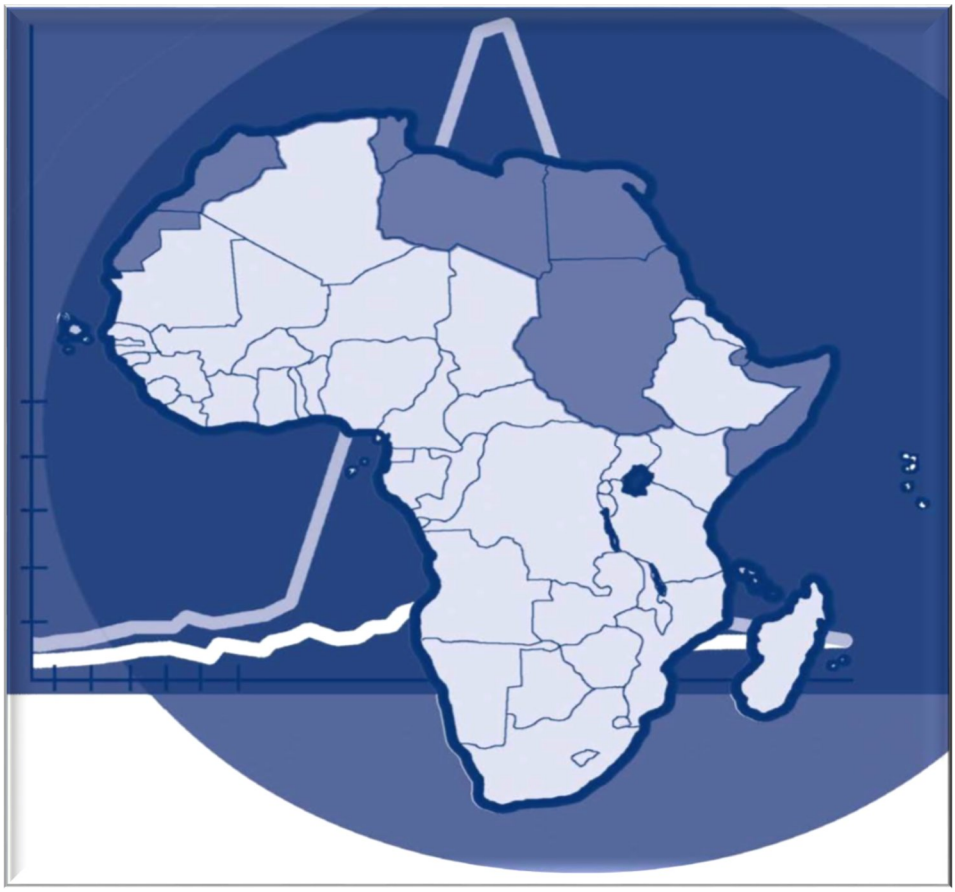
TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN THE WHO AFRICAN REGION

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.

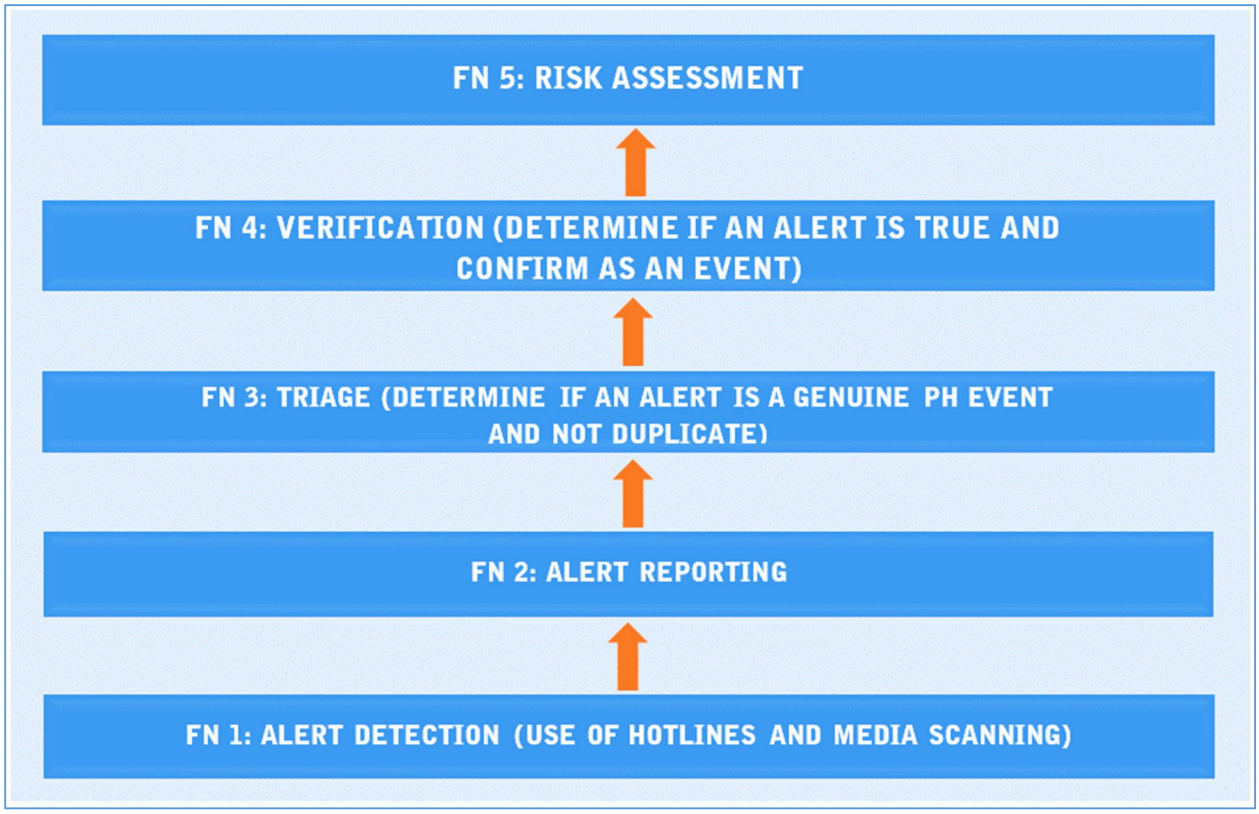
At the same time, emphasize the need to refer people with the suspected disease or condition for treatment. Provide them with procedures for reporting, including when and where to report; and ensure provision of necessary tools. Design simple community alert forms reporting events and tools (see Annex 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 A N D 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.* **O R** 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

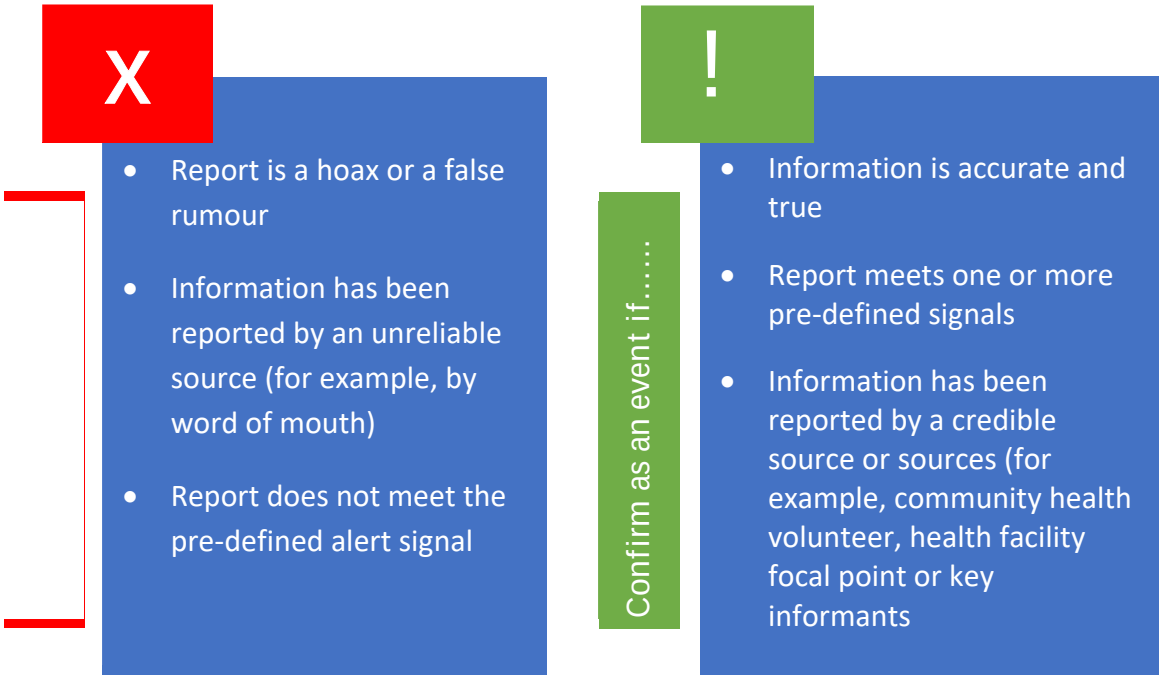
The process of alert verification should answer three main questions:

(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	

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION

SECTION 2: REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS

MARCH 2019

SECTION 2: REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS

2. REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS

Integrated Disease Surveillance and Response (IDSR) is a system with the potential to ensure a reliable supply of epidemiological information to the national level in order to fulfil IHR 2005 requirements. Ensuring reliable reporting of surveillance data throughout the system is important. Reliable reporting provides information for surveillance officers, district or provincial/regional health authorities, epidemiologists, and competent authority at Point of Entry (PoE) programme managers, the national IHR focal point, the WHO contact point and other health staff to:

(a) Identify emerging problems or conditions and plan appropriate responses, including informing relevant staff or levels.

(b) Take action in a timely way.

(c) Monitor disease trends in the area.

(d) Evaluate the effectiveness of the response.

This section describes how to report priority diseases, conditions and events within the required timelines. In IDSR, data collection and data reporting follow different timelines for different purposes:

(a) Immediate reporting of case-based information allows for early detection of unexpected or highly pathogenic/lethal public health events. All the diseases and conditions under immediate reporting should also be reported under aggregated weekly report in the IDSR Weekly Summary Reporting Form.

(b) Weekly aggregated reporting provides data for monitoring trends of diseases, conditions or events to early detect outbreaks.

(c) Monthly/quarterly aggregated reporting provides data for monitoring the health status of the population and impact of disease specific programmes, and for planning allocation of resources.

NB: National policy will determine reporting requirements and the public health events to be reported and whether data from the districts and health facilities are to be reported immediately, weekly, monthly, or quarterly.

Paper-based tools are the most commonly used tools for reporting these diseases, events and conditions. While paper-based tools can provide timely information, countries should aim to have electronic tools to facilitate rapid transmission of data to enable timely response to public health threats (eIDSR). The potential benefits of using electronic reporting tools for eIDSR include: more timely reporting, investigation, and response to outbreaks. Electronic reporting may also improve data quality; enhance virtual, near real-time disease and events monitoring capability; may lead to reduced system costs and easily generate automated alerts. In addition, information can be more easily stored and accessed. See Section 9 for electronic IDSR (eIDSR) System Guide for countries,

The targeted public health workforce for IDSR are primarily staff at all levels of the health system (both human and animal), data management personnel who will oversee the Information Communication Technology (ICT) aspect of the system at all levels, supervisory and disease-specific programme personnel at all levels, that is, local, district, regional and decision-makers at the national level. It is important that countries aim at having an interoperable approach of strengthening eIDSR by creating systematic linkages and information-sharing platforms. This can be done by formalizing agreements between Ministries of Health Units, that is, HMIS, IDSR, Maternal (MDSR) and Newborn (PDSR), Health services delivery information system, National and regional public health reference laboratories and laboratory networks and the Ministry of Agriculture/Livestock/Wildlife Units, that is, Surveillance units, and Veterinary facilities/institutions and Surveillance units within the Ministry of Environment units.

2.1 Immediate reportable diseases, conditions and events

Immediate reporting is indicated when an epidemic-prone disease or other potential Public Health Emergency of International Concern (PHEIC) is suspected or is otherwise required under the International Health Regulations (2005). Immediate reporting should also be done for diseases and events considered priorities at the national level which may not necessarily be PHEICs. The diseases, conditions and events requiring immediate notification to the next level are listed in Table 2. Immediate reporting allows timely action to be taken to prevent the re-emergence or rapid transmission of epidemic prone diseases or events or their propagation, especially those due to highly virulent infectious, chemical, biological or radio nuclear agents.

Information that is reported immediately, such as single cases or clusters of reportable events, **will generate an alert and initiate a case-based reporting system**. This means that, specific information about that suspected case, or, if it is a cluster, specific information of each of the cases identified, will be collected thoroughly and reported to the next level. At the same time, an initial investigation will be initiated. For events reported at PoE, information is reported to the

next level (district in which the PoE is situated) as well as simultaneously to the IHR NFP. Reporting units with no diagnostic capacity, will use the suspected case definition given to identify and report diseases, conditions and events. Additionally, information of contacts will be collected. section 4 describes how to conduct contact tracing and also how to report contacts.

For conditions like maternal and perinatal deaths, the circumstances leading to the death need to be gathered and analysed and health providers should use the national Maternal Perinatal Death Surveillance and Response (MPDSR) in consultation with the relevant focal points.

In IDSR, there are two types of thresholds used to initiate response: an alert threshold and an epidemic threshold. These thresholds are normally expressed in terms of the number (or proportion) of cases of a disease and the critical point (threshold) beyond which action must be taken. Trained health-care personnel should always determine the alert and epidemic thresholds. Thresholds for alerts and epidemic for epidemic-prone diseases, conditions or events are shown in section 11.

Please refer to Section 11 for disease-specific information including surveillance case definitions, alert and epidemic thresholds for reporting suspected cases or events.

Table 2.1: Diseases, conditions or events requiring immediate reporting

1. Acute haemorrhagic fever syndrome (Ebola Virus Disease, Marburg, Lassa Fever, RVF, Crimean-Congo)	16. Neonatal tetanus
2. Adverse effects following immunization (AEFI)	17. Perinatal death
3. Anthrax	18. Plague
4. Bacterial meningitis	19. Poliomyelitis (Acute Flaccid Paralysis) (AFP)
5. Chikungunya	20. Rabies (Human)
6. Cholera	21. SARIs
7. Dengue fever	22. SARS
8. Diarrhoea with blood (*Shigellosis*)	23. Smallpox
9. Dracunculiasis (Guinea Worm disease)	24. Typhoid fever
10. Influenza due to new subtype	25. Yaws or endemic syphilis or bejel
11. Listeriosis	26. Yellow fever
12. Maternal death	27. Zika virus disease
13. Measles	28. Unexplained cluster of illness/death from human or animal/bird*
14. Middle East respiratory syndrome (MERS)	29. Any public health event of international concern (infectious, zoonotic, food borne, chemical, radio nuclear or due to an unknown condition)
15. Monkey Pox	

* Examples of clusters can be:

- any of cluster of illness or deaths among people living in the same community within a specific time period (for example, one week)
- Unexplained cluster of deaths of animals/birds within a specific time period (for example, one week)
- Illness or death among people after exposure to animals
- Health-care worker illness after exposure to patients with similar illnesses
- Unexpected increases in admission to health care facilities of persons with similar severe symptoms
- Sudden illness in a person who has travelled out of the country in the past 14 days
- Any unusual illness or sudden death in the community within a specific time period (for example, one week)
- Unexpected large numbers of children absent from school due to the same illness in the same seven-day period.
- Unexpected large numbers of sales at pharmacies of many people buying medicines for the same kind of illness

NB: Ensure that adequate information is collected for events which are reported. Some of the events might have a link with the Agricultural or Livestock/Wildlife sector or Food or Environment or other sectors, ensure information is also sought from these sectors.

