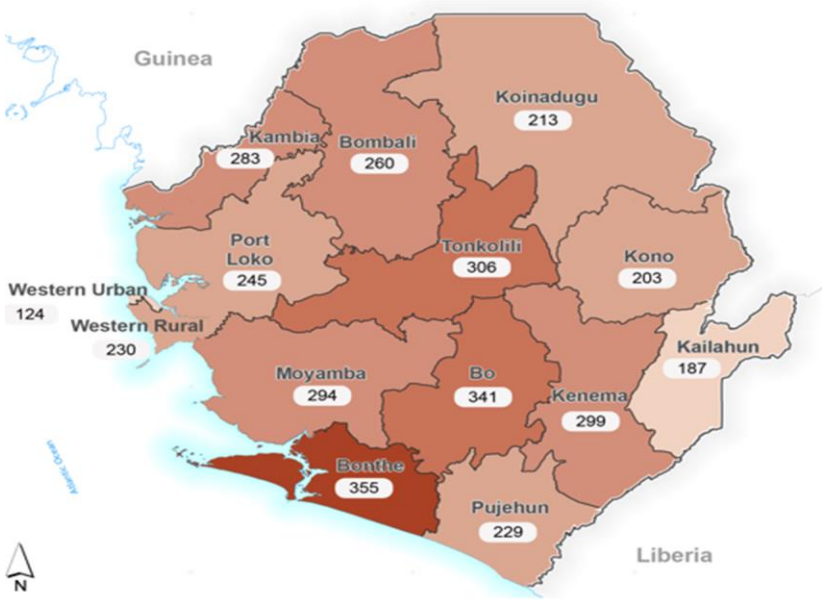
MINISTRY OF HEALTH AND SANITATION
THE REPUBLIC OF SIERRA LEONE

TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE

THIRD EDITION



SECTION 11:

SUMMARY GUIDELINES FOR SPECIFIC PRIORITY DISEASES

TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN SIERRA LEONE

THIRD EDITION

SECTION 11: SUMMARY GUIDELINES FOR SPECIFIC PRIORITY DISEASES

JANUARY 2020

This booklet contains Section 11 of the IDSR Technical Guidelines for Sierra Leone. It was adapted from Section 11 of the IDSR Technical Guidelines that were prepared by the World Health Organization Regional Office for Africa (AFRO) and the US Centers for Disease Control and Prevention (CDC) in 2019.

The booklet acts as a reference document for specific priority diseases and should be used as annex of the main IDSR Technical Guidelines for Sierra Leone which contains section 1 to 10.

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FOREWORD

Sierra Leone has been implementing Integrated Disease Surveillance and Response (IDSR) strategy since 2004 when the first edition of the IDSR technical guidelines was adapted from the generic technical guidelines of World Health Organization (WHO) AFRO region. In 2015, Sierra Leone adapted the second edition of the WHO IDSR technical guidelines (2010). This second edition responded to key new developments in the world such as revision of the International Health Regulations (IHR, 2005), the emergence of new diseases, conditions and events and the formulation of strategies for disaster risk management. Non-communicable diseases were also included along with community-based surveillance and alignment with broader health system strengthening objectives.

The country has made great milestones in the implementation of IDSR and was the first country in Africa to roll out electronic IDSR in all its public health facilities in 2019. This has greatly improved some of the key IDSR indicators such as the proportion of health facilities submitting weekly reports which stood at 96% in December 2019. Despite this good progress, there are still challenges that need to be overcome to ensure the gains are sustained and improved further. For example the unprecedented Ebola Virus Disease (EVD) outbreak of 2014-2016 that occurred in the West African region affected some of the health indicators such as human resource for health. Following this epidemic, the government of Sierra Leone has been very proactive in prioritizing health security in general as demonstrated by the official launch of the National Health Security Action Plan (NAPHS) for Sierra Leone by his Excellency the president in September 2019.

In order to ensure that the country's surveillance and response system is updated with the current information, materials and technologies, the country has now adapted the third edition of the WHO IDSR technical guidelines, tools and training modules (2019). The purpose of revising the guidelines to the 3rd Edition was to:

(a) Align with the current health security situation and needs of Sierra Leone.

(b) Align with the objectives, targets and elements of the National Action Plan for Health Security(NAPHS) for Sierra Leone, 2018-2022

(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 (EBS), 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.

These guidelines were adapted by key stakeholders including representatives of relevant Ministries, Departments and Agencies (MDAs) and partners such as WHO, CDC, USAID, Public Health England and AFENET.

Recognizing that surveillance is a public health good and a cost-effective intervention, it is my hope that all stakeholders will come together in implementing these guidelines. The guidelines should be implemented within the context of health system strengthening towards universal health coverage, One Health approach, improved use of laboratory network capacity in surveillance and response and better community engagement in public health interventions.

Prof. Alpha T. Wurie
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ACKNOWLEDGEMENTS

The third edition of the Integrated Disease Surveillance and Response (IDSR) Technical Guidelines was adapted through the active participation and involvement of relevant Ministries, Departments, Agencies (MDAs), training institutions and partners dealing with disease surveillance in Sierra Leone. The adaptation process involved rigorous review of the generic WHO guidelines in a workshop that was held in December 2019. A smaller group of technical experts retreated to compile the suggested changes and produce the final draft which was then validated in a consultative meeting in January 2020 in which relevant stakeholders in disease surveillance participated.

These revised IDSR technical guidelines describes what needs to be established at each level of the health system in order to detect, confirm and respond to diseases, conditions and health events. The guidelines are intended for use by health workers at all levels, including surveillance officers, clinicians, laboratory personnel and public health workers. The guidelines will also be used by District Health Management Teams, data managers, IHR national focal points and other sectors implementing IHR, competent authorities at points of entry, veterinary and wildlife officers, environmental health officers, health training institutions, supply chain officers and other public health experts, including Non-Governmental Organizations.

The guidelines will serve as:

(a) a general reference for surveillance activities at all levels and a stand-alone reference for responsibilities at each level;

(b) a set of standard definitions for threshold levels to initiate response actions for specific diseases;

(c) a resource for developing training, supervision, monitoring and evaluation of surveillance activities; and

(d) a guide for improving early detection of and response to epidemic prone diseases.

We are grateful to the WHO Country Office Sierra Leone (Health Security and Emergencies Cluster) and US CDC for providing technical guidance throughout the adaptation process. We are also grateful to the Korean International Cooperation Agency (KOICA) and DFID for providing financial support through WHO for the adaptation process.

Finally, we are grateful to all the individuals listed below who contributed to the adaptation process of the 3rd edition of IDSR technical guidelines, tools and training modules:

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ABBREVIATIONS

AAR	After Action Reviews
ADR	Adverse Drug Reaction
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
AFRO	WHO Regional Office for Africa
AWD	Acute Watery Diarrhoea
CBS	Community-Based Surveillance
CBIS	Community-Based Information System
CDC	Centers for Disease Control and Prevention
CDO	County Diagnostic Officer
CEBS	Community Event-Based Surveillance
CFR	Case Fatality Rate
CHA	Community Health Assistant
CHO	Community Health Officer
CHW	Community Health Worker
DHIS2	District Health Information System Version 2
DHMT	District Health Management Team
DHSE	Directorate of Health Security and Emergency
DLL	District Laboratory Leads
DMO	District Medical Officer
DPC	Disease Prevention and Control Department
DRM	Disaster Risk Management
DSO	District Surveillance Officer
EBS	Event-Based Surveillance
eCBDS	Electronic case-based disease 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
HF	Health Facility
HW	Health 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
IBS	Indicator Based Surveillance
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IHR	International Health Regulations
ILI	Influenza Like illness
IMS	Incident Management System

IMC	International Medical Corps
IOM	International Organization for Migration
IPC	Infection Prevention and Control
IRC	International Rescue Committee
JEE	Joint External Evaluation
MAF	Ministry of Agriculture and Forestry
MCH	Maternal Child Health
MDR	Multidrug Resistance
MEF	Monitoring and Evaluation Framework
MOHS	Ministry of Health and Sanitation
MTI	Medical Teams International
NGO	Nongovernmental organization
NNT	Neonatal tetanus
NSTCC	National Surveillance Technical Coordination Committee
OIC	Officer in Charge
PBM	Pediatric bacterial meningitis
PCI	Project Concern International
PHE	Public Health Events
PHEIC	Public Health Emergency of International Concern
PHEMC	Public Health Emergency Management Committee
PHENOC	Public Health National Emergency Operation Center
PoE	Points of Entry
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
SLIPTA	Stepwise Laboratory Quality Improvement Process towards Accreditation
STI	Sexually-Transmitted Infections
UNICEF	United Nations Children's Emergency Fund
VHF	Viral Hemorrhagic Fever
WHO	World Health Organization
XDR	Extensively Drug-Resistant

GLOSSARY (DEFINITIONS OF KEY TERMS

Aetiology	Refers to the cause, set of causes, or origin of a disease or condition.
Acute	Any disease having a rapid (sudden) onset and following a short course.
Alert	An indirect early warning signs of a potential public health event occurring in a community under surveillance. Alerts must be investigated further and verified as to whether they represent a true event or not
Chronic	Any health condition that develops slowly or is of long duration and tends to result in some functional limitation and need for ongoing medical care.
Cluster	An aggregation of cases or health-related conditions in a given area, over a particular period, regardless of whether the number of cases is more than expected in relation to time or place or both.
Disease	An illness or medical condition, irrespective of origin or source, which presents or could present significant harm to animals, humans and plants
Disaster	The serious disruption of the functioning of a community or a society, causing widespread human, material, economic or environmental losses exceeding the ability of the affected community or society to cope using its own resources.
Elimination	Reduction to zero (or a very low defined target rate) of new cases in a defined geographical area
Endemic	A disease or condition regularly found among particular people or in a certain area.
Epidemic	Refers to an increase in the number of cases of a disease or an event above what is normally expected in that population in a given area over a particular period of time.
Epidemiological link	When a patient has or had exposure to a probable or confirmed case.
Epidemiology	The study of the distribution and determinants of health-related states and the application of this information to controlling public health problems.
Eradication	The purposeful reduction of specific disease prevalence to the point of continued absence of transmission in the world.
Event	Under the IHR (2005) (Article 1), an event is defined as 'a manifestation of disease, or an occurrence that creates a potential for disease' (with particular reference to public health events of international concern (PHEIC)). An emergency incident or occurrence, unplanned (e.g. extreme weather event or mass gathering), that may impact the safety and security of

	communities. NB: 'Event' and 'incident' are often used interchangeably.
Health management information system	A monthly reporting system for diseases, conditions, and risks that is reported to the MoHS from every healthcare facility electronically or on paper.
Human-animal-environment interface	A continuum of contacts and interactions among people, animals, their product and their environment(s); in some cases, facilitating transmission of zoonotic pathogens or shared health threats
Incident	An occurrence or event, natural or human-caused that requires an emergency response to protect life, property, or the environment. An incident may be geographically confined (for example, within a clearly delineated site or sites) or dispersed (for instance, a widespread power outage or an epidemic). Incidents may start suddenly (for example, a chemical plant explosion) or gradually (a drought). They may be of very short duration (for example, a call for emergency medical assistance), or continue for months or even years. War-related disasters, public health and medical emergencies, and other emergencies.
Incident Management operating System (IMS)	This is a standardized approach to emergency management, encompassing personnel, facilities, equipment, procedures, and communications within a common organizational structure. The IMS Standardized processes allow all who respond to the same incident to formulate a unified plan to manage the incident
International Health Regulations (2005)	International legal instrument that is binding in 196 countries. The regulations aim to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide.
Multi-Sectoral	Participation of more than one sector working together on a joint programme or response to an event (for example, a joint investigation by public health and law enforcement).
One Health	An approach to address a shared health threat at the human-animal-environment interface, based on collaboration, communication, and coordination across all relevant sectors and disciplines, with the ultimate goal of achieving optimal health outcomes for both people and animals. A One Health approach applies to the local, regional, national and global levels.
Outbreak	The occurrence of more cases than expected in a defined geographical area or time.
Pandemic	An epidemic occurring worldwide, or over a very wide area, crossing international borders and usually affecting a large number of people
Point of entry	Any passage, via land, air or sea, for international entry or exit of travelers, baggage, cargo, containers, conveyances, goods and postal parcels as well as agencies and areas providing services to them on entry or exit.

Reporting site	A site which reports about surveillance and outbreak data to the district level. A reporting site includes all health facilities (public, private and quasi-governmental, faith based), standalone laboratories and points of entry. A reporting site also contains event reports from community surveillance and response,
Zoonotic disease or zoonosis	An infectious disease that can be shared between animals and people.

Section 11: Summary guidelines for specific priority diseases, events and conditions

This section provides summary guidelines for each of the priority diseases, events and conditions targeted for surveillance by the Ministry of Health and Sanitation in Sierra Leone. It provides disease/event/condition specific guidance to:

- Take action to respond to alerts and action thresholds,
- Identify surveillance goals and objectives,
- Surveillance data analysis and interpretation,
- Prepare to use the district analysis workbook or database,
- Standard case definitions for reporting diseases/event s/conditions.

This section is intended as a rapid reference. When additional information is required, please use the detailed references listed in the summary. The table below shows how information is organized in this section.

Priority disease/event/condition for IDSR

Background

In this sub-section, you will find general information about:

- The disease or event, the causative agent, geographic range affected and other epidemiologic information.
- Transmission routes such as person-to-person, unprotected contact with infectious body fluids or contaminated materials, vector-borne, and so on.
- Why the disease/event is a priority for surveillance. For example, the disease/event is responsible for a high number of deaths, disability and illness,
- General and specific risk factors in African countries.
- Any additional background information that might serve the district surveillance team.

Surveillance Goal

This sub-section states how the surveillance information is used for action.

Standard case definition

Suspected case: A definition is provided for suspecting a case or outbreak of this disease or event.

Probable case: A definition is provided for a suspected case with epidemiological link to a confirmed case or an outbreak if laboratory confirmation results are not available.

Confirmed case: A definition is provided for classifying a case as confirmed

through laboratory diagnostic testing.

Respond to alert threshold

Some diseases or events have program specific thresholds for alerting the health facility or district to a potential problem.

For epidemic-prone diseases, diseases targeted for elimination or eradication, or public health events of international concern, a single case is a suspected outbreak and requires immediate reporting followed by patient treatment, collection of specimens for case confirmation, and investigation of the case to determine the risk factors and potential interventions.

For other priority diseases of public health importance, an outbreak or event is suspected when there is any unusual cluster, pattern, or increase in the number of cases when compared with previous time periods. This should prompt a response such as investigating what might have caused the unusual events. If laboratory confirmation is indicated, specimens should be collected for laboratory confirmation.

Respond to action threshold

For epidemic-prone diseases, diseases targeted for elimination or eradication, or public health events of international concern, a confirmed case should trigger a response such as conducting an emergency immunization activity, enhancing access to safe drinking water, community education campaigns, and improving case management.

For other priority diseases of public health importance, a confirmed outbreak should prompt an appropriate response such as improving coverage for specified immunizations, strengthening case management, providing information, education and communication about preventing and controlling the disease, and so on.

Analyse and interpret data

This sub-section contains generic information about the minimum data elements to collect, analyse and interpret. The key points to consider for interpreting the data and specific elements for analysis are also stated (time, place, and person).

Laboratory confirmation

In this sub-section, guidelines on laboratory confirmation are provided including: relevant diagnostic tests, how to collect, store and transport the specimens needed for laboratory confirmation, and information on the results of laboratory work.

Reference

Appropriate references for further information stated for each disease. Most are available from the WHO website.

Acute haemorrhagic fever syndrome

Background

Acute haemorrhagic fever syndromes can be attributable to Ebola and Marburg viral diseases (Filoviridae); Lassa fever (arenaviridae), Rift Valley fever (RVF) and Crimean-Congo haemorrhagic fever (CCHF) (Bunyaviridae); dengue (dengue haemorrhagic fever (DHF)) and yellow fever (Flaviviridae); and other viral, bacterial or rickettsial diseases with potential to produce epidemics.

All cases of acute haemorrhagic fever syndrome whether single or in clusters, should be immediately notified without waiting for the causal agent to be identified.

Surveillance goal

Early detection of acute haemorrhagic fever syndrome cases and outbreaks, rapid investigation, and early laboratory verification of the cause of all suspected cases. Investigation of all suspected cases with contact tracing. During epidemics, most infected patients do not show haemorrhagic symptoms and a specific case definition according to the suspected or confirmed disease should be used (e.g. case definitions for Ebola-Marburg, CCHF, RVF, Lassa, DHF, and yellow fever).

Standard case definition

Suspected case: Acute onset of fever of less than 3 weeks duration in a severely ill patient/ or a dead person AND any 2 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.

Probable case: A suspected case with epidemiologic link to confirmed cases or outbreak, but laboratory specimens are not available or awaited

Confirmed case: A suspected case with laboratory confirmation.

***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*

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Suspected cases should be isolated from other patients/people and strict infection prevention procedures should be implemented. Standard precautions should be enhanced throughout the health care setting and in communities.
- Treat and manage the patient with supportive care.
- Collect the appropriate specimen while observing strict infection prevention and control procedures to confirm the case.
- Complete a laboratory request form, use triple packaging of the specimens (see detailed SOP for triple packaging) and mark well the containers to warn of a potential laboratory biosafety risk
- Conduct case-contact tracing and follow-up and active case search for additional cases (See detailed SOP for contact tracing and follow up).
- Begin or enhance death reporting and surveillance; as well as screening procedures for fever and VHD related symptoms

Acute haemorrhagic fever syndrome

Respond to action threshold

If a single case is confirmed:

- Maintain strict viral haemorrhagic disease (VHD) infection prevention and control (IPC) practices* throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement IPC in the home care setting and during funerals and burials. Consider social distancing strategies.
- Conduct case-contact follow-up and active searches for additional cases that may not come to the health care setting.
- Request additional help from other levels as needed.
- Establish an isolation ward or treatment centre to handle additional cases that may come to the health centre and ensure strict IPC measures to avoid transmission in health care settings.
- Suspected cases should be isolated and treated for more common conditions with similar symptoms, which might include malaria, typhoid, louse borne typhus, relapsing fever or leptospirosis. Ensure a barrier is instituted between suspected and confirmed cases.
- Provide psychosocial support for the family, community and staff.
- Consider quarantine for high risk contacts with home support during the incubation period and ensure daily follow up of their movements.
- There are promising vaccine candidates under development for some VHDs that might be useful to be used in the event of outbreak in a ring vaccination approach and for health care workers.
- Treat conservatively the symptoms which might be presented; severe cases require intensive support care; if dehydrated ensure fluid replacement with fluids that contain electrolytes.
- A range of potential treatment options including blood products, immune therapies, and drug therapies are currently being evaluated,

Analyse and interpret data

Person: Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan outbreak response interventions accordingly.

Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.

Place: Map locations of cases' households and work sites. If you have a GPS gadget, this will add to understand exact location of the cases; as well as contacts.

Laboratory confirmation: Acute haemorrhagic fever syndrome	
Diagnostic test	Laboratory confirmed cases must test positive for the virus antigen, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT-PCR), or by detection of IgM antibodies directed against Ebola/Marburg, CCHF, Lassa or West Nile Fever
Specimen	For ELISA: Whole blood, serum or plasma For RT-PCR: Whole blood or blood clot, serum/plasma or tissue For immunohisto-chemistry: Skin or tissue specimens from fatal cases **NB: Rapid diagnostic tests (RDTs)o theoretically can be performed in any health care setting and without additional equipment, however, use of an RDT may result in both false positive and false negative test results. A nucleic-acid based (e.g., PCR) diagnostic assay, such as GeneXpert, must be used to confirm the RDT result. Recent guidance from WHO recommends that antigen detection RDT's for VHDs have no role in the routine management of VHDs in settings where PCR testing is available. However, they may have utility in settings without laboratory infrastructure and where specimens cannot be rapidly transported to a diagnostic laboratory, if their benefits and limitations are understood.**
When to collect the specimen	Collect specimen from all suspected patients. All cases must be investigated, with contact tracing. Blood samples and appropriate clinical specimens must be collected to confirm a diagnosis as rapidly as possible.

How to prepare, store, and transport the specimen	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE FULL PPE. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-20^{o}C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* ▪ Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. ▪ Store at room temperature. Formalin-fixed specimens may be transported at room temperature.
Results	Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

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Acute Jaundice Syndrome and Acute/chronic viral hepatitis

Background

Acute Jaundice Syndrome is one of the priority conditions selected for surveillance in Sierra Leone. **Jaundice** is a condition in which the skin, whites of the eyes and mucous membranes turn yellow because of a high level of bilirubin, a yellow-orange bile pigment.

Jaundice is not a very common presentation, but it has the potential of developing into an outbreak situation hence importance of surveillance. There are many causes of Jaundice, e.g. Hepatitis virus, malaria, aflatoxicosis, gall gladder obstruction due to tumors/gall stones etc. All these diseases are of public health importance and should be investigated. To differentiate acute jaundice from others of lesser public health importance, surveillance will focus only on jaundice of less than 2 weeks duration. Some causes of jaundice can be diagnosed in the District lab by testing the blood of the patients. Viral hepatitis is one of the commonest causes of acute jaundice.

Viral hepatitis A and viral hepatitis E

- Enterically transmitted hepatitis A virus (HAV) and hepatitis E virus (HEV) are a worldwide problem.
- Common source epidemics have been related to contaminated water and to contamination via infected food handlers.
- In general, both HAV and HEV are self-limiting viral infections; case fatality is normally low (0.1 – 0.3%). Women in the third trimester of pregnancy are especially susceptible to fulminant HEV disease.
- Both HAV and HEV are transmitted via the faecal-oral route.
- Prevention and control measures for hepatitis A and hepatitis E include adequate supplies of safe-drinking water and improvement of sanitary and hygienic practices to eliminate faecal contamination of food and water.

Viral hepatitis B and viral hepatitis C:

- Estimates indicate that worldwide, there are 257 million carriers of hepatitis B virus and 71 million carriers of hepatitis C virus.
- Acute Hepatitis B and C may be anicteric and thus unrecognized, but acute outbreaks are uncommon.
- Chronic infection and severe sequelae occur with hepatitis B – an estimated 15% to 25% of chronically infected persons will die prematurely of either cirrhosis or hepatocellular carcinoma. Chronic Hepatitis C infection is also common and 5% to 20% of those infected with HCV may develop cirrhosis. The risk of hepatocellular carcinoma in persons with HCV cirrhosis is 2-4% per year.
- Hepatitis B is transmitted by percutaneous or per mucosal exposure to blood or other infectious body fluids. In most countries where HBV is highly endemic, most acute infections occur during infancy, early childhood or via perinatal transmission from mother to infant. Other important routes of transmission include nosocomial exposure (transfusions, unsafe injection practices), shared needles or syringes among injecting drug users, household contact (e.g., communally used razors and toothbrushes) and sexual contact with an infected person.
- Hepatitis C is transmitted by parenteral exposure to blood and plasma derivatives. It is found in highest concentrations in blood. The major causes of HCV infection worldwide are use of

unscreened blood transfusions and re-use of needles and syringes that have not been adequately sterilized.

- Prevention and control measures for hepatitis B and C include transfusion safety, safe and appropriate use of injections and vaccination (hepatitis B). Screening and early treatment are efficient modes of secondary prevention.
- To address the increasing burden of viral hepatitis, in 2016, African member states adopted Prevention, Care and Treatment of viral hepatitis in the African Region: Framework for action 2016-2020

There is no specific treatment for acute viral hepatitis.

Aflatoxins

- Aflatoxins are poisonous substances produced by certain kinds of fungi (moulds) that are found naturally all over the world; they can contaminate food crops and pose a serious health threat to humans and livestock.
- Aflatoxins also pose a significant economic burden, causing an estimated 25% or more of the world's food crops to be destroyed annually.
- Most human exposure comes from nuts and grains
- Two closely related species of fungi are mainly responsible for producing the aflatoxins of public health significance: *Aspergillus flavus* and *A. parasiticus.*
- Under favourable conditions typically found in tropical and subtropical regions, including high temperatures and high humidity, these moulds, normally found on dead and decaying vegetation, can invade food crops.
- Food crops can become contaminated both before and after harvesting.
- Pre-harvest contamination with aflatoxins is mainly limited to maize, cottonseed, peanuts and tree nuts.
- Post-harvest contamination can be found in a variety of other crops such as coffee, rice and spices.
- Improper storage under conditions that favour mould growth (warm and humid storage environments) can typically lead to levels of contamination much higher than those found in the field.
- Long-term or chronic exposure to aflatoxins has several health consequences including: aflatoxins are potent carcinogens and may affect all organ systems, especially the liver and kidneys; they cause liver cancer, and have been linked to other types of cancer
- Acute poisoning can be life threatening. Large doses of aflatoxins lead to acute poisoning (aflatoxicosis) that can be life threatening, usually through damage to the liver. Outbreaks of acute liver failure (jaundice, lethargy, nausea, death), identified as aflatoxicosis, have been observed in human populations since the 1960s.
- The consumption of food containing aflatoxin concentrations of 1 mg/kg or higher has been suspected to cause aflatoxicosis. Based on past outbreaks it has been estimated that, when consumed over a period of 1–3 weeks, an AFB1 dose of 20–120 μg/kg bw per day (μgram is one billionth [1×10−9] of a kilogram) is acutely toxic and potentially lethal
- Control measures are required both pre- and postharvest. The most long-term, stable solution to controlling pre-harvest aflatoxin contamination is through enhancing the ability of the crop to resist fungal infection and/or prevent production of aflatoxins by the invading fungus
- Post-harvest interventions include preventive measures to address adequate storage conditions (moisture, temperature, mechanical or insect damage, and aeration), which influence contamination and toxin production by mould. Other measures, such as chemical decontamination or use of enterosorbents, can be used to remove aflatoxins from already contaminated foodstuffs
- Many countries have regulations governing aflatoxins in food with prescribed acceptable limits
- **Consumers can protect themselves by:** carefully inspecting whole grains and nuts for evidence of mould, and discard any that look mouldy, discoloured, or shriveled; buying grains and nuts as fresh as

possible that have been grown as close to home as possible, and which have not been transported over a long time; buying only reputable brands of nuts and nut butters – aflatoxin moulds are not entirely killed by processing or roasting, so can show up in products e.g. peanut butter

Surveillance Goal

The goal of conducting surveillance for acute jaundice syndrome is to:

- Detect hepatitis outbreaks.

- Detect aflatoxicosis outbreak
- Identify areas/populations at high risk to target prevention and control measures.
- Estimate burden of disease.

NB. If countrywide surveillance is not possible, surveillance in sentinel areas or hospitals may provide useful information on potential sources of infection**.**

Case Definitions:

I) Acute jaundice syndrome

Suspected case: Any person presenting with acute onset (within 14 days) of yellowness of eyes/skin with or without fever.

Confirmed case: A suspected case whose samples have:

- Turned positive for hepatitis virus,
- Turned positive for aflatoxin or
- Suspect who has consumed foods/grains confirmed to be contaminated with aflatoxins

II) Acute Viral Hepatitis:

Suspected case: Any person with discrete onset of an acute illness with signs/symptoms of;
(i) Acute infectious illness (e.g. fever, malaise, fatigue) and (ii) Liver damage (e.g. 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

III) Chronic Viral Hepatitis Case definition (HBV and HCV):

Chronic Hepatitis B:

- Persistence of HBsAg for over 6 months after acute infection indicates chronic HBV infection
- HBsAg and anti-HBc positive (usually IgG) in asymptomatic persons or patients with chronic liver disease and/or liver tumour indicates chronic HBV infection

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 (i.e. HCV Ab positive) cannot differentiate between acute, chronic infection and past infection.

Surveillance for detecting chronic hepatitis B and C

- Conduct HBsAg and Anti-HCV antibody sero-prevalence testing of the general population and all patients presenting with chronic liver disease (CLD);
- These may include:
    - General population testing approaches making use of existing community- or health facility-based testing opportunities or programmes such as at antenatal clinics, HIV or TB clinics
    - General population periodic sero-prevalence surveys using serological markers for viral hepatitis B and C
    - Patients presenting to health facilities with chronic liver disease (CLD) and/or liver tumour.

Respond to alert threshold

If hepatitis cases are suspected:

- Report case-based information to the appropriate levels (see annexes for case-based reporting form).
- Collect specimens and send to laboratory to identify the aetiology of the illness
- As necessary, treat and manage acute viral hepatitis patient(s) with supportive care.

If aflatoxicosis is suspected:

- Collect blood serum for laboratory confirmation
- Institute case management
- Collect food samples
- Active surveillance for more cases

Respond to action threshold

If hepatitis cases are confirmed

- Inform the DSO/DMOH
- Determine mode of transmission
- Identify population exposed to risk of infection
- Eliminate common source(s) of infection
- Implement appropriate prevention and control interventions depending in the hepatitis virus identified
- Patients with chronic viral hepatitis should be referred to tertiary or specialist centres; designated treatment centres for treatment, care and follow-up

If aflatoxicosis cases are confirmed:

- Seize and sample all foods of questionable standards
- Confiscate and destroy all aflatoxin contaminated foods
- Involve other stakeholders e.g. Ministry of Agriculture, administration
- Create public awareness

- Active surveillance
- Systematic sampling of all aflotoxin susceptible grains in the food chain in the country

Analyze and interpret data

Time: Analysis of suspected and confirmed cases by week and month. Graph cases and deaths weekly and monthly.

Construct an epidemic curve during outbreaks.

Place: Plot location of case households.

Person: Analyze by age and gender. Assess risk factors to plan and monitor prevention and control measures. Calculate the Incidence Rate for Acute Viral Hepatitis cases and Prevalence Rate for Chronic Viral Hepatitis B and C cases and Case Fatality Rate

Threshold levels for action for acute jaundice syndrome:

- If there are more than 2 cases of jaundice in a village or an urban unit (of 1000 population) within a week.
- A single case of death due to acute jaundice (jaundice of less than 2 weeks)

Laboratory confirmation: Acute Viral Hepatitis	
Diagnostic test	**Hepatitis A:** anti-HAV IgM positive **Hepatitis B:** Hepatitis B surface antigen (HBsAg) positive or anti-HBc IgM positive **Hepatitis C:** Anti-HCV Ab positive **Hepatitis D:** HBsAg positive (or anti-HBc IgM positive) plus anti-HDV positive (only as co-infection or super-infection of hepatitis B) **Hepatitis E:** anti-HEV IgM positive and/or anti-HEV IgG positive
Specimen	Whole blood, Serum or stool (for hepatitis A and E viruses)
When to collect the specimen	Specimens should be collected from suspected patients. IgM anti-HAV becomes detectable 5-10 days after exposure. HBsAg can be detected in serum from several weeks before onset of symptoms to days, weeks or months after onset; it persists in chronic infections. IgM anti-HBc positive usually disappears after 6 months.

How to prepare, store and transport the specimen	Use universal precautions to minimize exposure to sharps and body fluids. Collect 5-10 ml of venous blood. ▪ Let clot retract for 30 to 60 minutes at room temperature or centrifuge to separate serum from red blood cells. ▪ Aseptically pour off serum into sterile, screw capped tubes. ▪ Store serum at 4°C. ▪ For storage >5 days, samples are held at -20°C Transport serum samples using appropriate packaging to prevent breakage or leakage.
Results	Results are usually available within one to 3 days from arrival in the laboratory.

Laboratory tests for Aflatoxicosis

- Take blood samples from cases for aflatoxin levels
- Take suspected food samples
- Use rapid diagnostic kits
- Use chromatographic techniques

Laboratory Test for Chronic Viral Hepatitis

I) Chronic Viral Hepatitis B (HBV)

Basic initial laboratory investigations:

The following laboratory tests should be requested after thorough history and physical examination in HBsAg positive individuals;

a. Establish chronicity: Persistence of HBsAg for over 6 months after acute infection or presence of chronic liver disease/tumour.
b. Establish HBe antigen (Ag)/Antibody (Ab) status: HBe Ag and Ab
c. Establish inflammatory activity: liver function tests
d. Determine the level of viraemia – viral load: HBV DNA
e. Screen for the presence of chronic liver disease or other complications using clinical examination for stigmata of chronic liver disease, abdominal ultrasound, coagulation profile, full blood count
f. Screen for other co-infections: HCV Ab, HIV, HDV (in endemic regions)
g. Supportive investigation: determine blood urea and creatinine
h. Consider liver biopsy or fibro-scan if indicated

II) Chronic Viral Hepatitis C (HCV)

Initial Investigations for HCV Patients:

a. The screening test for HCV is a HCV Ab test. Unlike HBV testing, a positive HCV screening test (anti-HCV Ab) does not equate to active infection. Also, the HCV testing often provides several false positive results.
b. The following steps are recommended to establish active infection;
    - Confirm HCV Ab testing using ELISA
    - Confirm active infection using RNA testing; detectable HCV RNA confirms active infection; if RNA is undetectable, no further testing is indicated. It indicates past infection or false-positive serological test
    - Further testing for RNA positive cases include liver function test (LFT), abdominal ultrasound, viral genotyping, full blood count (FBC), blood urea and electrolytes (BUE) and creatinine
    - Screen for co-infections - HIV, HBV
    - Assess degree of inflammation and fibrosis by conducting the following test:
        - Aspartate aminotransferase-to-platelet ratio index (APRI) score
        - Fibrosis-4 (FIB4) score (the score uses a combination of age, platelet count, AST, ALT tests to derive the score)
        - Fibroscan

Liver biopsy is the gold standard.

References:

- WHO Recommended WHO/CDS/CPE/SMT/2001.13 Strategies for Prevention and Control of Communicable Diseases;
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- WHO Fact Sheet No 328, Hepatitis A, revised May 2008. 204, Hepatitis B, revised August
- WHO Fact Sheet No 204, Hepatitis B, revised August
- WHO Fact Sheet No 2008 164, Hepatitis C.
- WHO Fact Sheet No 280, Hepatitis E, revised January 2005.
- World Health Organization http://www.who.int/topics/hepatitis/en/
- United States, Centers for Disease Control and Prevention http://www.cdc.gov/hepatitis/
- Control of Communicable Diseases Manual, 18th Edition
- WHO Guidelines for the prevention, care and treatment of persons with chronic hepatitis B infection; March 2015
- WHO Guidelines for the screening, care and treatment of persons with chronic hepatitis C infection; April 2016
- WHO Global Hepatitis Report 2017
- WHO Guidelines on hepatitis B and C testing February 2017
- https://www.who.int/foodsafety/FSDigest_Aflatoxins_EN.pdf

Adverse Events Following Immunization (AEFI)

Background

AEFI surveillance serves as a quality assurance mechanism for national immunization programmes and, in most countries needs continuous strengthening. There are five possible causes of AEFI: 1/ a true product reaction; 2/ a product defect; 3/ an immunization error; 4/ immunization stress-related response; and 5/ a coincidental health event. It is important to identify and provide care to patients with AEFIs. Serious AEFIs should also be thoroughly investigated to determine their cause.

Surveillance goal

To monitor the safety of vaccines and immunization post-licensure and respond to safety concerns.

Standard case definition

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.

Respond to minor AEFI(s)

If a case is identified:

- Treat the patient
- Communicate with the parents and community that AEFI can occur with any vaccine
- Respond to rumours or public enquiries
- Complete case reporting form (for notified cases)

Respond to serious AEFI(s)

An AEFI is considered serious if it: results in death, is life-threatening, requires in-patient hospitalization or prolongation of existing hospitalization, results in persistent or significant disability/incapacity, is a congenital anomaly/birth defect, or requires intervention to prevent permanent impairment or damage.

