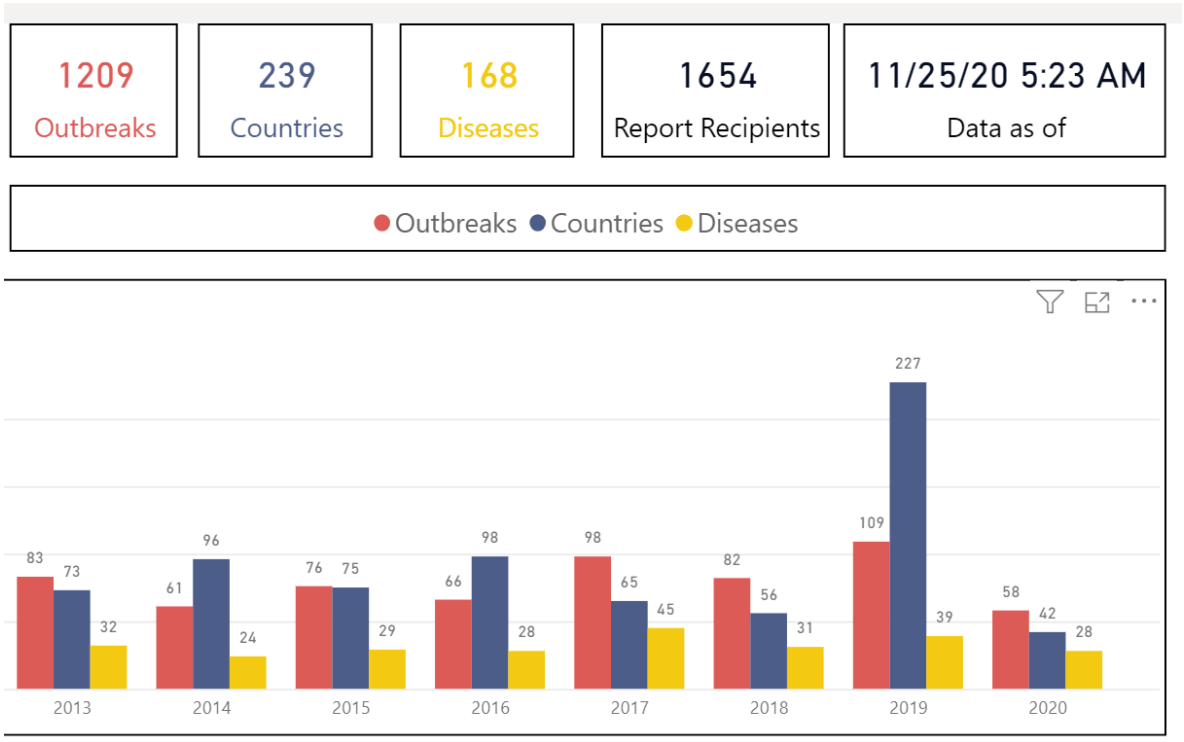


Figure 22. GDDOC Outbreak Monitoring

This figure shows you the outbreaks monitored by the US CDC GDD Operations Center over several years.

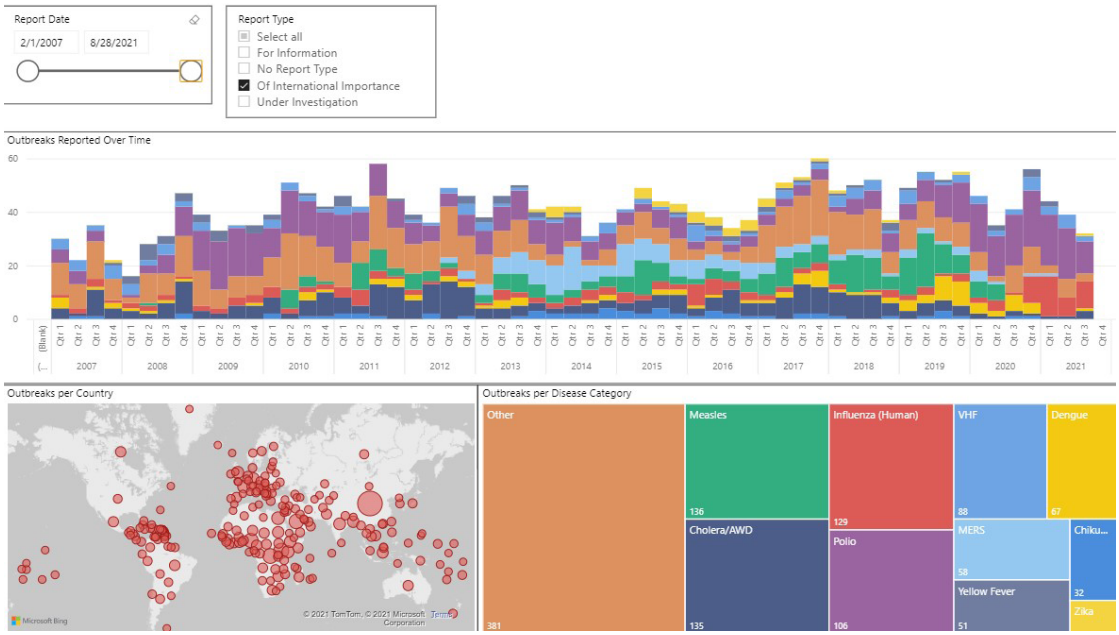


Figure 23. US CDC GDD Operations Center EBS Reporting 2007-2021

This journal article is another helpful resource you can refer to that looks back at EBS detection from 2012-2016.

Health Security
Volume 15, Number 5, 2017 Mary Ann Liebert, Inc.
DOI: 10.1089/hs.2017.0004

What We Are Watching—Top Global Infectious Disease Threats, 2013-2016: An Update from CDC's Global Disease Detection Operations Center

Kira A. Christian, A. Danielle Iuliano, Timothy M. Uyeki, Eric D. Mintz, Stuart T. Nichol, Pierre Rollin, J. Erin Staples, and Ray R. Arthur

Figure 24. Reference

EBS is defined as the organized collection, monitoring, assessment, and interpretation of unstructured information regarding public health events that may represent an acute risk to human health. Conducting EBS includes establishing an EBS unit to better track public health events of concern.