2.1.1 Report case-based information to the next level

If an immediately reportable disease, condition or other public health event is suspected**, the health facility must report case-based information to the next level within 24 hours.** Information obtained through preliminary investigation of suspected case includes:

(a) Patient's geographical location

(b) Health facility or facilities that managed or handled the patient or referred the patient

(c) Patient's identification and demographic information

(d) Information about signs and symptoms, including date of onset, history of vaccination (where applicable) and information about any relevant risk factors including contacts

(e) Laboratory results (if available)

(f) History of travel

(g) History of contacts (human or animal)

Any maternal or perinatal death, once it occurs, should also be reported immediately within 48 hours of occurrence. A sample reporting form for both is given in Annex K. Reference should be made to the national integrated Maternal Perinatal Death Surveillance and Response guidelines.

(a) Make the initial report by the fastest means possible (telephone, e-mail, radiophone, text message, social media). The health facility should contact the district health authority immediately and provide information about the patient or event.

(b) Follow up the initial verbal report with a written report using a standardized case-based report form. A sample case-based reporting form for recording case-based information is in Annex 2F at the end of this section. If a computer or other electronic device is available for surveillance or case management, complete and submit the form electronically to the next level. On electronic platforms, ensure that you protect the patient's privacy by encrypting patient ID data so only few health staff can access the detailed information, or you can also set up appropriate user rights such as creating a password for your use when using a common office computer.

(c) If a laboratory specimen is requested at this time, make sure that the patient's identifying information on the specimen, the laboratory investigation form, and the case-based reporting form all match. Ensure proper packaging to ensure reliable results. Ensure also that a copy of the case-based form accompanies the laboratory form and the specimen. A sample laboratory form is included in Annex 2G.

(d) Disease-specific case-based reporting forms for particular diseases and conditions of concern (for example, AFP, cholera, VHF, maternal death, and MDR/XDR TB) are in the

annex at the end of Section 11. These forms may be used to begin gathering initial information for the case investigation.

- Note: Some epidemic-prone diseases or conditions like Maternal or Perinatal deaths have specific reporting requirements, depending on national or regional policies. Please refer to disease-specific conditions and requirements in Section 11 of this guide.

(e) Ensure that adequate information is available for events which are reported, as some **events might have a link with the Agricultural or Livestock, Wildlife sector or Food or environment or other sectors** including the community. Such information sharing is crucial and should start at the community level, health facility and subsequently at the district and region. At the National level, the IHR National Focal Point (NFP) should notify WHO of an event that is a potential public health emergency of international concern (PHEIC) using the decision instrument in the IHR 2005 (Annex 2A).

(f) For all events, establish a line listing of suspected cases or events or conditions reported as part of initial and ongoing investigation and ensure it is always updated, while at the same time maintaining the link with appropriate sectors, depending on a particular disease or event. The line list should be kept where there is a suspected outbreak and where an isolation unit has been opened, but if several isolation units have been opened, the district should maintain a combined line list. Refer to Annex 4E for a sample line list.

2.1.2 Notifying a potential Public Health Emergency of International concern under IHR 2005

If a potential Public Health Emergency of International Concern (PHEIC) is suspected (as defined in Annex 2 of the IHR 2005), the District Surveillance Focal Person should report to the National IHR Focal Point immediately using the fastest means of communication and at the same time notify the Regional or Provincial Surveillance Officer. If a potential Public Health Emergency of International Concern (PHEIC) is detected at Point of Entry, immediate reporting should also be made to the National IHR Focal Point, while at the same time notifying the district and region or province (See Annex 2B for a framework of reporting).

The process of notifying WHO of events under IHR 2005 involves the use of the "Decision instrument in the IHR. This is a national level function coordinated by the IHR NFP with the support of appropriate experts, depending on the emergency.

2.1.3 Reporting events from community sources

Any suspected event occurring in the community, including maternal and neonatal events, should be reported immediately. The trigger mechanisms of reporting must be clearly defined and the information must be immediately notified to a community focal person, if already identified, or to a nearby health facility or sub-district head. Minimum information collected should include:

(a) Date of event and date of report
(b) Suspected disease, condition, or event
(c) What happened?
(d) When did this happen? (day, month, year)
(e) Where did this happen? (Exact location, Village, District/County, Province/State/Region)
(f) Who is affected? (age, gender, occupation, etc.)
(g) How many have been affected?
(h) Has anyone died? If yes, how many?
(i) Is the event ongoing?
(j) Are there any animal deaths/exposures?
(k) Recent history of travel to an affected area
(l) Other information you have.
(m) Name and contact number of the person reporting
(n) Any action taken

See Annex 2C for a reporting format when an event is identified, Annex 2D for monthly summary and Annex 2E for reporting structure for community alert and verification of events from community sources.

2.2 Summarize immediate and weekly reportable diseases

After an initial case has been detected or an outbreak is suspected or confirmed, summary data are important for analysis and monitoring. For example, at the health facility or district, the surveillance focal point can draw an epidemic curve to see if and when the epidemic thresholds for specific diseases have been crossed. Additionally, these data from epidemic investigation can be used to check whether the case-fatality rate is below, at or above the expected target. The weekly data analysis of the suspected or confirmed epidemic should also help point out possible high-risk groups with regard to a patient's case location or residence, age group, sex, and

exposure during social events (for example, a funeral), occupational hazards (for example, butchering), consuming game meat, or exposure to a contaminated food or beverage.

At the district level, weekly data analysis includes verification of the quality of the data coming from the reporting sites and the completeness and timeliness of these reports. For eIDSR, an identified person should be responsible to ensure that data verification is done and approved for further transmission. Additionally, an in-depth analysis of individual immediate case-based reporting forms received from the reporting sites will also be performed, in addition to the weekly aggregated data. The incidence and case-fatality rates should be calculated and compared with the set alert and epidemic thresholds to determine if it is increasing or decreasing. Epidemic curves should be updated regularly to monitor the trends or evolution of epidemics occurring in the districts. Districts which have computers are encouraged to store the information electronically and forward the surveillance data sets to the next higher level in this format.

I. Weekly reporting of immediate notifiable diseases:

Weekly reporting provides data for monitoring trends of diseases or conditions to early detect outbreaks. It is important to ensure that the WHO weekly reporting format is adhered to across all health facilities and districts to facilitate comparison within and between the facilities and districts.

After immediately reporting to the next level about instances of notifiable diseases, conditions or events, collect and report weekly summary information of the event or disease or condition which you have reported, as well as for other weekly reported priority diseases, conditions and events, as listed in Table 2. See Annex 2H for format for developing a weekly summary form which is an aggregate of case-based forms.

With eIDSR (see section 9), this will be updated automatically in the database, while in countries using paper-based reporting, this will be done manually and entered into a computer. This aggregation is important to understand the trend of the immediate reportable diseases and plan for effective intervention. For early detection of outbreaks via weekly aggregated reporting, it is recommended to keep the number of variables at a minimum, ideally reporting only the number of cases and deaths, to avoid unnecessary burden on the health care facilities and maximize reporting efficiency.

Based on epidemiological evidence, countries may decide to include additional diseases, conditions and events in diseases for weekly reporting, for example, malaria, MDR-TB, Diarrhoea with severe dehydration in children under five years of age, severe malnutrition, and

neonatal deaths. Only diseases or conditions or events which could result in public health action should be considered for entry on the list of aggregated weekly reporting. Some rare but high-risk public health events should be removed from routine aggregated reporting to be reported on an immediate basis. The list of priority public health events to be reported by health-care facilities will be established by a group of relevant stakeholders from and related to the National Public Health Surveillance System.

II. Zero reporting

If no cases of an immediately reportable disease have been diagnosed during the week, record a zero (0) on the reporting form for that disease. If the space is left blank, the staff that receives the report will not be able to develop information from a blank space. Submitting a zero report for each immediately reportable disease when no cases were detected during the week tells the staff at the next level that a complete report has been filled.

2.3 Report monthly and quarterly routine summary information for other diseases of public health importance

At a minimum, report summary data about other endemic diseases to the next level each month. This information is valuable to disease-specific programmes and can be used when monitoring progress with prevention and control activities as well as for detecting any emergent, unexplained or unusual events or disease patterns.

Routinely report the total number of cases and deaths seen in a given period (for example, monthly or quarterly) for other diseases of public health importance. All health facilities including referral or zonal or teaching hospitals should report summary totals to the district under their catchment area. Districts should aggregate reports from all reporting sites and provide summary totals to the provincial, regional or central level. Each level should observe any unusual increases or events seen during analysis of monthly summary reports. The summary results should be analysed and the results used to monitor progress towards disease control targets, measure achievements of disease-prevention activities in the district or region or province, and identify hidden outbreaks or problems so that a response action can be taken.

Table 2.2: Diseases and conditions Requiring Monthly or Quarterly Reporting

1. Acute and chronic viral hepatitis 2. Buruli ulcer 3. Diabetes mellitus (New cases) 4. Diarrhoea with severe dehydration in children under 5 years of age 5. HIV/AIDS (New Cases) 6. Hypertension (New cases) 7. Injuries (Road Traffic Accidents) 8. Leprosy (quarterly) 9. Lymphatic Filariasis 10. Malaria	11. Malnutrition in children under 5 years 12. Epilepsy 13. Noma 14. Non-neonatal tetanus 15. Onchocerciasis 16. Severe pneumonia in children under 5 years of age 17. Sexually transmitted diseases (STIs) 18. Schistosomiasis 19. Trachoma 20. Trypanosomiasis 21. Tuberculosis (quarterly) 22. Underweight neonates (less than 2500 g)

Note: Based on risk mapping and disease burden, countries may decide to categorize any other diseases, conditions or events into immediate, weekly or monthly or quarterly report.

Each month, the health facility should calculate the total number of cases (suspected and laboratory-confirmed) and deaths due to priority diseases, conditions and events seen in the health facility. Separate totals are calculated for outpatient cases and inpatient cases. The summary totals are recorded on a form (please see Annex 2H) and sent to the district level. The district aggregates the totals from all the health facilities that reported and submit district summary totals to the provincial, regional or central level. In countries with sub-districts, the health facilities can submit data summaries to the sub-districts for onward transmission to the districts.

Special effort should be made to obtain from the health information system, the total number of outpatients and inpatients seen for any health condition (including those not in the IDSR list) during the reported period. On a regular basis (weekly or monthly), review the overall Health Management Information System (HMIS) to ensure that data has been well captured. At least once every month, data validation needs to occur, and periodic edits should be conducted before transmission to the next higher level.

In cases where a computer is available for surveillance or case management, patient records can be analysed to generate the weekly, monthly or quarterly reports. This information is important for producing national and sub-national situation reports. All datasets should be shared with the health authorities with a copy to the respective disease prevention and control programme: this

is important for coordination at the central level, and for the building or strengthening of a national IDSR database system.

Depending on each level of laboratory services, laboratory data should be organized in a register so that it can generate monthly summaries. During outbreaks, submission of the weekly summaries of the specimen processed, the types of specimen and the results should be done to assist in completion of the variables in the line list register. Efforts should be made to also update the laboratory component of the IDSR data and link epidemiological/clinical data. Monthly summaries can include the core tests done for which the country has selected as indicator pathogens on the basis of major PHEIC. This is important, as the analysis can produce important trends which can necessitate further investigations.

2.4 Improve routine reporting practices

In some health facilities, more than one person may be responsible for recording information about patients seen in the facility. For example, the clinician records the patient's name and diagnosis in a clinic register. Later in the day, a nurse tallies the number of cases and deaths seen in an outpatient service. The ward nurse tallies the number of admitted cases.

Each week, month, or quarter, a records clerk or statistician calculates summaries for all the diseases and records them in a standard form. Events should be aggregated separately from diseases. In case the health facility is equipped with computers, individual patient records should be entered, from which the IDSR priority diseases or conditions subset will be extracted and analysed to get the required weekly, monthly or quarterly compilations.

In outbreak scenarios, isolation units that are separate from health facilities can be opened, and they will use a different register to record diseases or events. It is important that this information be captured in the overall IDSR weekly, monthly or quarterly summaries.

2.4.1 Review the flow of information at the reporting site

During supervisory visits to reporting sites, ensure that:

(a) All reporting sites including secondary and tertiary hospitals in the catchment area of your district are visited

(b) Clinicians record legibly information in the patient registers using the recommended case definitions so that health workers who tally the cases at the end of the day can reliably record the required diagnoses on the tally sheet.

(c) Clinicians, ward nurses or other responsible staff should complete the case-based reporting form preferably while the patient is still present.

(d) Clinicians record laboratory results in the patient registers

(e) In health facilities with laboratories, laboratories should record results of IDSR priority diseases in the laboratory registers with linkage to epidemiological data

(f) Integration of laboratory results into the IDSR reporting forms should be conducted at the health facility level

(g) Records clerks or statisticians have summary forms that contain spaces for recording cases and deaths due to the priority diseases or conditions according to the standard case definitions.

(h) Health staff review the weekly, monthly and quarterly IDSR data summary totals and provide comments on the forms about results seen during data analysis. (See section 3).

(i) Health workers record the summary totals on a recommended weekly, monthly and quarterly IDSR summary reporting form (See Annex 2G).

2.4.2 Keeping records and procedures for managing reporting forms

Keep a record of IDSR forms, notifications and reports received at your level. The record you keep is an essential data source for calculating indicators for your country's IHR report and for monitoring performance of the IDSR indicators. A sample IDSR Reports and Data Sharing Log Book form is in Annex 2I.

Periodically check with reporting sites that you supervise (community, health facility, sub-district and district) to ensure that the correct forms and procedures are available to staff so they can record and report the required cases of priority diseases and conditions:

(a) Take steps to ensure that all health workers know or have access to the standard case definitions recommended by national policy. Establish or modify existing procedures so that all health workers are able to apply the standard case definitions in detecting and reporting priority diseases, conditions, outbreaks or events.

(b) Sensitize staff on diseases or conditions that require immediate reporting for case-based surveillance, including potential PHEIC and other priority diseases or events of national and regional concern. For example, all the health staff should be aware of epidemic-prone diseases for which a single suspected or probable case is a suspected outbreak requiring immediate action, and of any unusual or unexplained event with potential for affecting human health.

(c) Review with health staff the role that case-based data plays in determining risk factors and the means of disease transmission or exposure to health risks in a public health event. Make sure the staff has access to a standardized form for reporting case-based information.

(d) Ensure that the surveillance unit has access to fast communication means (facsimile, internet connection, telephone, text message, electronic mail, telegrams, personal messages, or other rapid communication means). For the district, specify how the district should notify the regional or national levels and who should be contacted at these levels.