- Treat the patient
- Communicate with the parents and community that AEFI can occur with any vaccine
- Respond to rumours or public enquiries
- Complete reporting form and send it immediately to initiate investigation
- If a product- or immunization error-related problem is identified take remedial action to avoid another AEFI occurring from the same cause

Analyse and interpret data

Determine the cause of the event. Beware of mass psychological illness if a number of school-aged or older individuals are involved at the same time.

Reference

- *"Global Manual on Surveillance of Adverse Events Following Immunization"* *http://www.who.int/vaccine_safety/publications/Global_Manual_revised_12102015.pdf?ua=1*
- *Definition and application of terms for vaccine pharmacovigilance. Report of CIOMS/WHO Working Group on Vaccine Pharmacovigilance. Geneva, Council for International Organizations of Medical Sciences, 2012*

Anthrax (human)

Background

- Anthrax is a widespread zoonotic disease caused by the spore-forming bacterium *Bacillus anthracis*, a Gram positive rod-shaped bacterium. A. It is transmitted from infected domestic livestock (cattle, sheep, goats, buffaloes, pigs and others) or wild game animals to humans by direct contact or indirect contact with animals or their products.
- The incubation period typically ranges from 1 to 7 days, but may be longer (up to two to three weeks for cutaneous anthrax and up to 42 days for inhalation anthrax). Persons exposed to occupational hazards include those handling infected carcasses and those employed in the processing of bones, hides, wool and other animal products. Persons may also become infected by handling or consuming meat from animals that are sick with or have died of the disease. Biting flies have been reported to transmit the disease from infected animals to humans however how readily or often this occurs is unknown.
- Human anthrax is a serious problem in several countries and has potential for explosive outbreaks (especially the gastrointestinal form that is contracted from eating infected meat); while pulmonary (inhalation) anthrax is mainly occupational, the threat of biological warfare attacks should not be forgotten. Anthrax has a serious impact on the trade of animal products.
- The control of anthrax is based on its prevention in livestock. Programmes based only on prevention in humans are costly and likely to be ineffective except for those industrially exposed.
- There is an effective vaccine for those persons considered at risk for occupational exposure, and successful vaccines are used for livestock, particularly for herds with ongoing exposure to contaminated soil or vegetation.
- In most countries anthrax is a notifiable disease.

Surveillance goal

- To detect outbreaks.
- To monitor control and prevention programmes

Standard case definition: Anthrax (Human)

Suspected case

Any person with acute onset characterized by several clinical forms which are:

(a) 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.

***(b)* G*astro-intestinal*:** Any person with abdominal distress characterized by nausea, vomiting, anorexia and followed by fever

***(c)* P*ulmonary (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

***(d) 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:

(a) isolation of *B. anthracis* from an affected tissue or site; or

(b) Other laboratory evidence of *B. anthracis* infection based on at least two supportive laboratory tests.

Respond to alert threshold: Anthrax (Human)

If a single case is suspected:

- Report case-based information immediately to the appropriate levels (public health sector and animal health sector)
- Use standard barrier precautions for all forms. Use protective equipment and clothing (gloves, gowns, face shields), and respiratory protection if there is a risk of aerosols, disinfection and dressing any cuts and abrasion before putting on protective clothing.
- Perform environmental cleaning (disinfection) with hypochlorite.
- Treat and manage the patient with supportive care and using antibiotics such as Penicillin V, procaine penicillin (uncomplicated cases), or penicillin G (severe cases)
- Collect specimen safely to confirm the case.
- Conduct joint (public health and animal health sectors) investigation of cases/deaths
- Vaccination is required for animals when exported/imported
- In humans, selective preventive vaccination may be considered in case of occupational exposure. It's important to take thorough history to determine if there is occupational exposure, as unnecessary administration of antibiotics might led to antimicrobial resistance (AMR)

Respond to action threshold

If a single case is confirmed:

- Standard infection control precautions are sufficient and should be used when managing the patients
- Particular attention should be paid to body fluid spills which should be managed by the usual methods for cleaning and decontamination of anybody fluid spills. This should be done promptly and thoroughly, because organisms which remain on surfaces may form spores which are infectious
- As is usual practice, personal protective equipment should be used in situations where there is potential for splashes and inoculation injuries. Any incidents should be reported immediately
- Mobilize the community for early detection and care.
- Proper burial or cremation (if practiced) of dead bodies (humans and animals)
- Conduct community education about the confirmed case, how the disease is transmitted, and how to use infection control in the home care setting.
- Conduct active searches for additional cases that may not come to the health care setting (older women or small children, for example) and provide information about prevention in the home and when to seek care.
- Request additional help from national levels as needed.

Analyse and interpret data: Anthrax (Human)
Time: Graphs of number of suspected / probable / confirmed cases by date. **Place:** Map of suspected and confirmed human and animal cases by geographical area (district) **Person:** Table showing the number of suspected / probable / confirmed cases by date, age and sex

Laboratory confirmation: Anthrax (Human)	
Diagnostic test	Isolation of *Bacillus anthracis* from a clinical specimen (e.g. blood, lesions, discharges) Demonstration of *B.anthracis* in a clinical specimen by microscopic examination of stained smears (vesicular fluid, blood, cerebrospinal fluid, pleural fluid, stools) Positive serology (ELISA, Western blot, toxin detection, chromatographic assay, fluorescent antibody test). Detection of nucleic acid by PCR.

Specimen	**Cutaneous** 1.For vesicular lesions, two swabs of vesicular fluid from an unopened vesicle 2.For eschars, the edge should be lifted and two swab samples rotated underneath 3.For ulcers, the base of the lesion should be sampled with two saline moistened swabs 4. Blood cultures obtained prior to antimicrobial therapy, if the patient has evidence of systemic symptoms. 5. A full thickness punch biopsy of a papule or vesicle including adjacent skin should be obtained from all patients with a lesion being evaluated for cutaneous anthrax, to be submitted in 10 percent formalin for histopathology. 6.In patients not on antibiotic therapy or on therapy for <24 hours, a second biopsy specimen 7. Acute and convalescent serum samples for serologic testing. **Gastro-intestinal** 1. Blood cultures obtained prior to antimicrobial therapy. 2. Ascites fluid for culture and PCR. 3. Stool or rectal swab for culture and PCR. 4. Oropharyngeal lesion, if present, for culture and PCR. 5. Acute and convalescent serum samples for serologic testing. 6. Autopsy tissues from fatal cases for histopathology. **Inhalation** 1. Blood cultures obtained prior to antimicrobial therapy. 2. Pleural fluid, if present, for culture and PCR. 3. CSF in patients with meningeal signs, for culture and PCR.

	4. Pleural and/or bronchial biopsies for immunohistochemistry (IHC).. 5. Acute and convalescent serum samples for serology 6.Autopsy tissues from fatal cases for histopathology
When to collect the specimen	Specimens should be collected from any patient being evaluated for cutaneous *Bacillus anthracis* infection. It may not be possible to demonstrate *B.anthracis* in clinical specimens if the patient has been treated with antimicrobial agents. Organism is best demonstrated in specimen taken at the vesicular stage Specimens for culture should be obtained prior to initiation of antimicrobial therapy If available at reference laboratories specimens may be submitted for PCR Caution: *B. anthracis* is highly infectious
How to prepare, store and transport specimen	**Vesicular stage**: collect fluid from intact vesicles on sterile swabs. **Eschar stage**: without removing eschar, insert swab beneath the edge of eschar, rotate and collect lesion material. Store specimen for ≤24 h and transport for ≤2h at room temperature. **Stool**: collect 5-10 g in a clean sterile leak-proof container. Store for ≤24 h at 4°C. Transport ≤1h at room temperature. **Blood**: collect per institution's procedure for routine blood culture. Collect 10 ml of blood in EDTA tube for PCR. Transport ≤2h at room temperature. **Sputum**: collect expectorated specimen into a sterile leak proof container. Store for ≤24 h at 4°C. Transport ≤2 h at room temperature.
Results	*Diagnostic services for Anthrax are not routinely available. Advance arrangements are usually required for Anthrax diagnostic services. Contact the appropriate National authority or WHO.*

Reference: Anthrax (Human)

- *WHO. Anthrax in humans and animals. World Health Organization, Geneva. (2008) (Available on http://www.who.int/csr/resources/publications/ AnthraxGuidelines2008/en/index.html*
- *WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2*
- *WHO recommended Strategies for the Prevention and Control of Communicable Diseases, WHO/CDS/CPE/SMT/2001.13*
- *2003 WHO Manual for Laboratory Diagnosis of Anthrax (http://www.searo.who.int/en/Section10/Section17/ Section58/Section909.htm)*
- *Anthrax Information for Health Care Providers, CDC (http://emergency.cdc.gov/agent/anthrax/anthrax-hcp-factsheet.asp)*
- *Recommended Specimens for Microbiology and Pathology for Diagnosis: Inhalation, Cutaneous, and Gastrointestinal Anthrax, CDC (http://emergency.cdc.gov/agent/anthrax/lab-testing/recommended specimens.asp)*

Bacterial Meningitis

Background

- *Neisseria meningitidis*, *Haemophilus influenzae* type b (Hib), and *Streptococcus pneumoniae* constitute the majority of all cases of bacterial meningitis and 90% of bacterial meningitis in children.

- Meningococcal meningitis is the main form of meningitis causing epidemics and remains a major public health challenge in the African meningitis belt, an area that extends from Senegal to Ethiopia. In these countries, large outbreaks may occur during the dry season (November through May). Outside of the meningitis belt, smaller outbreaks may occur year-round.

- Epidemics in the meningitis belt were traditionally associated with *Neisseria meningitidis* serogroup A before the introduction of a meningococcal A conjugate vaccine (MACV) (MenAfriVac vaccine) into meningitis belt countries starting in 2010. MACV is immunogenic in both infants and adults and confers long-term protection. It has dramatically reduced the circulation of Nm A and eliminated Nm A epidemics.

- Epidemics from other serogroups continue to occur: since 2013 major epidemics due to Nm serogroup C occurred in Nigeria and Niger. From 2016 to 2018, major mixed epidemics of *Neisseria meningitidis serogroup W* and *Streptococcus pneumoniae* have been reported in Ghana. In 2016 and 2017 Togo reported epidemics due to Nm serogroup W. In addition, in 2006 Burkina and Niger reported an epidemic due to Nm serogroup X.

- Human-to-human disease transmission is via large respiratory droplets from the nose and throats of infected people.

- Incubation period is 2 to 10 days.

- Attack rates are highest among children aged less than 15 years. Case fatality rates are usually 8-15% among treated patients, and >70% among untreated cases. Many survivors suffer long-term sequelae including mental retardation, hearing loss and loss of limb use.

- Ceftriaxone is the drug of choice for treatment during epidemics because it is effective on the predominant meningitis pathogens. In addition, antimicrobial resistance to ceftriaxone has not yet been detected in Africa.

- During epidemics in the meningitis belt, antibiotic prophylaxis is not recommended

- The current response to meningitis epidemics consists of reactive mass vaccination campaigns with bivalent (A C) or trivalent/quatrivalent polysaccharide vaccine (A, C, W/ A, C, Y W) as soon as possible after an epidemic has been declared. Polysaccharide vaccines do not protect very young children (<2 years) and only provide protection for up to three years.

Surveillance goals

- To promptly detect meningitis outbreaks and to confirm aetiology of meningitis outbreaks.
- To use the data to plan for treatment and vaccination supplies and other prevention and control measures.
- To assess and monitor the spread and progress of the epidemic and the effectiveness of control measures.
- To monitor the epidemiology of meningitis including serogroup shifts.
- To monitor antibiotic susceptibility.

Standard case definitions: 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 leucocyte count >100 cells/mm3; or CSF leucocyte 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 (i.e. polymerase chain reaction) a bacterial pathogen (Neisseria meningitidis, Streptococcus pneumoniae, Haemophilus influenzae type b) in the CSF or blood.

Respond to alert threshold

Alert threshold:

For populations between 30 000 and 100 000 inhabitants, an attack rate of 3 cases per 100 000 inhabitants per week (Minimum of 2 cases in one week)

- For populations less than 30 000 inhabitants, 2 cases in 1 week or an increase in the number compared to the same time in previous non-epidemic years.

Respond to alert threshold:

- Inform next level of health system
- Record cases on a line listing form
- Investigate and laboratory confirm the cases
- Treat all suspected cases with appropriate antibiotics as recommended by National protocol.
- Intensify surveillance for additional cases in the area
- Prepare for eventual response

Respond to action thresholds Bacterial Meningitis

Epidemic threshold:

- For populations between 30 000 and 100,000*: an attack rate of 10 cases per 100 000 inhabitants per week.
- For populations less than 30 000 inhabitants: 5 cases in 1 week** or the doubling of the number of cases over a 3-week period.

*For district populations with more than 100 000 inhabitants, it is recommended to calculate attack rates by sub-districts containing 30 000 to 100 000 inhabitants.

**In special situations such as mass gathering refugees displaced persons or closed institutions, two confirmed cases in a week should prompt mass vaccination.

Respond to epidemic threshold:

- Mass vaccination within 4 weeks of crossing the epidemic threshold***
- Mobilize community to permit early case detection, treatment, and improve vaccine coverage during mass vaccination campaigns for outbreak control.
- Continue data collection, transmission and analysis.
- Maintain regular collection of 5-10 CSF specimens per week throughout the epidemic season in all affected districts to detect possible serogroup shift. Distribute treatment to health centres
- Treat all cases with appropriate antibiotics as recommended by National protocol.

***If a neighbouring area to a population targeted for vaccination is considered to be at risk (cases early in the dry season, no recent relevant vaccination campaign, high population density), it should be included in a vaccination programme.

Analyse and interpret data
▪ Time: In meningitis belt countries during epidemic season, graph weekly cases and deaths. Otherwise, graph monthly trends in cases and deaths. Construct an epidemic curve for outbreak cases. ▪ Place: In epidemics (not in endemic situations), plot location of case households and estimate distance to the nearest health facility. ▪ Person: Count total sporadic and outbreak cases. Analyse age distribution. Target case fatality rate: <10%

Bacterial Meningitis

Laboratory confirmation	
Diagnostic test	Microscopic examination of CSF for Gram negative diplococci Culture and isolation of *N. meningitidis, Streptococcus pneumoniae, and Haemophilus influenzae b* from CSF or blood RT-PCR (national reference laboratory)
Specimen	Cerebrospinal fluid (CSF) Note: CSF is the specimen of choice for culture and microscopic exam. If CSF not available, collect blood (10 ml adults, 1-5 ml for children) for culture.
When to collect the specimen	Collect specimens from 5 to 10 cases once the alert or epidemic threshold (see "Meningitis" in Section 8.0) has been reached.
How to prepare, store, and transport the specimen	▪ Prepare the patient and aseptically collect CSF ▪ Fill one dry tube (culture) and one cryotube (PCR) ▪ If the dry tube cannot arrive within two hours to the laboratory, place 1 ml of CSF into a pre-warmed bottle of trans-isolate medium. ▪ Incubate at body temperature (36ºC to 37ºC). ▪ Never refrigerate specimens that will be cultured.

Results	Isolation of *Neisseria meningitidis, Streptococcus pneumoniae, and Haemophilus influenzae b. Neisseria meningitidis is* a fastidious organism, is expensive and difficult. It requires excellent techniques for specimen collection and handling and expensive media and antisera. Initial specimens in an outbreak or for singly occurring isolates of *N. meningitis or Neisseria meningitidis* should be serogrouped and an antibiogram performed to ensure appropriate treatment. Trans isolate medium (TI) is stable. If properly stored at temperature (4ºC) it can be kept for up to two years after preparation. In the refrigerator, the liquid phase turns gelatinous but reliquifies at room temperature. Unused TI bottles should be kept tightly sealed. If there is any colour change (yellowing or clouding of the liquid medium) or drying or shrinkage of the agar slant, the medium should not be used.

Reference: Bacterial Meningitis

- *Managing meningitis epidemics in Africa: A quick reference guide for health authorities and health-care workers Revised 2015, WHO/HSE/GAR/ERI/2010.4. Rev.1*
- *Weekly Epidemiological Record No 51/52, 577-588, 19 December 2014(http://www.who.int/wer)*
- *Meningitis outbreak response in sub-Saharan Africa. WHO guideline, WHO/HSE/PED/CED/14.5*
- *Standard Operating Procedures for Surveillance of Meningitis, Preparedness and Response to Epidemics in Africa, WHO document. WHO/AFRO/FRH October 2018, Brazzaville*
- *Laboratory Methods for the diagnosis of Meningitis caused by Neisseria meningitidis, Streptoccus pneumoniae and Heamophilus Influenza. WHO document WHO/CDS/EDC/99.7 WHO, Geneva*
- *Meningitis outbreak response in sub-Saharan Africa. WHO guideline, WHO/HSE/PED/CED/14.5*
- *Weekly Epidemiological Record No 51/52, 577-588, 19 December 2014 (http://www.who.int/wer)*
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- *Standard Operating Procedures for Surveillance of Meningitis, Preparedness and Response to Epidemics in Africa, WHO document. WHO/AFRO/FRH October 2018, Brazzaville*

Buruli ulcer (BU) (Mycobacterium ulcerans disease)

Background

- Skin infection caused by *Mycobacterium ulcerans* (an acid fast bacilli (AFB))
- Occurring mainly as skin lesions (nodules, plaques and ulcers) than can be complicated by bone and joint involvement. Involvement of other organs like the eyes is rare
- Spreading in inter-tropical areas, in swampy soils or water body surroundings, forestry or surface mining zones
- Patients are classified into three categories:
  - **Category I**: patient with a single lesion which size is less than 5 cm of diameter (early lesion)
  - **Category II**: patient with single lesion which size is between 5 and 15 cm of diameter
    - **Category III**: patient single lesion which size is over 15 cm of diameter or with multiple lesions or lesion located in critical site (face, head & neck, breast, perineum, genitalia, lesion spanning over joints)
- BU case management has improved greatly through use of WHO recommended antibiotics (rifampicin and streptomycin) in 2004. Since 2017, full oral combined antibiotics (rifampicin and clarithromycin) are now recommended for treatment of cases with wound care of ulcers. Surgery is still needed for late cases (category III). Cumulative number of cases in the WHO African Region that is the most affected (95% of global cases) is around 90,000 in 2017.
- Mode of transmission is still unknown. *M ulcerans* could penetrate the skin through insect bite (water bugs); micro trauma or small wounds
- Confirmation of diagnosis is done by PCR, AFB search with Ziehl-Neelsen (ZN) staining, culture or histology. Specimens of lesions are taken by swab in ulcer, fine needle aspiration (FNA) or biopsy in case of surgery. New diagnostic tests based of the presence of mycolactone, a toxin released by *M ulcerans in lesions,* are under development.

