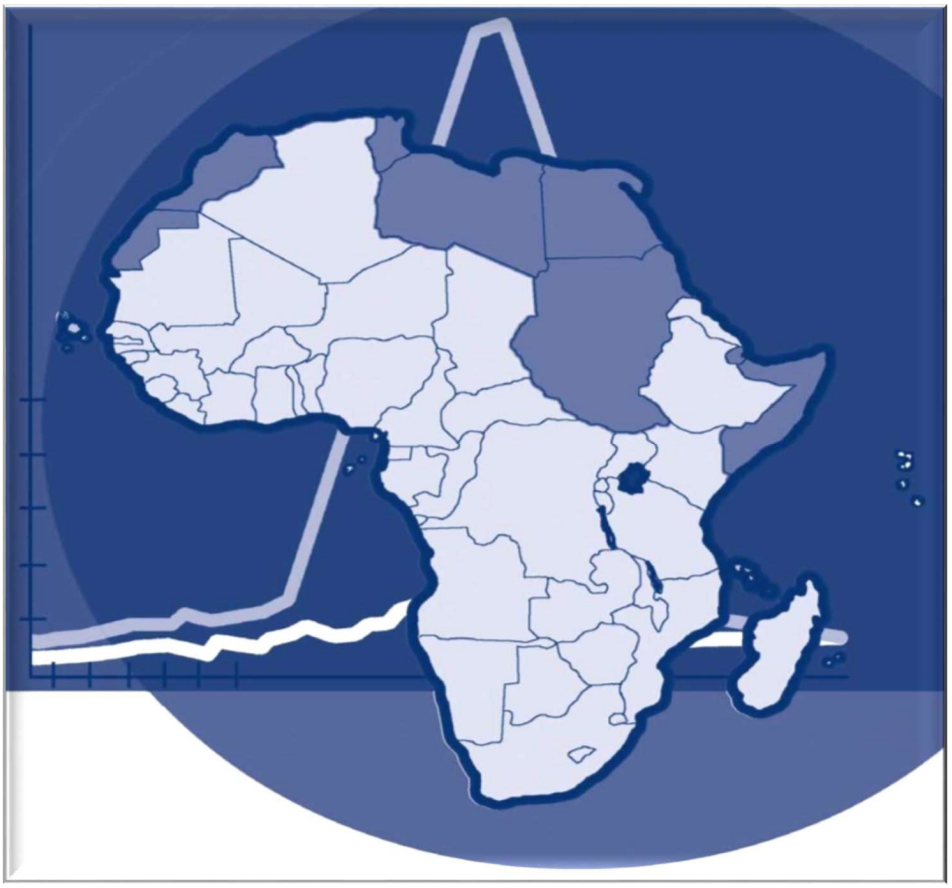
TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN THE WHO AFRICAN REGION

THIRD EDITION

BOOKLET TWO: SECTIONS 1, 2 AND 3



World Health Organization
REGIONAL OFFICE FOR Africa

This booklet comprises the following sectionS of the Integrated Disease Surveillance and Response Technical Guidelines:

Section 1: Identify and record cases of priority diseases, conditions and events

Section 2: Report priority diseases, conditions and events

Section 3: Analyse and interpret data

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MARCH 2019

World Health Organization
Regional Office for Africa
WHO Health Emergency Programme
Brazzaville, Republic of Congo

Centers for Disease Control and Prevention
Center for Global Health
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CONTENTS

ABBREVIATIONS

AAR	after action reviews
AEFI	adverse events following immunization
AFP	acute flaccid paralysis
AFRO	WHO Regional Office for Africa
AWD	acute watery diarrhoea
CDC	Centers for Disease Control and Prevention
CDO	County Diagnostic Officer
CBS	community-based surveillance
CBIS	community-based information system
CEBS	community event-based surveillance
CFR	case fatality rate
CHA	Community Health Assistants
CHSS	Community Health Services Supervisor
CHO	County Health Officer
CHT	County Health Team
CHV	Community Health Volunteer
CSO	County Surveillance Officer
DDO	District Diagnostic Officer
DHIS2	District Health Information System version 2
DHO	District Health Officer
DHT	District Health Team
DPC	Disease Prevention and Control Department
DRM	Disaster Risk Management
DSO	District Surveillance Officer
EBS	event-based surveillance
eDEWS	Electronic Disease Early Warning System
EOC	Emergency Operations Centre
EPI	Expanded Program on Immunization
EPR	Emergency Preparedness and Response
EVD	Ebola virus disease
HCF	healthcare facility
HCW	healthcare worker
HIV/AIDS	human immunodeficiency virus and acquired immune deficiency syndrome

HMER	Health Management Information Systems, Monitoring and Evaluation and Research Units
HMIS	Health Management Information System
HPO	Health Promotion Officer
IDSR	Integrated Disease Surveillance and Response
IBS	Indicator Based Surveillance
IMS	Incident Management System
IEC	Information, Education and Communication
IMC	International Medical Corps
IOM	International Organization for Migration
IPC	Infection Prevention and Control
IHR 2005	International Health Regulations (2005)
IRC	International Rescue Committee
JEE	Joint External Evaluation
LISGIS	Liberian Institute of Statistics and Geo-Information Services
MCH	Maternal Child Health
MDR	multidrug resistance
MEF	Monitoring and Evaluation Framework
MOH	Ministry of Health
MOA	Ministry of Agriculture
MTI	Medical Teams International
NGO	nongovernmental organization
NNT	Neonatal tetanus
NSTCC	National Surveillance Technical Coordination Committee
OIC	Officer in Charge
PCI	Project Concern International
PHE	Public health events
PoE	Points of Entry
PHEIC	Public health emergency of international concern
PHEMC	Public health emergency management committee
PPE	Personal protective equipment
RRT	Rapid response team
RTA	road traffic accident
SARS	Severe Acute Respiratory Syndrome
SCI	Save the Children International
SFP	Surveillance Focal Point
SIMEX	simulation exercise

STI	sexually-transmitted infections
UNICEF	United Nations Children's Emergency Fund
VHF	Viral Haemorrhagic Fever
WHO	World Health Organization
XDR	Extensively drug-resistant

FOREWORD

In 1998, the World Health Organization (WHO) Regional Office for Africa (AFRO), together with its technical partners, adopted a strategy for developing and implementing comprehensive public health surveillance and response systems in African countries, initially called Integrated Disease Surveillance. However, to highlight the linkage between surveillance and response, the strategy was later renamed Integrated Disease Surveillance and Response (IDSR). The first edition of the IDSR technical guidelines (2002) was widely adopted by Member States. Although progress towards a coordinated, integrated surveillance system has been mixed, almost every country in the Region and their partners invested human and material resources in the process, in an effort to build capacities for public health surveillance systems for early detection, confirmation and response to public health threats, to prevent unnecessary illness, death and disability. The coming into force in 2007, of the International Health Regulations (IHR 2005), the emergence of new diseases, conditions and events and the formulation of strategies for disaster risk management (DRM) resulted in the need to revise the first edition of the IDSR guidelines. There was also a need to address the increasing burden of noncommunicable diseases. Also, community-based surveillance for early detection, rapid confirmation and response to public health threats had to be enhanced, while alignment with broader system strengthening objectives was necessary. This led to the development of the second edition of the IDSR guidelines in 2010.

Despite the availability of the IDSR technical guidelines, the Region continues to face challenges in public health surveillance systems, which hinder its capacity to prevent, detect and respond to public health threats. The unprecedented Ebola virus disease (EVD) outbreak in 2014 in West Africa, and other recent health emergencies have shown that the IHR (2005) has not been fully implemented in many Member States. Consequently, addressing health emergencies remains a major challenge.

Following my election in January 2015 as Regional Director, after internal and external consultations, in May 2015, I unveiled the *Transformation Agenda of the WHO Secretariat in the African Region, 2015-2020.* One of the five interrelated and overlapping priorities in the Transformation Agenda is improving health security.

I am glad to unveil the third edition of the IDSR guidelines, prepared by the WHO Health Emergencies (WHE) Programme in the WHO African Region, with the active participation of all the clusters. In addition, WHO headquarters, the intercountry support teams, hubs, WHO country

offices, Member States, and the United States Centers for Disease Control and Prevention (CDC) and other relevant stakeholders all provided valuable support.

Many public health events and emergencies and their associated risk factors could be prevented, or their effects mitigated. However, the health systems in most countries remain inadequate. To avert and mitigate the effects of future health security risks and emergencies, all Member States are urged to implement these IDSR guidelines.

These guidelines recommend thresholds for action on priority diseases, public health events and conditions and for responding to alerts. Using these action thresholds can be lifesaving. I therefore urge all Member States to fully implement this third edition of the IDSR guidelines everywhere in the WHO African Region because they explicitly describe what needs to be established at each level of the health system in order to detect, confirm, and respond to diseases/health events that are responsible for all preventable illnesses, deaths and disabilities in local communities.

The cost of good public health surveillance, as a public health good, is relatively low, compared to many other strategies. I appeal to all Member States, national, regional and international partners and funders to join us in beginning the hard work now. Let us all embrace these IDSR guidelines to strengthen capacities for preparedness, alert and response for health security throughout the WHO African Region. The guidelines should be used by:

(a) health workers at all levels (including surveillance officers, clinicians, laboratory personnel and public health workers)
(b) provincial and district health teams
(c) data managers
(d) IHR national focal points and other sectors implementing IHR
(e) competent authorities at points of entry (PoE)
(f) veterinary and wildlife health officers
(g) environmental health officers
(h) health training institutions
(i) supply chain officers
(j) other public health experts, including nongovernmental organizations (NGOs).

The guidelines are intended for use as:

(a) a general reference for surveillance activities at all levels;
(b) a set of standard definitions for threshold levels that initiate action for responding to specific diseases;
(c) a stand-alone reference for level-specific responsibilities;
(d) a resource for developing training, supervision, monitoring and evaluation of surveillance activities;
(e) a guide for improving early detection and response to epidemic-prone diseases.

Finally, I appeal to you all to ensure that the third edition of the IDSR guidelines are implemented within the broader context of health system strengthening; better coordination between human and animal health surveillance and other sectors involved in the One Health approach; improved use of laboratory network capacity in surveillance and response; and better community engagement in public health interventions.

Dr Matshidiso Moeti
WHO Regional Director for Africa

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The third edition of the Integrated Disease Surveillance and Response (IDSR) Technical Guidelines was prepared by the WHO Health Emergencies (WHE) Programme with the active participation and involvement of programmes dealing with disease surveillance at the WHO Regional Office for Africa (AFRO), Brazzaville, Congo and with technical reviews provided by the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Agency for International Development (USAID).

The purpose of revising these IDSR technical guidelines was to:

(a) Align with the current situation and needs of the Member States.

(b) Align with the objectives, targets and elements of the WHO Africa Region's strategy for health security and emergencies 2016–2020.

(c) Update the guidelines with contemporary information, taking into consideration new developments such as: emerging and re-emerging priority diseases, conditions and events.

(d) Incorporate recent recommendations from expert panels on strengthening the IHR, 2005 that are underpinned on the One Health approach.

(e) Holistically address disaster risk management (DRM) strategies.

(f) Take into account lessons learnt from the unprecedented EVD outbreak in West Africa, polio eradication and other humanitarian crises.

(g) Take advantage of technology advancement and utilize the opportunities offered by the internet and mobile phones to scale up the implementation of real time community event-based surveillance (CEBS), with robust geographical information system (GIS) platforms.

(h) Scale up other electronic surveillance systems and incorporate new ways for capacity building using the IDSR eLearning tools.

In planning to update these guidelines, suggestions and advice for improving the recommendations were sought and gratefully received from the IDSR development teams who prepared the 1st and 2nd editions. This revision builds on the technical expertise from more than 100 surveillance and disease experts at WHO, CDC and Ministries of Health in African countries who conceived and produced the 1st and 2nd Editions.

The revision process involved internal WHO consultation followed by a wider consultation that involved a series of meetings with various partners and Member States. In addition, the IDSR task force was constituted to help with the revision process. The final draft was peer reviewed by the *ad hoc* task force as well as during a final partner consultative meeting held in March 2018.