2.4.3 Perform periodic checks on data quality

While each provider may have some preferred methods for filling in forms, describing diseases, or abbreviating terms, it is important for every level of reporting (Facility, district, region or province, national) to use a standard approach to recording and reporting, as data that are not comparable, will lead to inappropriate decisions.

Some of the examples of factors which may affect data quality that needs to be periodically checked include:

(a) Poorly completed forms (missing values, etc.).

(b) Incomplete forms (for example, presence of blanks).

(c) Under-reporting or over-reporting of cases.

(d) Duplicate reporting.

(e) Unsystematic data collection and reporting.

(f) Untruthful reporting, (for example, reporting zero, while there is an ongoing outbreak of epidemic prone diseases).

(g) Inconsistent reporting formats (forms).

(h) Late submission or reporting.

(i) Inconsistent reporting periods.

(j) Calculation errors on aggregate reports.

(k) Lack of documentation and source data or files are lost.

During supervision, stress the importance of data quality and surveillance; that correct data will lead to analysis, interpretation, and the information that will be communicated will lead to action and evaluation. It is recommended that countries conduct regular data quality audits at the reporting sites. **(**See Annex 2J for checklist on key elements to assess in data quality audits).

2.4.4 Enhance linkages to strengthen community-based surveillance

A community-based surveillance system relies on the community members' capacity to identify and report public health problems to the nearest health facility or to the district health office. In this system, CBS focal persons identify and report events in the community that have public health significance. CBS focal persons act as community informants, and they report to the health facility, or in the case of a serious event, directly to the district authorities.

Community representatives that can be members of CBS team

Any community member acceptable by the community can be a CBS focal person. Representation could be from basic village-level services such as trained birth attendants, community or village health agents, or similar care providers, community health workers or volunteers, village leaders (religious, traditional or political) or school teachers, veterinarians, health extension workers, chemical sellers, and traditional healers. Once selected, the CBS focal persons should receive training and carry out supportive supervision on how to recognize certain diseases or health conditions for the purpose of reporting suspect cases.

Example: *CBS focal persons hear of several cases of acute watery diarrhoea with vomiting in the community. The informant suspects cholera and reports the alert to the local health facility and to the district level heath officer by text messaging. Members of the public health emergency rapid response team (RRT) travel to the community to verify and investigate the possible outbreak, and, based on the investigation results, implement control and prevention measures. The outbreak is quickly contained. Thanks to the early warning from the community-based surveillance liaison.*

District staff may identify sources in the community with opportunity to know about the community's health status. Examples of community sources include:

(a) Chemical Sellers
(b) School teachers
(c) Staff at private clinics
(d) Village leaders
(e) Religious leaders
(f) Traditional healers
(g) Birth attendants.
(h) Community health workers
(i) Community animal health workers

(j) Community Based Organizations (CBOs)

(k) Other societal leaders

(l) Veterinary health workers

(m) Any individuals involved in neighbourhood watch or other active surveillance approaches

(n) Other community resource persons

Depending on the event, resource availability and the context, countries may choose their source of information. The District can organize community-based surveillance focal points by:

(a) Working with community leaders to identify members of the community to receive relevant training.

(b) Train and provide job aids (for example, Community Registers, leaflets of case definitions, etc.) on priority diseases and public health events or hazards to community health informants. Give enough information about the disease so that the community source can refer cases to the health facility, or notify the health facility when unusual or unexplained health events occur in the community

(c) Involve CBS focal persons in risk mapping, emergency simulation exercises and risk communication during outbreaks.

(d) Ensure that the CBS gives regular and timely feedback of diseases/events reported from the community level. Districts need to ensure that there is sustained commitment by CBS and hence to continuously engage them.

(e) Disseminate alert and epidemic thresholds.

Please refer to the list in Annex 1B of key signs and symptoms to use in case definitions for community surveillance.

2.4.5 Strengthen linkages between Laboratory and Surveillance information

Public health laboratory system complements the syndromic disease surveillance.

(a) In case of a public health event, the laboratory where confirmation took place is to report the laboratory results as soon as the confirmation has been done to the respective health facility and surveillance officer, and simultaneously to the National level, as well as district, region or province.

(b) To strengthen the linkages between epidemiological and laboratory data, the case reported and the laboratory samples should have the same unique ID.

(c) Submission of the weekly summaries of the samples processed, and the types of samples, as well as the results, should be done whenever there is an outbreak, to assist in completion of the variables in the line list register.

(d) During supervision at reporting sites, liaise with the Laboratory Focal Person to ensure that the laboratorians record correctly data for diseases under surveillance and also that there is an established register.

(e) Make sure that the test results are linked with IDSR data at national, regional and district levels.

(f) The laboratory component of the IDSR Weekly or Monthly Summary Reporting Forms should be regularly updated immediately the respective disease laboratory results are ready.

(g) Liaise with the animal sector, so as to have a comprehensive report also from the veterinary laboratory, especially if they have recorded any animal information which might have risks to public health.

2.4.6 Promote a multisectoral One Health approach with effective involvement from human, animal, and environmental health sectors as wells as other relevant sectors to strengthen reporting

Ensure implementation of the One Health approach to improve reporting of public health risks across all levels, with emphasis also at the community level. Lay emphasis on strengthening the technical and community capacities of staff for all relevant sectors (including human physicians/nurses, veterinarians for livestock or wildlife) and environmental inspectors.

Interoperable and interconnected platforms with emphasis on strengthening information systems within and between the human, animal, and environmental sectors would be ideal in enhancing real time information sharing. There should be a conscious effort to formalize the system of sharing information with other sectors, that is, human health, animal health, environmental health, etc.

The other multisectoral key actors to foster collaboration in reporting and assessment of public health risks include: private sector, civil society, faith-based organizations, defence and security forces, prisons, Internally Displaced Persons (IDP) and refugee camps, technical and financial partners and academic institutions and research institutions. Ensure that they are also included to strengthen routine reporting and analysis of public health risks and events.

2.5 Data protection and security to protect patients confidentially

The public health community recognizes that there might be risks to both individuals and communities, if one uses name-based reporting of private health-related information.

To ensure protection of patient confidentiality and privacy, when reporting, use unique identifiers such as numbers instead of names and this will prevent identities from being inadvertently disclosed. The identifiable data should be however maintained where public health surveillance interventions occur and it is usually at the health facility level. Districts need to have guidelines on privacy and security of health data, which should be guided by the national level guidelines.

Note: Use of names may be required during an outbreak of infectious diseases for the purpose of contact tracing. Refer to section 4 on contact tracing and recording.

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2.6 Annexes to Section 2

Annex 2A IHR 2005 Decision Instrument

Annex 2B Algorithm of reporting immediate notifiable events/diseases

Annex 2C Community Alert Form for reporting of events from community sources

Annex 2D Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet

Annex 2E Reporting Structure for community alert and verification

Annex 2F IDSR immediate case-based reporting form

Annex 2G IDSR case-based laboratory reporting form

Annex 2H IDSR weekly/monthly summary reporting form

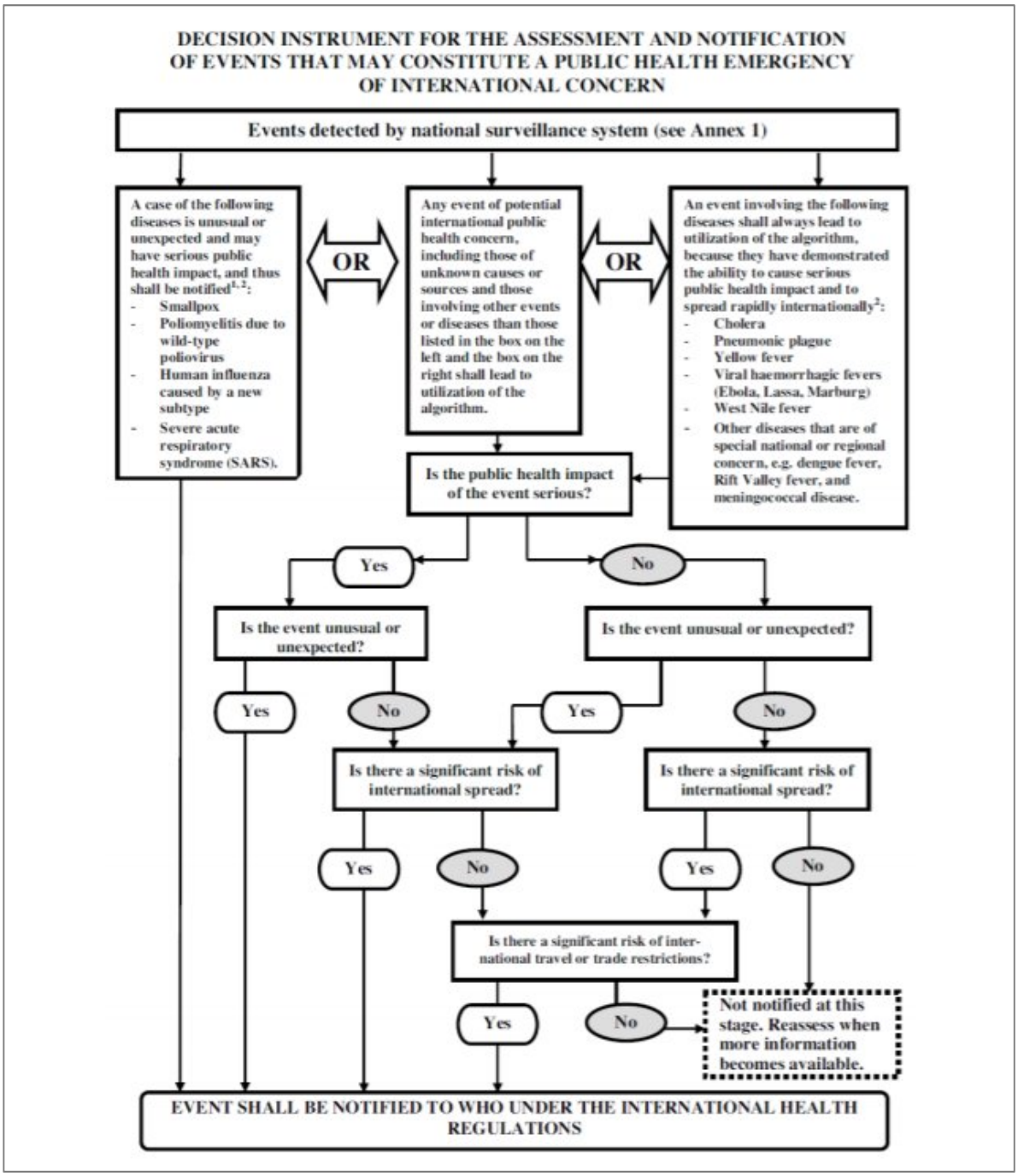
Annex 2I IDSR reports and data sharing log book

Annex 2J District level IDSR Data quality checklist

Annex 2K Maternal deaths, Perinatal deaths reporting form, and Still and neonatal deaths summary reporting form

Annex 2L WHO weekly reporting format

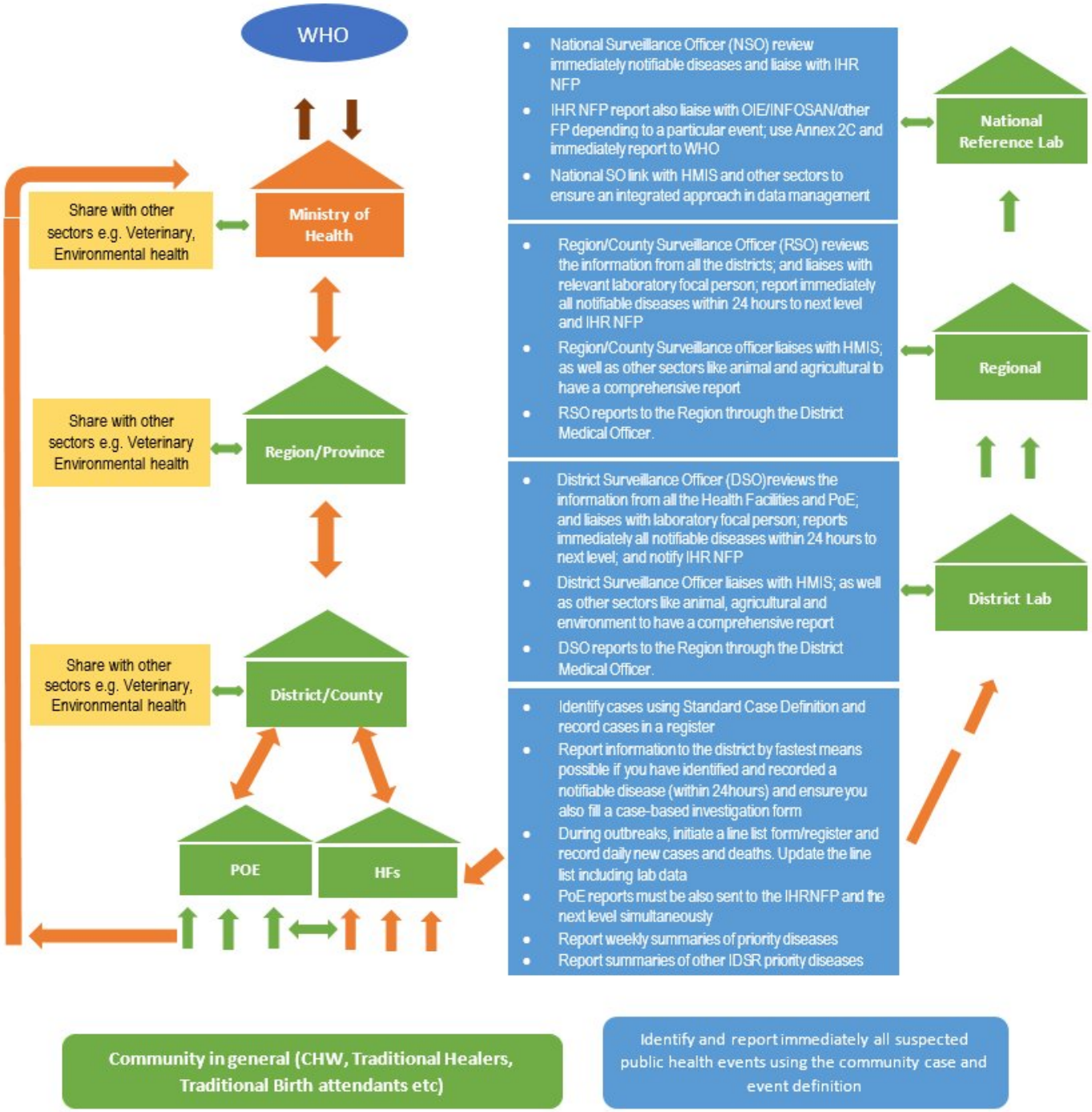
Annex 2A: IHR 2005 Decision Instrument



[1] As per WHO case definitions.
[2] The disease list shall be used only for the purposes of these Regulations.

*States Parties that answer "yes" to the question whether the event meets any two of the four criteria above shall notify WHO according to Article 6 of the IHR

Annex 2B: Algorithm of reporting immediate notifiable diseases/conditions/events



Annex 2C: Community alert reporting form

[Send this form immediately to your supervisor or nearby health facility]

Instructions: This form is completed by the CBS focal person and submitted immediately to nearest health facility/sub-district surveillance focal person when he or she identifies disease (s) or public health event as per the community case definition. It is also completed for unusual health events/alerts that are not captured by the given case definition.