Surveillance goal

- Geographical distribution of the disease to locate endemic areas and districts and focus early case finding, proper management with WHO recommended antibiotics and prevention of disabilities

Standard case definition

Suspected case: A person presenting a painless skin nodule, plaque or ulcer, living or having visited a BU endemic area

Confirmed case**:** A suspected case confirmed by at least one laboratory test (ZN for AFB, PCR, culture or histology). Confirmation of presence of mycolactone in skin lesions

Respond to alert threshold

If a single case is suspected:

- Report the suspected case to the appropriate level of the health system

At health facility level:

- Take a specimen for laboratory confirmation (swab or FNA)
- Begin wound dressing and combined antibiotic treatment with: Rifampicin 10 mg/kg daily oral intake for 8 weeks (56 days).
- Clarithromycin 7.5 mg/kg twice daily oral intake for 8 weeks (56 days)
- Refer category III patients to reference hospital/centre
- Fill in case report form (BU 01 or BU 02) with origin village GPS data and report to Health District, Regional and National levels

Search other cases in origin village of confirmed case of BU

Respond to action threshold

Not applicable to BU

Analyse and interpret data

Time: Graph of cases by year of diagnosis, graph of cumulative number of cases.

Place: Plot cases by location of households and colour shade endemic districts

Person: Count newly detected cases monthly by category of patients (Cat I, II or III). Analyse age and disability distribution and treatment outcomes (cases cured, cured without limitation of movement or amputation, relapse after recommended antibiotic treatment).

Chikungunya

Background

- Chikungunya fever is a viral illness that is spread by the bite of infected mosquitoes. The disease resembles dengue fever, and is characterized by severe, sometimes persistent, joint pain (arthritis), as well as fever and rash. It is rarely life-threatening. Nevertheless, widespread occurrence of diseases causes substantial morbidity and economic loss.
- The word "Chikungunya" is Makonde for "that which bends up," in reference to the stooped posture of patients afflicted with the severe joint pain associated with the disease. Epidemics of fever, rash and arthritis, resembling Chikungunya fever were recorded as early as 1779. However, the virus was first isolated between 1952-1953 from both man and mosquitoes during an epidemic in Tanzania.
- Chikungunya historically displayed interesting epidemiological profiles in that: major epidemics appeared and disappeared cyclically, usually with an inter-epidemic period of 7-8 years and sometimes as long as 20 years. After a long period of absence, outbreaks appeared in Indonesia in 1999 and have been virtually ongoing since 2004.

Surveillance goal

- Detect Chikungunya sporadic cases and outbreaks early, and seek laboratory verification.
- Identify high risk areas in order to improve prevention of outbreaks by taking steps to avoid mosquito bites and elimination of breeding sites.

Standard case definition

i. Acute clinical case

a. Clinical criterion: Fever >38.5^0 C (101.3^{0}F) and joint pain [a] (usually incapacitating [b]) with acute onset **AND**

b. Epidemiological criterion: resident or visitor in areas with local transmission of Chikungunya on the last 15 days (suspected case for epidemiological surveillance) **OR**

c. Laboratory criterion: confirmation by laboratory: PCR, serology or viral culture (confirmed case for epidemiological surveillance)

ii. Atypical case

Clinical case of laboratory confirmed Chikungunya accompanied by other manifestations: neurological, cardiological, dermatological, ophthalmological, hepatic, renal, respiratory, or haematological, among others.

iii. Severe acute case

Clinical case of laboratory-confirmed chikungunya presenting dysfunction of at least one organ or system that threatens life and requires hospitalization

iv. Suspected and confirmed chronic cases

Suspect chronic case: Person with previous clinical diagnosis of chikungunya after 12 weeks of the onset of the symptoms presenting with at least one of the following articular manifestations: pain, rigidity, or edema, continuously or recurrently.

Confirmed chronic case: Every chronic case with a positive chikungunya laboratory test

[a] Usually accompanied by exanthema, myalgia, back pain, headache and, occasionally, vomiting and diarrhoea (pediatric age group).

[b] In children aged <3 years, joint pain is expressed as inconsolable crying, irritability, rejection to mobilization and/or walking.

Respond to alert threshold

If Chikungunya cases are suspected:

- Report case-based information immediately to the next level
- Collect specimens for confirming the cases
- Conduct an investigation to determine the risk factors for transmission
- Manage and treat the cases using acetaminophen or paracetamol to relieve fever and non-steroidal anti-inflammatory agents

Respond to action threshold

If Chikungunya cases are confirmed

- Symptomatic treatment for mitigating pain and fever using non-steroidal anti-inflammatory drugs along with rest usually suffices. Persistent joint pain may require analgesic and long-term anti-inflammatory therapy.
- Prevention is entirely dependent upon taking steps to avoid mosquito bites and elimination of mosquito breeding sites.

To avoid mosquito bites:

- Wear full sleeve clothes and long dresses to cover the limbs
- Use mosquito repellents
- Use mosquito nets – to protect babies, old people and others, who may rest during the day. The effectiveness of such nets can be improved by treating them with permethrin (pyrethroid insecticide). Curtains (cloth or bamboo) can also be treated with insecticide and hung at windows or doorways, to repel or kill mosquitoes
- Mosquitoes become infected when they bite people who are infected with Chikungunya. Mosquito nets and mosquito coils and repellents will help prevent mosquitoes from biting people

Analyse and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks.

Place: Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly.

During outbreak, count cases and deaths weekly. Analyse by age. Assess risk factors to improve prevention of outbreaks.

Laboratory confirmation: Chikungunya	
Diagnostic test	Serological tests show a four-fold rise in antibody titer to Chikungunya virus; the virus may be isolated from the blood of acutely ill patients in newborn mice, mosquitoes or cell culture or detected using IFA or Reverse Transcription Polymerase Chain Reaction (RT-PCR)
Specimen	Serum
When to collect the specimen	Collect specimen from the first suspected case (s). Suspected CHIK cases occur in clusters. Collect representative specimens from suspected cases. If outbreak is confirmed, collect more specimens from cases and also mosquitoes from the affected homes for testing. Type of Specimen - Acute-phase blood (0-10 days after onset) - Convalescent-phase blood (7 - 21 days after onset) Time of collection: When patient presents; collect second sample during convalescence. Between days 7 and 21 after onset.
How to prepare, store, and transport the specimen	Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens (WHO, 1997). For ELISA: ▪ Refrigerate at 2º to 8º C serum or clot for testing within 24 hour. If kept for longer store at -80ºC. For virus isolation and RT_PCR ▪ Store frozen at -20ºC for short-term storage or at -70ºC or transport in fully charged dry shipper. Mosquitoes for testing should be transported in fully charged dry shipper. Focus on *Aedes* species
Results	Diagnostic services for Chikungunya are not routinely available. Contact the appropriate National authority or WHO.Ministry of Health, Disease Outbreak Management Unit should send samples to WHO reference labs e.g. KEMRI ▪ Preliminary results are ready within 24 hours after samples arrive in the laboratory. Confirmatory results are ready within a week from sample reception.

Reference: Chikungunya

- *Weekly Epidemiological Record N° 1, 2005, 80, 1-8; http//www.who.int/wer*
- *World Health Organization http://www.who.int/mediacentre/factsheets/fs327/en/*
- *United States, Centers for Disease Control http://www.cdc.gov/ncidod/dvbid/chikungunya/*
- *Sergon et al Seroprevalence of Chikungunya Virus (CHIKV) Infection on Lamu Island, Kenya, October 2004. Am J Trop Med Hyg. 2008 Feb;78(2):333-337*
- *Powers et al. Evolutionary relationships and systematics of the alphaviruses. J Virol. 2001 Nov;75(21):10118-31*

Cholera

Background

- Acute illness with profuse watery diarrhoea caused by *Vibrio cholerae* serogroups O1 or O139. The disease is transmitted mainly through the faecal-oral route; that is through eating or drinking contaminated food or water.
- Cholera causes over 100 000 deaths per year. It may produce rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases (less than 5% of all non-outbreak-related diarrhoea cases) and small outbreaks may occur.
- Incubation period is from a few hours to 5 days, usually in the range of from 2 to 3 days.
- There has been a resurgence of cholera in Africa since the mid-1980s, where over 80% of the world's cases occurred in 1999. The majority of cases occurred from January through April. In 2016, globally, 38 countries reported a total of 132 121 cases. Of cases reported globally, 54% were from Africa, 13% from Asia and 32% from Hispaniola. Imported cases were reported in 9 countries.
- Cholera may cause severe dehydration in only a few hours. In untreated patients with severe dehydration, the case fatality rate (CFR) may exceed 50%. If patients present at the health facility and correct treatment is received, the CFR is usually less than 1%. At least 90% of the cases are mild, and they remain undiagnosed.
- Risk factors: eating or drinking contaminated foods such as uncooked seafood or shellfish from estuarine waters, lack of continuous access to safe water and food supplies, attending large gatherings of people including ceremonies such as weddings or funerals, contact with persons who died of cholera.
- Other enteric diarrhoea may cause watery diarrhoea, especially in children less than 5 years of age. Please see *Diarrhoea with dehydration* summary guidelines.

Surveillance goal

- Detect and respond promptly and appropriately to cases and outbreaks of watery diarrhoea. To confirm an outbreak, collect and transport stool specimens transported in Cary-Blair medium.
- Do immediate case-based reporting of cases and deaths when an outbreak is suspected.

Standard case definition: Cholera

Suspected cholera case: In areas where a cholera outbreak has not been declared: Any patient aged two years and older presenting with acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea.

In areas where a cholera outbreak is declared: any person presenting with or dying from acute watery diarrhoea.

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

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately.
- Manage and treat the case according to national guidelines.
- Enhance strict hand-washing and isolation procedures.
- Conduct case-based investigation to identify similar cases not previously reported.
- Obtain stool specimen from 5 patients within 5 days of onset of acute watery diarrhoea, and before antibiotic treatment is started. See laboratory guidelines for information on how to prepare, store and transport the specimens.

Respond to action threshold

If a suspected case of cholera is confirmed:

- Establish treatment centre in locality where cases occur. Treat cases onsite rather than asking patients to go to standing treatment centres elsewhere.
- Initiate a line listing of suspected and confirmed cases and ensure laboratory results are linked with cases
- Strengthen case management including treatment.
- Mobilize community early to enable rapid case detection and treatment. Survey the availability of clean drinking water.
- Work with community leaders to limit the number of funerals or other large gatherings for ceremonies or other reasons, especially during an epidemic. If seen mandatory, establish bylaws
- Reduce sporadic and outbreak-related cases through continuous access to safe water. Promote safe preparation of food (especially seafood, fruits, and vegetables).
- Promote safe disposal of human waste.
- Ensure adequate collaboration with various sectors including water and sanitation to ensure appropriate interventions are addressed
- Cholera vaccine is available; but its utilization must be accompanied with strategies to improve water and sanitation

Analyse and interpret cholera data: Cholera

Time: Graph weekly cases and deaths and construct an epidemic curve during outbreaks. Report case-based information immediately and summary information monthly for routine surveillance.

Place: Plot the location of case households.

Person: Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyse distribution of cases by age and according to sources of drinking water. Assess risk factors to improve control of sporadic cases and outbreaks.

Laboratory confirmation: Cholera

Diagnostic test: Isolate V. cholerae from stool culture and determine O1 serotype using polyvalent antisera for V. cholerae O1. If desired, confirm identification with Inaba and Ogawa antisera.

If specimen is not serotypable, consider, V. cholerae O139 (see note in Results column).

Specimen: Liquid stool or rectal swab

When to collect the specimen:

For each new area affected by the outbreak, a laboratory confirmation should done. Collect stool sample from the first suspected cholera case. If more than one suspected case, collect until specimens have been collected from 5 to 10 cases. Collect stool from patients fitting the case definition and Onset within last 5 days, and Before antibiotics treatment has started

Do not delay treatment of dehydrated patients. Specimens may be collected after rehydration (ORS or IV therapy) has begun.

If possible, specimens should be collected from 5 – 10 suspected cases every 1 – 2 weeks to monitor cessation of the outbreak, changes in serotypes, and antibiotic sensitivity patterns of V.cholerae

How to prepare, store, and transport the specimen	▪ Place specimen (stool or rectal swab) in a clean, leak proof container and transport to lab within 2 hours. ▪ If more than 2- hour delay is expected, place stool-soaked swab into Cary-Blair transport medium. If Cary-Blair transport medium is not available and specimen will not reach the lab within 2 hours: Store at 4°C to 8°C ▪ Do not allow specimen to dry. Add small amount of 0.85% NaCl if necessary ▪ To transport, transport in well-marked, leak proof container

Results: cholera laboratory test	▪ Cholera tests may not be routinely performed in all laboratories. ▪ Culture results usually take 2 to 4 days after specimen arrives at the laboratory. ▪ Cary-Blair transport medium is stable and usually good for at least one year after preparation. It does not require refrigeration if kept sterile and in properly sealed container. If colour changes (medium turns yellow) or shrinks (depressed meniscus), do not use the medium. ▪ The O139 serotype has not been reported in Africa and only in a few places in southwest Asia.

References

- *Global Task Force on Cholera Control. Ending Cholera. A Global Roadmap to 2030. Publication date: 3 October 2017*
- *Management of the patient with cholera*, World Health Organization, 1992. WHO/CDD/SER/91.15 Rev1 (1992)
- *Epidemic diarrhoeal disease preparedness and response--Training and practice.* Facilitator and participant manuals. World Health Organization, 1997. WHO/EMC/DIS/97.3 and WHO/EMC/DIS/97.4
- *Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera*. CDC/WHO, 1999 CDC, Atlanta, GA, USA

Dengue Fever

Including Dengue haemorrhagic fever (DHF) and Dengue shock syndrome (DSS)

Background

- Dengue fever is an arbovirus transmitted by aedes mosquitoes (both Ae. aegypti and Ae. albopiticus). Dengue is caused by four serologically distinct, but closely related viruses: dengue virus (DENV) 1, 2, 3, and 4 of the Flaviviridae family.

- Dengue fever is an emerging pandemic that has spread globally during the past 30 years as a result of changes in human ecology. Dengue is found in tropical and sub-tropical regions around the world, predominately in urban and semi-urban areas. During dengue epidemics, infection rates among those who have not been previously exposed to the virus are often 40% to 50%, but can reach 80% to 90%.

- Dengue fever is a severe, influenza-like illness that affects infants, young children and adults, but seldom causes death. Dengue haemorrhagic fever (DHF) is a potentially deadly complication that has become a leading cause of hospitalization and death among children in Asia. There is good evidence that sequential infection with the different serotypes of dengue virus increases the risk of more severe disease that can result in dengue shock syndrome (DSS) and death.

- Epidemic dengue activity in Africa has mostly been classical dengue fever caused by DENV-1 and DENV-2 without associated mortality. The first major outbreak of DENV-3 in Africa was documented in Mozambique in 1984-1985. During this outbreak, most patients experienced secondary infections and 2 deaths were attributed to DHF and shock. In 2008, yellow fever and DENV-3 were found to be co-circulating in Abidjan, Cote d'Ivoire, however, no severe dengue cases or deaths attributable to dengue were identified.

- There is no specific treatment for dengue, but appropriate medical care frequently saves the lives of patients with dengue haemorrhagic fever.

- Infected humans are the main carriers and multipliers of the virus, serving a source of the virus for uninfected *Aedes aegypti* mosquitoes which maintain the urban dengue transmission cycle. The virus circulates in the blood of infected human for 2-7 days, at approximately the same time that they have a fever. A sylvatic transmission cycle has been documented in west Africa where DENV-2 has been found in monkeys. There is no evidence of person-to-person transmission.

- At present, the only method of controlling or preventing dengue virus transmission is to combat the vector mosquitoes using environmental management and chemical methods.

Surveillance goal

- Surveillance for suspected cases and investigation of clusters of suspected cases in areas with *Ae. aegypti* and *Ae. albopiticus* mosquitoes

Standard case definition: 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, four-fold or greater rise in IgG antibody titres, positive PCR or viral isolation).

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.

Respond to alert threshold: Dengue Fever

If a single case is suspected:

- Report case-based information immediately to the next level.
- Conduct active search for additional cases
- Collect specimens for confirming the cases

Respond to action threshold

If a single case is confirmed:

- Report case-based information immediately to the next level and initiate a line list/register of suspected cases
- Conduct active search for additional cases
- Collect specimens for confirming the cases and ensure results are linked with cases
- Survey the community to determine the abundance of vector mosquitoes, identify the most productive larval habitats, promote and implement plans for their elimination, management or treatment with appropriate larvicides.
- Educate the public and promote behaviours to remove, destroy or manage mosquito vector larval habitats.
- Manage and provide supportive treatment to dengue fever cases. Implement standard infection control precautions. Prevent access of mosquitoes to patients by using mosquito bed nets.

Analyse and interpret Dengue Fever data

Time: Graph cases and deaths weekly/monthly. Construct an epidemic curve during the outbreak.

Place: Plot location of case households and work sites using precise mapping.

Person: Case-fatality rate. Analyse age and sex distribution. Percentage of DHF / DSS cases and of hospitalisations.