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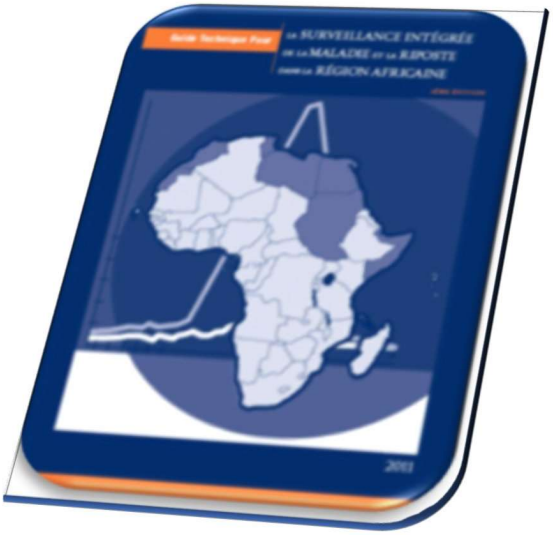
INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



SECTION 1: IDENTIFY AND RECORD CASES OF PRIORITY DISEASES, CONDITIONS AND EVENTS

MARCH 2019

SECTION 1: IDENTIFY AND RECORD CASES OF PRIORITY DISEASES, CONDITIONS AND EVENTS

1. DETECT AND RECORD CASES OF PRIORITY DISEASES, CONDITIONS AND EVENTS

The IDSR strategy incorporates both Indicator-Based surveillance (IBS) and Event-Based Surveillance (EBS) approaches to early detection of priority diseases, conditions and events. This section describes how to detect priority diseases, conditions and events using standard case definitions. The section also gives guidance on establishing EBS and using this approach for AlertAlerts detection, triaging and verification to detect public health events. The section also gives a description of procedures which need to be followed when planning for improvements of surveillance and response activities in your catchment area and emphasizes the role of the laboratory in surveillance and response.

1.1 Detection of priority diseases, conditions and events

Health staff (human, animal, and environmental) conduct surveillance activities at all levels of the health system (public and private) so they can detect public health problems of concern in their communities.

Community members also play an important role in surveillance by facilitating early detection and action to priority diseases, conditions and events. Community members should be oriented in surveillance so that they actively participate in detecting, reporting, responding to and monitoring health events related to humans or animals in their catchment area.

Various public health events and or risks may also occur at Points of Entry (PoE); and these health events can be recognized before, during or after travel, often when travellers have already left the Point of Entry. Staff at Points of Entry must be vigilant in ensuring that these events are identified, and reported on time to facilitate response.

Surveillance priorities may be communicable and noncommunicable diseases, conditions or events that include national or local priorities such as acute outbreaks and deaths or events associated with human and/or animal health events which might have direct consequences to human health. An essential function of a public health surveillance system is to be vigilant in its capacity to detect not only known public health threats with established case definitions and

formal reporting channels but also events or hazards that are not specifically included in the formal reporting system. These may be events such as clusters of disease patterns or rumours of unexplained deaths.

These diseases, conditions and events may come to the attention of the health system in several ways.

For example:

(a) A person falls ill and seeks treatment from a health facility.

(b) High rate of hospital admission for the same diseases or symptoms

(c) Community members report unusual events or occurrences at local levels such as a cluster of deaths or unusual disease pattern to the health facility, or perhaps a school might report unusual absences due to similar signs and symptoms such as an influenza-like illness (ILI).

(d) Health staff who conduct routine record reviews to find cases for a specific disease observe that cases of another priority disease have not been reported. For example, an officer who normally reviews the clinic register for cases of Acute Flaccid Paralysis (AFP) also sees that a case of cholera has also recently been recorded in the clinic register.

(e) Health staff conduct routine record reviews of the laboratory register and observe recorded confirmed cases of priority diseases such as yellow fever or cholera

(f) Radio, television, newspapers, or social media (WhatsApp, Facebook, etc.) report a rumour of rare or unexplained events in the area with potential exposure for humans.

(g) Vital events records show an increase in maternal deaths.

(h) Unusual reports of illness among health-care workers

(i) During analysis of the routine reports from all the facilities in the area, the district officer notices that other health facilities in the catchment area have also reported adult deaths due to bloody diarrhoea which might signify that there might be an outbreak of *Bacillary dysenteriae* or *Escherichia coli*

(j) An unusual death or number of deaths among animals, such as livestock, birds or rodent species, or an unusually high number of sick animals presenting the same signs,

(k) Environmental officers observed during assessment of water bodies, contamination which might be due to chemicals like lead, or due to other related chemicals due to mining activities, which might be an early trigger for public health interventions.

1.2 Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) approaches used to detect diseases, conditions and events

(a) The IDSR strategy uses both Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) approaches to detect diseases, conditions, and events.

(b) As part of efforts to increase the sensitivity of the surveillance system, all countries should also establish EBS system alongside the IBS at all levels of the health system, that is, at the national, regional/provincial, district, health facility and community levels.

(c) The IBS involves the use of standard case definitions to identify diseases, conditions, and events, whilst EBS uses AlertAlerts detection, triaging and verification to detect events.
   (i) In contrast with case definitions that are narrow and disease-specific, EBS requires the detection and immediate reporting of AlertAlerts, which are broad and indicate the possibility of a serious public health event. Alerts that are verified are classified as events.

(d) IBS and EBS are an integral component of the routine IDSR activities of the surveillance staff.

(e) Both IBS and EBS should use existing resources and infrastructure set aside for routine IDSR strategy.

1.3 Use standard case definitions

A standard case definition is an agreed-upon set of criteria used to decide if a person has a particular suspected disease or condition. The definition specifies clinical criteria, laboratory diagnosis and specifications on time, place and person.

Why do we need case definitions?

(a) To help decide if a person has a presumed disease or condition or event, or to exclude other potential disease diagnoses.

(b) To ensure that every case is diagnosed in the same way, regardless of where or when it occurred, or who identified it.

(c) To initiate action for reporting and investigating quickly if the clinical diagnosis takes longer to confirm.

(d) To compare the number of cases of the diseases, conditions or events that occurred in one time or place with the number occurring in another time or place.

Using standard case definitions is also important in implementing the IHR 2005. At all levels, including community, health staff (human, animal, environment) must be aware of case definitions of diseases, conditions or events that may afflict not only the local community but also have the potential for spread across geographical boundaries.

In describing Standard Case Definitions, for health facility level, a **three-tiered classification system is normally used – Suspected, Probable, Confirmed:**

(a) **Suspected case**: indicative clinical picture, that is, patient will have fewer or atypical clinical features without being a confirmed or a probable case.

(b) **Probable case**: clear clinical picture (meets the clinical case definition) that is, patient will have typical clinical features of the illness or is linked epidemiologically to a confirmed case, but a laboratory sample cannot be taken because the case is lost or dead or a sample has been taken but was not available for laboratory testing or was not viable for sufficient laboratory testing.

(c) **Confirmed case**: a suspected or confirmed case verified by laboratory analysis.

The classification might vary according to the epidemiology of the individual diseases.

In all outbreak scenarios, a more sensitive case definition to identify all suspected cases should always be used. Identification of cases in these scenarios will use the Syndromic surveillance approach where case detection will be based on clinical features without any laboratory diagnosis (See Introduction chapter for the description of Syndromic surveillance). If in the middle of an outbreak, the cause of the agent has been established, cases may continue to be classified as either suspected cases or confirmed cases. An additional tier classification, that is, "*Probable case definition*", may be added if officials feel that conducting laboratory tests on every patient with a consistent clinical picture and a history of exposure (for example, measles) is unnecessary.

Case definitions at the community level are usually simplified and are used to facilitate rapid detection of priority diseases, events and conditions or other hazards in the community. Case definitions at this level use key signs and symptoms to help the community to recognize when they should refer a person with these signs and symptoms for treatment and notify the health facility. Examples of how key signs and symptoms of community case definitions may be described are in Annex 1B.

All cases (suspected, probable and confirmed) should always be recorded in a recognized facility register or logbook, and the IDSR reporting forms.

1.3.1 One Health approach in identification of events

One Health aims at applying a holistic approach in jointly detecting events and conducting risk assessment in responding to possible public health events occurring at the human-animal-environment interface. Detection of events under the One Health approach thus requires all levels from community, district, and region to national to strengthen collaboration across sectors, and jointly share responsibility of detecting events which might have an impact on the health of humans, and their shared environment.

Examples of the One Health approach include detection of a rabid animal or reports of animal illness from the veterinary sector, which can facilitate investigations of human cases of disease or reports of human diseases which can be traced through exposure to chemical hazards within the environment.

Detection of events at PoE also requires a One Health approach and this requires involvement of all relevant sectors such as ministries responsible for health, agriculture, livestock, environment, immigration, and defence.

All events detected should be shared with relevant sectors as part of the One Health approach.

1.3.2 Distribute standard case definitions and registers to health facilities

Make sure that health facility personnel at all levels including PoE(s) know and have available standard case definitions (including those for reporting unusual events, disease patterns, or unexplained deaths) specified by the national level.

Some countries have prepared and disseminated case definitions for diseases under surveillance in the form of a poster or as a small pocket-sized booklet. These tools reinforce the use of standard case definitions for detecting and reporting priority diseases, conditions and events.

Ensure that health facility personnel know the process for recording and reporting, including reporting sites. Also ensure that health facilities record rumours. The registers, which are normally used in most countries, are the Outpatient Department (OPD) or Inpatient Department (IPD) registers. Surveillance officers should always liaise with the health information focal person to extract the priority disease of IDSR from the register.

Proposed case definitions based on established disease-specific programmes are in Annex 1A and are available in Section 11 of these guidelines.

1.3.3 Distribute community level case definitions using key signs and symptoms

Provide information to community health workers, traditional healers, birth attendants, community leaders and community volunteers on how to recognize and report priority diseases, conditions or events to the health facility. The case definitions for community level should be simpler than those used in health facilities. A list of examples of case definitions for use at the community level is in Annex 1B of this section.

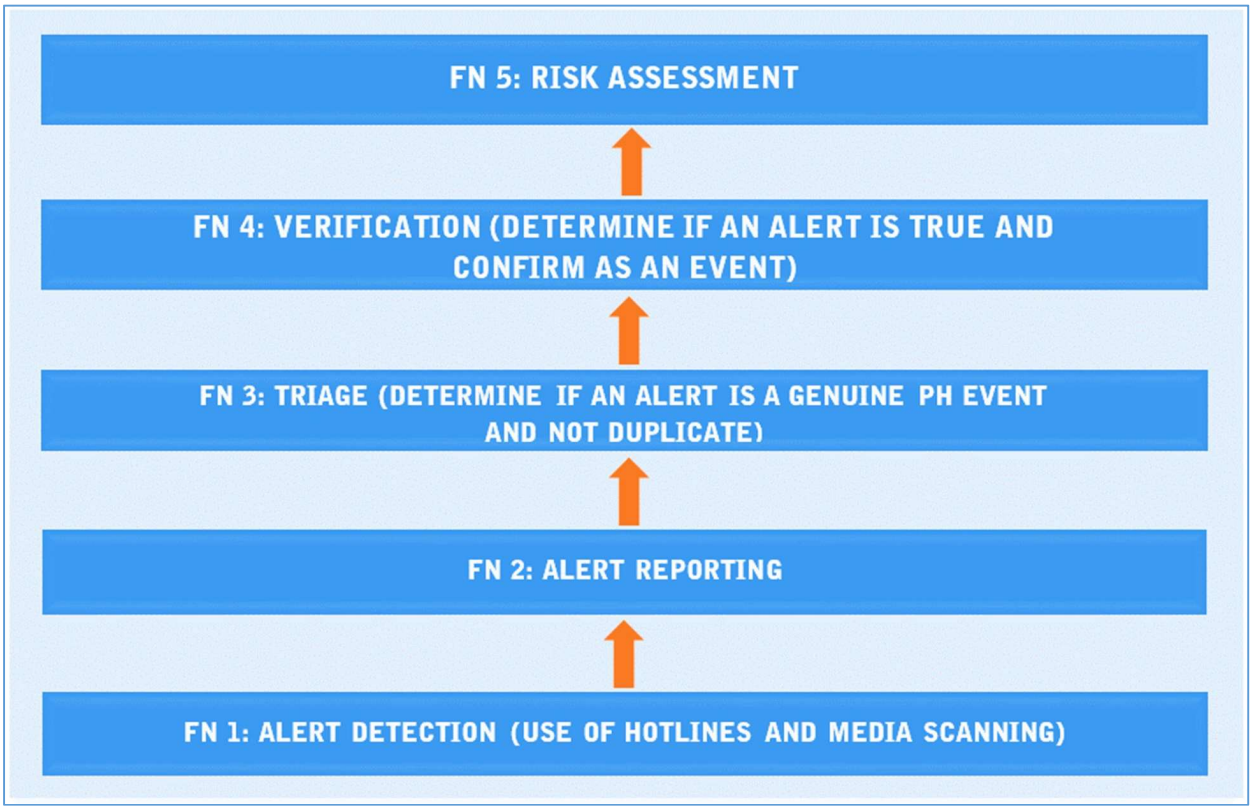
At the same time, emphasize the need to refer people with the suspected disease or condition for treatment. Provide them with procedures for reporting, including when and where to report; and ensure provision of necessary tools. Design simple community alert forms reporting events and tools (see Annex 2B) to enable them to refer a suspected case and show them how to fill information and those who are non-literate develop mechanisms of capturing information of events from them. Think of mechanisms like identifying someone from the family member who can assist with actual writing. Also, provide information to the community on priority diseases, using posters, newsletters and announcements during meetings. Also provide feedback methods and how timely information will be made available to the community, considering that this will encourage community members to participate in surveillance and response activities and also to understand the people in their community and changes in their health.