Community alert reporting form [Send this form immediately to your supervisor or nearby health facility]	
1. Name of CBS focal person reporting:_____	
2. Telephone number:_____Community_____District_____	
3. Date reporting (day, month, year)__ __/__ __/__ __ __ __	
4. Type of illness/Condition/Event/Alert (please describe): _____	
5. When did this happen (Date: Day/Month/Year); Time	__ __/__ __/__ __ __ __
6. Date/time this was detected (Date: Day/Month/Year); Time:	__ __/__ __/__ __ __ __
7. Where did this happen? (Location: community, ward/sub-district, district)	
8. How many people have been affected?	
9. Has anyone died? If yes, how many	
10. Are there sick or dead animals involved?	
11. Is the event ongoing as at the time of this report?	
12. What action has been taken?	

NB: Countries should adopt this form such that it is used to capture and notify/report the country's priority diseases (Indicator-based surveillance) and events/alerts (event-based surveillance) occurring at the community level. This can be carbonated in the form of a CBS Register or note book with a copy sent to the nearest health facility and copy kept at community with the CBS focal person. Sections of the register should include pictures or images of the community case definitions and the predetermined events/alerts to assist in detection at the community level.

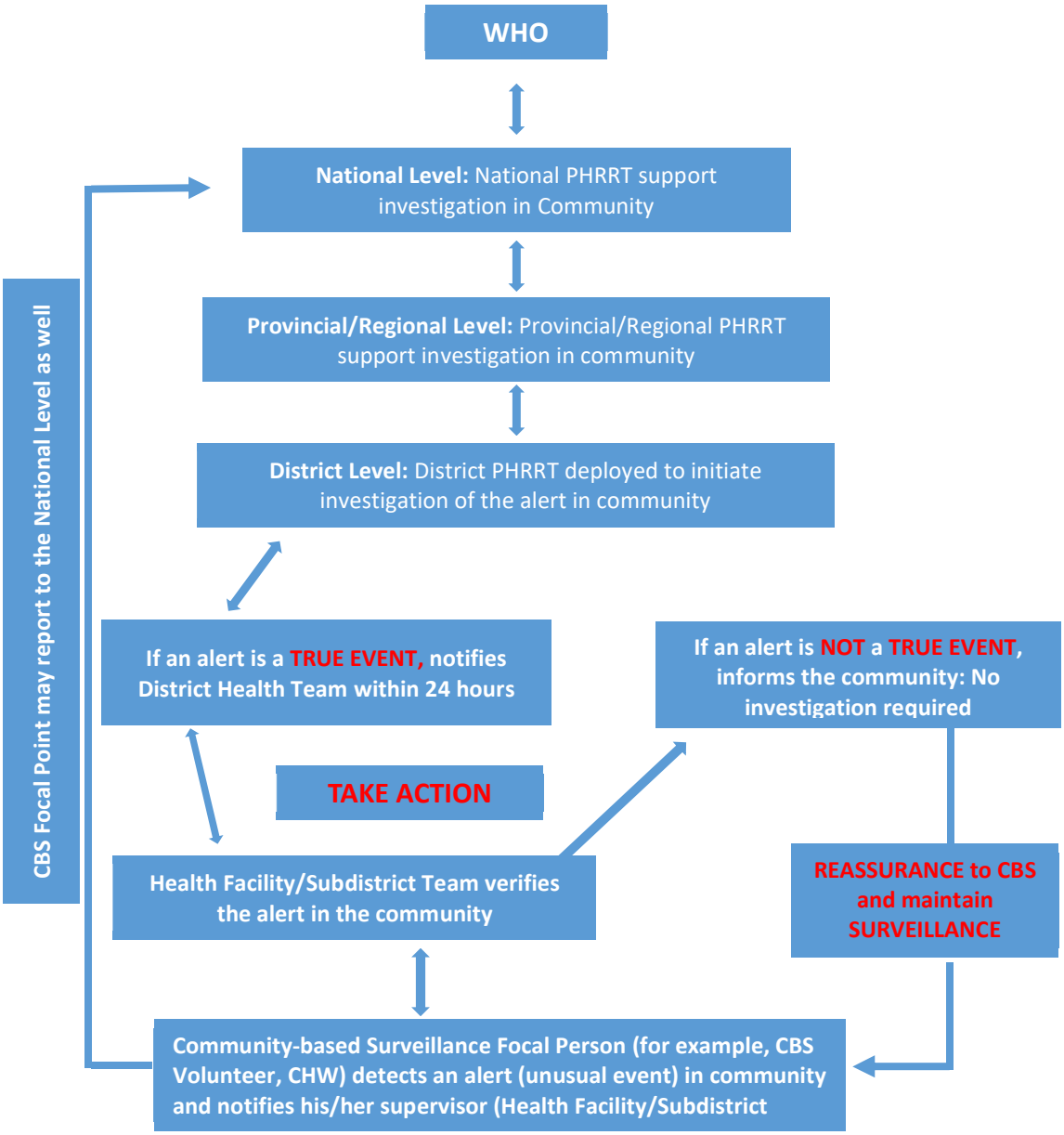
Annex 2D: Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet

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

Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet						
District_____Ward/Subdistrict_____ Community:_____Month_____ Year_____						
Serial Number	Type of illness/ Condition/Event/Alert	When did this happen? (DD/MM/YYY)	Where did this happen? (Community, District)	How many have been affected?	How many died?	what action was taken?

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

Annex 2E: Reporting Structure for community alert and verification



Annex 2F: IDSR immediate case-based reporting form

IDSR Immediate Case-Based Reporting Form		
	Variables/Questions	Answers – Case n
X	Record's unique identifier (YYYY-WEEK-CCC-PPP-DDD-Case nnn)	
1	Reporting Country	
2	Reporting Province/Region	
3	Reporting District	
4	Reporting Site (Health Facility, Camp, Village...)	
5	Disease/Event (diagnosis): *	
6	Inpatient or Outpatient?	
7	Date seen at health facility (day/month/year)	______\\
8	Patient Name(s)	
9	Date of Birth (day/month/year)	______\\
10	Age (...Years/...Months/...Days).	
11	Sex: M=Male F=Female	
12	Patient's residence: Name of Community/ Neighbourhood	
13	Name of Town/City	
14	Name of District of residence	
15	Urban/Rural? (U=Urban R=Rural)	
16	Address, (cell)phone number ... If applicable, name of mother and father if neonate or child	
17	Occupation	
18	Date of onset (day/month/year) of first symptoms	______\\
19	Travel history (Y or N), if Yes, state destination	
20	Number of vaccine doses received in the past against the disease being reported**	
21	Date of last vaccination	______\\
22	Date specimen collected	
23	Date specimen sent to lab	
24	Laboratory results	
25	Outcome: (Alive, Dead, transferred out, Lost to follow-up or unknown)	
26	Final Classification: Confirmed, Probable, Compatible, Discarded	
27	Date health facility notified District (day/month/year)	_ _ __ _ __ _ _\\
28	Date form sent to district (day/month/year)	______\\
29	Person completing form: name, function, signature	

*** Disease/Event (Diagnosis)**:
AFP, Anthrax, Cholera, Bloody Diarrhoea, Dracunculiasis (Guinea Worm Disease), Neonatal Tetanus, Non-neonatal Tetanus, Measles, Dengue, Chikungunya, Meningitis, Monkey Pox, Yellow Fever, SARS, SARI, Maternal death, Neonatal death, Viral Haemorrhagic Fever, Plague, Typhoid fever, Rabies (Human), Smallpox, death, Influenza due to new subtypes, Adverse Effects following immunization (AEFI), Any event or disease of public health importance (Specify)

**** Measles, Neonatal Tetanus (TT in mother), Yellow Fever, and Meningitis, etc.**
For cases of Measles, NT (TT in mother), Yellow Fever, and Meningitis; 9=unknown

Annex 2G: IDSR case-based laboratory reporting form

IDSR case-based Laboratory Reporting Form		
Part I: Referring health worker to complete this form and a copy sent to the laboratory with the specimen		
	Variables	**Answers**
1	Date of specimen collection (day/month/year)	
2	Suspected Disease or Condition	
3	Specimen type *	
4	Specimen unique identifier **	
5	Patient Name (s)	
6	Sex (M= Male F= Female)	
7	Age (….. Years/ …… Months/ … Days).	
8	Date Specimen sent to laboratory (day/month/year)	_________\
9	Phone and email address of clinician	
Part II. Laboratory to complete this section and return the form to district and clinician		
	Variables	**Answers**
1	Laboratory Name and location	
2	Date laboratory received specimen (dd/mm/yyyy)	_________\
3	Specimen condition: (Adequate/Not adequate)	
4	Type of test(s) performed	
5	Final Laboratory Result(s)	
6	Date (dd/mm/yyyy) laboratory sent results to district	_________\
7	Date Results sent to the clinician (dd/mm/yyyy)	_________\
8	Date district received laboratory results (dd/mm/yyyy)	_________\

* Blood, Plasma, Serum, Aspirate, CSF, Pus, Saliva, Biopsy, Stool, Urethral/Vaginal discharge, Urine, Sputum, food/water samples

** Same as the patient's identifier in the IDSR immediate case-based reporting form

Annex 2H: IDSR weekly/monthly summary reporting form

IDSR weekly/monthly summary reporting form					
Year:		Week:		Month:	
Country:		Province/Region:		District:	Population:
District ISO code:		Reporting Site Name:		Report Unique Identifier:	
Officially Expected Reports:		Number of reports received:			Reports received on time:
Notifiable Diseases and Events		Cases	Deaths	Lab confirmed cases	Observations
1	Acute Flaccid Paralysis				
2	Acute haemorrhagic fever syndrome				
3	Acute viral hepatitis				
4	Adverse Effects following immunization (AEFI)				
5	Anthrax				
6	Buruli ulcer				
7	Bacterial meningitis				
8	Chikungunya				
9	Cholera				
10	Chronic viral hepatitis B (New cases)				
11	Chronic viral hepatitis C (New cases)				
12	Dengue fever				
13	Diabetes mellitus (New cases)				
14	Diarrhoea with blood				
15	Diarrhoea with severe dehydration <5				
16	Dracunculiasis (Guinea worm disease)				
17	HIV/AIDS (New cases)				
18	Hypertension (New cases)				
19	Influenza-like illness				
20	Leprosy				
21	Listerosis				
22	Malaria				

IDSR weekly/monthly summary reporting form					
Year:		Week:		Month:	
Country:		Province/Region:		District:	Population:
District ISO code:		Reporting Site Name:		Report Unique Identifier:	
Officially Expected Reports:		Number of reports received:			Reports received on time:
Notifiable Diseases and Events		Cases	Deaths	Lab confirmed cases	Observations
23	Malnutrition < 5 years				
24	Maternal deaths				
25	Measles				
26	Mental health (Epilepsy)				
27	Middle East respiratory syndrome (MERS)				
28	Monkey Pox				
29	Neonatal tetanus				
30	Non-neonatal tetanus				
31	Newborn with low birthweight (less than 2500 g)				
32	Noma				
33	Onchocerciasis				
34	Perinatal deaths				
35	Plague				
36	Poliomyelitis (AFP)				
37	Public health events of international or national concern				
38	Rabies (Human)				
39	SARS				
40	Severe Acute Respiratory Infections (SARIs)				
41	Severe pneumonia <5				
42	Sexually Transmitted Infections				
43	Smallpox				
44	Trachoma				
45	Trypanosomiasis				

IDSR weekly/monthly summary reporting form					
Year:		**Week:**		**Month:**	
Country:		**Province/Region:**		**District:**	**Population:**
District ISO code:		**Reporting Site Name:**		**Report Unique Identifier:**	
Officially Expected Reports:		**Number of reports received:**			**Reports received on time:**
Notifiable Diseases and Events		**Cases**	**Deaths**	**Lab confirmed cases**	**Observations**
46	Typhoid fever				
47	Viral haemorrhagic fever				
48	Yellow Fever				
49	Zika virus disease				

Analysis, Interpretation, Decision, Action and Recommendations	
Epidemiological comments	
Decisions and action(s) taken	
Recommendations	
Report date: __________ **(dd/mm/yyyy)**	Responsible Officer:

Annex 2I: IDSR reports and data sharing logbook

IDSR Reports and Data Sharing Log book							
Country:							
Province /Region:							
District:							
Surveillance site name:							
Reception Date of the Report or Data set	**Report description: pick one from the list below ***	**Reporting site name**	**Reported period ****	**Report form well filled? (Y/N)**	**Report received Timely or Late?**	**Feedback sent to the reporting site? (Yes/No)**	**Comments**

*

Weekly AFP polio; Weekly Epidemic Prone Diseases; Weekly Influenza sentinel sites and labs findings; Monthly IDSR Aggregated data including malaria and Guinea worm disease; Monthly Paediatric bacterial Meningitis surveillance data; Monthly; Measles and yellow fever laboratory data; Monthly Measles, yellow fever and NNT case-based data; Monthly Bacteriology laboratory data; Monthly Rotavirus surveillance data; Quarterly Tuberculosis Report; Quarterly MDR and XDR Tuberculosis Report; Quarterly Leprosy Report; Quarterly Trypanosomiasis Report; Annual HIV Surveillance data, Etc.

**(Use epidemiological notation to record the reporting period, for example: W-2010-18 for weekly data, M-2010-12 for monthly data, Q-2010-02 for quarterly data)

Note: Instructions for completing forms can be printed on the reverse side if a paper form is used or in electronic format if reports are compiled and transmitted by computer

Annex 2J: District level IDSR Data quality checklist

District Level IDSR Data Quality Audit Checklist				
Name of Reporting Officer: _____				
Contact Phone Number: _____ **E-mail:** _____				
Health Facility: _____ **District:** _____				
Region/Province: _____ **Date** _____ _____/_____ _____/_____ _____ _____ _____				
Persons Met and Title				
CORE ACTIVITY	**THINGS TO LOOK FOR IN THE FACILITY**			**NOTES**
	General			
1. DATA COLLECTION TO IDENTIFY SUSPECTED CASES WITHIN HEALTH FACILITY	1. Is there an information flow for reporting to the district level (diagram or description)?			
	2. How frequently do you review and collect data (for example, daily, weekly, monthly)?			
	3. Is there a list of the country's notifiable diseases?			
	4. Is there a list of priority reportable diseases/conditions/events?			
	5. For each priority reportable disease, condition or event, does this facility have case definitions for suspected and confirmed cases?			
	6. Priority Reportable Diseases/conditions/events with case definitions			
	Disease (examples only. Please modify list for your setting.)	Yes	No	Notes
	AFP (Suspected Polio)			
	Tuberculosis			
	Viral Haemorrhagic Fever, for example, Ebola			
	Yellow Fever			
	Monkey Pox			
	Others: specify			
	Case-Based Reporting or Line List Form, IDSR weekly/monthly summary forms			
	1) Is the cased-based form or line listing form or IDSR weekly/summary form paper-based or electronic?			
	2) If paper-based, do you have adequate supply of case-based reporting or line listing forms?			
	3) Is your facility using them?			
	4) Do you get feedback about the final diagnosis?			