Laboratory confirmation: Dengue Fever	
Diagnostic test	Demonstration of IgM and IgG by antibody assays. Detection of viral genomic sequences by PCR. Isolation of the dengue virus using cell culture. Antigen detection Assays for acute phase samples when PCR or isolation is negative. Demonstration of dengue virus antigen in autopsy tissue by immunohistochemistry or immunofluorescence or in serum samples by enzyme immunoassays (EIA). *Note: there are several diagnostic techniques available to document an infection by the dengue virus. The IgM ELISA is the basic test for serologic diagnosis.*

Specimen	ELISA: Whole blood, serum or plasma from acute (0-5 days) and convalescent 6 or more days) depending on each case. PCR: Whole blood or blood clot, serum/ plasma or tissue preferably from acute specimens (0-5 days) The samples should be collected for diagnosing a suspected dengue fatality: A blood sample to attempt PCR, virus isolation and serology. If an autopsy is performed, blood from the heart should be collected.
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases. Type of Specimen ▪ Acute-phase blood (0-5 days after onset of symptoms) ▪ Convalescent-phase blood (≥ 6 days after onset) Time of collection ▪ Collect 2nd sample during convalescence. Between days 6 and 21 after onset. Laboratory diagnosis of fatal cases is indispensable for understanding the risk factors for severe cases.

Laboratory confirmation: Dengue Fever	
How to prepare, store, and transport the specimen	Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens. *For ELISA or PCR:* ▪ Refrigerate serum or clot. For long term storage freeze -20^{o}C ▪ Freeze (-20C or colder) tissue specimens for virus isolation If an autopsy has been performed and no fresh tissues are available, tissues fixed in formalin should be submitted for immunohistochemical studies.

Results	**Diagnostic services for Dengue fever and Dengue haemorrhagic fever are not routinely available.** Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

Reference

- *WHO Recommended Surveillance Standards* WHO/CDS/CSR/ISR/99.2

Dengue: Clinical and Public Health Aspects, CDC

Diabetes

Background

- Diabetes mellitus (DM) is a widespread chronic disease that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. Diabetes can cause serious health complications including heart disease, blindness, kidney failure, and lower-extremity amputations.

- The most common form is Type 2 diabetes that represents more than 85% of the cases. Other forms are less common such as Type 1 (10% of cases), specific diabetes and gestational diabetes (5% of cases).

- The risk factors that affect the onset of diabetes are well-known. They comprise non-modifiable factors like old age (over 45 years of age), family history, and the causes of diabetes in pregnancy. Modifiable risk factors for diabetes are obesity, physical inactivity and excessive alcohol consumption.

- The global prevalence in 2000 was estimated at 2.8%, with projections of 4.8% by 2030. The total number of persons affected will rise from 171 million in 2000 to 366 million in 2030 if no action is taken. Annual mortality linked to diabetes worldwide is estimated at more than one million.

- Diabetes is no longer considered rare in Africa. Recent estimates based on the WHO STEP-wise approach for monitoring the risk factors of non-communicable diseases indicate prevalence of between 1% and 20%. In some countries such as Mauritius, it reaches 20%.

- The rate of limb amputations due to diabetes varies from 1.4% to 6.7% of diabetic foot cases. In some African countries, the mortality rate is higher than 40 per 10,000 inhabitants.

Surveillance goal

- Estimate the magnitude of the disease
- Monitor trends and risk factors
- Identify populations at highest risk (e.g.; age groups, urban vs. rural)
- Monitor prevention and control program activities

Standard case definition: Diabetes Mellitus

Suspected new case:

Any person presenting with the following symptoms:

- Increasing thirst
- Increased hunger
- Frequent urination

Confirmed new case:

Any person with a fasting blood sugar of 6.1 mmol/L (110 mg/dl) Or venous plasma glucose measurement of ≥ 7 mmol/L (126 mg/dl) or capillary glucose ≥

Any person with a non-fasting glucose ≥ 11.1 mmol/L or venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl) or capillary mg/dl)

*Report only the first lab-confirmed

Diabetes

Recommended public health action

For people with diabetes:

- Treat confirmed cases according to the standardized case management guidelines (WHOPEN).

District-level Prevention:

- Implement an integrated prevention and control programme for non-communicable diseases focusing on diabetes through community awareness and education activities conducted in accordance with national prevention and control programmes for non-communicable diseases. These activities would include multi-sectoral strategies and plans of action on diet, weight-reduction, and physical activity.
- Implement clinical preventive measures and treatment interventions using evidence-based guidelines (screening high-risk patients, for example).

Analyse and interpret data

Time: Graph cases quarterly to analyse trends.

Place: Compare district trends with national and regional trends.

Person: Analyse the distribution of cases by age and other demographic factors. ****Data for non-communicable diseases is analysed for long term trends***

Laboratory confirmation

Diagnostic test	Measuring glucose in capillary blood using a reagent strip test and reference meter Measuring glucose in plasma using a glucose-oxidase colorimetric test method laboratory case definition (see section 8.0)
Specimen	Plasma Capillary blood
When to collect	Blood glucose measurements must be carried out on the day and at the time requested. Fasting specimen: for adult the fasting time is usually 10 to 16 hours. For children the fasting time is 6 hours.
How to prepare, store, and transport	Specimen should be examined as soon as possible (before 2 hours) at health facility where the specimen is taken.
Results	Results are ready within few hours.

Reference: Diabetes

- Non communicable Diseases: A strategy for the African Region, AFR/RC50/10
- Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12
- Diabetes prevention and control: a strategy for the African Region, AFR/RC57/7
- Steps manual: http://www.who.int/chp/steps/en/
- Gojka R et al, Global prevalence of diabetes, Diabetes Care 27(5): 1047–1053, 2004
- IDF, Diabetes Atlas, 2nd Edition, Brussels, International Diabetes Federation, 2003
- WHO, Preventing chronic diseases: A vital investment, Geneva, World Health Organization, 2005
- WHO, The burden of mortality attributable to diabetes, Geneva, World Health Organization, 2004.
- WHO-PEN: Protocols for health promotion, prevention and management of NCDs at primary care level http://www.afro.who.int/en/divisions-a-programmes/ddc/division/2257-who-pen-protocols.html
- District Laboratory Practice in Tropical Countries, Cambridge

Diarrhoea with blood (Shigella)

Background

- *Shigella dysenteriae* type 1 (SD1*)* is the most common cause of enteric infections and is transmitted from person-to-person through faecal-oral spread.
- Large scale outbreaks may be caused by SD1 with up to 30% of populations infected. The case fatality rate may approach 20% among young children and elderly persons with severe dehydration.
- The incubation period is from 1 to 4 days.
- Clinical illness is characterized by acute fever and bloody diarrhoea, and can also present with systemic symptoms and signs as well as dehydration especially in young children.
- Risk factor: overcrowded areas with unsafe water and poor sanitation (for example, refugee and famine populations).
- SD1 is frequently resistant to multiple antibiotics including trimethoprim-sulfamethoxazole.
- Enterohaemorrhagic and enteroinvasive *E. coli* and other bacteria or parasites such as *Entamoeba histolytica* may also cause bloody diarrhoea.

Surveillance goal

- Detect and respond to dysentery outbreaks promptly.
- Improve percentage of laboratory-confirmed cases and evaluate proportion verified as SD1.
- Determine antibiotic sensitivity pattern of the agents isolated (especially SD1) both for routine surveillance and during outbreaks.

Standard case definition

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* type1.

Respond to alert threshold: Diarrhoea with blood (Shigella)

If you observe that the number of cases or deaths is increasing over a period of time:

- Report the increase to the next level of the health system.
- Treat the suspected cases with oral rehydration and antibiotics based on recent susceptibility results, if available.
- Obtain stool or rectal swab specimen for confirming the SD1 outbreak.
- Investigate the case to determine risk factors contributing to transmission.

Respond to action threshold: Diarrhoea with blood (Shigella)

If a suspected outbreak is confirmed:

- Search for additional cases in locality of confirmed cases. Initiate a line list/register of cases
- Strengthen case management and treatment.
- Collect appropriate samples and link results with cases
- Mobilize community to enable rapid case detection and treatment.
- Identify high risk populations using person, place, and time data.
- Reduce sporadic and outbreak-related cases by promoting hand-washing with soap or ash and water after defecating and before handling food.
- Ensure access to safe water supply and storage, and use of latrines and safe disposal of human waste.
- Ensure adequate collaboration with various sectors including water and sanitation to ensure appropriate interventions are addressed

Analyse and interpret Diarrhoea with blood (Shigella) data

Time: Graph monthly trends in cases and deaths. Construct an epidemic curve for outbreak cases.

Place: Plot location of case households.

Person: Count cases and deaths each month. During an outbreak, count outbreak-related cases by week. Routinely analyse age distribution. Assess risk factors to improve control and prevention of sporadic diseases and outbreaks.

Laboratory confirmation: Diarrhoea with blood (Shigella)	
Diagnostic test	Isolate *Shigella dysenteriae* type 1 (SD1) in culture to confirm a shigella outbreak. If SD1 is confirmed, perform antibiotic sensitivity tests with appropriate drugs.
Specimen	Stool or rectal swab.
When to collect the specimen	For each new area affected by the outbreak, a laboratory confirmation should be done. Collect sample when an outbreak is suspected. Collect stool from 5-10 patients who have bloody diarrhoea and: • Onset within last 4 days, and • Before antibiotic treatment has started. Preferably, collect stool in a clean, dry container. Do not contaminate with urine. Sample stool with a swab, selecting portions of the specimen with blood or mucus. If stool cannot be collected, obtain a rectal swab sample with a clean, cotton swab.

How to prepare, store, and transport the specimen	Place stool swab or rectal swab in Cary-Blair transport medium. Transport to laboratory refrigerated. If Cary-Blair not available, send sample to laboratory within 2 hours in a clean, dry container with a tightly-fitting cap. Specimens not preserved in Cary-Blair will have significant reduction of *shigellae* after 24 hours.
Results	Culture results are usually available 2 to 4 days after receipt by the laboratory. SD1 isolates should be characterized by antibiotic susceptibility. After confirmation of initial 5-10 cases in an outbreak, sample only a small number of cases until the outbreak ends, to monitor cessation of the outbreak, and antibiotic sensitivity patterns, which will guide the definitive treatment. Refer to disease specific guidelines in Section 11.0 for additional information about the epidemic potential of *Shigella dysenteriae type 1*
Reference	

- *Guidelines for the control of epidemics due to Shigella dysenteriae type 1*. WHO/CDR/95.4
- *Safe Water Systems for the Developing World: A Handbook for Implementing Household-based Water Treatment and Safe Storage Projects*. Department of Health & Human Services. Centers for Disease Control and Prevention. Atlanta. 2000
- *Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera*. CDC/WHO, 1999 CDC, Atlanta, GA, USA

Diarrhoea with dehydration in children less than 5 years of age

Background

- Diarrhoea with dehydration in children less than 5 years of age is due to infections of the gastrointestinal tract caused by viruses (especially *Rotavirus*), bacteria *(E. coli, Salmonellae, Shigellae, Campylobacter, Yersinia*, and others), and parasites (*Giardia, Entamoeba*, cryptosporidia, and cyclospora). These diseases are transmitted through eating contaminated food or water, or through faecal-oral spread.
- Diarrhoeal diseases represent the second leading cause of death among children less than 5 years of age in many African countries, with more than 3 million deaths per year.
- Different epidemiological patterns (for example, seasonality) are observed for different pathogens.
- The WHO and UNICEF advocate that each district team use the Integrated Management of Childhood Illnesses (IMCI) strategy to reduce morbidity and mortality of childhood diarrhoea.

Surveillance goal

- Detect diarrhoea outbreaks promptly. Laboratory confirmation can confirm specific pathogenic agent outbreak, but laboratory confirmation is not necessary for routine surveillance of diarrhoea with dehydration.

Standard case definition

Suspected case:

Passage of 3 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. *Note:* Laboratory confirmation of specific agent causing outbreak is not routinely recommended for surveillance purposes.

Respond to alert threshold: Diarrhoea with dehydration in children less than 5 years of age

If you observe that the number of cases or deaths is increasing over a period of time:

- Report the problem to the next level.
- Investigate the cause for the increased number of cases or deaths and identify the problem.
- Make sure that cases are managed according to IMCI guidelines.
- Encourage home-based therapy with oral rehydration.

Respond to action threshold: Diarrhoea with dehydration in children less than 5 years of age

If the number of cases or deaths increase to two times the number usually seen in a similar period in the past:

- Assess health worker practice of IMCI guidelines for managing cases and improve performance for classifying diarrhoea with dehydration in children less than 5 years of age.
- Teach mothers about home treatment with oral rehydration.
- Conduct community education about boiling and chlorinating water, and safe water storage and preparation of foods.

Analyse and interpret data

Time: Graph cases and deaths to compare with same period in previous years. Prepare graphs for outpatient diarrhoea with some dehydration and for diarrhoea with severe dehydration. Construct an epidemic curve when outbreaks are detected.

Place: Plot location of case households.

Person: Report monthly totals due to diarrhoea with some dehydration and also for diarrhoea with severe

Laboratory confirmation

Laboratory culture of stools may be used to confirm possible outbreaks of specific agents, but is not necessary for case definition.

Reference

- *Management of childhood illness: Clinical skills training course for first level health facilities. World Health Organization. WHO/CDR/95.14*
- *Integrated Management of Childhood Illness: A WHO/UNICEF Initiative Bulletin of the World Health Organization. Vol. 75, 1997, Supplement 1, 1997. ISBN 92 4 068750 5*

Dracunculiasis (Guinea Worm Disease)

Background

- Dracunculiasis is commonly known as Guinea worm disease. It is caused by a large nematode, a disabling parasite that emerges through the skin of the infected person.
- This is an old disease, known since antiquity, inflicting an excruciating pain on affected individuals and usually causing temporary disability, leaving many patients with unfortunate socio-economic consequences. It is transmitted through ingestion of water containing a crustacean (cyclops) which is infested by an immature form (larvae) of the nematode. The Cyclops is found in stagnant surface water sources (ponds, traditional shallow wells). The female nematode discharges larvae from the host's skin when there is contact with water. The incubation period is usually between 10 to 14 months. There is no treatment or vaccine against the disease.
- Successful disease elimination strategies conducted by the endemic countries and an international coalition of partners has pushed Dracunculiasis towards eradication. During 2017, only 30 cases of Guinea worm disease worldwide were reported to WHO, compared to 892 000 in 1989, showing a reduction of 99.99%.
- In 1989, the disease was endemic in 20[1] countries: Benin, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Chad, Ghana, Ethiopia, India, Pakistan, Kenya, Mali, Mauritania, Niger, Nigeria, Sudan, Senegal, Togo, Uganda and Yemen.
- Africa remains the only affected continent, with 5 countries having reported infection emanating from indigenous transmission of the parasite either in human and/or in animal in 2018: Angola, Chad, Ethiopia, Mali and South Sudan.
- Since, 2012, emerging worms from animals, mostly dogs, and in a few instances, cats and baboons, have been reported in some of the remaining endemic countries and confirmed in the WHO Collaborating Centre at CDC for Dracunculiasis Eradication laboratory, as *Dracunculus medinensis*. Accordingly, dracunculiasis eradication, which was previously based on interrupting transmission in human, will now include interrupting transmission in both human and animal hosts.[2]

[1] From 2011 when Sudan was split into Sudan and South Sudan, the number of countries increased to 21, and then with the reporting and confirmation of an indigenous case in Angola in 2018, the number of countries is now 22, with 18 of them in the WHO Region for Africa.

[2] At its meeting in February 2018, the ICCDE revised the operative definitions of dracunculiasis elimination and eradication as follows:

- ***Elimination**: the confirmed absence of clinical illness (the interruption of transmission of Dracunculus medinensis in **human and animal**) for three years or longer **from a country** with such low risk of re-introduction of the parasite that preventive measures could be reduced to a strict minimum.*
- ***Eradication**: the confirmed absence of clinical manifestations (the interruption of transmission of Dracunculus medinensis in **human and animal**) for three years or longer **at the global level.***

Surveillance goal: Dracunculiasis

- Active detection and containment of cases at the community level and immediate reporting to the health centre, with immediate notification to the health district, regional and national level. This should subsequently be followed by weekly and monthly reporting of cases to the next level.
- In zones where local transmission of Guinea worm has been interrupted, maintain active searches for cases in high-risk areas and promptly follow-up and investigate all rumours of dracunculiasis (within 24 hours of notification) reported through the national surveillance system and/or directly by community members.
- Report all imported cases to countries or areas of origin for further follow up investigation to trace the source of infection for further action.
- Integrate dracunculiasis surveillance into National Surveillance systems and continue to report immediately/weekly/monthly, and also according to national reporting system.
- Use opportunities of other community-based health activities (e. g. NID campaigns for Polio and other vaccinations, NTD Mapping, Mass drug administration, ITN and other health commodities distribution, etc.), to conduct active case search for dracunculiasis, and document results.
- Continue publicity of the cash reward for reporting Dracunculiasis
- Systematically document and properly store information /surveillance data related to Guinea worm surveillance, to serve as evidence for future certification, and beyond until Global eradication is declared.

Standard case definitions: 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, i.e. 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.

Respond to alert threshold: Dracunculiasis

As a disease targeted for eradication, every rumour or suspected case of Guinea worm disease is an emergency.

- Follow up and investigate any rumour of dracunculiasis (within 24 hours of notification), using the national programme guidelines and WHO recommended forms, in order to determine whether or not there is a suspected case requiring further follow-up, monitoring and specimen collection for laboratory investigation.

If a single case is suspected:

- Report the case according to national program guidelines for eradication of Dracunculiasis.
- Treat the wound (if any) to decrease disability associated with painful leg lesions.
- Collect and preserve specimen of any emerged worm in ***70% alcohol***, according to WHO /National guidelines for specimen handling, and send to WHO Country Office for onward transmission to WHO Collaborating Centre at CDC, for laboratory analysis
- Conduct case investigation to confirm risk factors and assess the source and burden of infection.
- Improve access to safe water according to national guidelines.