1.4 Establish Event-Based Surveillance (EBS) at all levels

All countries should ensure that the event-based surveillance (EBS) system is established at all levels of the health system alongside the Indicator-Based Surveillance (IBS) system.

The establishment of EBS involves taking into consideration the functions of EBS as illustrated in figure 1.

Figure 1: Functions of EBS at all levels of the health system



The following steps are followed in establishing and monitoring an EBS system:

- Step 1: Establish EBS Hotlines and Media Scanning for Alert Detection
- Step 2: Alerts Detection
- Step 3: Registration of EBS Alerts
- Step 4: Conduct triaging of EBS Alerts
- Step 6: Conduct risk assessment and characterization
- Step 5: Conduct Verification of EBS alerts

The steps for establishing EBS at the national, regional/provincial, district and health facility levels are described in Annex 1C of this section.

1.5 Update district procedures for surveillance and response

Each year national, regional and district health officials should work together to update and adjust procedures for surveillance and response accordingly.

1.5.1 Update the description of the catchment area

At least annually, update information about the catchment area (health facilities, PoE, laboratories). This activity should be part of the health planning at the district, regional and national levels. Make sure there is a description on local population characteristics in the catchment area, what activities are happening, what risks should be accounted for, and what surveillance assets and gaps exist.

Risk mapping should extend to all public health hazards as specified by IHR 2005, including chemical, zoonotic, radiological and nuclear hazards. It is important to also include results from the risk mapping. WHO has developed an integrated risk profiling tool for assessment of public health threats, and this can be used within the broader framework of disaster risk management. (Strategic Tool for Assessing Risk Star, WHO, Draft Version, 3.3.1, July 2017).

Examples of potential risks include sources of contaminated water, lack of urgent transportation to a referral facility for women in childbirth, or potential hazards such as inadequate safety precautions in mining or occupational sites or slums where there is a public health risk, especially during heavy rains or poor latrine coverage.

To update the catchment area description, make sure you have current information about:

(a) The size of key target populations at all levels such as children less than five years of age, school-aged children, women of childbearing age, all children and adults from ages one to 30, people living in refugee settlements, internally displaced persons' settlements, out-of-school youth, and other vulnerable groups.

(b) Major public health activities in the area including public, private, and nongovernmental organization (NGO) immunization activities, clean water projects, family planning clinics, feeding centres for malnourished children, refugee camp health activities, information related to risk factors for noncommunicable diseases and so on.

In updating the district profile, you can use several methods among which is the creation of a forum with key health stakeholders at all levels, where there will be discussion on surveillance and response activities related to priority health events at the district level, and this can facilitate getting updates from stakeholders on various key areas in surveillance and response in which they are involved. This could be done through a monthly or quarterly meeting. Take the opportunity also to provide feedback about surveillance data which is reported from their institutions to the district. Involve officials from other relevant sectors in the forum to address health matters in a One Health approach.

1.5.2 Update the list of reporting sites and the names of focal surveillance officers in the district

Identify all of the health facilities, Points of Entry, and any other location in the country including community focal points required to report surveillance data or events to the next level. Create relationships with private facilities and NGOs, including the faith-based sites in the country, and involve them in surveillance activities. In some countries, there might be separate laboratory facilities and these should be recorded as reporting sites.

Record (update as needed) health facility and Points of Entry locations and names of staff who are responsible for surveillance activities. Also update the records for community focal points which may include community health workers, trained birth attendants, community leaders, public safety officials etc. Ensure that telephone and email contact information is recorded. Ensure that also in recording or updating the focal persons, identification is done of whether the focal persons have been trained in surveillance or not in order to plan for either new training or orientation to update their skills. A sample worksheet for listing the reporting sites and the contact focal person at each site is in Annex 1C of this section.

1.5.3 Identify potential community representatives that can be engaged in community-based surveillance

Any community member acceptable by the community can be a community-based surveillance (CBS) focal person. They should be selected by the communities they live in so as to increase empowerment and ownership of CBS. Representation could be from basic community-level services such as trained birth attendants, community or village health agents, or similar care providers, village leaders (religious, traditional or political), school teachers, veterinarians, health extension workers, chemical seller, and traditional healers and in many communities, a respected non-health person such as the barber, shop keeper, security personnel grandmother who regularly talks to community members, are effective focal points.

Keep an updated inventory of the selected people with their contact information, including the corresponding health facility. Ensure they have a list of simplified community case definitions to facilitate case detection and reporting. A sample worksheet for listing the reporting sites and contact focal person at each site is in Annex 1C of this section.

1.5.4 Distribute updated data collection forms, reporting tools, line list, registers and technical guidelines

As you conduct updates of the catchment area description, check to see that all reporting sites have an adequate supply of surveillance reporting tools (forms, line list, registers or other means for reporting surveillance data to the district). This must also be done during regular supervisory visits. Include updates about forms and procedures for reporting, investigating and responding to public health events in quarterly district meetings with health facilities and other reporting sites. Ensure you keep and update an inventory of all information to assist you in necessary follow-ups.

1.6 Role of the laboratory in surveillance and response

There are several diseases or conditions with signs and symptoms that are the same or similar as other diseases or conditions. For example, a child with fever and rash over the entire body might be diagnosed with measles, even though there could be several causes for the child's clinical presentation (for example, scarlet fever, rubella).

Laboratories should be used as early warning alerts to detect pathogens and other hazards that have potential to spread, for example, emergence of resistant strains in the hospital or the community (for example, multi-drug resistant tuberculosis). Laboratory confirmation of diagnoses of diseases, conditions and events under surveillance is essential in order to:

(a) Accurately confirm the diagnosis in an individual patient, and

(b) verify the cause (or etiology) of a suspected outbreak.

1.6.1 Specimen collection, storage and transportation

The type of specimen collected and its packaging (storage media) depends on the suspected disease. Specimens should be collected in adequate quantity into appropriate containers at the health care facility level or, if necessary, in the field during an outbreak investigation. All specimens must be triple packaged and labelled correctly and accompanied with the correct laboratory forms in order to arrive at the laboratory in good condition, and provide reliable results. Minimize delays between collection of the specimen and processing in the laboratory.

Ensure that health facilities have trained personnel, equipment as well as adequate reagents and consumables to enable sample collection. A clearly defined transportation process is required to enable health facilities to understand where to send samples.

Many factors can affect the reliability of interpretation of laboratory test results. For example, results are difficult to interpret when:

(a) A specimen is collected inappropriately, for example, a blood specimen has haemolysed.

(b) Delay in transportation and/or processing may result in bacterial contamination in a collected specimen such as urine.

(c) Use of wrong transport or storage media or container may cause reduced viability of the suspected organism.

(d) Given antibiotics before specimen for cultures are collected.

(e) Wrong temperature is used for storage of specimen.

The disease-specific reference tables in section 11 list recommended laboratory procedures for confirming priority diseases and conditions including:

(a) The diagnostic test for confirming the disease or condition

(b) The specimen to be collected

(c) When to collect the specimen

(d) How to collect the specimen

(e) How to prepare, store and transport the specimen

(f) When to expect the results

(g) Sources for additional information.

It is necessary to initiate public health measures even before laboratory confirmation has been received. It should be noted that the patient should be contained basing on signs and symptoms, and case management should be initiated immediately even prior to laboratory results such as in the case of Viral Haemorrhagic Fevers.

1.6.2 Establish a laboratory network

The local surveillance and the laboratory focal persons at each level of the health system should maintain an updated list of the laboratories that have the capacity to perform required laboratory testing. A sample worksheet for listing national laboratories for confirming priority diseases and conditions is in Annex 1F of this section. Provide information to all health facilities about the methods for transporting specimens including how to prepare, handle, ship and store the specimens. Make sure to disseminate information about packing and shipping infectious material as directed by national policy.

At healthcare facilities, district and regional health system levels, the focus is on safe collection, handling, transportation and processing of specimens as well as giving prompt feedback. The local surveillance or laboratory focal person should establish or strengthen routine communication with identified laboratories that receive specimens from your health facility or district. The purpose of this routine contact is to strengthen communication between the health facilities in the district that will be sending specimens, and the laboratory that will be receiving them. Develop procedures so that each entity understands their roles and responsibilities. Ensure that the procedures for specimen collection, transportation, confirming the disease or condition through laboratory testing and reporting the results are clear and can be reliably carried out.

To support regional or district level laboratories within the network, the national level health authority will establish a memorandum of understanding (MOU) with laboratories outside the area or network that have the capacity for specific diagnostic procedures not available locally. The national level should also support the laboratory through advocacy with high decision-makers in putting the mechanisms and structures in place to procure and enable quick access, when needed, to the necessary supplies to collect, handle, store, and ship specimens safely through the network.

In addition, it is also crucial to improve collaboration between human and veterinary and other relevant public health laboratories in line with the One Health approach.

1.6.3 Update inventory of supplies, reagents and equipment used for confirmation of diseases from laboratories performing the test

Surveillance activities should actively work with the laboratories regarding supplies, reagents and equipment to avoid duplication and maintain an updated list of supplies, reagents and equipment available in each laboratory. This should be done especially in public health facilities; but an attempt should be made also from private facilities to obtain a comprehensive inventory. The inventory should also consist of telephone numbers of the laboratory focal persons.

1.6.4 Describe laboratory procedures for confirming priority diseases and conditions

The national level should make sure that laboratory protocols and guidelines are established and known at all levels. A laboratory focal person should be identified at all levels. Each laboratory focal person should make sure that laboratory protocols and guidelines and procedures are followed at their assigned level. Refer to Annex 1E for roles and responsibilities of laboratory focal persons at all levels.

1.6.5 Establish a laboratory quality control and assurance programme

A quality assurance programme (internal and external quality control) is the backbone of good laboratory performance. Laboratory quality control and quality assurance are important for building confidence in the results obtained. Establishing or strengthening the laboratory quality assurance programmes will allow improvement of the reliability and reproducibility of laboratory results. Coordinate with regional or national laboratory authorities to establish activities for ensuring quality results from laboratories in the catchment area.