Thoughts on possible problems in data collection process **Examples:** • Unsystematic data collection and reporting procedures due to HCW not knowing • Lack of laboratory results due to lack of feedback from higher levels or from the requested laboratory	**List possible causes of omissions or problems.**		
	List recommended solutions, including target date and person responsible.		
2. RECORDING OF CASES	1. For suspected cases, what material is reviewed to determine suspected cases (for example, patient chart/folder/card, facility record, case-based form, line list)?		
	2. For suspected cases, how was diagnosis assessed (for example, laboratory confirmatory tests, patient signs and/or symptoms, patient history, or consultation)?		
	3. Are priority reportable diseases recorded in the health facility register or facility line list according to the country		
	4. Select randomly 3 priority diseases; verify how they are diagnosed and recorded		
Thoughts on possible problems in recording of cases, for example: Lack of documentation/recording Data or files are lost Poorly completed forms (missing values, forms not filled, presence of blanks, etc.).	**List possible causes of omissions or problems**		
	List recommended solutions, including target date and person responsible		
3. REPORTING	1. Who is responsible for reporting priority reportable diseases (health-care provider, laboratory, institution)?		
	2. When was the last time a supervisor made a site visit to your facility?		
	3. How often do you report information to the next level?		
	4. Is there a standard method for reporting each immediate reportable disease?		
	5. Is there a standard method for summary reporting each **priority** disease?		
	6. Is there a standard method of reporting an outbreak?		
	7. Is the report case-based or aggregate format?		
	8. Is the reporting protocol process mapped out or summarized in narrative format and readily visible in the facility (for example, on the wall)?		
	9. For priority diseases, are "0" cases recorded and reported?		
	10. Are the number of cases of notifiable diseases seen at the facility within a specified reporting period same as that reported to the district level? (Randomly select 3 notifiable diseases and verify)		
	11. Are each of the immediately reportable diseases consistently reported in a timely manner?		
	Immediately Reportable Diseases		**Notes**
	Disease	**Yes** **No**	

List findings seen For example: Under-reporting or Over-reporting of cases. Duplicate reporting Untruthful reporting, (for example, reporting zero, while there is an ongoing outbreak of epidemic-prone diseases) Inconsistent reporting formats (forms). Late submission/reporting. Inconsistent reporting periods,				
Thoughts on Report	**List possible causes of omissions or problems**			
	List recommended solutions, including target date and person responsible			

Annex 2K: Maternal death-reporting form and Perinatal death reporting forms

Maternal Death Reporting Form		
The form must be completed for all deaths, including abortions and ectopic gestation related deaths, in pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy		
Questions/Variables		Answers
1	Country	
2	District	
3	Reporting Site	
4	How many of such maternal deaths occurred cumulatively this year at this site?	
5	Date this maternal death occurred (day/month/year)	
6	Maternal death locality (Village or Town)	
7	Record's unique identifier (year-Country code-District-site-maternal death rank)	
8	Maternal death place (Community, health facility, district hospital, referral hospital or private hospital, on the way to health facility or	
9	Age (in years) of the deceased	
10	Gravida: how many times was the deceased pregnant?	
11	Parity: how many times did the deceased deliver a baby of 22 weeks/500g or more?	
12	Time of death (specify "During pregnancy, At delivery, during delivery, during the immediate post-partum period, or long after	
13	If abortion: was it spontaneous or induced?	
Maternal death history and risk factors		
14	Was the deceased receiving any antenatal care? (Yes/No)	
	Did she have Malaria? (Yes or No)	
15	Did she have Hypertension? (Yes or No)	
16	Did she have Anaemia? (Yes or No)	
17	Did she have Abnormal Lie? (Yes or No)	
18	Did she undergo any Previous Caesarean Section? (Yes or No)	
19	What was her HIV Status? (choose "HIV+; HIV-; or Unknown HIV status")	
	Delivery, puerperium and neonatal information	
20	How long (hours) was the duration of labour	
21	What type of delivery was it? (choose one from "1=Vaginal non-assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section"	
22	What was the baby status at birth? (Alive or Stillborn)	

Maternal Death Reporting Form		
The form must be completed for all deaths, including abortions and ectopic gestation related deaths, in pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy		
	Questions/Variables	Answers
23	In case the baby was born alive, is he/she still alive or died within 28 days after his/her birth? (choose 1=Still alive, 2=neonatal death, 3=died beyond 28 days of age)	
24	Was the deceased referred to any health facility or hospital? (Yes/No/Don't know)	
25	If yes, how long did it take to get there? (hours)	
26	Did the deceased receive any medical care or obstetrical/surgical interventions for what led to her death?	
27	If yes, specify where and the treatment received*	
28	Primary cause of the Maternal Death	
29	Secondary cause of the Maternal Death	
30	Analysis and Interpretation of the information collected so far (investigator's opinion on this death)	
31	Remarks	
32	Maternal death notification date (day/month/year)	
33	Investigator (Title, name and function)	
	*Treatment received	
	I.V. Fluids; Plasma; Blood Transfusion; Antibiotics; Oxytocin; Anti-seizure drugs; Oxygen; Anti-malarial; Other medical treatment; Surgery; Manual removal of placenta; Manual intra uterine aspiration; Curettage, laparotomy, hysterectomy, instrumental delivery (Forceps; Vacuum), Caesarean section, anaesthesia (general, spinal, epidural, local)	
	Definitions	
	Gravida: The number of times the woman was pregnant- Parity**:** Number of times the woman delivered a baby of 22 weeks/500g or more, whether alive or dead	

Perinatal death – reporting form		
The form must be completed for selected perinatal deaths, comprising stillbirths and early neonatal deaths		
Questions / Variables		**Answers**
Identification		
1	Country	
2	District	
3	Reporting site/facility	
4	Perinatal death locality (village or town)	
5	Place of death (community, health facility, district hospital, referral hospital or private hospital, on the way to health facility or hospital)	
6	Date this perinatal death occurred (day/month/year)	
7	Record's unique identifier (year-country code-district-site) for the mother.	
8	Record's unique identifier (year-country code-district-site) for the baby (deceased).	
Pregnancy progress and care (Perinatal death history and risk factors)		
9	Mother's age (in years)	
10	Type of pregnancy (singleton/twin/higher multiples)	
11	Did the mother of the deceased receive any antenatal care? (Yes/No/Unknown),	
12	If yes to 11, how many visits? _____	
13	Did the mother of the deceased have malaria? (Yes/No/Unknown)	
14	If yes to 13, did the mother receive treatment? (Yes/No/Unknown)	
15	Did the mother of the deceased have pre-eclampsia disease? (Yes/No/Unknown)	
16	If yes to15, did the mother receive any treatment? (Yes/No/Unknown)	
17	Did the mother of the deceased have severe anaemia (HB,7g/dl)? (Yes/No/Unknown)	
18	If yes to 17, did the mother receive any treatment? (Yes/No/Unknown)	
19	Did the mother of the deceased have recommended maternal immunizations (for example, tetanus toxoid) (Yes/ No/Unknown)	
20	Did the mother of the deceased have Rhesus factor (Rh) or ABO incompatibility? (Yes/ No/Unknown)	
21	If Rhesus positive, did the mother of the deceased receive Anti-D injection during this baby's pregnancy? (Yes/ No/Unknown)	

Perinatal death – reporting form		
22	Did the deceased present an abnormal lie (including breech presentation)? (Yes/ No/Unknown)	
23	What was the HIV status of the mother? (choose "HIV+; HIV-; or Unknown HIV status")	
24	What was the status of the syphilis test of mother? (Positive (+) or negative (-) If she was positive for syphilis, did she receive treatment	
Labour, birth, puerperium		
25	Date of birth (day/month/year)	
26	Attendance at delivery (Nurse/midwife/doctor/other-specify).	
27	Was foetal heart rate assessed on admission? (Yes, No)	
	What type of delivery was it? (choose one from "1=Vaginal non-assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section	
28	Sex of the baby (1=male; 2=female, 3=ambiguous)	
29	Birth weight in grams (>=2500; 1500-2499 (LBW); 1000-1499g (VLBW); <1000 (ELBW))	
30	Did the mother of the deceased have premature rupture of membranes (PROM)? (Yes/No/Unknown)	
31	Did the mother of the deceased have foul smelling liquor?	
32	Gestational age (in weeks) Method of estimation: Ultrasound /LMP (DD/MM/YY)	
33	How long (hours) was the duration of labour?	
Information on the death and actions taken before and after the death		
30	If stillbirth – gestational age (in weeks) of the deceased	
31	If neonatal death – age (in days) of the deceased	
32	If the deceased baby was born alive what was the APGAR Score?	
33	If the deceased baby was born alive, was resuscitation with bag and mask conducted?	
34	If the deceased baby was born alive, was he/she referred to any health facility or hospital? (Yes/No/Unknown)	
35	If the deceased baby was born alive, did he/she receive any other medical care beyond resuscitation? (Yes/No/Unknown)	
	If yes, specify where and the treatment received: * I.V. Fluids; Blood/Plasma transfusion; Antibiotics; Oxygen; Other medical treatment	
	Primary cause of death:	
	Secondary cause of death:	

Perinatal death – reporting form		
	Maternal condition (if applicable)	
34	Timing of death (1-fresh stillbirth; 2-macerated stillbirth)	
35	Any physical malformation noted on the deceased? (Yes/No)	
	If yes, type of birth defect (with full description):	
Investigator's report		
36	Analysis and interpretation of the information collected so far (investigator's opinion on this death)	
37	Perinatal death notification date (day/month/year)	
38	Investigator (Title, name and function)	

Stillbirths and neonatal deaths monthly summary reporting form

The form must be completed for stillbirths and neonatal deaths								
Questions/Variables								**Answers**
Identification								
1	Data for the month of							
2	Country							
3	District							
4	Reporting site/facility							
5	Births							
		Total Births	Stillbirths			Neonatal deaths		
			Antepartum	Intrapartum	Unknown	Early	Late	
	<1000 g (ELBW)							
	1000–1499 g (VLBW)							
	1500–1999 g (LBW)							
	2000–2499 g (MLBW)							
	2500 + g							
	Total							
Pregnancy progress and care (Perinatal death history and risk factors)								
6	Multiple pregnancies							
7	Born before arrival							
8	Mode of delivery							
	Normal vaginal delivery	Vacuum	Forceps	Caesarean	Unknown			
9	Gestational age							
	Term	Post-term	Ext preterm (<1000g)	Very preterm (1000-1499)	Mod preterm (1500-2499)	Unknown		
10	HIV status							
	Negative	Positive	Unknown					
11	Syphilis serology							
	Negative	Positive	Unknown					
12	Maternal age							
	>34 y	20-34	18-19 y	<18 y	Unknown			

Annex 2L: WHO Epidemiological week format, 2019-2020

Week Number	2019	2020
01	31-12-18 to 06-01-19	30-12-19 to 05-01-19
02	07-01-19 to 13-01-19	06-01-20 to 12-01-20
03	14-01-19 to 20-01-19	13-01-20 to 19-01-20
04	21-01-19 to 27-01-19	20-01-20 to 26-01-20
05	28-01-19 to 03-02-19	27-01-20 to 02-02-20
06	04-02-19 to 10-02-19	03-02-20 to 09-02-20
07	11-02-19 to 17-02-19	10-02-20 to 16-02-20
08	18-02-19 to 24-02-19	17-02-20 to 23-02-20
09	25-02-19 to 03-03-19	24-02-20 to 01-03-20
10	04-03-19 to 10-03-19	02-03-20 to 08-03-20
11	11-03-19 to 17-03-19	09-03-20 to 15-03-20
12	18-03-19 to 24-03-19	16-03-20 to 22-03-20
13	25-03-19 to 31-03-19	23-03-20 to 29-03-20
14	01-04-19 to 07-04-19	30-03-20 to 05-04-20
15	08-04-19 to 14-04-19	06-04-20 to 12-04-20
16	15-04-19 to 21-04-19	13-04-20 to 19-04-20
17	22-04-19 to 28-04-19	20-04-20 to 26-04-20
18	29-04-19 to 05-05-19	27-04-20 to 03-05-20
19	06-05-19 to 12-05-19	04-05-20 to 10-05-20
20	13-05-19 to 19-05-19	11-05-20 to 17-05-20
21	20-05-19 to 26-05-19	18-05-20 to 24-05-20
22	27-05-19 to 02-06-19	25-05-20 to 31-05-20
23	03-06-19 to 09-06-19	01-06-20 to 07-06-20
24	10-06-19 to 16-06-19	08-06-20 to 14-06-20
25	17-06-19 to 23-06-19	15-06-20 to 21-06-20
26	24-06-19 to 30-06-19	22-06-20 to 28-06-20
27	01-07-19 to 07-07-19	29-06-20 to 05-07-20
28	08-07-19 to 14-07-19	06-07-20 to 12-07-20
29	15-07-19 to 21-07-19	13-07-20 to 19-07-20
30	22-07-19 to 28-07-19	20-07-20 - 26-07-20
31	29-07-19 to 04-08-19	27-07-20 to 02-08-20
32	05-08-19 to 11-08-19	03-08-20 to 09-08-20
33	12-08-19 to 18-08-19	10-08-20 to 16-08-20
34	19-08-19 to 25-08-19	17-08-20 to 23-08-20
35	26-08-19 to 01-09-19	24-08-20 to 30-08-20
36	02-09-19 to 08-09-19	31-08-20 to 06-09-20
37	09-09-19 to 15-09-19	07-09-20 to 13-09-20
38	16-09-19 to 22-09-19	14-09-20 to 20-09-20
39	23-09-19 to 29-09-19	21-09-20 to 27-09-20

Week Number	2019	2020
40	30-09-19 to 06-10-19	28-09-20 to 04-10-20
41	07-10-19 to 13-10-19	05-10-20 to 11-10-20
42	14-10-19 to 20-10-19	12-10-20 to 18-10-20
43	21-10-19 to 27-10-19	19-10-20 to 25-10-20
44	28-10-19 to 03-11-19	26-10-20 to 01-11-20
45	04-11-19 to 10-11-19	02-11-20 to 08-11-20
46	11-11-19 to 17-11-19	09-11-20 to 15-11-20
47	18-11-19 to 24-11-19	16-11-20 to 22-11-20
48	25-11-19 to 01-12-19	23-11-20 to 29-11-20
49	02-12-19 to 08-12-19	30-11-20 to 06-12-20
50	09-12-19 to 15-12-19	07-12-20 to 13-12-20
51	16-12-19 to 22-12-19	14-12-20 to 20-12-20
52	23-12-19 to 29-12-19	21-12-20 to 27-12-20
53		28-12-20 to 03-01-21

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION

MODULE 3: ANALYSE AND INTERPRET DATA

MARCH 2019

SECTION 3: ANALYSE AND INTERPRET DATA

3. ANALYSE DATA

It is not enough to only collect, record and report numerical information about illness, death and disability from the catchment area; the data must also be analysed at each level where it is collected. Organizing and analysing data is an important function of surveillance. Analysing data provides the information that is used to take relevant, timely and appropriate public health action. Analysis of surveillance data allows for:

(a) Observing trends over time and alerting health staff and relevant stakeholders about emergent events or unusual patterns.