Analyse and interpret data

Time: Graph cases monthly.

Place: Plot distributions of localities (communities) from which cases have been reported.

Person: Count monthly cases and analyse age distribution. Use data to forecast interventions. Report monthly to next levels.

Laboratory confirmation

A clinical diagnosis is usually made when the blister has ruptured, and the anterior end of the female worm can be seen, and the worm emerges. Current programme standards require that the emerged worm is sent to the laboratory for confirmation as *D. medinensis*. Several other worms emerging from the skin may mimic Guinea worm disease, notably onchocerciasis and sparganosis, and should be differentiated from dracunculiasis through laboratory confirmation. Collect and preserve any emerged specimen according to WHO/ National guidelines for specimen handling and send to WHO Country office for onward transmission to WHO Collaborating Centre at CDC for laboratory analysis (mandatory).

Reference: Dracunculiasis

- *Dracunculiasis or guinea-worm*, Geneva, World Health Organization, WHO/CDS/CEE/DRA/99.2, 1999 and WHO/WER N°37 September 2003
- *Control of Communicable Diseases Manual*, 18th Edition
- *District Laboratory Practice in Tropical Countries*, Cambridge
- *Dracunculiasis Eradication*:(http://www.who.int/dracunculiasis/surveillance-control/en/)
- *Weekly epidemiological Records*, 2018, 93, 33–44(http://www.who.int)
- *Reports of meetings of International Task Force for Disease Eradication (ITFDE)*(https://www.cartercenter.org/news/publications/health/itfde_reports.html)
- *Report of meeting of ICCDE, February 2018.*

Ebola or Marburg virus diseases

Background

- The Ebola and Marburg viruses are both filoviruses.
  - Almost 3,000 cases of Ebola with over 1,900 deaths have been documented since the Ebola virus was discovered in 1976. Major Ebola outbreaks have occurred in Sudan, DRC, Cote d'Ivoire, Gabon, Uganda and Congo.
  - More than 500 cases of Marburg with over 400 deaths were reported during outbreaks of Marburg virus that occurred in DRC (1998-2000), Angola (2004-2005) and Uganda (3 cases in 2007).
- These two viruses are transmitted by direct contact with the blood, secretions, organs or other body fluids of infected persons. The infection of humans with Ebola virus through the handling of infected chimpanzees, gorillas, and forest antelopes (alive and dead) has been documented.
- Ecological studies are in progress to identify the natural reservoirs of both Marburg and Ebola. There is evidence that fruit bats are involved.
- Epidemics can be dramatically amplified in health care facilities with inadequate infection control precautions/barrier nursing procedures.
- Incubation period for Ebola and Marburg is 2 to 21 days.
- Between 20% and 80% of patients have haemorrhagic manifestations depending on the Ebola or Marburg virus strain. Patients become increasingly infectious as their illness progresses.
- High case fatality ratios have been reported during Ebola outbreaks (25% to 90%) and during Marburg outbreaks (25% to 80%)
- There is no specific treatment for either disease. Severe cases require intensive supportive care, as patients are frequently dehydrated and in need of intravenous fluids or oral rehydration with solutions containing electrolytes.
- Close contact with a severely ill patient, during care at home or in hospital, and certain burial practices are common routes of infection. Transmission via contaminated injection equipment or through needle-stick injuries is associated with more severe disease. Infection may also be spread through contact with soiled clothing or bed linens from an infected patient.

Surveillance goals

- Early detection of cases and outbreaks, rapid investigation, and early laboratory verification of the aetiology of all suspected cases.
- Investigation of all suspected cases with contact tracing.
- During epidemics, most infected patients do not show haemorrhagic symptoms and a specific case definition according to the suspected or confirmed disease should be used.
- Prevention efforts such as social distancing and vaccination should be supported.
- Monitoring case fatalities, assess spread of illness (chains of transmission), and death.

- Guide the support and care of survivors

Standard case definition: Ebola or Marburg virus diseases

Routine Surveillance:

Suspected case: Illness with onset of fever and no response to treatment of 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 epidemiologic link to confirmed cases or outbreak.

Community-based surveillance:

Alert case:

a. Illness with onset of fever and no response to treatment of usual causes of fever in the area;
   OR
b. At least one of the following signs: bleeding, bloody diarrhoea, bleeding into urine;
   OR
c. Any sudden death

Actions to take: If an alert case (living or dead) is identified, report the case to a surveillance team or to the closest health centre

This definition of "alert cases" for Ebola or Marburg virus disease has been developed for use by the community or community-based volunteers. It may be used for community-based surveillance during the pre-epidemic phase and during the outbreak.

Note: During an outbreak, case definitions are likely to be adapted to new clinical presentation(s) or different modes of transmission related to the local event

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; **OR**

A person (alive or dead) suffering or having suffered from a sudden onset of high fever and having had contact with: a dead or sick animal (for Ebola); a mine (for Marburg)

Standard case definition: Ebola or Marburg virus diseases

Note: During epidemics, most infected patients do not show haemorrhagic symptoms, therefore, the case definition for suspected or confirmed case does not include it.

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 during the illness, the preceding categories are reclassified as "laboratory confirmed" cases and "non-case".

Laboratory confirmed case: Any suspected or probably cases with a positive laboratory result for virus presence. Laboratory confirmed cases must test positive for the virus, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT- PCR), or by detection of IgM antibodies directed against Marburg or Ebola virus.

- **Non-Case**: Any suspected or probable case with negative laboratory results. "Non-case" showed no specific antibodies, RNA or specific detectable antigens

Respond to alert threshold: Ebola or Marburg virus diseases

If a single case is suspected:

If a single case is suspected:

- Report case-based information immediately (phone or text with information from generic case investigation form) to the appropriate authorities.
- Collect specimen to confirm the case(s). Carefully complete specimen request form and mark containers to warn laboratory of risk.
- Suspected cases should be isolated from other patients and strict barrier nursing techniques implemented. Eliminate body fluid exposure and wear VHF appropriate PPE.
- Standard precautions should be enhanced throughout the healthcare setting.
- Conduct case-contact follow-up (using case investigation form) and active case search for additional cases. Begin contact tracing (see contact tracing forms)

Begin or enhance death reporting and surveillance

Respond to action threshold: Ebola or Marburg virus diseases

If a single case is confirmed:

- Notify authorities at the next level and the WHO
- Maintain strict VHF infection prevention and control practices throughout the outbreak (see separate Infection Prevention and control guidelines).
- Mobilize the community for early detection and care of cases and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting and during funerals.
- Conduct case contact follow-up and active searches for additional cases that may not come to the health care setting.
- Psychosocial support for family, community, and staff.
- Begin screening procedures for fever and VHF-like symptoms at the entrances to health care facilities with hand washing
- Request additional help from other levels as needed.
- Establish isolation ward to handle additional cases that may come to the health centre. Ensure there is a barrier between suspected cases and confirmed cases in an isolation unit.
- Quarantine high-risk contacts with home support during the incubation period. Low risk contacts under daily follow-up should be encouraged to limit their movements
- Begin surveillance and screening of dead bodies including: any individual aged 5 years or more, dying within 14 days of symptom onset from an indeterminate cause, OR still births.)
- Treat accompanying similar symptoms, in particular malaria, typhoid, fever, louse-borne typhus, relapsing fever or leptospirosis.
- Implement IPC measures and avoid nosocomial transmission by strict implementation of barrier nursing. If barrier nursing material is not available, avoid any invasive procedure (e.g. blood sampling, injections, placement of infusion lines, or nasogastric tubes) and put on at least one layer of gloves for any direct contact with the patient; double gloving is advised during invasive procedures (e.g., surgery) that poses an increased risk for blood exposure.
- There is no specific treatment for either disease. Severe cases require intensive supportive care, as patients are frequently dehydrated and in need of intravenous fluids or oral rehydration with solutions containing electrolytes.

For EVD, a range of potential treatments including blood products, immune therapies and drug therapies are currently being evaluated.

Analyse and interpret data: Ebola or Marburg virus diseases

Person: Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan disease control interventions accordingly.

Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.

Place: Map locations of cases' households.

Laboratory confirmation: Ebola or Marburg virus diseases	
Diagnostic test	Laboratory confirmed cases must test positive for the Ebola or Marburg virus antigen, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT- PCR), or by detection of IgM antibodies directed against Ebola/Marburg.
Specimen	For ELISA: Whole blood, serum or plasma For RT-PCR: Whole blood or blood clot, serum/plasma or tissue For immunohisto-chemistry: Skin or tissue specimens from fatal cases **NB: RDTs theoretically can be performed in any health care setting and without additional equipment, however, use of an RDT may result in both false positive and false negative test results. A nucleic-acid based (e.g., PCR) diagnostic assay, such as GeneXpert, must be used to confirm the RDT result. Recent guidance from WHO recommends that antigen detection RDT's for VHDs have no role in the routine management of VHDs in settings where PCR testing is available. However, they may have utility in settings without laboratory infrastructure and where specimens cannot be rapidly transported to a diagnostic laboratory, if their benefits and limitations are understood.**
When to collect	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.

How to prepare, store, and transport	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-20°C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* ▪ Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. ▪ Store at room temperature. Formalin-fixed specimens may be transported at room temperature.

Laboratory confirmation : Ebola or Marburg virus diseases

Results

Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

Reference

- WHO Interim Guidelines -Case Definitions Recommendations for Ebola and Marburg Virus diseases. 9th August 2014
- Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) Haemorrhagic Fever. BDP/EPR/WHO, Geneva March 2008.
- Infection control for VHF in the African health care setting, WHO, 1998. WHO/EMC
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- WHO Fact Sheet No 103, Ebola haemorrhagic fever, revised December 2008
- WHO Fact Sheet, Marburg haemorrhagic fever, revised July 2008
- Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) Haemorrhagic Fever. BDP/EPR/WHO, Geneva March 2008.
- WHO recommended Guidelines for Epidemic Preparedness and Response: Ebola Haemorrhagic Fever (EHF). WO/EMC/DIS/97.7.
- Dengue haemorrhagic fever: diagnosis, treatment, prevention and control. 2nd edition. Geneva: World Health Organization. 1997.

Epilepsy

Background

- Epilepsy is defined as the recurrence of, at least, two epileptic seizures with sudden occurrence of abnormal signs which could be: motor, tonic, sensitive, sensorial, neuro-vegetative, or psycho-behavioural. These symptoms could or could not be associated to a loss of conscience. It can appear at any age.
- Epilepsy is the most common result of brain cells disturbance that lead to excessive nerve-cell discharges. According to the disturbance on some or many groups of cells, seizures could be partial or generalized.
- Seizures with tonic-clonic muscle movements are named convulsion or fit or attack. Convulsion can appear at any age; all convulsions are not systematically epilepsy.
- Epilepsy is frequent in the Region and its prevalence rate range from 2.2 to 58 per 1000 persons. Studies from five sub-Saharan African countries showed an incidence ranging from 64 to 156 per 100,000 person/year.
- This higher incidence may be a consequence of many risk factors which are related with predisposing factors such as poor perinatal care, head trauma, consanguinity.
- Many etiological factors are related with communicable diseases (malaria, tuberculosis, meningitis, neurocysticerocisis and HIV), noncommunicable diseases (high blood pressure, diabetes, alcoholism and illicit drug use), poorer medical facilities, poorer general health and a lower standard of living. Misunderstanding linked to cultural beliefs, sigma and exclusion do not facilitate appropriate care.
- Epilepsy substantially increases mortality risk, particularly in conditions of later detection due to lack of well-trained health workers to diagnose and treat neurological disorders.
- Death and injury occur primarily due to status epilepticus (especially in the case of abrupt medication withdrawal), burns and drowning.

It has been estimated that in developing countries, up to 80% of people with epilepsy are not receiving treatment, or are often not even identified. While the etiological diagnosis of the epilepsies may be more difficult in developing countries, due to limited investigative resources, many can be diagnosed on the basis of simple clinical and epidemiological knowledge.

Standard case definition: **Epilepsy**

Suspected case: Any person with one epileptic seizure

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 antiepileptic (AED) strengthens the hypothesis of a confirmed case. Epileptic seizures can last for 30 seconds to 3 minutes. When they are intricate without a pause, they can lead to *status epilepticus*.

Respond to alert threshold

Suspected cases

- All health personnel should check for early signs of epilepsy. Diagnosis should include good interviews
  (describing as precisely as possible the seizure type) and clinical examination.
- Once diagnosed, search for underlying and associated causes. Check for abnormal increases on number
  of cases and propose appropriate environmental measures if needed.

Confirmed cases

- Immediate treatment should be ensured starting with low doses of any anti-epileptic drug then increasing
  progressively until an effective steady state. In case of poor seizure control management strategies must be: increase the dose or try an alternative drug, refer to an upper level health structure.
- Referral to higher level health structure should be done if seizures continue regardless of pharmacological
  treatment or if first seizure occurs in an adult aged 30 years and above.

Respond to action threshold

All cases: Information and education measures on epilepsy and risk factors at community level

Analyse and interpret data

Person: Analyse sex and age distribution (by age group from 6 years
onwards) **Time**: Graph quarterly cases

Place: Plot the distribution by area of residence

Laboratory confirmation: **Epilepsy**	
Diagnostic test	▪ Blood glucose (random capillary blood, and venous blood sugar), electrolytes to exclude other conditions such as diabetes, kidney pathology ▪ Exclude other conditions such as cerebral malaria, meningitis, toxoplasmosis; cerebral calcifications follow tuberculosis (tuberculoma), parasitic diseases and others by conducting appropriate medical investigations.
Specimen	Blood, and cerebro-spinal fluid
When to collect the specimen	Glucose – During the emergency admission of the patient (random blood glucose) Confirmed subsequently (fasting blood glucose)
How to prepare, store, and transport the specimen	Use universal precautions to minimize exposure to sharps and any body fluid
Results	Results are always available within 1 to 3 hours from arrival in the laboratory

References :

- WHO, Epilepsy in the WHO African Region: Bridging the Gap, WHO Regional Office for Africa, Congo, 2004.
- WHO, Epilepsy: a manual for medical and clinical officers in Africa, WHO, Geneva 2002

Foodborne Illnesses

Background

- Foodborne illnesses are caused by a variety of bacterial, viral, parasitic or fungal pathogens or their toxins that enter the body through consumption of food or water. In addition to diseases listed elsewhere in this guideline such as cholera, and shigellosis, surveillance for foodborne illnesses may involve other causes such as salmonellosis, hepatitis A or chemical contamination.
- A foodborne illness occurs when two or more people have shared common food or drink followed by an onset of symptoms within a short time period.
- Most people with a foodborne illness do not seek medical care, so cases and outbreaks of foodborne illness usually are neither recognized nor reported.
- The first symptoms often occur in gastrointestinal tract. Nausea, vomiting, abdominal cramps and diarrhoea are frequent symptoms of foodborne diseases.
- Outbreaks may be localized affecting as few as 2 individuals who ate a common meal or product, but large and geographically widespread outbreaks may also occur. Large outbreaks occur when food is contaminated prior to distribution and is widely consumed by many people in many areas.
- Surveillance for foodborne illnesses is needed to monitor food safety and target health promotion actions aimed at food handlers for safer food practices and improved personal hygiene.

Surveillance Goal

- To promptly identify any unusual cluster of disease potentially transmitted through food, which may need a public health investigation or response.
- Monitor the magnitude of foodborne illnesses
- Identify high risk foods or food practices.
- Monitor risk factors to inform public health interventions and health promotion for targeted foods or food practices.

Standard case definition: Foodborne illness

A foodborne illness is suspected when 2 or more people present with similar symptoms and who consumed common food or drink

A foodborne illness is defined according to the specific agent causing the disease (for example, cholera, hepatitis A, salmonellosis, shigellosis).

A confirmed foodborne illness is a laboratory confirmed case of a specific agent with a link to a common food or drink source.

Respond to alert threshold: Foodborne illness

If observed that ≥2 people are ill and have eaten food from a common source:

- Immediately report the illness to the next level of the heath system
- From patients and from the suspected food items and drinks, collect specimens for laboratory confirmation
- Treat suspected cases

Respond to action threshold: Foodborne illness

If an outbreak of a foodborne illness is confirmed:

- Search for additional cases in locality of confirmed cases
- Strengthen case management and treatment
- Mobilise community for rapid case detection and treatment
- Identify high risk groups
- Remove from the restaurant menu or the supermarkets shelves, food items from which evidence of unsafe food may be obtained.
- Eventually call for in-depth investigation of the food chains that may be associated with the outbreak
- Reduce sporadic and outbreak-related cases by promoting hand washing with soap and water after defecating/urinating and before food handling/meals; strengthen access to safe water supply and storage, use of latrines and safe human waste disposal
- Scale-up food safety health promotion activities using the WHO *Five Keys to Safer Food* (see reference below) and the Hazard Analysis Critical Control Point (HACCP) system
- Scale-up food inspection activities

Analyse and interpret data: Foodborne illness

- Time: Graph monthly trends in cases and deaths; Construct an epidemic curve for outbreak cases.
- Place: Plot location of households for cases and deaths
- Person: Count cases and deaths each month. During an outbreak, count outbreak-related cases by week.
- Routinely review clinical data and laboratory results from food and human analyses to identify clusters of cases in time, place or person. Investigate any suspected foodborne outbreaks detected in the data.