Standard operating procedures (SOPs) are among the most important documents in a diagnostic laboratory. Ensure that each laboratory has up-to-date written SOPs for all techniques performed in the laboratory. These procedures should be the same throughout a country's laboratory network so that each laboratory is performing tests in the same manner. These SOPs should also incorporate internal quality controls. In addition, laboratories should participate in quality assurance programmes and corrective actions implemented based on sub-standard/poor results, in order to maintain excellence in the laboratory. Laboratories should be encouraged to engage in the **WHO Stepwise Laboratory Improvement Process Towards Accreditation (SLIPTA)** if not yet accredited. Refer to WHO Stepwise Laboratory Quality Improvement Process towards Accreditation (SLIPTA) *[Checklist Version 2:2015 for Clinical and Public Health Laboratories for how to do SLIPTA assessment and http://apps.who.int/iris/handle/10665/204423].*

1.7 Annexes to Section 1

Annex 1A WHO/AFRO standard case definitions for reporting suspected priority diseases, conditions and events from the health facility to the district

Annex 1B Community level case definitions using key signs and symptoms

Annex 1C Guide for establishing Event-Based Surveillance (EBS) at the national, regional/provincial, district and health facility levels

Annex 1D List of district reporting sites

Annex 1E Laboratory functions by health system level

Annex 1F Responsibilities of Laboratory Focal Persons at All Levels

Annex 1G List of national health and veterinary laboratories for confirming priority diseases, conditions, and events

Annex 1A: WHO AFRO standard case definitions for reporting suspected priority diseases conditions and events from the health facility to the district

WHO/AFRO proposes that health facilities use the following examples of standard case definitions for reporting suspected cases of priority diseases and conditions to the district level. Please refer to the disease-specific guidelines in section 11 for additional information for each of the priority diseases targeted for surveillance by WHO/AFRO which include action to be taken in response to alert and epidemic thresholds.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Acute Haemorrhagic fever syndrome	**Suspected case:** Acute onset of fever of less than three weeks duration in a severely ill patient/ or a dead person AND any two of the following; haemorrhagic or purpuric rash; epistaxis (nose bleed); haematemesis (blood in vomit); haemoptysis (blood in sputum); blood in stool; other haemorrhagic symptoms and no known predisposing factors for haemorrhagic manifestations OR clinical suspicion of any of the viral diseases. **Confirmed case:** A suspected case with laboratory confirmation or epidemiologic link to confirmed cases or outbreak. Note: During an outbreak, case definitions may be changed to correspond to the local event. It is important to note that during outbreaks, most cases might not show haemorrhagic manifestation, a proper history taking is crucial
Acute and chronic viral hepatitis	**(a) Acute Viral Hepatitis:** ***Suspected case***: Any person with discrete onset of an acute illness with signs/symptoms of: (i) Acute infectious illness (for example, fever, malaise, fatigue) and (ii) Liver damage (for example, anorexia, nausea, jaundice, dark coloured urine, right upper quadrant tenderness of body), **AND/OR** (iii) Raised alanine aminotransferase (ALT) levels more than ten times the upper limit of normal ***Confirmed case***: A suspected case that is laboratory confirmed by virus specific biomarkers: • **Acute Hepatitis A:** anti-HAV IgM positive or positive for HAV RNA • **Acute Hepatitis B:** Hepatitis B surface antigen **(**HBsAg) positive AND anti-hepatitis B core antigen (anti-HBc) IgM positive, HBV DNA positive • **Acute Hepatitis C:** HCV RNA positive (Viral Load), HCV core antigen positive (where available) and anti-HCV IgM positive. Markers of acute hepatitis A (anti-HAV IgM) and hepatitis E (anti-HEV IgM) are negative. • **Acute Hepatitis D:** HBsAg positive (or anti-HBc IgM positive) plus anti-HDV positive (usually IgM), and HDV RNA (HDV infection ONLY occurs as co-infection or super-infection of hepatitis B) • **Acute Hepatitis E:** anti-HEV IgM positive **(b) Chronic Viral Hepatitis Case definition (HBV and HCV):** **Chronic Hepatitis B:** • HBsAg is the first serological marker to appear. Persistence of HBsAg for at least six months indicates chronic infection • Anti-HBc positive (usually IgG)

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Chronic Hepatitis C: • Hepatitis C virus RNA positive in a person with anti-HCV positive (usually IgG) • HCV RNA positive OR HCV core antigen positive **NB:** Antibody detection (that is, HCV Ab positive) cannot differentiate between acute, chronic infection and past infection
Adverse events following immunization (AEFI)	Any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine. The adverse event may be any unfavourable or unintended sign, abnormal laboratory finding, symptom or disease.
Anthrax	**Suspected case:** Any person with acute onset characterized by several clinical forms which are: **1. Cutaneous form**: Any person with skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by oedema that may be mild to extensive. 2. **Gastro-intestinal:** Any person with abdominal distress characterized by nausea, vomiting, anorexia and followed by fever **3. Pulmonary (inhalation):** any person with brief prodromal resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnoea and high temperature, with X-ray evidence of mediastinal widening **4. Meningeal:** Any person with acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections, but may present without any other clinical symptoms of anthrax **AND** has an epidemiological link to confirmed or suspected animal cases or contaminated animal products **Confirmed case:** A confirmed case of anthrax in a human can be defined as a clinically compatible case of cutaneous, inhalational or gastrointestinal illness that is laboratory-confirmed by: 1. isolation of *B. anthracis* from an affected tissue or site; or 2. Other laboratory evidence of *B. anthracis* infection based on at least two supportive laboratory tests. **Note:** *It may not be possible to demonstrate* B. *anthracis in clinical specimens if the patient has been treated with antimicrobial agents*
Buruli ulcer (*Mycobacterium ulcerans* disease)	**Suspected case**: A person presenting a painless skin nodule, plaque or ulcer, living in or having visited a BU endemic area **Confirmed case:** A suspected case confirmed by at least one laboratory test (Ziel-Neelsen stain (ZN stain) for AFB, PCR, culture or histology). Confirmation of presence of mycolactone in skin lesions
Chikungunya	**Suspected case**: Any person with acute onset of fever >38.5°C and severe arthralgia/arthritis not explained by other medical conditions. **Confirmed case**: A suspected case with laboratory confirmation.
Cholera	**Suspected cholera case**: In areas where a cholera outbreak has not been declared: Any patient aged two years and older presenting acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea. In areas where a cholera outbreak is declared: any person presenting or dying from acute watery diarrhoea.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Confirmed cholera case: A suspected case with Vibrio cholerae O1 or O139 confirmed by culture or PCR polymerase chain reaction and, in countries where cholera is not present or has been eliminated, the Vibrio cholerae O1 or O139 strain is demonstrated to be toxigenic
Dengue Fever	**Dengue Fever Suspected case:** Any person with acute febrile illness of 2-7 days duration with 2 or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia. **Dengue Fever Confirmed case:** A suspected case with laboratory confirmation (positive IgM antibody, fourfold or greater increase in IgG antibody titers in paired (acute and convalescent) serum specimens, positive PCR or Isolation of the dengue virus using cell culture). **Dengue Haemorrhagic Fever**: A probable or confirmed case of dengue with bleeding tendencies as evidenced by one or more of the following: positive tourniquet test; petechieae, ecchymoses or purpura; bleeding: mucosa, gastrointestinal tract, injection sites or other; haematemesis or melaena; and thrombocytopenia (100 000 cells or less per mm3) and evidence of plasma leakage due to increased vascular permeability, manifested by one or more of the following: 20% rise in average haematocrit for age and sex, 20% drop in haematocrit following volume replacement therapy compared to baseline, signs of plasma leakage (pleural effusion, ascites, hypo-proteinaemia). **Dengue Shock Syndrome**: All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (≤ 20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.
Diabetes	**Suspected new case**: Any person presenting the following symptoms: (a) Increased thirst (b) Increased hunger (c) Frequent urination **Confirmed new case:** Any person with a fasting 6.1 mmol/L (110 mg/dl) Or venous plasma glucose measurement of ≥ 7 mmol/L (126 mg/dl) or capillary glucose ≥ 6.1 mmol/L (110 mg/dl) **OR** Any person with a non-fasting glucose ≥ 11.1 mmol/L (200mg/dl) Or venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl)
Diarrhoea with blood (Dysentery)	**Suspected case**: A person with (abdominal pain) and diarrhoea with visible blood in stool. **Confirmed case**: Suspected case with stool culture positive for *Shigella dysenteriae* type 1.
Diarrhoea with dehydration in children less than five years of age	***Suspected case***: Passage of three or more loose or watery stools in the past 24 hours with or without dehydration and: *Some dehydration* -- two or more of the following signs: restlessness, irritability; sunken eyes; thirsty; skin pinch goes back slowly, or *Severe dehydration* -- two or more of the following signs: lethargy or unconsciousness; sunken eyes; not able to drink or drinking poorly; skin pinch goes back very slowly. ***Confirmed case***: Suspected case confirmed with stool culture for a known enteric pathogen.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Note: Laboratory confirmation of specific agent causing outbreak is not routinely recommended for surveillance purposes.
Dracunculiasis	***Rumour*** • ***Information*** about the occurrence of Guinea worm disease (Dracunculiasis) from any source. ***Suspected case*** • ***A person*** presenting a skin lesion with itching or blister living in an endemic area or risk areas for Guinea worm, with the emergence of a worm. ***Confirmed case*** A case of guinea-worm disease is a person exhibiting a skin lesion with emergence of a Guinea worm, and in which the worm is confirmed in laboratory tests to be *D. medinensis*. That person is counted as a case only once during the calendar year, that is, when the first worm emerges from that person. All worm specimens should be obtained from each case patient for laboratory confirmation and sent to the United States Centers for Disease Control and Prevention (CDC). All cases should be monitored at least twice per month during the remainder of the calendar year for prompt detection of possible emergence of additional guinea worms.
Ebola or Marburg virus diseases	**Routine Surveillance:** ***Suspected case***: Illness with onset of fever and no response to usual causes of fever in the area, and at least one of the following signs: bloody diarrhoea, bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine. ***Confirmed case***: A suspected case with laboratory confirmation (positive IgM antibody, positive PCR or viral isolation), or epidemiological link to confirmed cases or outbreak **In Outbreak setting, the following standard case definitions may guide appropriate detection of cases:** ***Suspected case:*** Any person, alive or dead, suffering or having suffered from a sudden onset of high fever and having had contact with: - a suspected, probable or confirmed Ebola or Marburg case; - a dead or sick animal (for Ebola) - a mine (for Marburg) **OR** • Any person with sudden onset of high fever and at least three of the following symptoms: - headaches - lethargy - anorexia / loss of appetite - aching muscles or joints - stomach pain - difficulty swallowing - vomiting - difficulty breathing - diarrhoea - hiccups; **OR** • Any person with inexplicable bleeding; **OR** • Any sudden, inexplicable death; ***Probable case:*** Any suspected case evaluated by a clinician; **OR** Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link with a confirmed case Note: if laboratory specimens are collected in due time
Epilepsy	**Suspected case**: Any person with one epileptic seizure