(b) Identifying geographical areas at higher risk.

(c) Characterizing personal variables such as age, gender or occupation that place a person at higher risk for the disease or event.

(d) Monitoring and evaluation of Public Health interventions.

In general, analysing routine surveillance data should address the following questions:

(a) Have any priority diseases or other public health events of concern been detected during the reporting period (this week, for example)? Is an outbreak or unusual public health event suspected?

(b) Of the cases, deaths or events detected, how many were confirmed?

(c) Where did they occur?

(d) How does the observed situation compare to previous observation time periods this year or the previous year? For example, when compared to the start of the reporting period, is the problem increasing?

(e) Are the disease trends stable, improving or worsening?

(f) Is the reported surveillance information representative enough of the reporting site's catchment area? Out of all the sites that should report, what proportion has actually reported?

(g) How timely were the data received from the reporting sites?

(h) What period (seasonality) is it occurring?

(i) Who is affected? Which occupational groups are most at risk?

Each site that collects or receives data should prepare and follow an analysis plan for analysing routine surveillance information (refer to Annex 3A of this section).

This section describes how to receive surveillance data and analyse it by time, place and person. The analysis may be done electronically or manually. Methods for carrying out the analysis and steps for interpreting and summarizing the findings are also included. Information in this section can be applied at the national, district, health facility and community levels.

3.1 Receive, handle and store data from reporting sites

The routine flow of surveillance data is usually from reporting sites to the next level, up to the central level. A reporting site is a site which reports about surveillance and outbreak data to the next level. This includes all health facilities (public, private and quasi-governmental, faith-based), standalone laboratories, and PoE. A reporting site also contains event reports from community surveillance and response.

At the health facility level, both inpatient and outpatient services are surveillance sites. The information collected from the site is compiled in standard forms (Weekly and Monthly IDSR Summary Reporting Forms, Case-based Investigation forms, Line listing forms, etc.), analysed and then forwarded to the district health management team. In areas where there is already an eIDSR system, data is entered using a mobile phone or a computer, and the district health management team can access compiled information from a computer (*Refer to Section 9 on eIDSR on more countries specific examples)*. In some countries, a sub-district team collects the data from the communities and health facilities in its catchment area and forwards it to the district team. Districts merge, aggregate and send their data and reports to provinces, regions or states and subsequently to the central health authorities.

Adequate data protection and security must be ensured. Care must be taken not to leave documents containing personal health information related to notifiable conditions on work desks or anywhere they may be visible to unauthorized persons. Hard copies of identified notifiable conditions should be stored in locked cabinets in a secure location. Data which is stored in a computer should be password protected with appropriate restricted access. Network hardware and any back up or copies of notifiable conditions data must be password protected and stored in a secure location.

3.1.1 Receive data

Make a careful record of all data received from the reporting site. The surveillance team at each level or reporting site where data is received should:

(a) Acknowledge receipt of the data/report.

(b) Log into an appropriate logbook any data set or surveillance report received from any reporting site (Refer to Annex 2G in Section 2).

(c) Record in the log the date the data was received, what is the report about and who is the sender.

(d) Verify whether the data set arrived on time or was late.

(e) Check the completeness of the data set or reports, that is, the number of data sets/reports as against the number of expected data sets or reports

(f) Review the data quality:
   (i) Verify whether the form (hard copy or electronic file) is filled out accurately.
   (ii) Ensure that the form is filled completely (for example, no blanks).

(g) Check to be sure there are no discrepancies on the form. Verify from the reporting site (by phone, e-mail or text message) and correct any discrepancies.

(h) Merge the data and store them in a database.

(i) For electronic surveillance refer to the section 9 on eIDSR.

3.1.2 Enter and clean the data

At each level where data is received (health facility, district, province or national), the surveillance team should always liaise with the Health Information System focal person to extract the priority IDSR diseases from the register and enter correctly into aggregated IDSR reporting forms while listing data from all the reporting sites. Troubleshooting and cleaning data prior to analysis is an important data management practice. Disease trends and maps will not be accurate if information about number of cases, time of onset, or geographical location of cases is missing. Use opportunities during supervisory visits to sensitize clinicians and laboratory staff about the importance of quality practices for recording patient information in patient logbooks/register or reporting forms. Emphasize that patient logs are sources of data for reporting public health information and may play a role in detecting an unusual event or otherwise undetected public health problem.

Ensure that health facility personnel know the algorithm for reporting including reporting levels. Also ensure that there are recording logbooks, including recording logbooks of rumours. The registers which are normally used in most countries are the OPD and IPD registers, and the surveillance officer should always liaise with the health information focal person, to extract the priority disease of IDSR from the registers.

Data may be recorded and aggregated either manually or electronically if a computer is available. Regardless of the method, use the following practices:

(a) Update aggregate totals for each week or month that data was received.

(b) Record a zero when no cases were reported. If a space which should have been filled in is left blank/dash/not applicable, the next level may have an incorrect picture of the situation. They will not know if data is missing or if no cases were reported. Zero reporting allows the next level to know that surveillance did not detect a case of the particular disease or condition.

(c) Ensure that weekly totals include only those cases or deaths actually reported for that epidemiological week (Monday to Sunday). Late reports from previous weeks should be entered with the relevant week and totals updated accordingly.

(d) Avoid duplicate entries by using the report or case record unique identifier to prevent, and also check for, multiple entries of the same records.

(e) Establish frequent contacts with the reporting sites in order to clarify issues of missing information/errors and address inconsistencies detected in the reporting.

(f) Ensure consistency and harmonization of data.

(g) Ensure that update of information on laboratory results is done by linking to the respective case record unique identifier.

Once the data has been received and entered into the aggregate forms, review it carefully to ensure that no mistakes were made during entry. Since surveillance data informs decisions about disease control and prevention actions, there are important ethical, social and economic consequences if data is not entered and managed correctly or on time.

During an outbreak, ensure that data is collected using a line list.

3.2 Analyse data by time, place and person

Findings from data analysis may trigger investigations and subsequent response to an outbreak, condition, or public health event. Data should be analysed by time, place and person (refer to Table 3.1).

Table 3.1: Types of analysis, objectives, data display tools and methods

Type of analysis	Objective	Method	Data Display Tools
Time	Detect abrupt or long-term changes in disease or unusual event occurrence, how many occurred, the seasonality and the period of time from exposure to onset of symptoms.	Compare the number of case reports received for the current period with the number received in a previous period (days, weeks, months, quarters, seasons or years).	Record summary totals in a **table** or on a **line graph** or **histogram or sequential maps.**
Place	Identify where cases are occurring (for example, to identify high-risk area or locations of populations at risk for the disease).	Plot cases on a map and look for clusters or relationships between the location of the cases and the health event being investigated. (for example, cases near a river, cases near a market)	Plot cases on a spot map of the district or area affected during an outbreak. Dot density analysis can also be used to depict the number of cases by geographical location. **NB:** The information can also be presented in a table or a bar chart, but plotting cases in a map will assist in quick assessment and allow prompt
Person	Describe reasons for changes in disease occurrence, how it occurred, who is at greatest risk for the disease, and potential risk factors.	Depending on the disease, characterize cases according to the data reported for case-based surveillance such as age, sex, place of work, immunization status, school attendance, and other known risk factors for the diseases.	Extract specific data about the population affected and summarize in a **table or a bar chart or a pie chart**

3.2.1 Analyse data by time

Data from this type of analysis is usually shown on a graph. The number or rate of cases or deaths is placed on the vertical or y-axis. The time period being evaluated is placed along the horizontal or x-axis. Events that occurred that might affect the particular disease being analysed can also be noted on the graph.

Graphs can show how many cases and deaths have occurred in a given time. It is easier to see changes in the number of cases and deaths by using a graph, especially for large numbers of cases or showing cases over a period of time.

Graphs are made with lines (a trend line) or bars (a bar graph or histogram) to measure the number of cases over time. How to *make a graph* is described in Annex 3B of this section.

Figure 3.1: Example of line graph: Weekly trend of reported Cerebrospinal Meningitis cases, Gondwana County, Epidemiological weeks 1-9, 2017

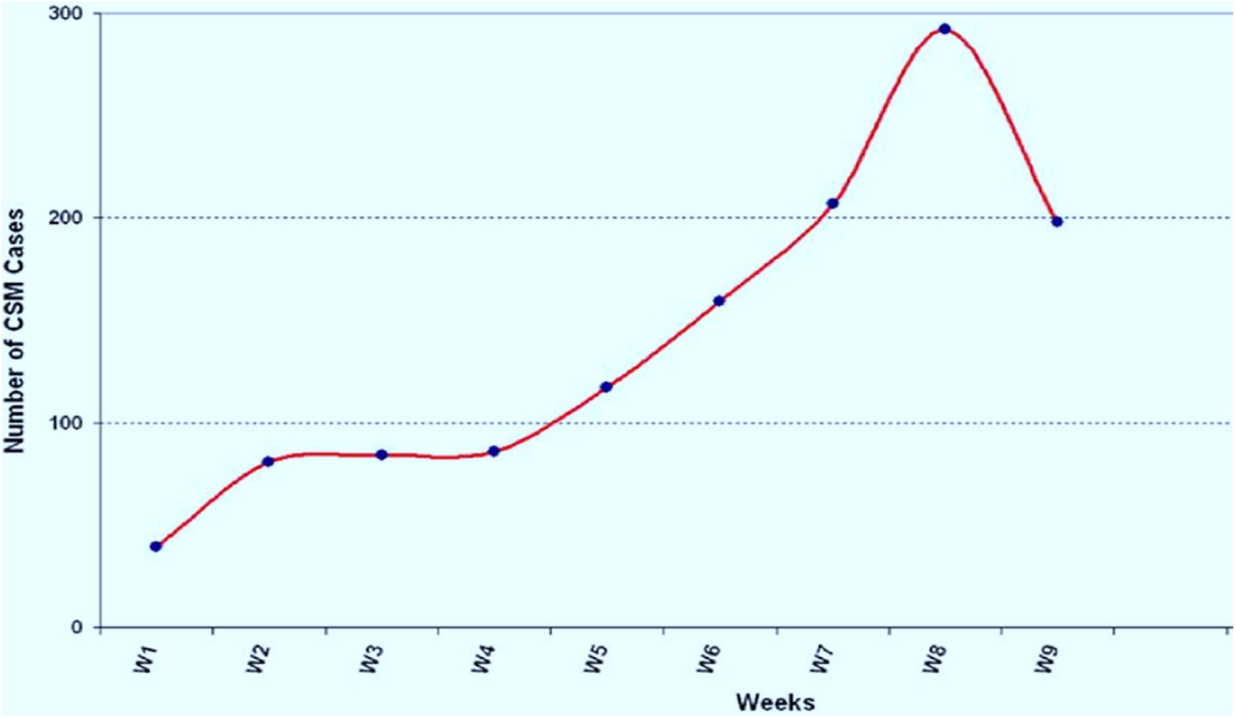


Figure 3.2: Trend line by week, Burkina Faso

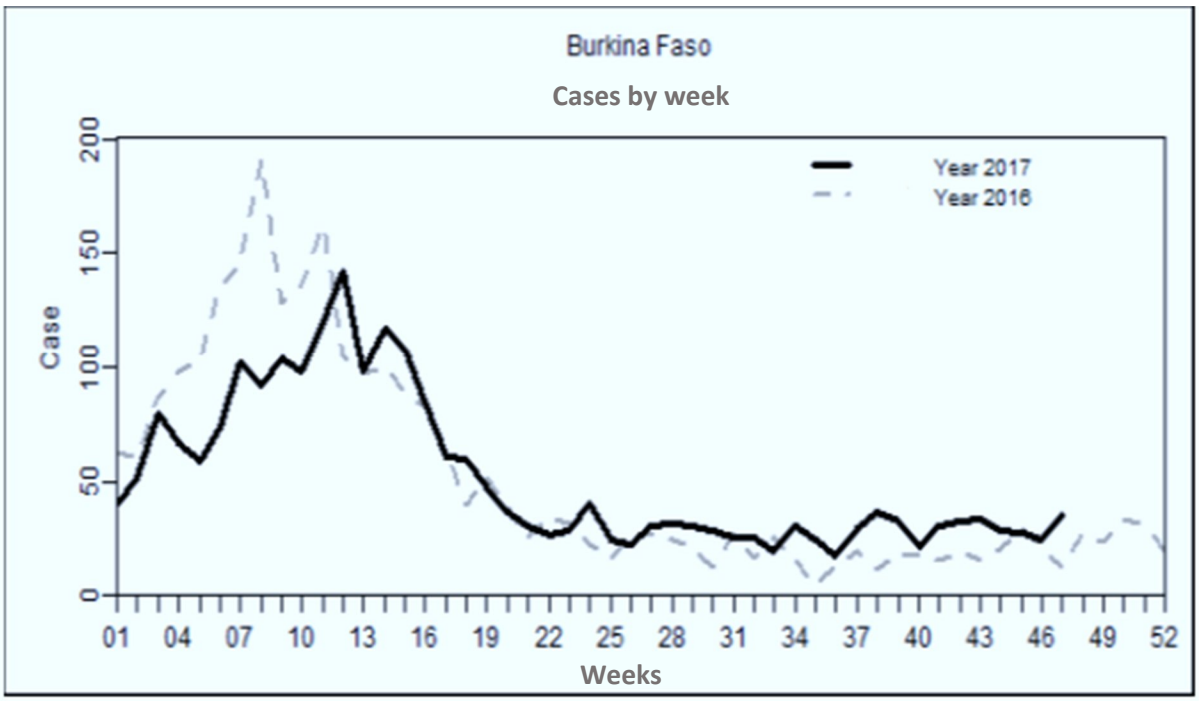
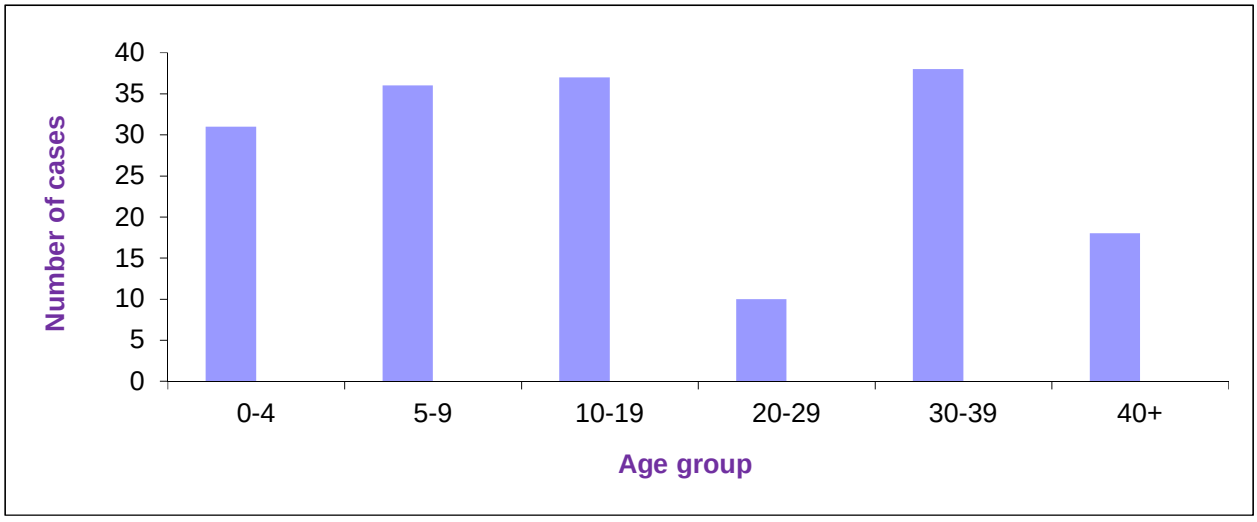


Figure 3.3 Example of a bar graph: Example: Age distribution of diarrhoeal cases during an outbreak in Town X, 2004



Using a histogram

Prepare a histogram using data from the case reporting forms and line lists. Plot cases on the histogram according to the date of onset. As the histogram is developed, it will demonstrate an epidemic curve. The title of the graph should include the name of the geographical location being described.