SESSION 7

ESTABLISHING AN EVENT-BASED SURVEILLANCE UNIT

Purpose

- Describe the daily workflow of an EBS unit
- Identify the core competencies and specialized skillsets required to conduct EBS
- Define the key resources and tools necessary for an EBS unit
- Describe “mystery” diseases and how to assess their risk
- Describe the role of SMEs and SME lists in EBS

Total time: 45 minutes

The **mission of an EBS** unit is to provide a single source of reliable, comprehensive, and high-quality information on international disease outbreaks and other health threats. How do they accomplish this? List a few ways that EBS units fulfil their objective.

Staff are the most important resource

Staff of an EBS unit are the most important resources, who efficiently and effectively use the rest of the resources to fulfill mission objectives. Well-coordinated teamwork, work sharing, transparency, and flexibility within a structured work plan allow for an environment of efficiency to make effective use of all resources.

Other resources

In addition to staff, an EBS Unit should also include:

- Information sources, such as subject matter experts, public health agencies, WHO and WHO Regional Offices, partner country Ministries of Health, Agriculture, or other relevant Ministries, and non-governmental organizations,
- Communication tools, and
- Information technology tools.

Q1: What are the required skills of an ideal EBS Unit analyst?	**Q2:** What are the desired skills and attributes of an ideal EBS Unit analyst?

Create, review, and revise EBS Unit Standard Operating Procedures

Standard Operating Procedures (SOPs) should be written, reviewed, and followed by the EBS unit, and updated at a frequency determined by the Director (e.g., annually). One analyst should be the lead on the development and annual review of the SOPs.

Daily general workflow of an EBS Unit

This schematic outlines the sets of tasks that the EBS unit staff use routinely to identify, verify, and communicate with key stakeholders about acute public health events. We will now go over each of these in turn.

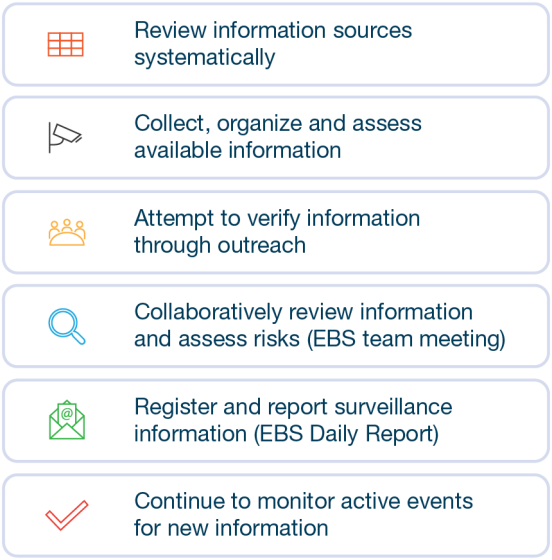
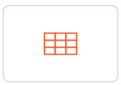


Figure 25. EBS Unit Tasks



Review information sources systematically

Analysts begin the workday by screening multiple sources to see if there is a new public health event of interest or an update to a previously identified event.

Collect, organize and assess available information

Once an EBS analyst has detected a signal, the analyst should follow the appropriate steps to contextualize this information:

- Check additional sources for corroborating reports,
- Check baseline disease epidemiologic data to determine if this information is unusual or unexpected (consider geographic locations, seasonality, etc.),
- Determine whether an event meets reporting criteria, and
- Determine whether an event requires alert and response actions (including EBS unit coordination).

Attempt to verify information through outreach

Verification is an essential step of the epidemic intelligence process that consists of confirming the reality (authenticity and conformity) of a possible public health threat. This is done by actively cross-checking the validity of the information using reliable sources, or verifying pertinence in order to confirm and, when possible, to characterize the nature of the event.

Collaboratively review information and assess risks in the EBS team meetings

During the mid-day EBS Unit Daily Meeting, analysts:

- Share and discuss signals (unverified) or events (verified) discovered over the past 24 hours to decide if reporting/updating is warranted,
- Identify the “lead analyst” for continued monitoring and reporting of each new signal or event,
- Discuss/characterize a high-level risk assessment (i.e. geo-scope; public health impact) based on all available information and contextualized data,
- Identify information to be conveyed in the daily report, and
- Discuss policy, logistics, administrative, or other issues.

Register and report surveillance information

Following the EBS Unit Daily Meeting, analysts:

- Continue surveillance of information,
- Enter key information into outbreak database (i.e. an event management system),
- After discussion in the team meeting, develop an event report/update to be included in the EBS Daily Report,
- Seek comments and feedback from SMEs on the EBS Daily Report if needed, and
- Finalize and distribute the EBS Daily Report.

Continuous monitoring of events for new information

Analysts continuously monitor events for new information, including:

- Following up on information sources and feedback until the event is no longer actively being followed or is “closed”,
- Regularly checking for updates on websites,
- Continuously checking email (EBS group mailbox) or other communications from reliable sources to verify event information,
- Continuing to share updated information in daily EBS team meetings, and
- Providing updates on the EBS Daily Report.

Conduct risk assessments for undiagnosed “mystery” diseases

Some reports describing outbreaks will not have an etiology. These reports may refer to the outbreak as “mystery”, “unknown”, or “unidentified” outbreaks. Analysts should take steps to assess these reports in order to verify and determine a diagnosis.

If the source is verified (e.g., WHO, UN Organizations, MOH/MOA):

- Confirm case and death numbers,
- Confirm whether laboratory testing was conducted and results obtained or pending, and
- Inquire whether there has been a public health response.

If the source is unverified (e.g., media, blog, or social media), search other sources to seek corroborating media reports (“triangulating” multiple media reports).

If additional media reports confirm information contained in the original media report, you should verify that the additional media reports are original publications and not just redistributions of the first report through media recycling.

Q1: What should you do if the “mystery” disease etiology remains unconfirmed?