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Suspected new case: Report only the first diagnostic of the case in the health centre **Confirmed case**: Any person with recurrence of, at least, two epileptic seizures. A positive response to treatment with any AED strengthens the hypothesis of a confirmed case. Epileptic seizures can last for 30 seconds to three minutes. When they intricate without a pause, they can lead to *status epilepticus*.
Human influenza caused by a new subtype	**Suspected H5N1 case**: Any person presenting unexplained acute lower respiratory illness with fever (>38 ºC) and cough, shortness of breath **OR** difficulty breathing **AND** one or more of the following exposures within the 7 days prior to symptom onset: (a) Close contact (within 1 meter) with a person (for example, caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5N1 case; (b) Exposure (for example, handling, slaughtering, de-feathering, butchering, preparation for consumption) to poultry or wild birds or their remains or to environments contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month; (c) Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month; (d) Close contact with a confirmed H5N1 infected animal other than poultry or wild birds; (e) Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting. **Confirmed H5N1 case**: A person meeting the criteria for a suspected case **AND** positive laboratory results from a laboratory whose H5N1 test results are accepted by WHO as confirmatory. NB: ***Include IHR case definition for reporting of human infection with a novel influenza virus***
Hypertension	**Suspected new case at first visit:** Any individual presenting a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure. **Confirmed case:** Any individual presenting on at least two occasions a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure
Influenza-like Illness (ILI)	An acute respiratory infection in a child or adult with: • Sudden onset of fever > 38 ºC AND • Cough • with onset within the last 10 days. **A confirmed case of influenza** is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus).
Injuries (Road Traffic Accidents)	**Road traffic injury:** Any person who has sustained an injury as a result of a road traffic crash presenting himself/herself for the first time. **Road traffic fatality:** Any person killed immediately or dying within 30 days as a result of an injury crash.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Lassa and Crimean-Congo Haemorrhagic Fevers (CCHF)	**Suspected case of CCHF**: Illness with sudden onset of fever, malaise, weakness, irritability, headache, severe pain in limbs and loins and marked anorexia. Early development of flush on face and chest and conjunctival infection, haemorrhagic exanthema of soft palate, uvula and pharynx, and often fine petechial rash spreading from the chest and abdomen to the rest of the body, sometimes with large purpuric areas. **Confirmed case of CCHF**: A suspected case with laboratory confirmation (positive IgM antibody, PCR, viral isolation or IgG seroconversion by ELISA or IFA) or epidemiological link to confirmed cases or outbreak. **Suspected case of Lassa Fever**: Illness with gradual onset with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain hearing loss and a history of contact with excreta of rodents or with a case of Lassa Fever **Confirmed case of Lassa Fever:** A suspected case that is laboratory confirmed (positive IgM antibody, PCR or virus isolation) or epidemiologically linked to a laboratory confirmed case.
Leprosy	**Suspected case**: A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skin lesion, loss or decrease of sensations in skin patch, enlargement or peripheral nerve. **Confirmed case:** A person showing at least two cardinal signs of leprosy and who has not completed a full course of treatment with Multi Drug Therapy (MDT).
Lymphatic Filariasis	**Suspected case**: Resident of an endemic area with a clinical sign of hydrocoele or lymphoedema for which other causes of these findings have been excluded. **Confirmed case:** A person with positive laboratory diagnosis of microfilaremia in blood smear, filarial antigenaemia or positive ultrasound test.
Malaria	***Uncomplicated malaria*** Any person living in area at risk of malaria with fever or history of fever within 24 hours; without signs of severe disease (vital organ dysfunction) is diagnosed clinically as malaria. ***Confirmed uncomplicated malaria*** Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites. ***Unconfirmed severe malaria*** Any patient living in area at risk of malaria hospitalised with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically ***Confirmed Severe malaria*** Any patient hospitalized with *P. falciparum* asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Malnutrition	**Low birth weight neonates:** Any new born with a birth weight less than 2500 grams (or 5.5 lbs) **Malnutrition in children:** (a) Children under five who are underweight (indicator: weight for age<-2 Z Score) (b) Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality) (c) Bilateral pitting oedema **Malnutrition in pregnant women:** Pregnant women giving birth to low birth weight babies (birth weight < 2.5 Kg) (poor nutritional and health status of the women, can predict which population groups may benefit from improved antenatal care of women and neonatal care for infants).
Maternal Deaths	The death of a woman while pregnant or within 42 days of the delivery or termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
Measles	**Suspected case**: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles. **Confirmed case**: A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an outbreak.
Middle East Respiratory Syndrome Coronavirus (MERS-CoV)	**NB Several case definitions exist, depending on whether a person resides in Middle East or not. Please refer section 11 for details** **Suspected case:** A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (for example, pneumonia or ARDS), based on clinical or radiological evidence, and who has travelled within 14 days before onset of illness to the Middle East[2] or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred. Individuals with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures (Note: see section on Recommendations for testing in clusters associated with health care settings): (a) close physical contact[1] with a confirmed or probable case of MERS-CoV infection, while that patient was ill; (b) a health care facility in a country where hospital-associated MERS-CoV infections have been reported; (c) direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS-CoV is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission. **Confirmed case** A person with laboratory confirmation of MERS-CoV infection, irrespective of clinical signs and symptoms.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Bacterial Meningitis	***Suspected meningitis case:*** Any person with sudden onset of fever (>38.5 °C rectal or 38.0 °C axillary), and neck stiffness or other meningeal signs, including bulging fontanelle in infants. ***Probable meningitis case:*** Any suspected case with macroscopic aspect of cerebrospinal fluid (CSF) turbid, cloudy or purulent; or with a CSF leukocyte count >10 cells/mm3 or with bacteria identified by Gram stain in CSF; or positive antigen detection (for example, by latex agglutination testing) in CSF ***In infants:*** CSF leukocyte count >100 cells/mm3; or CSF leukocyte count 10–100 cells/mm3 and either an elevated protein (>100 mg/dl) or decreased glucose (<40 mg/dl) level. ***Confirmed meningitis case*** Any suspected or probable case that is laboratory confirmed by culturing or identifying (that is, polymerase chain reaction) a bacterial pathogen (Neisseria meningitidis, Streptococcus pneumoniae, Haemophilus influenzae type b) in the CSF or blood.
Monkey pox	***Suspected case***: An acute illness with fever > 38.3 C (101 F), intense headache, lymphadenopathy, back pain, myalgia, and intense asthenia followed one to three days later by a progressively developing rash often beginning on the face (most dense) and then spreading elsewhere on the body, including soles of feet and palms of hand. ***Probable case*:** A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case ***Confirmed case*:** A clinically compatible case that is laboratory confirmed. ***Differential diagnosis:*** Alternative causes of clinical symptoms that must be considered include other rash illnesses, such as, smallpox, chickenpox, measles, bacterial skin infections, scabies, syphilis, and medication-associated allergies.
Neonatal tetanus/Non-neonatal tetanus	**Suspected case**: *Neonatal Tetanus*--Any newborn with a normal ability to suck and cry during the first two days of life, and who, between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both. *Non-neonatal Tetanus*—Any person > 28 days of age with acute onset of one of the following: lockjaw, sustained spasm of the facial muscles, or generalized muscle spasms. **Confirmed case**: No laboratory confirmation recommended.
New HIV Case	WHO/AFRO recommends that countries use either Bangui or Abidjan HIV/AIDSR case definitions. A positive ELISA for confirming HIV and a rapid test for confirming the positive results are sufficient for an epidemiologic case definition for HIV Infection.
Noma	**Suspected new case**: Any child with a mouth ulcer and other warning signs such as; malnutrition, poor hygiene, recent illness from; measles, persistent diarrhoea, or malaria should be regarded as a potential noma case. **Confirmed new case**: Any person with a gangrenous disease which starts as gingival ulceration and spreads rapidly through the tissues of the mouth and face, destroying the soft and hard tissues.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Onchocerciasis	**Suspected case**: In an endemic area, any person with fibrous nodules in subcutaneous tissues. **Confirmed case**: A suspected case that is laboratory confirmed by presence of one or more of the following: microfilariae in skin snips, adult worms in excised nodules, or typical ocular manifestations (such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body).
Plague	***Suspected case***: (a) compatible clinical presentation; (sudden onset of fever, chills, headache, severe malaise, prostration and very painful swelling of lymph nodes, or cough with blood stained sputum, chest pain, and difficulty in breathing); and (b) consistent epidemiological features, such as exposure to infected animals or humans and/or evidence of flea bites and/or residence in or travel to a known endemic locus within the previous 10 days. ***Confirmed case***: Any person with suspected case confirmed by isolation of *Yersinia pestis* from blood or aspiration of buboes, or specific seroconversion or rapid diagnostic test detecting the Ag F1 in endemic areas
Poliomyelitis (Acute flaccid paralysis)	**Suspected case:** Any child under 15 years of age with acute flaccid paralysis or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis. **Confirmed case**: A suspected case with virus isolation in stool.
Perinatal deaths	**A perinatal death** is defined as the death of a baby of at least 28 weeks of gestation and/or 1,000 g in weight and early neonatal death (the first seven days after birth) **A stillbirth** is defined as any death of a baby before birth and with no signs of life at birth of at least 1 000 g birthweight and/or at least 28 weeks gestation and 35 cm long. **Early neonatal** death is defined as any death of a live newborn occurring before the first seven complete days of life. Day 1 is clinically considered the first day of life.
Human Rabies	**Suspected:** A person with one or more of the following: headache, neck pain, nausea, fever, fear of water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected. **Confirmed:** A suspected case that is laboratory confirmed
Rift Valley Fever (RVF)	**Suspected case** **Early disease** (a) Acute febrile illness (axillary temperature >37.5 ºC or oral temperature of >38.0ºC) of more than 48 hours duration that does not respond to antibiotic or antimalarial therapy, and is associated with: (b) Direct contact with sick or dead animal or its products **AND / OR**: (c) Recent travel (during last week) to, or living in an area where, after heavy rains, livestock die or abort, and where RVF virus activity is suspected/confirmed **AND / OR:** (d) Abrupt onset of any one or more of the following: exhaustion, backache, muscle pains, headache (often severe), discomfort when exposed to light, and nausea/vomiting **AND / OR**:

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	(e) Nausea/vomiting, diarrhoea OR abdominal pain with one or more of the following: • Severe pallor (or Hb < 8 gm/dL) • Low platelets (thrombocytopenia) as evidenced by presence of small skin and mucous membrane haemorrhages (petechiae) (or platelet count < 100x109 / dL) • Evidence of kidney failure (oedema, reduced urine output) (or creatinine > 150 mol/L) **AND / OR**: • Evidence of bleeding into skin, bleeding from puncture wounds, from mucous membranes or nose, from gastrointestinal tract and unnatural bleeding from vagina **AND / OR:** • Clinical jaundice (3-fold increase above normal of transaminases) **Late stages of diseases or complications (2-3 weeks after onset)** (a) Patients who have experienced, in the preceding month a flu-like illness, with clinical criteria, who additionally develop the following: (b) CNS manifestations which resemble meningo-encephalitis **AND/OR** (c) Unexplained visual loss **OR** (d) Unexplained death following sudden onset of acute flu-like illness with haemorrhage, meningo-encephalitis, or visual loss during the preceding month. **Confirmed case:** Any patient who, after clinical screening, is positive for anti-RVF IgM ELISA antibodies (typically appear from fourth to sixth day after onset of symptoms) or tests positive on Reverse Transcriptase Polymerase Chain Reaction (RT-PCR).
Severe Acute Respiratory Infections (SARIs)	**Severe acute respiratory infection (persons≥ 5 years old):** Any severely ill person presenting manifestations of acute lower respiratory infection with: (a) Sudden onset of fever (>38ºC) AND (b) Cough or sore throat AND (c) Shortness of breath, or difficulty breathing (d) With or without Clinical or radiographic findings of pneumonia **OR** Any person who died of an unexplained respiratory illness.
Severe Acute Respiratory Syndrome (SARS)	***Suspected case of SARS*** is an individual with: 1. A history of fever, or documented fever ≥ 38 °C **AND** 2. One or more symptoms of lower respiratory tract illness (cough, difficulty breathing, shortness of breath) **AND** 3. Radiographic evidence of lung infiltrates consistent with pneumonia or ARDS or autopsy findings consistent with the pathology of pneumonia or ARDS without an identifiable cause **AND** 4. No alternative diagnosis can fully explain the illness. ***Confirmed case of SARS***: An individual who tests positive for SARS-CoV infection by the WHO recommended testing procedures.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Severe Pneumonia in Children under 5	**Clinical case definition (IMCI) for pneumonia** A child presenting cough or difficult breathing and: (a) 50 or more breaths per minute for infant age 2 months up to 1 year (b) 40 or more breaths per minute for young child 1 year up to 5 years. ***Note:*** *A young infant age 0 up to 2 months with cough and fast breathing is classified in IMCI as "serious bacterial infection" and is referred for further evaluation.* **Clinical case definition (IMCI) for severe pneumonia:** A child presenting cough or difficult breathing and any general danger sign, or chest in-drawing or stridor in a calm child. General danger signs for children 2 months to 5 years are: unable to drink or breast feed, vomits everything, convulsions, lethargy, or unconsciousness. **Confirmed case:** Radiographic or laboratory confirmation of pneumonia may not be feasible in most districts.
Sexually transmitted infections	**Genital ulcer syndrome (non-genital ulcer syndrome (non-vesicular):** **Suspected case**: Any male with an ulcer on the penis, scrotum, or rectum, with or without inguinal adenopathy, or any female with ulcer on labia, vagina, or rectum, with or without inguinal adenopathy. **Confirmed case:** Any suspected case confirmed by a laboratory method. **Urethral discharge syndrome:** **Suspected case**: Any male with urethral discharge with or without dysuria. **Confirmed case**: A suspected case confirmed by a laboratory method (for example Gram stain showing intracellular Gram-negative diplococci).
Smallpox (*Variola*)	**Suspected case**: An illness with acute onset of fever > 38.3 C (101 F) followed by a rash characterized by vesicles or firm pustules in the same stage of development without other apparent cause. **Probable case:** A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case. **Confirmed case:** A clinically compatible case that is laboratory confirmed.
Trachoma	**Suspected case**: Any patient with red sticky eyes who complains of pain and itchiness of the eyes. **Confirmed case:** Any patient with red sticky eyes who complains of pain and itchiness of the eyes where examination of the eyes confirms one of the stages of Trachoma infection according to the **WHO Simplified Trachoma Grading System**.
Trypanosomiasis	**Suspected case**: ***Early stage:*** a painful chancre originating as a papule and then evolving into a nodule at the primary fly bite site. There may be fever, intense headache, insomnia, painless lymphadenopathy, anaemia, local oedema and rash. ***Late stage:*** cachexia, somnolence, and central nervous system signs.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Confirmed case: A suspected case confirmed by card agglutination trypanosomal test (CATT) or by isolation of trypanosomes in blood lymph nodes or cerebrospinal fluid.
Tuberculosis	**Suspected case**: Any person with a cough of 3 weeks or more. **Confirmed case**: ***Smear-positive pulmonary*** TB: (a) a suspected patient with at least 2 sputum specimens positive for acid-fast bacilli (AFB), or (b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined by the treating medical officer, or (c) one positive sputum smear by microscopy and one sputum specimen positive on culture for AFB. ***Smear negative PTB*:** a patient who fulfils all the following criteria: (a) two sets taken at least 2 weeks apart of at least two sputum specimens negative for AFB on microscopy, radiographic abnormalities consistent with PTB and a lack of clinical response despite one week of a broad spectrum antibiotic, a decision by a physician to treat with a full course of anti-TB chemotherapy, or (b) a patient who fulfils all the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and miliary), a decision by a physician to treat with a full course of anti-TB chemotherapy, or (c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequent sputum culture result is positive.
Typhoid Fever	**Suspected case:** Any person with gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes, abdominal pain and constipation or diarrhoea. **Confirmed case:** Suspected case confirmed by isolation of *Salmonella typhi* from blood, bone marrow, bowel fluid or stool.
West Nile Fever	**Suspected case:** A hospitalized case of encephalitis due to unknown cause **Confirmed case:** Confirmation of West Nile Fever is through laboratory diagnostics to identify WNV-specific IgM
Yaws and endemic syphilis or bejel	**Suspected case:** a person with a history of residence in an endemic area (past or present) who presents clinically active (visible) yaws lesions **Confirmed case: a** suspected case with a positive serological test (rapid treponemal test for syphilis confirmed by DPP test) Imported case: a person who presents clinically active yaws serologically confirmed in an area where yaws is not known to be endemic **Index case**: first case of yaws which is detected in a community ***Contact of a case:*** a person who has close, frequent contact with the infected person. A contact for the purpose of yaws eradication is the household, classmates or close playmates as identified by the contact
Yellow Fever	**Suspected case**: Any person with acute onset of fever, with jaundice appearing within 14 days of onset of the first symptoms. **Probable case:** A suspected case **A N D** One of the following: (a) Epidemiological link to a confirmed case or an outbreak (b) Positive post-mortem liver histopathology

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Confirmed case: A probable case AND One of the following (a) Detection of YF-specific* IgM (b) Detection of four-fold increase in YF IgM and/or IgG antibody titres between acute and convalescent serum samples (c) Detection of YFV-**specific*** neutralizing antibodies ***YF-specific means that antibody tests (such as IgM or neutralizing antibody) for other prevalent flavivirus are negative. This testing should include at least IgM for Dengue and West Nile and may include other flavivirus depending on local epidemiology.*** **OR** One of the following: (a) Detection of YF virus genome in blood or other organs by PCR (b) Detection of yellow fever antigen in blood, liver or other organs by immunoassays Isolation of the yellow fever virus
Zika virus disease	***Suspected Case:*** A person presenting rash and/or fever and at least one of the following signs or symptoms: (a) arthralgia; or (b) arthritis; or (c) conjunctivitis (non-purulent/hyperaemic). ***Probable case:*** A suspected case with presence of IgM antibody against Zika virus and an epidemiological link (with no evidence of infection with other flaviviruses). ***Confirmed case:*** A person with laboratory confirmation of recent Zika virus infection: • presence of Zika virus RNA or antigen in serum or other samples (for example, saliva, urine, tissue, whole blood); or IgM antibody against Zika virus positive (commercially available ELISA) *These case definitions may change based on new knowledge*

Annex 1B: Community level case definitions using key signs and symptoms

Inform community leaders, community health workers, traditional healers, birth attendants, and health workers who conduct outreach activities in hard-to-reach areas about the priority diseases and conditions under surveillance in your area. Use key signs and symptoms of case definitions which have simple language and easier to understand than the IDSR health facility case definitions. The following are examples of some of selected case definitions which can be used to help the community to recognize the diseases and refer a person with these signs for treatment and notify the health facility.

Examples of how key signs and symptoms of case definitions may be described at the community level	
Acute Flaccid Paralysis (AFP)	Any child under 15 years old with a sudden onset of weakness and /or inability to use their hand(s) and or leg(s)
Acute watery diarrhoea	Any person with 3 or more loose stools within the last 24 hours
Acute haemorrhagic fever syndrome	Any person who has an unexplained illness with fever and bleeding or who died after an unexplained severe illness with fever and bleeding
Adverse event following immunization (AEFI)	Any unusual event that follows immunization
Diarrhoea in children less than 5 years of age	Any child who has three or more loose or watery stools in the past 24 hours with or without dehydration
Diarrhoea with blood (Dysentery)	Any person with diarrhoea, stomach pain and visible blood in the stool
Guinea Worm (Dracunculiasis)	Any person presenting a skin wound living in an endemic area or risk areas of Guinea worm, with a worm coming out
Hepatitis	Any person with fever and yellowing in the white part of the eyes
Animal bite (potential rabies)	Any person who is bitten by a dog or other mammal
Influenza-like illness (ILI)	Any person with fever and cough or throat pain or runny nose
Leprosy	Any person with skin patch with loss of feeling
Malaria	**[If in an endemic country]:** Any person with fever or a history of fever in the previous 24 hours and or the presence of pallor (whiteness) of the palms in young children **[If in a non-endemic country]:** Any person who has been exposed to mosquito bite and a history of fever or fever in the previous three days
Measles	Any person with fever and rash
Meningitis	Any person with fever and neck stiffness

Examples of how key signs and symptoms of case definitions may be described at the community level	
Maternal death	The death of a woman while pregnant or within 42 days after delivery
Neonatal death	Any death of a live newborn occurring before the first 28 complete days of life
Neonatal tetanus	Any newborn who is normal at birth, and then after 2 days, becomes stiff and unable to suck or feed or has convulsions/fits.
Onchocerciasis	Any person in an endemic area with fibrous nodules under the skin
Plague	Any person with painful swelling under the arms or in the groin area. In an area known to have plague, any person with cough, chest pain and fever.
Pneumonia	Any child less than 5 years of age with cough and fast breathing or difficulty in breathing.
Rabies (human)	Any person with a sense of apprehension, headache, fever, malaise and indefinitive sensory changes often referred to the site of a preceding animal bite. Excitability and hydrophobia are frequent symptoms.
Sexually transmitted infections (STIs)	Any person male or female who has an urethral/vaginal discharge or genital sores or pain
Tuberculosis	Any person with cough for 3 weeks or more
Typhoid fever	Any person with a prolonged fever during the previous 3 weeks or more
Viral haemorrhagic fever	Any person who has fever and two or more other symptoms (headache, vomiting, yellow eyes, running stomach, weak in the body) or who died after serious sickness with fever or bleeding
Yellow fever	Any person who has fever and two or more other symptoms (headache, vomiting, running stomach, weak in the body, yellow eyes) or who died after serious sickness with fever or bleeding

Examples of how key signs and symptoms of case definitions may be described at the community level	
Unusual health events	• Two or more persons presenting similar severe illnesses in the same setting (for example, household, workplace, school, street) within one week • Two or more persons dying in the same community within one week • Increase in number of animal sicknesses and/or deaths, including poultry, within one week • Any human illness or death after exposure to animals and animal products, including poultry (for example, eating, physical handling) • Any person who has been bitten, scratched, or whose wound has been licked by a dog, or other animal. • Two or more persons that pass watery stools and/or vomiting after eating/drinking at a given setting (for example, wedding, funeral, festival, canteen, food sellers, etc.) • Unexpected large numbers of children absent from school due to the same illness • Any event in the community that causes public anxiety

Annex 1C: Guide for establishing Event-Based Surveillance (EBS) at the national, regional/provincial, district and health facility levels

Event-based surveillance (EBS) is the organized and rapid capture of information about events that are of potential risk to public health. Information is initially captured as an alert which is considered by the Early Warning and Response system as an alert representing potential acute risk to human health, such as an outbreak. All alerts may not necessarily become real events, as such they all need to be triaged and verified before a response is initiated.

EBS provides the opportunity for early detection of events leading to timely response. It is therefore mandatory that all countries aim at establishing EBS alongside IBS at all levels of the health system; namely national, regional/provincial, district, sub-district/health facility and community levels.

The following are the description of the required steps for establishing EBS at the national, regional/provincial, district and sub-district/health facility levels.

NB: EBS at community level have been described in the Introduction Section of the Third Edition IDSR Technical Guidelines.

I. Steps for establishing EBS at the national/regional/provincial Levels

Step 1: Establish EBS Hotlines and Media Scanning for Alert Detection

This step involves two major activities namely establishing EBS Hotlines and Media Scanning Centres as described below:

A. Establish EBS Hotlines

(a) A hotline is a phone line that the public can use to obtain information from an organization or to give the organization information. It is a short number to receive direct phone calls or information from social media platforms such as WhatsApp, Facebook, or Twitter.

(b) It should be toll free (The cost of reporting alerts to public health authorities should be zero).

(c) It is recommended to have a single number that can be used as a hotline to make reporting easy to remember. The same number can be used for hotline, Short Message Service (SMS) and social media platforms to avoid confusion. For example, if the hotline number is 499, messages sent by SMS or Facebook Messenger should also be sent to the same number.

(d) Community residents should be motivated to self-report events that may impact the public's health, including emerging public health events or outbreaks.

(e) Disseminate the hotline number by advocacy through health authorities, community health volunteers, nongovernmental organizations, religious and other leaders, or schools and also advertise through messaging in local languages by TV, radio and newspapers.

(f) Develop partnership with communication companies that can spread the hotline number by test messages to their clients. The messages sent should include the purpose of the EBS, the importance of immediately reporting alerts and how alerts can be reported.

(g) Train a team of employees to operate the EBS hotline 24 hours to respond to calls or request information from the community.

The Call methodology:

(a) The responder to the call should start by greeting and thanking them for their proactivity to report to the ministry of health or rellevant ministry hosting the hotline, concerning potential public health events.

(b) Then the responder should follow a prepared set of questions that directly reflect the questions posed in the alert logbook.

(c) The call should be ended by thanking the caller for their time , patience and proactivity.

(d) The responder should directly register in the alert logbook the alerts that meet the pre-defined list of alerts.

(e) Calls should be returned as soon as possible in situations where a call is interupted or disconnected or if calls are received while the responder is busy; this will ensure that all alerts are collected.

The Messaging methodology:

(a) Once an SMS or a social media message is received, an instant automated message should greet the sender, thank them and state that an operator will contact them.

(b) Automated questions or responders can collect information from the sender.

(c) Data should be registered directly in the alert logbook according to the pre-defined list of alerts for the country.