Highlight significant events on the histogram with arrows. For example, review the log of reported outbreaks to highlight the dates when:

(a) Onset of the first (or index) case occurred

(b) The health facility notified the district

(c) The first case was seen at the health facility

(d) The district began the case investigation

(e) The laboratory confirmed the outbreak

(f) A response was initiated

(g) The district notified the higher level

The results of this analysis allow users of this information to look back at the outbreak and answer questions such as when patients were exposed to the illness, the length of the incubation period, type of the source, duration between detection and confirmation of the outbreak and transmission pattern of the illness and likely time of exposure to the causative agent.

Figure 3.4 Example of histogram (epidemic curve): Reported cholera cases, District A, Epidemiologic week 1–31, 2016

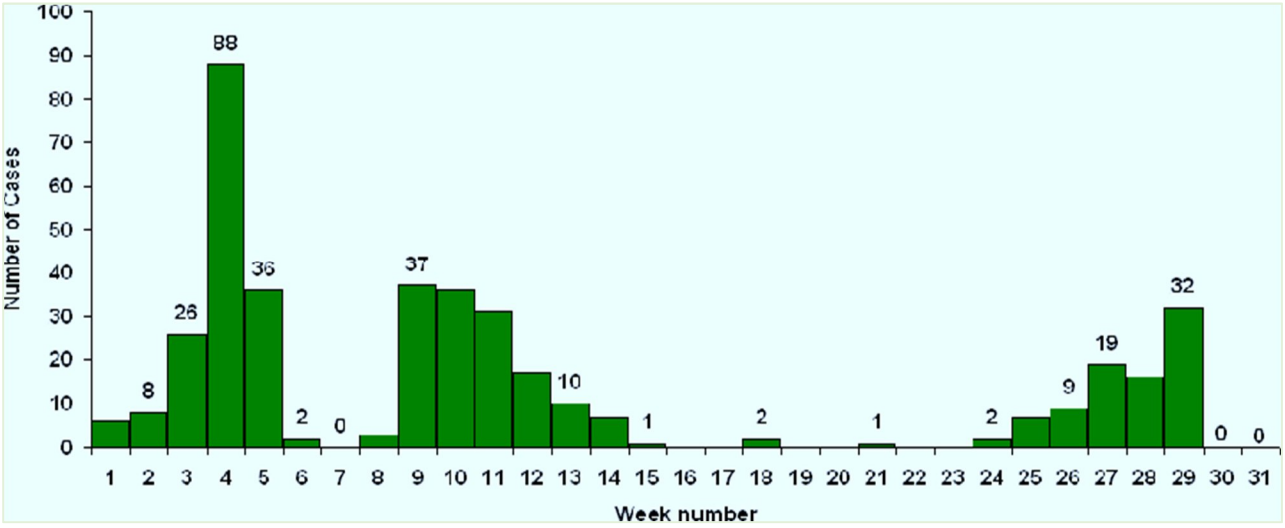
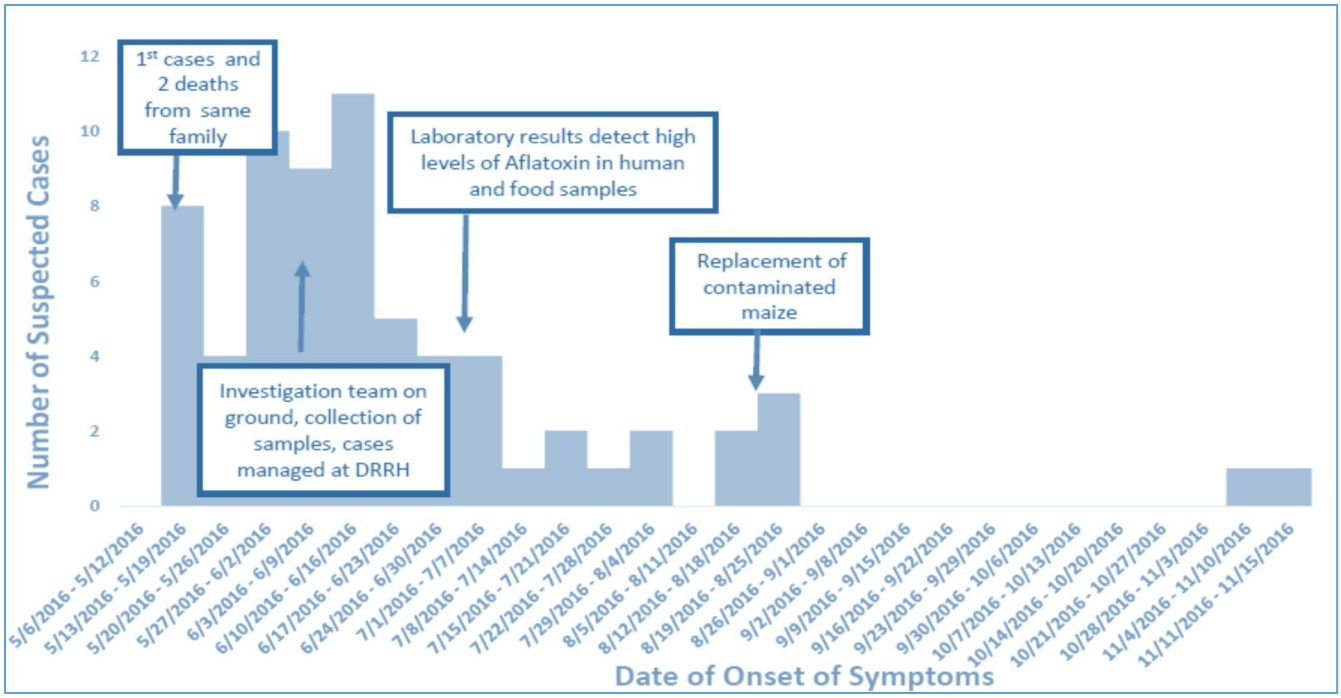


Figure 3.5: Cases of Aflatoxicosis by date of onset of symptoms, Dodoma and Manyara Regions, Tanzania, 2016



3.2.2 Analyse data by place

Analysing data by place provides insight about where a disease is occurring. Establishing and regularly updating a spot map of cases for selected diseases can give ideas as to where, how, and why the disease is spreading. The dot density will give the total number of cases per defined geographical area.

Use the place of residence on the case reporting forms or line list to plot and describe:

(a) Clusters of cases occurring in a particular area.

(b) Travel patterns that relate to the method of transmission for this disease.

(c) Common sources of infection for these cases.

Use manual methods or open source Geographic Information System (GIS) software, such as Health Mapper, QGIS, or Geographic Information Software (GIS) to create maps to use as part of routine analysis of disease surveillance of data. On a map of the area where cases occurred, mark the following:

(a) Roads, water sources, location of specific communities and other factors related to the transmission risk for the disease or condition under investigation. For example, a map for neonatal tetanus includes locations of traditional birth attendants and health facilities where mothers deliver infants. Location of the patients' residences or most relevant geographical characteristic for this disease or condition (for example, by village, neighbourhood, work camp, or refugee settlement). Another example is when mapping young patients during a meningitis outbreak; remember to locate the school that the patients attend or other locations as appropriate to the disease or condition being investigated. Please see section 11, for disease-specific guidelines for specific recommendations for analysing data by place.

Figure 3.6: Example of district spot map showing location of suspected and confirmed cases

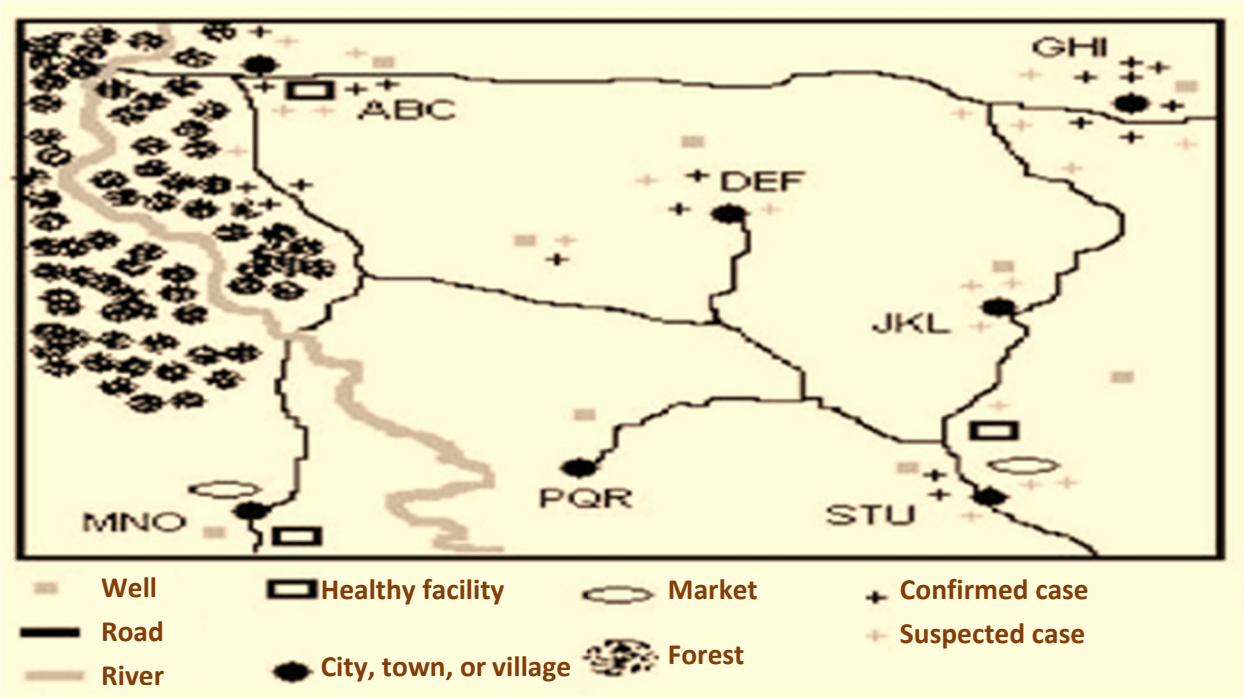
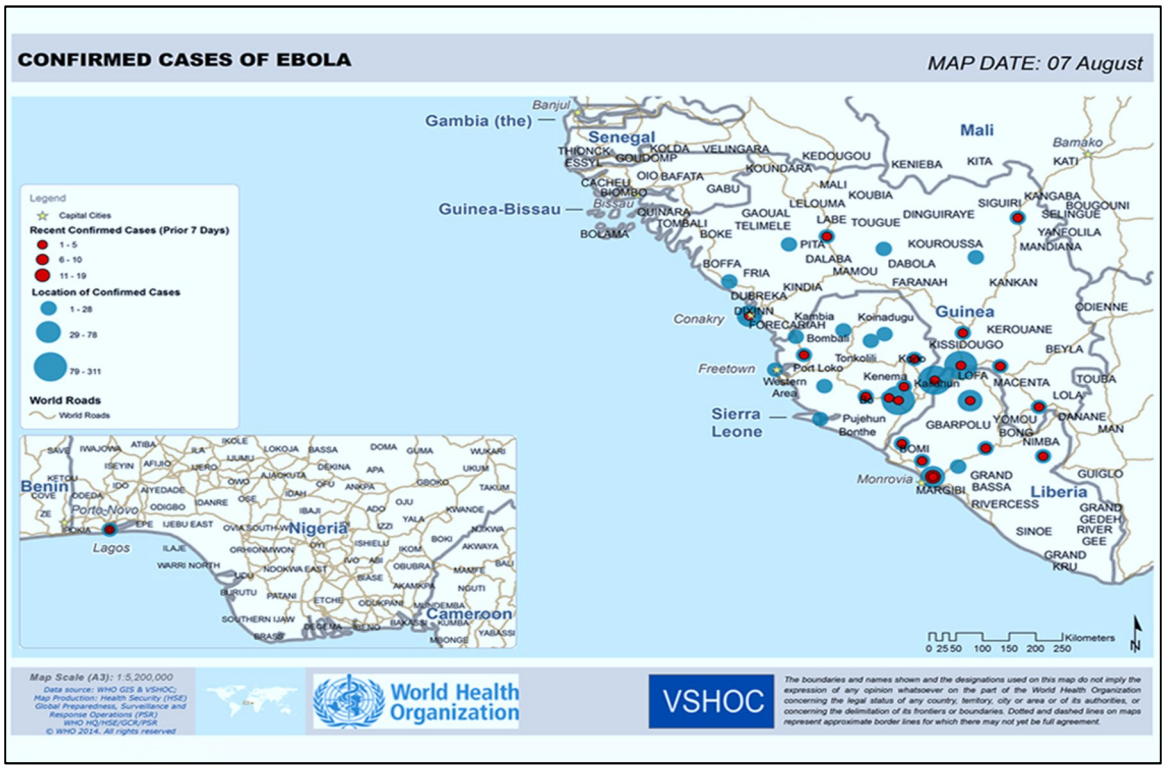


Figure 3.7 Example of a spot map using a GIS software showing concentration of cases along one particular area



3.2.3 Analyse data by person

Analysis by person describes the population with the condition as well as those at risk of contracting the condition or being exposed to factors associated with it. These factors may reveal important clues to understanding the disease, why it occurred and how to control it, thus preventing further spread. Make a distribution of the cases by each of the person variables in the reporting form. For example, compare the total number and proportion of suspected and confirmed cases by:

(a) Age group
(b) Sex
(c) Occupation
(d) Urban and rural residences
(e) Vaccination status
(f) Risk factors
(g) Outcomes
(h) Final classification

Use disease-specific information to decide which variables to compare. For example, if information has been collected about a malaria outbreak, specify the age groupings that are targeted by the National Malaria Programme. Compare the age groupings of cases detected in young children (aged 2 months to 59 months) cases in older children (aged 5 to 14 years) and cases in adults (age 15 and over).

Analysis by person is usually recommended for describing the population at risk. This analysis is easiest when the data is case-based.

Identifying numerators and denominators

A simple count of cases does not provide all of the information needed to understand the impact of a disease on the community, health facility or district. Simple percentages and rates are useful for comparing information reported to the district. The first step in analysing data by person is to identify the numerator and denominator for calculating percentages and rates.