Subject Matter Experts

A Subject Matter Expert (SME) is a person who is considered to be highly trained in a particular subject or disease or has obtained significant experience in a particular country or region of the world.

Q2: What areas of EBS can SMEs contribute to?

SME list

All EBS analysts should develop and maintain SME lists that can be used to quickly identify and find contact information for SMEs that can be consulted for assistance during an event. SME lists can be maintained in a straightforward manner using programs such as Microsoft Excel, or on a shared network drive. The list should be updated at regularly defined intervals.

Key information that should be gathered on an SME includes:

- Disease/area of expertise
- Contact name
- Organization/unit
- Contact information (office phone, mobile phone, email)

An SME list template can be found in Appendix 3 of your Participant Guide.

Anthropologic expertise

When analysts are investigating a public health threat such as a disease outbreak in specific ethnic groups, an EBS unit would benefit from the advice of a medical anthropologist or social behaviorist on the cultural practices of that specific group. Why do you think this is important?

Q1: Why is it important to include medical anthropologists or social behaviorists in this context?

Source lists

Analysts should use a “Source List” to save a source list of website names including URLs and corresponding passwords. These can be stored in a password-protected database such as an MS Excel spreadsheet if required.

Q1: What are some formal, or official verified sources that provide verified information?

Q2: What are some informal sources that provide information?

Q3: What information should be included in a password-protected database or spreadsheet?

The EBS team functions as one unit

EBS team group email

Q1: What type of issues should be communicated through a shared email address?

Respond to queries from partners

Email is the easiest and fastest way to respond to other public health agencies and partners.

- Email monitoring should be conducted constantly.
- Analysts responding to email should take note of the sensitivity of the information and when in doubt, clarify with the EBS Unit Director.
- Responses to queries sent by email should always include a copy to the group mailbox the for EBS Unit's situational awareness.
- Responses should be accurate and rapid.

Shared resource portal for research and reference

Analysts can share research and reference information through:

- Electronic portals (such as Microsoft SharePoint) for saving tagged documents by disease, country, region, etc., or
- A shared network drive (secured by permissions) can serve as a repository for relevant documents.

List of priority public health events

A list of priority public health events for surveillance should be established in the context of EBS selection criteria and national planning for EWAR. The list may contain:

- Diseases (e.g. measles),
- Syndromes (e.g. hemorrhagic fevers),
- Hazards (e.g. contamination of drinking water source), and
- Unexpected/unusual events (e.g. unexplained mortality).

Reporting templates

EBS analysts should develop and use templates for drafting reports for leadership and key stakeholders. When developing daily reports, an analyst should consider the audience, purpose, timeline, and template defined for daily, summary (weekly/monthly), ad hoc, and urgent reports.

Reporting templates should include the following essential information:

- Event description,
- Timelines,
- Public health impact,
- Geographic scope and risk of spread,
- Ongoing or planned activities, and
- Additional context.

Media aggregators for automating online searching

EBS Units should utilize leading media aggregators for automating internet-based searching for EBS. EBS units should customize such systems to best fit the geo-scope of the EBS unit's "reach" as well as the priority disease categories as determined by the country.

A Source List template with selected examples of media aggregators can be found in Appendix 4 of your Participant Guide.

Infectious disease databases

Baseline disease epidemiologic data should be checked to assess compatibility with known scientific information. Doing so can help determine whether the event meets EBS unit reporting criteria, and requires alert and response actions, including EBS unit coordination and reporting.

Event Management Systems

Software is recommended to design a database, or Event Management System (EMS) for logging, managing, and reporting public health events that meet the EBS Unit's criteria. The EMS should:

- Only be accessible to EBS analysts,
- Allow analysis of quantitative and qualitative data,

- Includes a function for generating reports directly,
- Contain the “Active List” of all public health events that are currently actively followed by the EBS Unit, and
- Be reviewed and revised weekly by analysts.

Develop and use Line Lists

A Line List is an organized, detailed table that summarizes key information about each case in an outbreak. Line Lists could be helpful when tracking an outbreak to determine trends in the outbreak over time. Line Lists can be built and added to over time in an MS Excel spreadsheet.

An EBS unit should use Line Lists to:

- Maintain all the relevant verified information regarding key outbreaks,
- Undertake epidemiologic analyses to contribute to discussions in the relevant forum and contribute to broader epidemiologic investigations,
- Share key information during ad hoc presentations (e.g., constructing epidemic curves for use in slide presentations),
- Assist in communications with SMEs, and
- Track information found in media-reported or otherwise unverified cases.

You can view a sample Line List in Appendix 5 of your Participant Guide.

SESSION 8

TRAINING REVIEW AND CASE STUDY

Purpose

- Review training
- Complete the case study

Total time: 30 minutes

Post-training knowledge check

The purpose of the post-training case study is to assess your knowledge and ability to apply what you have learnt during this training. The case study is presented in Appendix 4 of this guide. Please follow the facilitator's instructions to complete this case study.

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 the expectations you expressed in the introductions exercise were met. We strongly encourage you to share what we have discussed and learned today with other health professionals who were not able to attend.

APPENDIX 1

SOURCE LIST TEMPLATE WITH SELECTED EXAMPLES: PRIMARY SOURCES

Source or System Name	Verified?	URL	User ID	Password
WHO Disease Outbreak News	yes	https://www.who.int/emergencies/disease-outbreak-news	userID	password
ECDC Weekly Threat Report	yes	https://www.ecdc.europa.eu/en/threats-and-outbreaks/reports-and-data/weekly-threats	userID	password
WHO AFRO Outbreaks and Emergencies Bulletin	yes	https://www.afro.who.int/health-topics/disease-outbreaks/outbreaks-and-other-emergencies-updates	userID	password
World Organization for Animal Health	yes	https://www.oie.int/	userID	password
Avian Flu Diary	yes	https://afludiary.blogspot.com/	userID	password
<add more continuing below>				

APPENDIX 2

EXAMPLE – DAILY REPORT

At A Glance:
INTERNATIONAL IMPORTANCE
Rubeola (Measles) in France (UPDATE)

Public Health Events:

Public Health Event: OF INTERNATIONAL IMPORTANCE
Agent/Disease: Rubeola (Measles)
Country: France Location: Southeast of France
Source: Ministry of Health
GeoScope: High Risk: Medium

Event Description: This is an update regarding the outbreak of measles in France last reported by on 26 May.