(d) Information about the sender should be collected for further communication and details about the alerts reported. A direct call to the sender may be needed if more information is required.

NB: Hotlines should be established at the national, regional/provincial and district levels.

(a) At the national level: The hotline with the call respondents can be established at the National Public Health Emergency Operation Centre (PHEOC) to capture and register alerts from the entire country.

(b) At the regional/provincial and district levels: The hotline can be established at the Regional/Provincial Health Authorities premises or at the Regional/Provincial PHEOC if available to capture and register alerts from the region/province.

(c) At the district level: The hotline can be established at the District Health Authorities premises to capture and register alerts from the district including the health facilities and community focal persons.

B. Establish Media Scanning Centre

(a) Media are channels of general communication amongst a population and they act as gathering tools used to store and disseminate information or data, for example, newspapers, magazines, TV, radio, bulletins and other printed forms of communication, as well as electronic or online sources.

(b) Media scanning is an active process that should be performed using different media.

(c) Media scanning is recommended to be performed at the national level.

(d) Train health personnel to conduct media scanning regularly, for example, daily.

(e) The sources of media scanning can be official and non-official.

(i) Official Media sources*:*

- NB: Alerts detected from official sources are reliable and do not need further verification.

Examples of official media sources:

- Websites of governmental sectors including, Ministries of Health, Agriculture, Environment, Foreign Affairs, etc.
- Websites for official organizations such as universities and internationally recognized centres of research.
- WHO Official websites for Early Warning, for example, WHO IHR Event Information Site for National Focal Points, which is a secured platform accessible only to national focal points.
- WHO Disease Outbreak News.
- Websites for WHO regional offices, for example, AFRO, EMRO, EURO, SEARO, WPRO, PAHO.
- Disease-specific websites, for example, Global Influenza Surveillance and Response.

(ii) Unofficial Media sources:

- NB: Alerts detected through these sources are not reliable and need to be verified.

Examples of unofficial media sources:

- Newspapers and magazines
- Online content of TV and radio channels
- Social media, for example, Facebook, Twitter
- Unofficial websites, for example, ProMED, The Global Information Network (GPHIN), HealthMap, MEDISYS, etc.

Methods of online media scanning

Online information scanning can be done manually and automatically.

The Steps for Manual Scanning

(a) Develop a checklist for scheduled (for example, daily) review of online sources.

(b) Develop a list of prioritized alerts regarding strategies, capacities and resources of the country.

(c) Develop a list for keywords related to the prioritized alerts including diseases, syndromes or events.

(d) Visit all predetermined websites in the checklist of online sources to scan for keywords.

The Automated scanning

(a) There are multiple automated technological tools that can be used for scanning of online information from pre-defined sources.

(b) These tools can save time and effort and support early detection of public health threats.

(c) Examples of automated scanning are:

(i) Rich site summary (RSS feeds) are standardized software tools that monitor the pre-defined websites and inform the user with updates.

(ii) Contributor-based sources are based on sharing information among health professionals, in which individuals collect information that can be accessed through shared feeds, for example, ProMed.

(iii) Automated information feeds or services developed by governments or international organizations that collect health information from several sources and then can decrease time spent in scanning for individual sources. These are called data aggregators.

Step 2: Alerts Detection

(a) Alerts detection is the process of capturing information on the potential public health events reported to the hotline.

(b) Members of the general public may communicate with the hotline desk through phone calls, SMS, social media messaging or website chats.

(c) The hotline desk team should filter received notifications from callers to determine which alerts are valid.

(d) A list of alerts developed by national public health authorities should be provided to the hotline desk operators, or responders, so that they are able to continue with the registration of alerts.

(e) The call responder or operator should register valid alerts in a alert logbook.

(f) Alerts can also be detected by media scanning either manually or automated.

(g) Examples of pre-detemined alerts:

Code	Alerts to be reported
01	Two or more persons presenting a similar severe illness in the same setting (for example, household, workplace, school, street) within one week
02	Unexplained large number of deaths of poultry, livestock, other domestic animals or wildlife
03	Severe illness of a health-care worker after exposure to patients with similar symptoms
04	One or more hospitalized patients with unexplained severe illness, including failure to respond to standard treatment

Step 3: Registration of EBS Alerts

(a) Alerts that are captured from media and hotlines and correspond to the pre-defined list of alerts, should be registered in the alert book. See Sample Alert Logbook for Hotlines and/or Media Scanning on the next page.

(b) Each alert captured should include data about the alert's detection, triage and verification, until the response.

(c) Alert registration should include the minimum data set for tracking the alerts for example:

(i) Source/informant: Name, contact phone and time and date of the call/detection.

(ii) Alert: when it happened, who was affected (cases, deaths) and where it starts and spreads.

(iii) Follow-up of the alert: Triage, verification, risk assessment and response.

Sample Alert Logbook for Hotlines and/or Media Scanning

ALERT LOGBOOK FOR HOTLINES AND/ OR MEDIA SCANNING *[NB: This should be completed by The Call Responder/Designated Media Scanner]*	
Variables	**Response**
1. Source of Information:	
(a) Source: CBS, HEBS, Media Scanning, Hotline (This can be further categorized)	
(b) Reporter info: Employee at national team, community health volunteer, health-care worker, etc.	
(c) Date and Time: of detection/receiving alert (DD/MM/YYYY and HH:MM)	__ __/__ __/__ __ ____ __ __:__ __
(d) Reference/Contact: Link, Contact name and Phone number	
2. Alert Information:	
(a) Alert Type: Human; Animal; Environmental	
(b) Alert: from the country's list of alerts	
(c) Location: details about the location that can follow the administrative levels	
(d) Date of start: when did this start	
(e) Cases: number of cases	
(f) Deaths: number of deaths	
(g) Description: narrative text for any further information, including any response activities (by community or health authority or someone else)	
3. Follow-up activities	
(a) Follow-up: Discard, Monitor, Verify Date-Time: DD/MM/YYYY/ HH:MM	__ __/__ __/__ __ ____ __ __:__ __
(b) Sent for verification: Yes/No Date-Time: DD/MM/YYYY/ HH:MM	__ __/__ __/__ __ ____ __ __:__ __
(c) Verified: Yes/No Date-Time: DD/MM/YYYY/ HH:MM	__ __/__ __/__ __ ____ __ __:__ __
(d) Risk Assessment: Very Low/Low/Moderate/High/Very High	
(e) Sent to Response: Yes/No Date-Time: DD/MM/YYYY/ HH:MM	__ __/__ __/__ __ ____ __ __:__ __
(f) Response Status: Not started; Ongoing; Completed Date-Time: DD/MM/YYYY/ HH:MM	__ __/__ __/__ __ ____ __ __:__ __

Step 4: Conduct triaging of EBS Alerts

Conduct assessment of alerts for verification

(a) If the alert matches with one of the priority alerts for the country, the alert should immediately undergo verification.

(b) If the alert is generically defined, for example, an unusual event that may pose a public health threat, a qualified public health specialist or team leader should assess the alert to decide whether to discard the alert, or to proceed for verification.

Step 5: Conduct Verification of EBS Alerts

(a) Verification is an essential step to confirm the validity of the captured alerts and should be conducted by subject matter experts, for example, public health specialist.

(b) Verification should be done at the local level nearest to the location of the alert.

(c) If the alert is detected at the national level, this is reported to the respective regional/provincial focal point (Regional/Provincial health Team) where the alert is located by phone call or SMS or email, etc.

(d) The Regional/Provincial Health Team then notifies the respective District Health Team.

(e) Trained District Health Team with support from regional/national experts should conduct verification of the alerts.

(f) All alerts should be verified within 24 hours.

(g) *Once an alert is verified and requires action, it is determined to be an event.*

(h) The District Health Team with support from regional/national experts should promptly start investigations by collecting further information in the field (conducting physical examinations, collecting laboratory samples, etc.) using the existing respective IDSR case/event investigation forms.

(i) The confirmed events that meet the standard case definition should be captured by the respective District Health Team in the IBS system and reported to the next level of the health care system, that is, through the existing *IDSR data collection tools and follow the IDSR reporting procedures (refer to section 2 of the Third edition IDSR Technical Guidelines).*

Step 6: Conduct risk assessment and characterization

(a) Once an alert is verified as an event, risk assessment begins.

  (i) *Risk assessment is a systematic and continuous process for gathering, assessing and documenting information to provide the basis for actions to manage and reduce the negative consequences of an acute public health event.*

(b) The first risk assessment of an event should take place within 48 hours of the detection of one or more alerts.

(c) The National team should lead the risk assessment with the respective regional/provincial health and district health team.

(d) Every assessment is a process by which the available information about a real event is analysed and judgement is made as to whether it poses an immediate risk to public health. In this case full risk assessment is done (refer to section 4 of the Third edition IDSR Technical Guidelines).

(i) For an alert that has been substantiated as a true event but does not pose an immediate threat to the public, the team should monitor the event and undertake risk assessments when new information becomes available

II. Steps for establishing EBS at district level

(a) The steps for establishing EBS at district level follow similarly as at the national level.

(b) However, the district level health authorities mostly receive EBS-related information in the form of alerts mainly from the health facilities and communities through phone calls/text messages/WhatsApp.

(c) Receive and document alert reports:

(i) Record verbal or written information from health facilities and communities about suspected outbreaks, rumours, unexplained events/alerts into the District log of suspected outbreaks (refer to Section 4, Annex 4A of the Third Edition IDSR Technical Guidelines).

(d) The district health team should carry out the following functions: triaging, verification and risk assessment.

(e) Triage alerts

(i) When the district health team receive information about a reported alert, they should conduct triaging by asking the following questions:

- Is the reported information relevant to early warning (that is, could this alert be a genuine public health event?)
- Was this alert previously reported (that is, is this alert a duplicate?)

(ii) Triage can take place in person-field visit, by text messaging or over the phone.

(iii) After triage:

- If the report is not relevant or is a duplicate, then it can be discarded. There is no further action that is needed to be taken.
- If the information is to be discarded, communicate the following information to the HEBS focal persons/Surveillance focal persons who reported the alert:
  - They should continue to monitor the situation and notify the district if the situation changes and alert is met.

- It is proper that they have reported an alert that has been determined to be false alert, and they are encouraged to continue reporting alerts when they are detected.

- If the report is pertinent and is not a duplicate, then the information must be verified by the district health team that received the information about the alert.

(f) Verify alerts

(i) The district health team must verify all triaged alerts that are pertinent to EBS.

(ii) The district health team receiving alerts from health facilities and communities must also verify these alerts before they are determined to be events.

(iii) Verification is the determination that an alert is valid (that is, it is not a false alarm or a false rumour), reliable, and that it corresponds to at least one of the alerts pre-defined for EBS implementation.

(iv) Criteria for verification may include asking questions of those who have notified the alert to ensure that they have correctly understood the alert, whether or not the alert has been confirmed by at least two different sources, or the fact that the alert has been notified by a person with medical authority (for example, veterinarian, physician or laboratory assistant).

(v) To conduct verification, the district health team will ask questions of the person reporting the alert, 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.

(vi) Verification can take place in person by field visit or over the phone.

(vii) Use the EBS verification tool; see sample of Event-Based Surveillance: Verification Tool on next page.

(viii) The result of verification is the confirmation that the alert is true or false. Once an alert is verified it becomes an event.

(ix) After verification:

- If the alert is considered to be a public health event, it is reported immediately to the region/province.
- If the alert is not considered to be a public health event, the situation will be monitored to ensure that it does not become a public health event.
- Record confirmed events in existing IDSR data collection tools and platforms and report to next level (Refer to section 2 of the Third Edition IDSR Technical Guidelines).

(g) Conduct Risk Assessment as directed in the national guidance.