(a) The *numerator* is the number of specific events being measured (such as the actual number of cases or deaths of a given disease, for example the number of cases of measles that occurred during the year in school-aged children).

(b) The *denominator* is the number of people in the population in which the cases or deaths of a given disease occurred, or the population at risk.

Using simple percentages

Simple percentages can be calculated to compare information from populations of different sizes. For example:

Health facility	Number of measles cases this year in school-aged children
A	42
B	30

By looking only at the number of reported cases, it appears that a higher occurrence of measles cases occurred in health facility A. But when the number of reported cases at each health facility is compared to the total number of school-aged children living in each catchment area, then the situation becomes clearer.

Health facility	Number of school-aged children living in the catchment area
A	1 150
B	600

By calculating the incidence (that is, number of new cases) of measles cases during the last 12 months in school-aged children, the district officer can compare the impact of the illness on each facility. The numerator is the number of new cases that occurred over one year. The denominator is the number of school-aged children at risk in each catchment area. The measure obtained is called incidence rate or attack rate. In this example, the incidence rate is higher in health facility B than in health facility A.

Health facility	Incidence of measles per 100 school-aged children during last 12 months
A	4%
B	5%

3.2.4 Make a table for analysis by person

For each priority disease or condition under surveillance, use a table to analyse characteristics of the patients who are becoming ill. A table is a set of data organized in columns and rows. The purpose of a table is to present the data in a simple way. For surveillance and monitoring, use a table to show the number of cases and deaths from a given disease that occurred in a given time.

To make a table:

(a) Decide what information you want to show on the table. For example, consider analysis of measles cases and deaths by age group.

(b) Decide how many columns and rows you will need. Add an extra row at the bottom and an extra column at the right to show totals as needed. In the example, you will need a row for each age group, and a column for each variable such as age group or cases and deaths.

(c) Label all the rows and columns, including measurements of time. In the example below, the analysis is done yearly. Analysis by person is also recommended for analysis of outbreak data.

(d) Record the total number of cases and deaths as indicated in each row. Check to be sure the correct numbers are in the correct row or column.

Age group	Number of reported measles cases per year	Number of deaths per year
0–4 years	40	4
5–14 years	9	1
15 years and older	1	0
Age unknown	28	0
Total	**78**	**5**

3.2.5 Calculate the percentage of cases occurring within a given age group

When the summary totals for each age group are entered, one analysis that can be done is to find out what percent of the cases occurred in a given age group. To calculate this percentage:

(a) Identify the total number of cases reported within each age group from the summary data for which time or person characteristics are known. (For example, there are 40 cases in children 0 - 4 years of age.)

(b) Calculate the total number of cases for the time or characteristic being measured. (In this example, there are 78 cases whose age is known.)

(c) Divide the total number of cases within each age group by the total number of reported cases. (For example, for children aged 0 -4 years, divide 40 by 78. The answer is 0.51.)

(d) Multiply the answer by 100 to calculate the percent. (Multiply 0.51 X 100. The answer is 51%.)

Age group	Number of reported cases	Percentage of reported cases in each age group
0–4 years	40	51%
5–14 years	9	12%
15 years and older	1	1%
Age unknown	28	36%
Total	**78**	**100%**

3.2.6 Calculate the attack rates

The attack rate is the measure of frequency of morbidity, or speed of spread, in an at-risk population. An attack rate describes the risk of getting the disease during a specified period, such as the duration of an outbreak. Attack rate is defined as the frequency with which an event (such as a new case of illness) occurs in a population at risk over a specified period, and is usually calculated in an outbreak scenario. It is expressed per population at risk; for example: 4.5/100 000 population.

$$\frac{\text{No. new cases during specified period}}{\text{Size of population at risk at start of that period}} \qquad (\quad h \quad 100\% \quad 1000)$$

Example:

16 cases of cholera in village with a population of 800. Attack rate =16/800 =0.02

0.02 x 100 = 2.0, that is, 2 cases per 100 population = 2.0%

During an outbreak, this data will need to be updated frequently (often daily) to see if the information being received changes the ideas regarding the causes of the outbreak.

3.2.7 Calculate a case-fatality rate

A case-fatality rate helps to:

(a) Know the proportion of deaths among cases.

(b) Indicate whether a case is identified and managed promptly.

(c) Indicate any problems with case management once the disease has been diagnosed.

(d) Identify a more virulent, new or drug-resistant pathogen.

(e) Indicate poor quality of care or no medical care.

(f) Compare the quality of case management between different catchment areas, cities, and districts.

(g) Assess health seeking behaviours.

(h) Identify underlying conditions to severe diseases, for example, immune deficiency.

(i) Public health programmes can impact the case-fatality rate by ensuring that cases are promptly detected and good quality case management takes place. Some disease control recommendations for specific diseases include reducing the case-fatality rate as a target for measuring whether the outbreak response has been effective.

To calculate a case-fatality rate:

1. Calculate the total number of deaths. (In the example of the measles data, there are a total of 5 deaths.)
2. Divide the total number of deaths by the total number of reported cases. (For example, the total number of reported cases is 78. The number of deaths is 5. So divide 5 by 78. 5 ÷ 78 is 0.06.)
3. Multiply the answer times 100 (0.06 X 100 equals 6%).

Age group	Number of reported cases	Number of deaths	Case-fatality rate
0–4 years	40	4	10%
5–14 years	9	1	11%
15 years and older	1	0	0
Age unknown	28	0	0
Total	78	5	6%

Please see the disease-specific guidelines in section 11.0 for recommendations about the essential variables to compare for each disease.

3.3 Compare analysis results with thresholds for public health action

Thresholds are markers that indicate unusual situation and require that something should happen or change. They help surveillance and programme managers answer the question, "When should I take action, and what will that action be?" Information on establishing thresholds is in Section 4.1 of this guide.

Thresholds are based on information from two different sources:

(a) In some instances, there might already be a situation analysis which has been done to describe the risks for occurrence of a particular disease, and who the people at risk might be and there is already a described action that needs to be done once the risks have been identified to prevent a wider outbreak.
(b) International recommendations from technical and disease control programme experts.

These guidelines discuss two types of thresholds: an alert threshold and an epidemic threshold. Not every disease or condition uses both types of thresholds, although each disease or condition has a point where a problem must be reported and an action taken.

An *alert threshold* suggests to health staff and the surveillance team that further investigation is needed. Depending on the disease or condition, an alert threshold is reached when there is one suspected case (as for an epidemic-prone disease or for a disease targeted for elimination or eradication) or when there is an unexplained increase for any disease or unusual pattern seen over a period of time in weekly or monthly summary reporting.

Action *(epidemic) threshold* triggers a definite response. It marks the specific data or investigation finding that alerts an action beyond confirming or clarifying the problem. Possible actions include communicating laboratory confirmation to affected health centres, implementing an emergency response such as an immunization activity, community awareness campaign, or improved infection control practices in the health care setting. Several thresholds have been proposed for action based on disease surveillance findings. For rare diseases or diseases targeted for eradication, detection of a single case suggests an epidemic. In such situations, one case is unusual and is a serious event. This is because these rare or targeted diseases have the potential for rapid transmission or high case-fatality rates.

In other situations, a number of cases will trigger a response. For example, the epidemic threshold for bacterial meningitis in countries of the meningitis belt is 10 suspected cases per 30 000 - 100 000 inhabitants per week and under 30 000 inhabitants is five suspected cases in one week or doubling of the number of cases in a three-week period (minimum of two cases in one week), and the alert threshold is three suspected cases per 30 000 - 100 000 inhabitants per week and under 30 000 inhabitants is two suspected cases per week or an increased incidence compared to previous non-epidemic years (Source: *Weekly Epidemiological Record No 51/52, 577-588, 19 December 2014(http://www.who.int/wer)*.

The epidemic threshold for malaria in some countries is 3rd Quartile of confirmed malaria cases for the past five years; alert threshold is 2nd quartile/Median of confirmed malaria cases.

In practice, the national level is responsible for communicating the thresholds for priority diseases to all reporting sites in the health system. This facilitates use of surveillance information for action at the level where it is collected. Periodically, surveillance thresholds are assessed and reset at national or international levels according to the observed trends of the diseases, events or conditions under surveillance.

Suggested thresholds for taking action in specific diseases or conditions are discussed under section 11.0.

3.4 Draw conclusions from the findings to generate information

(a) Routinely (weekly, monthly or quarterly) gather or present the graphs, maps and tables and meet with the district health team or relevant stakeholders to review analysis results and discuss the findings.

(b) Systematically review the findings following the district's analysis plan (see Annex 3A) if one has been prepared

(c) Make sure you also correlate the analysis you have done with other data sources, like from animals (domestic or wildlife), or the environment to assist in correct interpretation of your findings. For example, if you have seen a number of human rabies cases, it will be important to get information from the animal sector on the status of any current bite investigations, quarantined animals, or dogs vaccinated.

(d) Consider quality of the data when interpreting results for example:
   (i) missing data values (completeness per month, per event).
   (ii) inconsistencies (between linked data elements — validation).
   (iii) arithmetic errors (in correlation and aggregation).
   (iv) obvious fluctuations (sharp increase or decrease per month, per event).

It is important in a system where eIDSR has been established to ensure that there are features to improve data quality and these might include:

(a) Data input validation
(b) Maximum and Minimum values
(c) Validation rules
   (i) At a minimum, review the findings to:
      - Assess whether the situation is improving or not, and
      - Make a comparison of the observed data to the expected data
      - Consider possible explanations for an apparent increase in cases
      - Has there been a change in the number of health facilities reporting information?
      - Has there been a change in reporting procedures or surveillance system?
      - Has there been any change in the case definition that is being used to report the disease or condition?
      - Is the increase or decrease a seasonal variation?
      - Has there been a change in screening or treatment programmes, or in community outreach or health education activities that would result in more people seeking care?
      - Has there been a recent immigration or emigration to the area or an increase in refugee populations?

- Has there been any change in the quality of services being offered at the facility (for example, lines are shorter, health staff are more helpful, drugs are available, clinic fees are charged)?
- Is there an increase or improvement in laboratory testing/diagnostic procedure?
- Is there an increased awareness of disease in the public? For example, mass vaccination campaign and awareness of a particular disease will lead to an increase of cases presented to the facility
- Backlog of cases being reported which were supposed to be reported earlier?

3.5 Summarize and use the analysis to improve public health action

Prepare and share with all stakeholders including affected communities who need this information, a concise action-oriented summary reports of the surveillance findings. Use simple tables, graphs and maps, with clear and short description, interpretation, comments and recommendations.

Make statements that describe the conclusions you have drawn from the surveillance data analysis results. Use them to take action to:

(a) Conduct an investigation to find out why there is an increase/decrease in the number of cases.
(b) Collaborate with specific disease reduction programmes to intensify surveillance if an alert threshold has been crossed.
(c) Carry out advocacy with political leaders and the community for more resources if a lack of resources is identified as a cause for the increased number of cases.

Information sharing is an important surveillance function and a powerful mechanism of coordination. It motivates the staff who send reports and builds partnership through the transparency that information-sharing displays. Thus, it is important to share analysis results and provide feedback on time. Please refer to sections 7 and 8 of these guidelines for information and examples about communication and sharing feedback.

3.6 Annexes for Section 3

Annex 3A Make a plan for routine analysis of surveillance information and an example of analysis plan for cholera in Country A, 2017.

Annex 3B How to manually make a line graph.

Annex 3A: Make a plan for routine analysis of surveillance information

A minimum plan for routine analysis of surveillance information should include the following information which could be presented as tables, graphs and maps.

1. Calculate completeness and timeliness of reporting. Monitoring whether surveillance reports are received on time and if all reporting sites have reported is an essential first step in the routine analysis of the surveillance system. This assists the district (or other level) surveillance team in identifying silent areas (areas where health events may be occurring, but which are not being reported) or reporting sites that need assistance in transmitting their reports. It also depicts how representative the data is for the specific level.
2. Calculate district (or other level) totals by week (or by month). Update the total number of reported cases and deaths for the whole year. This is summary information that helps to describe what has happened in the particular reporting period.
3. Prepare cumulative totals of cases, deaths and case-fatality rates since the beginning of the reporting period.
4. Use geographical variables (such as hospitals, residence, reporting site, neighbourhoods, village and so on) to analyse the distribution of cases by place. This is information that will help to identify high-risk areas.
5. Analyse disease trends for at least the diseases of highest priority in your district. Monitor the trends for cases, deaths, and case fatality rates to identify any unusual increases or disease patterns.
6. Data validation and quality analysis. Establish a data validation team at all levels. Meetings should be held periodically to review reports. All reports submitted must be checked for consistency with various sources.

An example of a product from an analysis plan for routine surveillance information is on the next page.

Example of data analysed for cholera in Country A, 2017				
	Distribution by Time			
Onset week	**Total**	**Outcome**		**Case-fatality rate**
		Alive	**Deaths**	
26	**23**	16	7	30
27	**97**	92	5	5
28	**88**	87	1	1
29	**21**	19	2	10
32	**11**	11	0	0
33	**11**	9	2	18
Total	**251**	234	17	7
Distribution by Place				
District	**Total**	**Outcome**		**Case-fatality rate**
		Alive	**Deaths**	
District 1	**1**	1	0	0
District 2	**92**	86	6	7
District 3	**158**	147	11	7
Total	**251**	234	17	7
District		**Population**	**Cases**	**Attack rate per 100 000**
District 1		179888	92	**51**
District 2		78524	158	**201**
Distribution by Person				
Age Group	**Total**	**Outcome**		**Case-fatality rate**
		Alive	**Deaths**	
0-4	**37**	35	2	5
5-9	**55**	50	5	9
10-14	**30**	28	2	7
15-19	**23**	23	0	0
20-24	**28**	27	1	4
25-29	**26**	24	2	8
30-34	**12**	11	1	8
35-39	**8**	6	2	25
40 +	**32**	30	2	6
Total	**251**	234	17	7
Sex	**Total**	**Outcome**		**Case-fatality rate**
		Alive	**Deaths**	
Female	**122**	114	8	7
Male	**129**	120	9	7
Total	**251**	234	17	7

Annex 3B: How to manually make a line graph

How to make a line graph	
1.	Decide what information you want to show on the graph.
2.	Write a title that describes what the graph will contain (for example, *monthly totals for inpatient cases and deaths due to malaria with severe anaemia*).
3.	Decide on the range of numbers to show on the vertical axis. • Start with 0 as the lowest number • Write numbers, going up until you reach a number higher than the number of cases • Chose an interval if the numbers you will show on the vertical axis are large.
4.	Label the vertical axis, explaining what the numbers represent.
5.	Label the horizontal axis and mark the time units on it. The horizontal axis is divided into equal units of time. Usually you will begin with the beginning of an outbreak, or the beginning of a calendar period, such as a week, month or year.
6.	Make each bar on the graph the same width.
7.	Mark the number of cases on the graph or histogram. For each unit of time on the horizontal axis, find the number of cases on the vertical axis. Fill in one square for each case, or for some number of cases in the column for the day on which the patient was seen. Show deaths by using a different pattern of lines, or a different colour. If you are making a line graph, instead of making a bar or filled-in squares, draw a cross or make a point where the horizontal and vertical lines cross. Connect the points on the graph to show the trend going up or down over time.