According to the National Institute for Health Surveillance (InVS), the number of measles cases reported between 1 January 2008 and 30 June 2011 has now exceeded 20,000. This is an increase of approximately 3,000 cases since InVS last updated case numbers inclusive of April 2011. The data for the month of June remains provisional at this time.

French authorities note that the third epidemic wave, described as “massive” in comparison with first and second waves in 2009 and 2010, has peaked in March 2011 (See attached Epi Curve by InVS). The highest incidence of cases reported between July 2010 and June 2011 continue to be seen in the southeastern part of France (See attached map by InVS).

During the first 6 months of 2011, more than 14,000 cases were reported. Of these cases, 15 suffered neurological complications, 615 had severe pneumonia, and 6 died. For comparison, in 2010, 5,071 cases were reported, of which 8 suffered neurological complications (encephalitis / myelitis), 287 had severe pneumonia and two died.

Epidemiologic investigations and genotyping by laboratories earlier in 2011 have confirmed the transmission of measles virus among several European countries and to the Region of the Americas. As of May 2011, 38 countries in the WHO European Reg

APPENDIX 3

SME LIST TEMPLATE, WITH EXAMPLES OF SUBJECT MATTER AREA AND COUNTRY

Pathogen or Subject Matter Area	Name and E-mail Address	Country or Region	Name and E-mail Address
Anthrax	Dr. XYZ; XYZ@CDCexample.com	WHO AFRO	Dr. XYZ; XYZ@whoexample.com
Brucellosis		Angola	
Cholera		Burundi	
Dengue		Djibouti	
Ebola		Egypt	
Floods		WHO EMRO	
Humanitarian disaster		Haiti	
Measles		Indonesia	
Polio		Nepal	
Rabies		Swaziland	
Typhoid fever		Zambia	

APPENDIX 4

SOURCE LIST TEMPLATE WITH SELECTED EXAMPLES: MEDIA AGGREGATORS

Source or System Name	URL	Number of Languages	User ID, Password	Moderated?	Subscription or permission required to access?
Epidemic Intelligence from Open Sources	https://portal.who.int/eios/#	< 50	Consult source list	No	Permission
GPHIN	https://gphin.canada.ca/	9	Consult source list	Yes	Permission +subscription fee (could be waived)
MediSys	https://medisys.newsbrief.eu/medisys/homeedition/en/home.html	26	N/A; open	No	N/A
ProMED		4	N/A; open	Yes	N/A
HealthMap		7	N/A; open	No	N/A
<add more continuing below>					

APPENDIX 5

LINE LIST TEMPLATE WITH EXAMPLE: INFLUENZA A (H5N1), HUMANS, EGYPT

Case No.	Gender	Age (yr)	Location (State/Province/ Governorate)	Onset Symptoms	Hosp Date	Outcome / Date	Date of Death	Comments / Contacts, e.g., exposures	Lab Confirmation
1	Male	28	Alexandria	May 1 2004	May 3 2004	Recovered	N/A	Exposure to sick/ dead poultry	yes
2	Male	30	Damietta	Mar 06 2004	Mar 16 2004	Recovered	N/A	Culled poultry on a farm where he worked	yes
3	Female	31	Giza	Mar 12 2004	Mar 16 2004	Died	Mar 27 2006	Slaughtered chickens at home	yes
4	Male	18	Luxor	Mar18 2004	Mar 19 2004	Recovered	N/A	No exposure	no

APPENDIX 6

RWANDA CASE STUDY

It's 10:30 am on 17 July in the Command Center. You are an EBS analyst performing a media scan on EIOS and you find the following article:

EIOS EPIDEMIC INTELLIGENCE FROM OPEN SOURCES

Monitoring | Communities and Teams | Documents | Dashboards

Uganda reports Rift Valley fever outbreak

Filed Under: **Rift Valley Fever**; **VHF**

Lisa Schnirring | News Editor | CIDRAP News | Jul 17, 2018

Share | Tweet | LinkedIn | Email | Print & PDF

Uganda's health ministry has reported a Rift Valley fever outbreak involving two of its districts, and Rwanda is reporting the disease in animals along with suspected human cases, events that are occurring alongside an ongoing outbreak in Kenya, the World Health Organization (WHO) African regional office said yesterday in its latest weekly outbreak report.

The outbreaks pose a threat to other countries in the region, especially East Africa, which is experiencing heavy rains, according to the WHO.

Livestock contract the virus from mosquitoes, and though humans can be infected by mosquitoes, the virus is more commonly passed by contact with blood or organs of infected animals or drinking milk from sick ones.

Rod Waddington / Flickr cc

Uganda cases in 'cattle corridor'

In Uganda, two unrelated cases were confirmed on Jun 28 in two separate districts in the western part of the country. Both involve men who had exposure to animals. One patient is a 47-year-old butcher who got sick on Jun 20 and died at home the following evening. Health officials collected a postmortem sample and sent it to the Uganda Virus Research Institute (UVRI).

The second patient is a laborer and herder whose symptoms began on Jun 25. He was hospitalized and isolated the following day because of suspected viral hemorrhagic fever. Samples were collected during hospitalization and sent to the UVRI. The man died on Jun 30, and a safe burial was performed, the WHO said.

Another confirmed case has been reported from a third district, but the WHO said it is awaiting more information about the illness. Two other suspected cases are under investigation, and animal samples have been collected from the farm where one of the patients worked and from the slaughterhouse where the other worked.

Uganda's government has deployed a rapid response team to the affected districts, established an isolation unit at Mbarara Regional Hospital as the main treatment center, and prepared district hospitals to handle cases.

The WHO said the affected districts are in the "cattle corridor" that stretches from the southwest to the northeast regions of the country.