Reference

- *WHO Foodborne disease outbreaks: Guidelines for investigation and control*
  http://www.who.int/foodsafety/publications/foodborne_disease/outbreak_guidelines.pdf

Hypertension

Background

- **Hypertension** or **high blood pressure** (HBP) is a chronic condition in which the blood pressure in the arteries is elevated. It is classified as either primary (essential) or secondary. 'Primary' hypertension is elevated blood pressure where no medical cause is found. 'Secondary' hypertension is caused by other conditions that affect the arteries, heart, endocrine system or kidneys.
- Hypertension is a major risk factor for cardiovascular diseases such as heart attack or stroke. According to The World Health Report 2001, cardiovascular disease related deaths are increasing in the African Region, and in 2000 accounted for 9.2% of the total deaths in the African Region. Prevalence ranges from 25% to 35% in adults aged 25 to 64 years.
- Hypertension affects approximately 1 billion worldwide and it is estimated that more than 20 million people in the African Region are affected.
- Major risk factors for hypertension are ageing, lack of physical activity, obesity, and a diet high in salt and fat. Other risk factors include; tobacco and alcohol use.
- Lifestyle modifications shown to lower BP include; weight reduction for individuals who are overweight or obese, reducing the amount of fat and salt in the diet, and eating more fresh fruits and vegetables, increased physical activity, and reduction of alcohol and tobacco consumption.

Surveillance goal

- Prevention of secondary illness by early detection and standardized treatment
- Estimation of disease burden and reduction of identified risk factors
- Monitor control and prevention activities

Standard case definition

Suspected new case at first visit:

Any individual presenting with 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 with 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.

Recommended public health action: Hypertension

- Health promotion for non-communicable diseases focusing on HBP should be established, including community-based education on behaviour change and adoption of healthy lifestyles
- Promote secondary prevention and treatment interventions at health facilities according to national guidelines.

Analyse and interpret data

Time: Graph cases quarterly to analyse trends.

Place: Compare district trends with national and regional trends.

Person: Analyse the distribution of cases by age and other demographic factors.

Data for non-communicable diseases is often analysed for long term trends

Laboratory confirmation

Diagnostic is clinical.

Reference

- *WHO, Atlas of heart disease and stroke, Geneva, World Health Organization, 2004.*
- *Non communicable Diseases: A strategy for the African Region, AFR/RC50/10*
- *Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12*
- *http://www.who.int/chp/steps/en/*
- *http://www.afro.who.int/dnc/databases/afro infobase/index.html*
- *WHO CVD-risk management package for low-and medium resource settings.*
- *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure U.S. Department of health and Human Services, National Institutes of Health, National*

  Heart, Lung, and Blood Institute, NIH Publication No. 03-5233, December 2003

- *Handbook of Hypertension, Vol 20. Editor; C.J. Bulpitt, 2000*
- *http://www.cdc.gov/bloodpressure/*

Influenza caused by a new subtype

Background

- An influenza pandemic occurs when a new influenza A virus emerges with efficient and sustained human-to-human transmission in populations with limited immunity. Influenza pandemics occurred in 1918, 1957 and 1968; 2009. The 1918 pandemic killed an estimated 40–50 million people. It is predicted that a pandemic of equivalent magnitude could kill 62 million people, 96% of them in developing countries.
- Influenza caused by new subtype were reported in i) 1997/human infections with the A(H5N1) virus HPAI; ii) 2009/Influenza A (H1N1) pandemic; iii) 2013/human infections with A(H7N9) virus. Other avian influenza viruses have resulted in sporadic human infections including the A(H7N7) and A(H9N2) viruses. Some countries have also reported sporadic human infections with swine influenza viruses, particularly the A(H1) and A(H3) subtypes.

- Successful mitigation or control of pandemic influenza is dependent on early recognition of sustained human-to-human transmission of a new influenza A virus. Countries have been encouraged as part of pandemic preparedness planning to enhance surveillance to (i) detect the emergence of new disease; (ii) characterize the disease (epidemiology, clinical manifestations, severity); and (iii) monitor its evolution and start control measures.
- **Under the IHR** (2005), a State Party is to i**mmediately notify WHO of any laboratory confirmed case of a recent human infection caused by an influenza A virus with the potential to cause a pandemic. Evidence of illness is not required for this report.**

Surveillance goals

- To detect and investigate the first evidence of sustained human-to-human transmission of an influenza virus with pandemic potential.
- To assess the earliest cases of pandemic influenza occurring in a country in order to characterize the new disease including its clinical characteristics, risk factor information, and epidemiological and virological features.
- To monitor the course of the pandemic within the country, regionally and globally.

Standard case definitions: Influenza caused by a new subtype

1-For infections with other non-seasonal influenza viruses, case definitions must be adapted to the situation. The following case definitions are proposed for further adaptation:

- ***Suspected case*:** Fever (temperature >38ºC) **and** [cough **or** shortness of breath **or** difficulty breathing] with onset within the last 10 days in a person with one or more of the following epidemiological exposures in the 2 weeks prior to symptom onset in [Area X] since/during [date Y/date Y to Z[b]].
    - Close contact (within 1metres) with a person who is a suspected, probable, or confirmed case;
    - Exposure to animals or their remains or to environments contaminated by their faeces in an area where non-seasonal influenza infections in animals or humans have been suspected or confirmed in the last month;
    - Consumption of raw or undercooked animal's products in an area where influenza infections in animals or humans have been suspected or confirmed in the last month;
    - Close contact with a confirmed influenza infected animal;
    - Handling samples suspected of containing non-seasonal influenza virus in a laboratory or other setting
- **Probable case:**

  A suspected case with **either**:
    - positive laboratory confirmation of influenza A virus infection but insufficient laboratory evidence for subtype
    - A person dying of an unexplained acute respiratory illness who is considered to be epidemiologically linked to a probable or confirmed case of non-seasonal influenza in a human.
- **Confirmed case:** Laboratory confirmation of a recent [d] infection with non-seasonal influenza virus in a person
- **Discarded case:** A suspected or probable case with a negative test of the non-seasonal influenza virus

[b] *where one case has been confirmed, set start date at least 28 days (2 maximum incubation periods) prior to onset of first confirmed case*

[c] *Whose non-seasonal influenza virus test results are accepted by WHO as confirmatory.*

[d] *An infection is considered recent if it has been confirmed by positive results from polymerase chain reaction (PCR), virus isolation, or paired acute and convalescent serologic tests. An antibody titre in a single serum is often not enough to confirm a recent infection, and should be assessed by reference to valid WHO case definitions for human infections with specific influenza A subtypes.*

Standard Case Definitions: Influenza caused by a new subtype

2-For some zoonotic influenza subtypes, **specific cases definitions are existing such as for H5N1 and H7N9.**

- Link of the WHO H5N1 case definitions: ***http://www.who.int/influenza/resources/documents/case_definition2006_08_29/en/***
- Link of the WHO H7N9 case definitions: ***https://www.who.int/influenza/human_animal_interface/influenza_h7n9/en/***

3-IHR case definition for human influenza caused by a new subtype

- An influenza A virus is considered to have the potential to cause a pandemic if the virus has demonstrated the capacity to infect a human and if the heamagglutinin gene (or protein) is not a variant or mutated form of those, i.e. A/H1 or A/H3, circulating widely in the human population. An infection is considered recent if it has been confirmed by positive results from polymerase chain reaction (PCR), virus isolation, or paired acute and convalescent serologic tests. An antibody titre in a single serum is often not enough to confirm a recent infection, and should be assessed by reference to valid WHO case definitions for human infections with specific influenza A subtypes.

Respond to alert threshold: Influenza caused by a new subtype

Respond to a suspected case of human influenza caused by a new subtype or to an unusual event of severe acute respiratory infection:

Triggers for investigation

Examples of triggers include:

- respiratory disease in humans that is associated with recent exposure to animals;
- clusters[1] of severe acute respiratory infection[2] (SARI) or pneumonia in families, workplaces or social networks;
- SARI occurring in a health-care worker who cares for patients with respiratory diseases;
- SARI or pneumonia in travellers from countries or areas affected by emerging acute respiratory infections;
- SARI occurring in a laboratory worker or researcher handling novel influenza and other emerging respiratory pathogens;
- number of respiratory disease hospitalizations or deaths greater than expected;
- laboratory detection of human infection with a non-seasonal influenza virus or a novel respiratory pathogen;
- abrupt, unexplained changes in the trends of respiratory disease occurrence or clinical outcomes observed in routine surveillance activities; and
- unusually high levels of sales of pharmaceuticals used for respiratory illness that cannot be explained by known or expected disease trends.

[1] A "cluster" is defined as two or more people with onset of symptoms within the same 14-day period and who are associated with a specific setting, such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.

[2]SARI is an acute respiratory infection with history of fever or measured fever of ≥38 C⁰ and cough, with onset within the past 10 days, that requires hospitalization

Key steps for an investigation*: *Influenza caused by a new subtype

- Prepare for the investigation
  - Assemble a multidisciplinary investigation team
  - Inform relevant authorities
  - Gather information and supplies
- Investigate initial cases reported
- Protect the investigators
- Develop case definitions
- Find additional cases
  - Identify and monitor contacts of cases
  - Active case finding
- Enhance surveillance
- Collect specimens
- Undertake animal health and environmental investigations
- Manage and analyse the data (time, place, person)
- Some public health questions that may require complementary studies to be implemented
- Implement response and control measures
  - Manage the sick
  - Prevent further transmission
  - Infection prevention and control
  - Communicate the risk
  - Monitor the event and the response
- Report and notify
  - Report results of the investigation
  - Notify to local, subnational and national public health authorities.

Respond to action threshold: **Influenza caused by a new subtype**

If a single case of human influenza caused by a new subtype is confirmed or if another acute respiratory disease of epidemic or pandemic potential is confirmed:

- Manage the sick
- Prevent further transmission
- Infection prevention and control
- Communicate the risk
- Monitor the event and the response: An event is deemed to be contained if active surveillance in the at-risk population has not yielded new cases during twice the presumed incubation period for that disease

Refer for more details to WHO *protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018*
https://www.who.int/influenza/resources/publications/outbreak_investigation_protocol/en/

Analyse and interpret data: Influenza caused by a new subtype

1-Manage the data

- use a line list and
- establish procedures for record-keeping and data validation

2-Analyse the data

Time: Construct an epidemic curve, with the weekly number of cases on the y-axis, and their date or time of illness onset on the x-axis. Construct secondary epidemic curves by cases classification status (suspect, probable and confirmed cases), death status, exposure types, etc.

These curves can provide information on magnitude of the event, patterns of spread and exposure, time trend of the event, disease incubation period, type of exposure, outliers, impact of interventions implemented.

Place: Cases should be mapped by geographical location; for example, by village, by home or by location in a health-care facility. Maps may be local, regional or national, depending on the geographical spread of the event.

The visual interpretation of the maps can provide important etiological clues, identify clustering and provide details on the geographical extent of disease spread. Two types of maps are to be used:

• Spot map – use spot maps to assess the likely mode of spread (cases clustered, scattering of cases, etc.)

• Area map – use area maps to take into consideration the underlying population in that location (allows for direct comparison of incidence rates between sites, regions, etc.).

Person:

To understand the clinical spectrum and disease dynamics, it is necessary to analyse:

• epidemiological and clinical parameters of the cases;

• attack rates by age, sex, occupation and exposure history; and

• for clinical parameters, the spectrum of illness severity, including proportion of cases with pneumonia, those requiring hospitalization, intensive care unit admission and the proportion that were fatal.

Laboratory detection and confirmation: **Influenza caused by a new subtype**

1-Specimen collection and handling

A list of specimens that should be collected to test the presence of respiratory disease pathogens comprise: sputum, bronchoalveolar lavage, tracheal aspirate, nasopharyngeal aspirate, nasal wash, nose or throat swab, nasopharyngeal swab, tissue from biopsy or autopsy including from lung, serum, whole blood and urine. All of those specimens' type should be stored at 4°C and shipped to the national influenza reference laboratory. If the influenza testing will be done in ≤ 48 hours the specimens should be kept at 4°C, and at – 70°C if the test is planned in more than 48 hours. When the event aetiology is unknown, it is useful to collect various specimens when feasible, to maximize opportunities for detection and characterization.

2-Specimen testing

Various laboratory-based techniques can be used to identify human influenza virus infections:

1) Detection of influenza-specific RNA by RT-PCR (reverse transcription polymerase chain reaction)
2) Isolation in cell culture
3) Direct antigen detection (low sensitivity)

If influenza is suspected as the causative agent, specific protocol provides a suggested laboratory-testing algorithm with RT-PCR (cf references).

Laboratory detection and confirmation: Influenza caused by a new subtype

- Manipulation of samples from patients meeting clinical and epidemiological risk factors that suggest infection with non-seasonal influenza viruses should be performed at a minimum of biosafety level 2 (BSL-2) containment and BSL-3 practices.
- All manipulations of live virus samples must be performed within a class-II (or higher) biosafety cabinet.
- The WHO Manual for the laboratory diagnosis and virological surveillance of influenza, 2011 provides more information.
  https://www.who.int/influenza/gisrs_laboratory/manual_diagnosis_surveillance_influenza/en/

3-Specimen referral

Laboratory results should be confirmed by an approved laboratory

All influenza A virus-positive samples that cannot be subtyped should **be sent immediately to a WHO Collaborating Centers** for further analysis. Their list and contact are on WHO website , link: https://www.who.int/influenza/gisrs_laboratory/collaborating_centres/list/en/

References

- *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018*
- *WHO Fact Sheet on Avian and other zoonotic Influenza, 2018*
- *WHO Guidance for Surveillance during an Influenza Pandemic,Update 2017*
- *WHO Summary of key information practical to countries experiencing outbreaks of A(H5N1) and other subtypes of avian influenza, 2016*
- *WHO Infection prevention and control of epidemic-and pandemic prone acute respiratory infections in health care guidelines, 2014*
- *WHO Manual for the laboratory diagnosis and virological surveillance of influenza, 2011*
- *WHO Operational guidance on sharing influenza viruses with human pandemic potential (IVPP) under the Pandemic Influenza Preparedness (PIP) Framework*
- *WHO Operational guidance on sharing seasonal influenza viruses with WHO Collaborating Centres (CCs) under the Global Influenza Surveillance and Response System (GISRS)*
- *WHO Standard guidance for the clinical management of influenza infections, expected publication in 2019*
- *WHO Collaborating Centers for influenza contact are on WHO website, link: https://www.who.int/influenza/gisrs_laboratory/collaborating_centres/list/en/*

Influenza-like Illness (ILI)

Background

- Respiratory infections are a significant cause of infectious disease morbidity and mortality in the world. The mortality rates are particularly high among infants, children and the elderly. However, the burden of disease is not well characterized in Africa.
- The most common pathogens causing respiratory infections are; Streptococcus pneumonia, Haemophilus influenzae type b (Hib), Staphylococcus aureus and other bacterial species, respiratory syncytial virus (RSV), measles virus, human parainfluenza viruses type 1, 2, and 3 (PIV-1, PIV-2 and PIV-3), influenza virus
- An improved understanding of the epidemiology and seasonality of respiratory infections in Africa is essential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals for prophylaxis and treatment, infection control).
- The threat of respiratory infections due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness.
- Surveillance for respiratory infections, mainly the viral ones, is based on the Influenza-like Illness (ILI) case definition.

Surveillance goals

- Describe the seasonality of influenza
- Signal the start and end of the influenza season
- Establish baseline or average levels of influenza and severe influenza-related disease
- Describe circulating viruses
- Identify locally circulating virus types and subtypes and their relationship to global and regional patterns
- Monitor antiviral sensitivity
- Identify and monitor groups at high-risk of severe disease and complications from infection
- Assist in understanding the relationship of virus strains to disease severity

Standard case definition

An acute respiratory infection with:

- measured fever ≥ 38 ºC
- cough
- with onset within the last 10 days

Respond to an alert threshold: Influenza-like Illness (ILI)

Please refer to the *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018*, if there is an unusual event (clusters of acute respiratory infections or of

atypical respiratory infections, a cluster of deaths, for example) of respiratory infection.

Respond to an action threshold: Influenza-like Illness (ILI)

Please refer to the *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018*, if a single case of pandemic-prone acute respiratory disease is suspected.

Analyse and interpret data

Time: Frequency of reporting: Epidemiological and virological data collected from the sentinel sites should be analysed **on a weekly basis**. Graph cases weekly. Construct an epidemic curve throughout the year and describe transmission patterns and changes in the level of respiratory activity compared to the previous week(s), year(s)

Place: Cases should be mapped by geographical location; for example, by village, by home or by location in a health-care facility.

Person: For individual ILI patients tested for influenza viruses, the **minimum data to be collected and analysed for each patient**, especially if a specimen is collected, is : Unique identifier (to link laboratory and epidemiological data), Sex, Age, History of fever and body temperature at presentation, Date of symptom onset, Date of specimen collection, Antiviral use for present illness at the time of specimen collection, Pregnancy status., Presence of chronic pre-existing medical illness(es) (Chronic respiratory disease, Asthma, Diabetes, Chronic cardiac disease, Chronic neurological or neuromuscular disease, Haematological disorders, HIV). Data on ILI can be aggregated by age groups to facilitate analysis and reporting. Recommended major **age groupings for reporting** are**:** 0 to <2 years, 2 to <5 years, 5 to <15 years, 15 to <50 years, 50 to <65 years, ≥ 65 years.

For the laboratory data, as a minimum, it is recommended that the following data should be collected:

- The number of samples tested for influenza during the week.
- The proportion of samples that were positive for influenza for ILI
- Types and subtypes of viruses detected during the week.
- Results from antiviral resistance testing (if applicable).