Sample of Event-Based Surveillance: Verification Tool

When an alert is notified by a CBS Focal Person or health facility, the District Health Team will use this tool to verify whether the alert is TRUE or FALSE

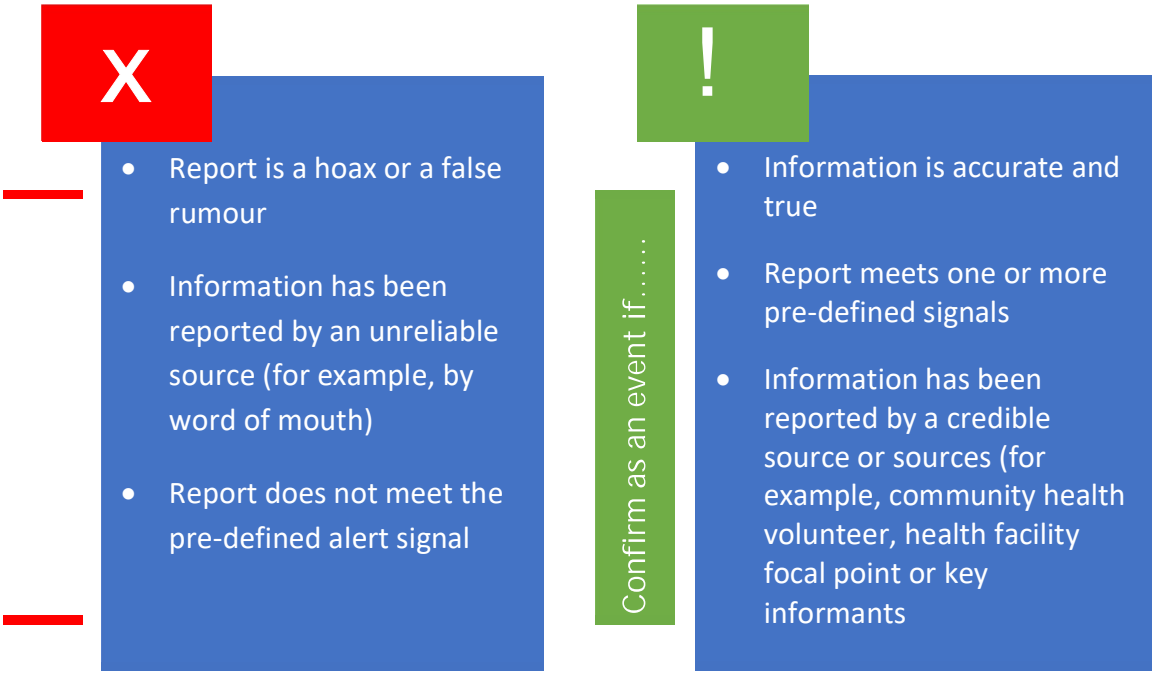
The process of alert verification should answer three main questions:

(a) Is the report accurate (that is, True)?

(b) Has the information been reported by a reliable source or sources?

(c) Does the report meet the criteria for one or more alerts?

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



III. Steps for establishing EBS at health facility level

The steps involve considering the following important points:

(a) Indicator-Based Surveillance (IBS) in health facilities encompasses immediate, weekly or monthly reporting of a pre-determined list of diseases based on case definitions.

(b) Event-Based Surveillance (EBS) in health facilities (HEBS) trains clinicians, nurses, and other relevant health-care professionals to report on a pattern of disease alerts, such as a cluster of illnesses and is not disease-specific.

(c) EBS may allow for detection of emerging or re-emerging public health threats because it is not disease-specific, requires immediate notification, and is highly sensitive and broad.

(d) Additionally, since reporting does not require laboratory results for reporting and relies on clinicians' experience, EBS is more practical and fairly simple to establish and sustain.

(e) Health facilities should participate in both IBS and EBS since the two complement each other leading to early detection of diseases, conditions and events.

Steps for establishing EBS in health facilities

Step 1: Alert detection

(a) Select and train HEBS focal persons: Existing health facility surveillance focal persons can be trained to perform this role.

(b) HEBS focal persons must inform other staff to immediately notify them when they see or hear about one of the alerts happening in their workplace.

(c) Health-care professionals including clinicians, nurses, and infection control officers should be sensitized to recognize alerts and report them immediately.

(d) Detecting an alert means identifying or suspecting the occurrence of the pre-determined alerts designated by national public health authorities.

(e) Examples of HEBS alerts:

Code	Health Facility EBS Alerts to be reported
01	Any severe illness in health staff after taking care of a patient with similar illness
02	Large, sudden increase in admission for any severe illness of the same type
03	Any severe, unusual, unexplainable illness including a failure to respond to standard treatment
04	Increased use of a particular medicine

Step 2: Reporting Alerts

(a) Reporting alerts involves communicating with a HEBS focal person/surveillance Focal Persons in the health facilities who intend report to the district team immediately.

(b) This can be done by telephone call, SMS, or in person, but it must happen immediately: on the same day and as soon as possible.

Step 3: Triaging and verification

(a) The district health team upon receipt of report of alerts should triage and verify all alerts within 24 hours of alert detection using the verification tool.

(b) In case of true event immediate investigations and response measures is implemented as per the existing IDSR structures.

(c) The district team should provide regular feedback to the reporting health facilities.

Annex 1D: List of district reporting sites

Record information for contacting the health workers or community health workers or PoE officers or anyone who provides information to the district related to surveillance and outbreak, events detection. Include, for example, community health workers, trained birth attendants, community leaders and public safety officials. This list is to be updated regularly to add new sites and delete non-functional or non-participating sites.

Example:

Name of health facility or point of patient contact with health service	Address or location of facility or point of contact	Designated focal person for surveillance and response	Telephone or email (or other contact information)
Lima Health Centre	*Box.123* *Mlima Zone*	*Dr Moyo*	*Tel: 123-458 or send message by railroad's daily contact with Mlima station*

Annex 1E: Laboratory functions by health system level

Laboratory functions by health system level			
Level	**Collect**	**Confirm**	**Report**
Healthcare Facilities	Use standard case definitions to determine initiation of specimen collection process. Assist First Contact Laboratory in specimen collection within approved guidelines. Document specimens with clinical history. Transport specimens to First Contact Laboratory and Referral Laboratory per approved guidelines, include the case-based laboratory reporting form	Use standardized case definitions to initiate or request appropriate testing for disease confirmation. Handle specimens within approved SOPs and guidelines.	Record details of specimen collection and transport. Receive test results and provide feedback.
District or Province	Communicate collection policies and procedure to providers. Request additional specimen collection materials as needed. Store specimens per appropriate conditions pending transport or additional studies. Direct additional collection as needed based on outbreak investigation. Arrange for specimen transport to First Contact Laboratory and Referral Laboratory per approved guidelines, include the case-based laboratory investigation and reporting form.	Perform laboratory studies for presumptive diagnosis as appropriate and available. Store representative samples for transportation in specified conditions as per guidelines. Carry out routine analysis of laboratory results. Routinely examine the laboratory analysis for changes in trends	Record, store and backup laboratory results and details of laboratory testing including all tests done and timeliness of analysis. Provide feedback of results to clinical staff and patients. Ensure regular receipt of Laboratory results from National level. Update line-lists with laboratory results and follow-up on any missing results with testing laboratory. Report results and timeliness details to next level. Report observed changes in trends during routine analysis of laboratory results to the national level. Use summary information for outbreak investigation

Laboratory functions by health system level			
Level	**Collect**	**Confirm**	**Report**
National Referral Labs (some labs may act as first contact labs and referral labs	Set specimen collection guidelines, policies and procedures with the national authorities. Distribute appropriate specimen collection and transportation kits for epidemic-prone diseases. Request for additional specimen to be collected by laboratory or providers as needed. Store specimens within approved conditions for further referral and analysis or additional research or investigation.	Set confirmation policies and procedures with the national authorities. Perform laboratory studies for confirmation as appropriate: • microscopy, culture, antimicrobial susceptibility testing, serotyping, serological investigation, molecular detections and identification, genomic sequencing. Store representative isolates from the outbreak as needed.	Record, store and backup laboratory results and details of laboratory testing including all tests done and timeliness of analysis. Report results to Regional/District Health Teams and all relevant stakeholders at the national and regional/district levels for onward dissemination to submitting health facility or laboratory. Report case-based and summary data according to the agreed protocol. Report laboratory results from screening sentinel populations at target sites. Carry out routine analysis of laboratory analysis, data and results and examine for changes in trends
Global Reference	Set specimen collection guidelines, policies and procedures, and share with the national authorities. Request for additional specimen to be collected, as needed.	Perform additional analysis on referred specimens or isolates as appropriate.	Record, store and back up laboratory results and details of laboratory testing including all tests done and timeliness of analysis. Report laboratory results to National Reference Laboratory or National Laboratory. Coordination Team for onward dissemination.

Annex 1F: Responsibilities of Laboratory Focal Persons at All Levels

National level laboratory focal person

(a) Coordinate all laboratory related activities in support of disease preparedness, surveillance and response.

(b) Establish and support collaboration with epidemiologists/surveillance officers.

(c) Define laboratory testing capabilities in-country and those referred internationally and share this information with all stakeholders.

(d) Maintain an updated list of the laboratories performing required laboratory testing.

(e) Maintain and update list of inventory of supplies, reagents and equipment from all the laboratories.

(f) Establish agreements with international laboratories for provision of laboratory diagnosis or confirmation of priority diseases not yet available in the country and coordinate appropriately.

(g) Support the laboratory through advocacy with higher levels in accessing the necessary infrastructure, equipment and supplies to collect, handle, test, store, and ship specimens safely.

(h) Ensure that there is a sample transportation framework within the country and outside the country to facilitate sample transportation.

(i) Ensure that laboratory results are reported in a timely manner to all relevant stakeholders and used appropriately to inform public health action and patient clinical management.

(j) Ensure that there is a proper record for laboratory results.

(k) Ensure that the laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

Regional laboratory focal person

(a) Maintain an updated list of the laboratories that will perform required laboratory testing.

(b) Provide information to all health facilities for correct transport of specimens.

(c) Maintain and update list of inventory of supplies, reagents and equipment from all the laboratories in the Region.

(d) Ensure that laboratory confirmation procedures established at the national level are known and followed in the region and districts.

(e) Ensure that specimen collection, transport materials and laboratory diagnostic tests are available to enable the timely detection of priority diseases.

(f) Coordinate with health facilities and laboratory in collecting, safely packaging and reliably transporting the appropriate specimen for confirming the suspected case.

(g) Receive results from the laboratory and promptly report them according to country procedures to all that require them for public health action and patient clinical care.

(h) Ensure that there is a proper record for laboratory results.

(i) Communicate with reference laboratory and National Laboratory Coordinators as necessary.

(j) Ensure that the laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

District laboratory focal person

(a) Establish or strengthen routine communication with identified laboratories that receive specimens and health facilities or districts sending the specimens.

(b) Maintain and update list of inventory of supplies, reagents and equipment from all the health facilities and laboratories in the district.

(c) Ensure that procedures for sample collection, transportation, confirming the disease or condition and reporting the results are clear and can be reliably carried out in the designated places.

(d) Communicate with Regional laboratory focal person.

(e) Communicate with the national reference laboratory as required.

(f) Ensure that there is a proper record for laboratory results.

(g) Ensure that the laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

Facility laboratory focal person

(a) Maintain and update list of inventory of supplies, reagents and equipment at the facility.

(b) Ensure that standard operating procedures (SOP) for sample collection, transportation, confirming the disease or condition and reporting the results are available and being followed.

(c) Communicate with district laboratory focal person and regional laboratory focal person as required.

(d) Ensure that there is a proper record for laboratory results.

(e) Ensure that the laboratory has a quality assurance programme (internal and external quality control) to improve the reliability and reproducibility of laboratory results.

Annex 1G: List of national laboratories for confirming priority diseases and conditions

Periodically update the list of laboratories in your district or those specified by the national level for confirming priority diseases and conditions. Include in the list whom to contact for assistance. The following list is an example.

Example:

Priority disease, conditions and events	Focal Person, Name of Lab, address, phone number, email
Polio	***Example: John Zimbe; National Laboratory, 145 Kenyatta Road, Pretoria, SA; 234-701342555***
Cholera	
HIV	
Tuberculosis	
Measles	
Plague	
Human influenza caused by a new subtype	
Rift Valley disease	
Dengue fever	
Public health events of national or international concern	
Anthrax	
Chikungunya	
Typhoid fever	

1.8 References

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