The article describes the following:

- Two cases in humans (one death), in separate districts in the western part of the country
- The cases were reported by WHO AFRO
- Another confirmed case from a third district, but more information is needed
- Two other suspected cases are under investigation
- Animal samples have been collected
- Information on a concurrent outbreak of Rift Valley fever in Kenya

Considering what you have learnt so far, answer the following questions

Q1: Is the source reporting the outbreak of RVF in Uganda an official source or an unofficial source?

Q2: Based on the source type, is verification required to confirm the RVF outbreak in Uganda?

Q3: Would you consider Rift Valley fever to be a priority disease for Rwanda? If so, why?

Q4: Would you consider an outbreak of Rift Valley fever occurring in Uganda to be important for Rwanda to monitor? If so, why?

You continue to scan media of this event and you come across the following twitter feed:

You start seeing rumors on Twitter describing abortions and deaths in animals in northern Rwanda near the border with Uganda.

Considering what you have learnt so far, answer the following questions.

Q5: What verification activities would you perform at this time?

Q6: Would you contact someone for cross-checking the information known? If so, who?

It's 8:30am on 6 August in the Command Center and you receive notice that the Ministry of Agriculture and Animal Resources issued a situation update noting:

- 154 cows have died from RVF
- 257,900 cattle have been vaccinated against RVF
- An estimated 316,445 cows have been treated with ParmaPy Plus – a drug to kill ticks, flies, and mosquitoes that transmit RVF

Now that the outbreak has been confirmed you and your colleagues draft a notification about the RVF outbreak in cattle in Rwanda.

Q7: With whom do you share an RVF notification?

Q8: What is some of the information you would include in the notification?

Q9: How do you support outbreak response activities?

Public notification of RVF outbreak

Rwanda's EBS teams has contacted AFRO to report the available information according to the Ministry of Agriculture and Animal Resources' investigation: "Rwanda is experiencing an epizootic, with suspected human cases."

AFRO has published in its weekly bulletin information on this multi-country RVF outbreak, based on information received by Uganda's PHEOC, Rwanda's RBC and Kenya's MOH.

Public notification of RVF outbreak

Rwanda's EBS teams has contacted AFRO to report the available information according to the Ministry of Agriculture and Animal Resources' investigation: "Rwanda is experiencing an epizootic, with suspected human cases."

AFRO has published in its weekly bulletin information on this multi-country RVF outbreak, based on information received by Uganda's PHEOC, Rwanda's RBC and Kenya's MOH.

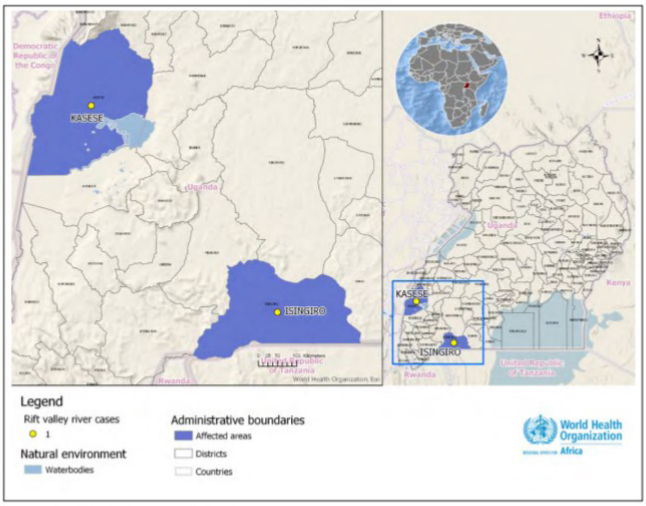
Rift Valley fever | **Uganda** | 2 **Cases** | 2 **Deaths** | 100% **CFR**

EVENT DESCRIPTION

On 29 June 2018, the Uganda Ministry of Health notified WHO of an outbreak of Rift Valley fever (RVF) in Isingiro and Kasese districts, all located in the western region of the country. Two unrelated simultaneous cases were confirmed on 28 June 2018, one in each district. The first case-patient was a 47-year-old male from Kanyatsi village in Munkunyu sub-county, Kasese District, whose main occupation was as a butcher. He fell ill on 20 June 2018 with symptoms of fever and headache, and self-administered antimalarial treatment. The case-patient died at home on the evening of 21 June 2018, with the body oozing blood from multiple orifices. The district health authority collected a nasal swab (posthumous) on notification of the death and the specimen was sent to the Uganda Virus Research Institute (UVRI) on 25 June 2018. The test result released on 28 June 2018 was positive for RVF by reverse transcriptase-polymerase chain reaction (RT-PCR).

The second case-patient was a 35-year-old male casual labourer and herdsman from Kabare village in Isingiro town council, Isingiro District. The village is located near Lake Nakivale and borders Lake Mburo National park. On 25 June 2018, he developed fever, headache, and anorexia, which was followed by epistaxis. He presented to the local health facility the same day, but was immediately referred to the regional referral hospital because of the severity of his illness and suspicion of a viral haemorrhagic disease. The case-patient was admitted in the isolation unit. A blood specimen was obtained and shipped to UVRI on 26 June 2018. The test result released by UVRI on 28 June 2018 was positive for RVF on RT-PCR. The case-patient died on 30 June 2018 and a supervised burial was carried out.

Geographical distribution of Rift Valley fever cases in Uganda, 20 - 30 June 2018



There is a report of another confirmed RVF case in Ibanda District, on which more information is being sought. Two other suspected cases are reportedly being investigated in Mbarara (1) and Kasese (1) districts. Additionally, 55 animal specimens were collected from the farm where one of the confirmed cases worked and in Isingiro town council abattoir. A further update will be provided on the evolution of this event.

Report writing activity

We're going to practice logging the RVF outbreak into a mock event management system as an EBS analyst would.

Review the GDDOC examples below, then log the RVF outbreak in the template that follows. Remember to consider criteria for EBS reporting, outbreak timeliness metrics, and EBS report components.

GDDOC example of a first report in Uganda

Country: Uganda
Agent/Disease: Rift Valley Fever
Event ID: 2235-B92.4-2018
First reported to GDDOC: 6/29/2018
Location: Kanese, Insingiro
Source: CDC Programs
Geographic scope: medium
Public health risk impact: high

Event description

The GDD Operation Center (GDDOC) has learned of two human cases of Rift Valley fever (RVF) reported in Uganda. The first case, which was fatal, was in a 49-year-old man from Kasese district who worked as a meat trader, and who had possibly also consumed meat, in Kiruhura district. He was initially suspected of being infected with anthrax, however, preliminary laboratory results at Uganda Virus Research Institute (UVRI) on 27 June indicate infection with RVF.

The second case, also fatal, was in a 35-year-old man from Insingiro district who worked as a herdsman; he also has a history of slaughtering and consuming meat from an ill cow. The patient was hospitalized on 26 June with fulminant viral haemorrhagic fever (VHF), and later died. Preliminary laboratory tests at UVRI on 27 June also indicate infection with RVF.

The UVRI VHF team is in the field conducting animal and human investigations in both locations, serving as the Ministry of Health's Rapid Response Team.

The GDDOC last reported RVF in Uganda in February 2018, at which time nine human cases with five deaths were reported from the districts of Kiboga, Mityana, Kyankwanzi, Kiruhura, Buikwe, and Arua.

The GDDOC will report additional information as it becomes available.

GDDOC example of information on RVF in Rwanda

Country: Rwanda
Agent/Disease: Rift Valley Fever
Event ID: 2248-B92.4-2018
First reported to GDDOC: 6/7/2018
Location: Eastern Province
Source: CDC Programs
Geographic scope: medium
Public health risk impact: high

Event description

The OIE has reported outbreaks of Rift Valley fever (RVF) among cattle in Eastern Province, Rwanda. Eight outbreaks were reported in Kirehe district (three outbreaks) and Ngoma district (five outbreaks). Of 33 susceptible cattle, there were 26 cases with two deaths. The cases were all in dairy cows and calves.

Laboratory testing was conducted at the National Veterinary Laboratory, samples tested positive by serology on 6 and 29 June. In response to the outbreak, the Ministry of Agriculture and Animal Resources (MINAGRI) implemented quarantine measures including banning the movement of livestock and livestock products in the districts of Kirehe, Ngoma, and Kayonza. Further, a vaccination campaign among livestock was conducted in 18 districts, which included 237,386 cattle, 22,727 goats, and 17,872 sheep, representing a coverage of 84.6%, according to OIE.

To prevent cases among humans, a community sensitization campaign using the media is underway, educating the public with regard to mosquito control and avoiding meat from livestock that appear ill. MINAGRI has also advised reporting of suspected cases among livestock to veterinarians.

The GDD Operations Center will provide updates as they become available.

GDDOC example of an update to a report in Uganda

Country: Uganda
Agent/Disease: Rift Valley Fever
Event ID: 2235-B92.4-2018
First reported to GDDOC: 6/29/2018
Location: Western Uganda
Source: CDC Programs
Geographic scope: medium
Public health risk impact: high

Event description

This is an update to the cases of Rift Valley Fever (RVF) in Uganda, last reported by the GDD Operations Center (GDDOC) on 3 August 2018.

To date, there have been a total of 25 cases in humans with 13 deaths (case-fatality proportion=52.0%) attributable to RVF reported from Uganda during 2018. Cases have been reported from the districts of Insingiro (11 cases, 4 deaths), Mbarara (2 fatal cases), Kasese (1 fatal case), Sheema (1 fatal case), Ibanda (1 case), Lwengo (1 case), exported from Mubende (1 case), Sembabule (1 case), Iganga (1 fatal case), Kiruhura (2 cases, 1 death), Rakai (1 fatal case), Buikwe (1 fatal case), and Yumbe (1 fatal case).

All cases have been confirmed positive from RVF by polymerase chain reactions (PCR) at the Uganda Virus Research Institute (UVRI). The index case, which was fatal, was in a 35-year-old herdsman from Isingiro district who had illness onset on 22 June. Most cases have been reported in people who work as herdsman, butchers, or farmers.

Ongoing outbreaks of RVF affecting both humans and animals have been reported in the neighbouring countries of Kenya, Rwanda, and South Sudan. Reoccurrences of RVF have become common in Uganda in recent years. The last documented outbreak ended in January 2018 and affected several districts including Arua, Buikwe, Kiboga, Kiruhura, Kiynkwanzi, and Mityana. The rainy season, flooding, and confirmed outbreaks in neighboring Kenya, Rwanda and South Sudan all increase the risk of RVF transmission in Uganda. The affected districts are located in the cattle corridor, and uncontrolled movement of livestock can propagate the risk of spread of RVF to new areas. The RVF epizootic causes agricultural impact and economic losses to communities because of high mortality and abortion rates among infected livestock. WHO recommends strengthening the multisectoral One Health approach to mitigate this RVF outbreak in Uganda and neighboring countries.

The GDDOC will report additional information as it becomes available.

Now it's your turn. Fill in the logging template with details of the RVF outbreak described throughout this case study.

Country:
Agent/Disease:
Event ID:
First reported to GDDOC:
Location:
Source:
Geographic scope:
Public health risk impact:

Event description

MODULE 7

EVENT-BASED SURVEILLANCE TRAINING EVALUATION GUIDE & SURVEYS

U.S. Centers for Disease Control and Prevention

EVENT-BASED SURVEILLANCE TRAINING EVALUATION GUIDE

This module can be applied following the completion of event-based surveillance (EBS) training using the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance*

There are two parts to the EBS training evaluation:

- *The Event-Based Surveillance Post-Training Evaluation Survey* administered at the end of the EBS training, and
- *The Event-Based Surveillance Training Impact Evaluation Survey* administered approximately three months after the EBS training which includes a survey and administration of the post-training knowledge check for a second time.

Instructions for Event-Based Surveillance Post-Training Evaluation Survey

A copy of the survey should be printed out for each participant in the training. Give participants about 15 minutes to complete the survey. Emphasize that the survey is anonymous and should be answered honestly. Be prepared to answer questions about the meaning of any of the survey items.

The survey starts with four demographic questions. Items 1-21 are answered on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. Items 22-26 include a 'not applicable' option to account for training that doesn't include elements such as role-plays and case studies. The survey finishes with three open-ended questions.

Scoring

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
1	**2**	**3**	**4**	**5**	**0**

For the Likert-scale questions, higher scale scores represent higher values assigned to the underlying dimension, except for the dimension 'Perceived difficulty', where a higher score indicates less difficulty.

Coding

DEMOGRAPHIC QUESTIONS	
Age range	
18-34	Age 1
35-49	Age 2
50-64	Age 3

DEMOGRAPHIC QUESTIONS	
Age range	
65+	Age 4
Prefer not to say	Age 5
Gender	
Male	Gen 1
Female	Gen 2
Prefer not to say	Gen 3
Current professional role	Dem open
Highest level of education completed	
None	Edu 1
Primary education	Edu 2
Secondary education	Edu 3
Post-secondary education at university or college	Edu 4
Graduate level education	Edu 5
Prefer not to say	Edu 6
TRAINING OUTCOME DIMENSIONS	
Subjective enjoyment	
1. Overall, I liked today's training.	Enj 1
Perceived usefulness	
2. I think the training will be useful for my EBS role.	Use 1
3. Investing time in this training was useful.	Use 2
Perceived difficulty *Note: For perceived difficulty, a higher score indicates less difficulty.*	
4. I could understand the concepts being presented in the training.	Dif 1
5. I could understand the language (special terms and technical words) used in the training.	Dif 2

TRAINING OUTCOME DIMENSIONS	
Perceived difficulty *Note: For perceived difficulty, a higher score indicates less difficulty.*	
6. There was enough time to cover the concepts in this training.	Dif 3
Subjective knowledge gain	
7. I will be able to remember the new concepts well.	Kno 1
Attitude towards training	
8. I will apply what I learned to my day-to-day work in EBS.	Att 1
9. I would recommend this training to my colleagues.	Att 2
TRAINING DESIGN DIMENSIONS	
Activation	
10. I was able to share my experience relevant to the topics being discussed.	Act 1
11. The training helped me to connect new concepts with my existing knowledge.	Act 2
Demonstration	
12. I was aware of the learning objectives of the training.	Dem 1
13. The learning objectives of the training were achieved.	Dem 2
14. Concepts were illustrated with concrete examples.	Dem 3
15. The media employed (PPT, video, posters etc.) were helpful for my learning.	Dem 4
16. The media employed (PPT, video, posters etc.) were suitable for presenting the training.	Dem 5
Application	
17. I was able to practise what I had learned during the training.	App 1
18. In the training I received useful feedback on my performance.	App 2
19. In the training I had the opportunity to try out things which I will implement later in my work.	App 3
Integration	
20. Because of this training, I now understand the importance of integrating these new concepts into my existing work in the area of surveillance.	Int 1

TRAINING DESIGN DIMENSIONS	
Integration	
21. It became clear to me how I can apply the concepts covered in day-to-day EBS work.	Int 2
Activity-based learning	
22. Peer-to-peer discussions helped me to better understand the topics.	Abl 1
23. Facilitator-led discussions helped me to understand the topics.	Abl 2
24. Role-play exercises helped me to better understand the topics.	Abl 3
25. Case study exercises helped me to understand the topics.	Abl 4
26. The lectures helped me understand the topics.	Abl 5
OPEN-ENDED QUESTIONS	
What did you like best about the EBS training?	Ope 1
How could the EBS training be improved?	Ope 2
Please use this space to provide further comments on this training, if any.	Ope 3

Instructions for Event-Based Surveillance Training Impact Evaluation

The Event-Based Surveillance Training Impact Evaluation Survey should be administered approximately three months following the training using the *Training Curriculum for Event-Based Surveillance in Health Facilities and Communities and Internet-Event Based Surveillance*. This evaluation may be administered in different settings based on the country context. Regardless of the setting, this evaluation should be conducted in the same manner. One copy of the survey should be printed out for individuals who participated in the training. Give participants about 15 minutes to complete the survey. Emphasize that the survey is anonymous and should be answered honestly. Be prepared to answer questions about the meaning of any of the survey items.

The survey starts with four demographic questions. Items 1-17 are answered on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The survey finishes with three open-ended questions.

Re-Administration of the Post-Training Knowledge Check

In order to attain a more objective measure of the participants' knowledge retention, the *Post-Training Knowledge Check* that was administered during the participants' last EBS training should be re-administered as part of the *Training Impact Evaluation*. Wherever possible, try to recreate the conditions of the first *Post-Training Knowledge Check* such as giving participants the same amount of time to complete the test and making sure they complete the test on their own.

Scoring

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	**2**	**3**	**4**	**5**

For the Likert-scale questions, higher scale scores represent higher values assigned to the underlying dimension.

Coding

DEMOGRAPHIC QUESTIONS	
Age range	
18-34	Age 1
35-49	Age 2
50-64	Age 3
65+	Age 4
Prefer not to say	Age 5
Gender	
Male	Gen 1
Female	Gen 2
Prefer not to say	Gen 3
Current professional role	Dem open
Highest level of education completed	
None	Edu 1
Primary education	Edu 2
Secondary education	Edu 3
Post-secondary education at university or college	Edu 4
Graduate level education	Edu 5

DEMOGRAPHIC QUESTIONS	
Highest level of education completed	
Prefer not to say	Edu 6
TRAINING IMPACT DIMENSIONS	
Perceived utility	
1. The training covered what I needed to know for my role in EBS.	Use 1
2. The training equipped me to carry out my EBS-related functions.	Use 2
3. It was worthwhile doing the EBS training.	Use 3
Subjective knowledge retention	
4. I can remember what I learned in the EBS training.	Kno 1
5. I am still able to explain what I learned in the training to others in my field of work.	Kno 2
6. I have no need for refresher training in EBS.	Kno 3
Perceived performance	
7. The EBS training has had a positive impact on the way I conduct EBS.	Per 1
8. I am contributing to EBS efforts in a significant way as a result of the EBS training.	Per 2
9. My EBS supervisor is able to give me useful feedback on my performance.	Per 3
Application	
10. I have been able to put into practice what I learned during the training.	App 1
11. I have referred back to the training materials in order to carry out my EBS role effectively.	App 2
12. I feel that EBS is important for achieving surveillance goals.	App 3
Integration	
13. I know how to get help if I have a problem in relation to my EBS role.	Int 1
14. I feel like I am part of a team.	Int 2
15. I feel like my EBS work is valued.	Int 3

TRAINING IMPACT DIMENSIONS	
Integration	
16. My supervisor supports me to achieve EBS goals.	Int 4
17. I am contributing to surveillance efforts in a significant way as a result of the EBS training.	Int 5
OPEN-ENDED QUESTIONS	
Is there any content you would like to have included in the EBS Training Curriculum to help you succeed in your EBS role?	Ope 1
Describe any factors that are hindering you in your EBS role that you feel should be addressed in future EBS trainings.	Ope 2

EVENT-BASED SURVEILLANCE TRAINING EVALUATION SURVEY

Please answer the following questions based on your experience participating in this event-based surveillance (EBS) training. Your feedback will help us to improve this training in the future. Please answer honestly and openly. Your responses will remain completely anonymous and will only be used for evaluation and reporting purposes.

Age range (circle one)

- 18-34
- 35-49
- 50-64
- 65+
- Prefer not to say

Gender (circle one)

- Male
- Female
- Prefer not to say

Current professional role _____

Highest level of education completed (circle one)

- None
- Primary education
- Secondary education
- Post-secondary education at university or college
- Graduate level education
- Prefer not to say

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. Overall, I liked today's training.	◯	◯	◯	◯	◯
2. I think the training will be useful for my EBS role.	◯	◯	◯	◯	◯

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
3. Investing time in this training was useful.	○	○	○	○	○
4. I could understand the concepts being presented in the training.	○	○	○	○	○
5. I could understand the language (special terms and technical words) used in the training.	○	○	○	○	○
6. There was enough time to cover the concepts in this training.	○	○	○	○	○
7. I will be able to remember the new concepts well.	○	○	○	○	○
8. I will apply what I learned to my day-to-day work in EBS.	○	○	○	○	○
9. I would recommend this training to my colleagues.	○	○	○	○	○
10. I was able to share my experience relevant to the topics being discussed.	○	○	○	○	○
11. The training helped me to connect new concepts with my existing knowledge.	○	○	○	○	○
12. I was aware of the learning objectives of the training.	○	○	○	○	○
13. The learning objectives of the training were achieved.	○	○	○	○	○
14. Concepts were illustrated with concrete examples.	○	○	○	○	○
15. The media employed (PPT, video, posters etc.) were helpful for my learning.	○	○	○	○	○
16. The media employed (PPT, video, posters etc.) were suitable for presenting the training.	○	○	○	○	○

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
17. I was able to practise what I had learned during the training.	○	○	○	○	○
18. In the training I received useful feedback on my performance.	○	○	○	○	○
19. In the training I had the opportunity to try out things which I will implement later in my work.	○	○	○	○	○
20. Because of this training, I now understand the importance of integrating these new concepts into my existing work in the area of surveillance.	○	○	○	○	○
21. It became clear to me how I can apply the concepts covered in day-to-day EBS work.	○	○	○	○	○

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
22. Peer-to-peer discussions helped me to better understand the topics.	○	○	○	○	○	○
23. Facilitator-led discussions helped me to understand the topics.	○	○	○	○	○	○
24. Role-play exercises helped me to better understand the topics.	○	○	○	○	○	○
25. Case study exercises helped me to understand the topics.	○	○	○	○	○	○
26. The lectures helped me understand the topics.	○	○	○	○	○	○

What did you like best about the EBS training?

How could the EBS training be improved?

Please use this space to provide further comments on this training, if any.

EVENT-BASED SURVEILLANCE TRAINING IMPACT EVALUATION SURVEY

Please answer the following questions based on the impacts you think your most recent event-based surveillance (EBS) training has had on your EBS role. Your feedback will help us to improve this training in the future. Please answer honestly and openly. Your responses will remain completely anonymous and will only be used for evaluation purposes.

Age range (circle one)

- 18-34
- 35-49
- 50-64
- 65+
- Prefer not to say

Gender (circle one)

- Male
- Female
- Prefer not to say

Current professional role _____

Highest level of education completed (circle one)

- None
- Primary education
- Secondary education
- Post-secondary education at university or college
- Graduate level education
- Prefer not to say

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. The training covered what I needed to know for my role in EBS.	○	○	○	○	○
2. The training equipped me to carry out my EBS-related functions.					

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
3. It was worthwhile doing the EBS training.	○	○	○	○	○
4. I can remember what I learned in the EBS training.	○	○	○	○	○
5. I am still able to explain what I learned in the training to others in my field of work.	○	○	○	○	○
6. I have no need for refresher training in EBS.	○	○	○	○	○
7. The EBS training has had a positive impact on the way I conduct EBS.	○	○	○	○	○
8. I am contributing to EBS efforts in a significant way as a result of the EBS training.	○	○	○	○	○
9. My EBS supervisor is able to give me useful feedback on my performance.	○	○	○	○	○
10. I have been able to put into practice what I learned during the training.	○	○	○	○	○
11. I have referred back to the training materials in order to carry out my EBS role effectively.	○	○	○	○	○
12. I feel that EBS is important for achieving surveillance goals.	○	○	○	○	○
13. I know how to get help if I have a problem in relation to my EBS role.	○	○	○	○	○
14. I feel like I am part of a team.	○	○	○	○	○
15. I feel like my EBS work is valued.	○	○	○	○	○
16. My supervisor supports me to achieve EBS goals.	○	○	○	○	○
17. I am contributing to surveillance efforts in a significant way as a result of the EBS training.	○	○	○	○	○

Is there any content you would like to have included in the EBS Training Curriculum to help you succeed in your EBS role?

Describe any factors that are hindering you in your EBS role that you feel should be addressed in future EBS trainings.

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