Laboratory testing: Influenza-like Illness (ILI)

1- For the influenza virus:

- Specimens can be positive seven days or more after the onset of illness but ability to detect virus drops off notably after five to seven days, depending on the test used.
- Reverse transcriptase-polymerase chain reaction (RT-PCR) is the most sensitive method for detecting influenza virus and is the recommended influenza surveillance assay for most laboratories.
- Virus culture is also needed on at least a subset of specimens in order to allow detailed antigenic and genetic characterization of the virus.
- Antiviral resistance testing should be considered for high-risk patients if capacity exists in the laboratory in addition to taking a sample from non-high-risk patients

Further technical information on the role of laboratory can be found in the

- WHO Global Epidemiological Surveillance Standards for Influenza, 2014. *https://www.who.int/influenza/resources/documents/influenza_surveillance_manual/en/*
- WHO Manual for the laboratory diagnosis and virological surveillance of influenza, 2011. https://www.who.int/influenza/gisrs_laboratory/manual_diagnosis_surveillance_influenza/en/

Reference

- *WHO Global Epidemiological Surveillance Standards for Influenza, 2014.*
- *AFR generic protocol for influenza sentinel surveillance 2015* https://afro.who.int/publications/protocol-national-influenza-sentinel-surveillance
- *Protocol for the investigation of acute* respiratory illness outbreaks of unknown aetiology
- *https://afro.who.int/publications/protocol-investigation-acute-respiratory-illness-outbreaks-unknown-etiology*
- *WHO Fact Sheet on Seasonal Influenza, 2018*
- *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018*
- *WHO Infection prevention and control of epidemic-and pandemic prone acute respiratory infections in health care guidelines, 2014*
- *WHO Manual for the laboratory diagnosis and virological surveillance of influenza, 2011*
- *WHO Operational guidance on sharing seasonal influenza viruses with WHO Collaborating Centres (CCs) under the Global Influenza Surveillance and Response System (GISRS)*
- *WHO Operational guidance on sharing influenza viruses with human pandemic potential (IVPP) under the Pandemic Influenza Preparedness (PIP) Framework*
- *WHO Standard guidance for the clinical management of influenza infections, expected publication in 2019*
- *Influenza WHO health topic page: (http://www.who.int/influenza/en/)*

Injuries (Road traffic accidents)

Background

- Injury is a physical damage resulting when the human body is briefly or suddenly subjected to levels of energy exceeding its physiological tolerance or the impairment in function resulting from the lack of one or more vital elements (water, air, warmth). The energy causing the injury can be mechanical, electrical, thermal, radiant or chemical. Injury is classified as intentional and unintentional.
- All injuries account for 10% of the world's deaths. 5.8 million People die each year as a result of different types of injuries. Of the all systems that people have to deal with on a daily basis; road transport is the most complex and the most dangerous.
- Road traffic accidents result in unintentional injury.
- A traffic collision (motor vehicle collision, motor vehicle accident, car accident, or car crash) occurs when a road vehicle collides with another vehicle, pedestrian, animal, road debris, or other geographical or architectural obstacle. Traffic collisions can result in injury, property damage, and death.
- Worldwide, the number of people killed in road traffic crashes each year is estimated at 1.2 million, while the number of injured could be as high as 50 million.
- Road traffic injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention.
- Road traffic injuries continue to be among the leading causes of death and disability among young people aged between 5 and 44 years and the leading cause of death in the category of people between 15-29 years. The majority of such deaths are currently among "vulnerable road users"-pedestrians, pedal cyclists and motorcyclists.
- Without increased efforts and new initiatives, the total number of road traffic deaths worldwide and injuries is forecast to rise by some 67% by 2020, and in low income and middle-income countries deaths are expected to increase by as much as 83%
- The African region has the highest fatality rate for road traffic crashes at 32/100 000 population

Road traffic injuries are preventable. Very substantial reductions in juries can be achieved by implementing measures which address risk factors (excessive and inappropriate speed, driving under the influence of alcohol, non-use of seat belts and child restraints, non- use of helmets for cyclists)

Surveillance goal

- Estimate and monitor incidence of road traffic injuries and related outcomes
- Identify risk factors and high risk areas to inform prevention policy and programs
- Evaluate programmes aimed at preventing road traffic injuries

- Establish alert thresholds for fatalities to allow health facility personnel review care and services provided to injured persons
- Establish incidence alert thresholds and monitor trends to enable district health personnel inform relevant stakeholders

Standard case definition

Road traffic injury: Any person who has sustained an injury as a result of a road traffic crash presenting for the first time.

Road traffic fatality: Any person killed immediately or dying within 30 days as a result of an injury crash.

Respond to alert threshold

- Promote primary prevention by supporting interventions to address risk factors
- Review and monitor care and services provided to injured persons
- Review arrangements for mass casualty management

Respond to action threshold

- Step up enforcement of measures to address risk factors
- Activate mass casualty management system

Analyse and interpret data

Person: Analyse the distribution of cases by sex, age and other demographic factors

Time: Graphs to show monthly figures of cases and deaths, curves for the year to depict trends
Place: Plot location of cases and identify high risk areas

Laboratory confirmation

Imaging of the injured person - when required

Reference

- *World Health Report*, 2004, WHO
- WHO- 2010 Status report on Road Safety in Africa, 2010, WHO
- 2004 Peden, M.; et al (eds), *World Report on Road Traffic Injury Prevention*, 2004, WHO
- Holder Y., Peden M., Krug E. et al (eds), *Injury Surveillance Guidelines*, 2001, Geneva WHO
- Harvey A, (Ed). *Data systems*, Geneva, World Health Organisation,2010

Lassa and Crimean-Congo Haemorrhagic Fevers

Background

- Crimean-Congo haemorrhagic fever (CCHF) virus belongs to the Bunyaviridae virus family and Lassa fever belongs to the Arenaviridae family.
    - CCHF is endemic in parts of Africa and outbreaks have been reported from Uganda, Mauritania, and South Africa. Mauritania reports a few cases each year and South Africa reported 165 laboratory-confirmed cases between 1981 and March 2006.
    - Lassa fever is known to be endemic in Guinea, Liberia, Nigeria and Sierra Leone, but probably exists in other West African countries as well. Some studies indicate that 300,000 to 500,000 Lassa fever cases with 5,000 deaths occur each year in West Africa.
- CCHF spreads to humans either by tick-bites, or through contact with viraemic animal tissue immediately post-slaughter.
- The animal reservoir of the Lassa virus is a rodent of the genus Mastomys. Mastomys infected with Lassa virus do not become ill but shed the virus in their excreta (urine and faeces) and humans usually become infected through aerosol or direct contact with excreta of infected rodents. Lassa fever can also be spread between humans through direct contact with the blood, pharyngeal secretions, urine, faeces or other body secretions of an infected person.
- Person-to-person transmission of both CCHF and Lassa fever viruses has occurred in health care settings after exposure to blood and secretions of infected patients.
- The incubation period for CCHF following a tick bite is usually 1-3 days (maximum 9 days) and following contact with blood or tissues is usually 5-6 days (maximum 13 days). The incubation period for Lassa fever ranges from 6-21 days.
- The onset of symptoms among CCHF patients is sudden with fever, myalgia and other signs and symptoms. The reported case fatality ratio for CCHF is between 3% and 30%.
- About 80% of human Lassa fever infections are mild or asymptomatic; the remaining cases have severe multi-system disease. The onset of disease in symptomatic patients is usually gradual starting with fever,

general weakness and malaise. Lassa fever is difficult to distinguish from many other diseases which cause fever, including malaria, shigellosis, typhoid fever, yellow fever and other VHFs. The overall case fatality ratio ranges from 1 to 15% among hospitalized patients.

- General supportive therapy is the mainstay of patient management in CCHF. Intensive monitoring to guide volume and blood component replacement is required. The antiviral drug, ribavirin, has been used in the treatment of established CCHF infection. Both oral and intravenous formulations seem to be effective. Ribavirin is effective treatment for Lassa fever is given early in the course of clinical illness.

Surveillance goal : **Lassa and Crimean-Congo Haemorrhagic Fevers**

- Early detection of cases and outbreaks, rapid investigation, and early laboratory verification of the aetiology of all suspected cases.
- Investigation of all suspected cases with contact tracing.

Assess and monitor the spread and progress of epidemics and the effectiveness of control measures.

Standard case definitions

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 enanthem 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 indicated by a four-fold rise in titer by ELISA or IFA) or epidemiologic 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.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Suspected cases should be isolated from other patients and strict barrier nursing techniques implemented.
- Standard infection control precautions should be enhanced throughout the healthcare setting.
- Treat and manage the patient with supportive care.
- Collect specimen to confirm the case(s).
- Case-contact follow-up and active case search for additional cases.

Respond to action threshold

If a single case is confirmed:

- Maintain strict VHF infection control practices* throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting. For CCHF, educate the public about the mode of tick transmission and enhance rodent control activities for Lassa fever.
- Conduct active searches for additional cases.
- Request additional help from other levels as needed.

Analyse and interpret data: Lassa and Crimean-Congo Haemorrhagic Fevers

- Person: Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan disease control interventions accordingly.
- Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.
- Place: Map locations of cases' households.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against CCHF, or Lassa Fever
Specimen	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5

How to prepare, store, and transport the specimen	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-20C or colder) tissue specimens for virus isolation *For Immunohistochemistry :* ▪ Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. ▪ Store at room temperature. Formalin-fixed specimens may be transported at room temperature.
Results	Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

References: Lassa and Crimean-Congo Haemorrhagic Fevers

- *Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) Haemorrhagic Fever. BDP/EPR/WHO, 2008.*
- *Infection control for VHF in the African health care setting, WHO, 1998. WHO/EMC*
- *Ergonul O. Crimean-Congo Haemorrhagic Fever. Lancet Infect Dis 2006;6:203-14.*
- *WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2*
- *WHO Fact Sheet No 208, Crimean-Congo Haemorrhagic Fever, revised November 2001*
- *WHO Fact Sheet No 179, Lassa Fever, revised April 2005*

Leprosy

Background

- Leprosy is a chronic mycobacterial disease of the skin, the peripheral nerves and upper airway mucous membranes. The disease is transmitted mainly through airborne spread from nasal secretions of patients infected by Hansen's bacillus (*Mycobacterium leprae*) and also through inoculation into broken skin. Leprosy is endemic in several tropical areas around the world, including Africa.

- Patients are classified into two groups, depending on presence of skin and nerve signs:
  - Multibacillary patients (MB) with more than 5 skin patches and several nerve enlargements.
  - Paucibacillary patients (PB) with one to five skin patches and a single nerve enlargement.

- Leprosy control has improved greatly through use of WHO recommended multidrug therapy (MDT). MDT combining two or three drugs (rifampicin, clofaximine and dapsone) is very effective in curing leprosy. At the end of 1999, leprosy point prevalence in African countries was 1.6 cases per 10 000 population with about 70 000 registered cases. Seventeen years later, at the end of 2016, this prevalnec rate was reduced to 0.25 cases per 10 000 population and les than 25 000 registered cases

- Incubation period is 6 months to 20 years or more. Infection is probably frequent but clinical disease is rare, even among the closest contacts of patients. Multibacillary patients are most contagious, but infectiousness is reduced rapidly as soon as multiple drug therapy begins. Leprosy can be complicated by neuritis and leprosy reactions, resulting in impairment and disabilities of hands, feet, and eyes.

- Leprosy has historically been associated with social isolation and psychosocial consequences. This social stigma still persists in some countries in Africa.

Surveillance goal

- Observe national trends towards the leprosy elimination target, defined as a reduction in prevalence to less than 1 new case with grade-2 disabilities per 1 000 000 population.
- Monitor resistance of Hansen's bacillus to drugs used for MTD on an ongoing basis.
- As leprosy nears elimination, supplement routine surveillance with community-based surveillance, including active case search among household contacts of leprosy patients, especially during mass medicine administration or immunization campaigns.

Standard case definition

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 multidrug therapy (MDT).

Respond to alert threshold: Leprosy

If a single case is suspected:

- Report the suspected case to the appropriate level of the health system.
- Investigate case for risk factors.
- Begin appropriate case management:

-- *MB patients must be treated for 12 months with a three-drug regimen (12 MB blister packs to be taken in a period of 18 months).*

Respond to action threshold

If a suspected case is confirmed:

- Examine patients for skin and nerve signs at each contact patient has with a health worker to diagnose and care for leprosy reactions and impairments.
- Examine risk factors for treatment interruption (for example, inadequate supplies of MDT in the health centre, poor accessibility of patients' villages, and so on). Give sufficient blister packs for a full course of treatment to patients unable to attend a health centre monthly.
- Identify any fast increase or decrease of new cases during a period. Assess adequacy of surveillance in areas where under- or ever-reporting is suspected. Monitor distribution of MDT drugs.

Analyse and interpret data

Time: Graph cases by date diagnosed and treatment begun.

Place: Plot cases by location of households and disease classification (MB or PB)

Person: Count newly detected cases monthly by the type of leprosy (MB or PB). Analyse age and disability distribution and treatment outcomes (cases cured, defaulted, relapsed).

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- *Global Leprosy strategy for the period 2016-2020 (SEA-GLP-2016.2)*
- *WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2*

Lymphatic Filariasis

Background

- Lymphatic filariasis is the second leading cause of permanent and long-term disability worldwide. It affects over 120 million persons in 80 countries, and over 40 million persons are seriously incapacitated by the disease; 20% of the world population is at risk of infection. Of those infected, roughly 1/3 are in India, 1/3 in Africa, and the rest in the Americas, Asia, and the Pacific. In 1997, resolution WHA50.29 called for the elimination of lymphatic filariasis as a global public health problem. The strategy adopted is based on:
  - Reducing transmission below a threshold where new infection ceases to occur
  - Treatment of the problems associated with disability control and prevention.

- Causal agents:in Africa only the filariae *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*

- Modes of transmission: transmitted by various species of mosquitoes, these parasitic filarial worms lodge in the human lymphatic system, producing millions of immature microfilariae that circulate in the blood. Microfilariae appear in the peripheral blood after 3 to 6 months for *Brugia malayi*, 6 to 12 months for *W bancrofti*, often with nocturnal periodicity. When a mosquito thereafter bites the infected person, the microfilariae are picked up and the infection may be transmitted to others after about 2 weeks.

- Clinical description:
  - Filarial infection may be clinically asymptomatic (even in the presence of laboratory evidence of lymphatic and kidney damage); the disease may also present as one or more acute

Surveillance goal

There are currently 3 options and the choice will depend on the local situation:

1. Routine monthly reporting of aggregated data on probable and confirmed cases from periphery to intermediate level and to central level

2. Sentinel population surveys (standardized and periodical),

3. Active case-finding through surveys of selected groups or through mass surveys. International: Annual reporting from central level to WHO (for a limited number of countries).

Standard case definition

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.

Respond to alert threshold: **Lymphatic Filariasis**

- Confirm community prevalence of infection by surveys

Respond to action threshold

Case management

Hygiene measures for the affected body parts (and, when necessary, antibiotics and antifungal agents) can decrease the risk of adenolymphangitis:

- Washing the affected parts twice daily with soap and water
- Raising the affected limb at night
- Exercising to promote lymph flow
- Keeping nails short and clean
- Wearing comfortable footwear
- Using antiseptic or antibiotic creams to treat small wounds or abrasions, or in severe cases systemic antibiotics.

For the treatment of filarial carriers, the regimen recommended by the country is to be followed:

- In areas where there is neither onchocerciasis nor loiasis: DEC 6 mg/kg single dose.
- In areas where Onchocerciasis has been excluded but not loiasis: individual clinical decision.

The current strategy for filariasis control rests essentially on anti-parasitic measures. To interrupt transmission, the entire at risk population must be given a yearly, 1-dose regimen of the following:

Areas with concurrent onchocerciasis:

- 400 mg of albendazole + ivermectin 150 mg per kg of body weight once a year for 4-6 years

Areas with no concurrent Onchocerciasis

- Diethylcarbamazine 6 milligrams per kg of body weight + albendazole 400 mg once a year, or
- Diethylcarbamazine fortified salt for daily use for at least 6-12 months.

NOTE: In areas with *concurrent loiasis* (sub-Saharan Africa rain forest), mass interventions cannot at present be envisaged systematically (unless Onchocerciasis is a severe public health problem), because of the risk of severe adverse reactions in patients with high-density *Loa* infections (about 1 in 10,000 treatments).

It is important to educate the population on the importance of compliance during mass chemotherapy. Special efforts for vector control are not required as regards Lymphatic Filariasis. They should be carried out under other existing vector control programmes such as anti-malaria vector control operations.

Analyse and interpret data: Lymphatic Filariasis	
▪ Map the distribution of lymphatic filariasis and identify implementation units that will require mass drug administration ▪ Analyse the drug coverage in implementation units ▪ Assess the decline of parasitological indices microfilaremia before starting MDA and after at least four rounds of MDA till the criteria of less than 1% microfilaraemia in the population and less than 0.1% antigenaemia in school entry children is achieved	
Diagnostic test	Night blood smear Filarial antigen test
Specimen	Blood smear Blood
When to collect	Night between 10pm and 2am Any time of the day
How to prepare, store, and transport	Spread three drops of blood on a glass slide and spread across the slide to make three lines. After fixing with heat perform Geimsa stain and examine under microscope. Antigen is tested for by either a rapid immunochromatographic card test (ICT) or by an lab based ELISA test
Results	Positive test is when microfilarieae of W.bancrofti is seen under the microscope Positive if filarial antigen is detected

Reference: Lymphatic Filariasis

- WHO.*Monitoring and epidemiological assessment of the programme to eliminate lymphatic filariasis at implementation unit level* WHO/CDS/CPE/CEE/2005.50
- WHO. *Lymphatic filariasis.* WHO/CDS/CPE/SMT/2001.7
- *WHO. Training module on lymphatic filariasis for drug distributors (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.10 (Parts 1 &2)
- *WHO. Training module on lymphatic filariasis for drug distributors (in countries where onchoerciasis is co-endemic).* WHO/CDS/CPE/CEE/2000.11 (Parts 1 & 2)
- *WHO. The programme to eliminate lymphatic filariasis – essential elements for medical personnel (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.12
- *WHO. The programme to eliminate lymphatic filariasis – essential elements for medical personnel (in countries where onchoerciasis is co-endemic).* WHO/CDS/CPE/CEE/2000.13
- WHO. *Preparing and implementing a national plan to eliminate filariasis (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.15

Malaria

Background

- Malaria is an endemic tropical illness with fever following the bite of an infected female Anopheles mosquito which transmits the parasite. Five parasite species cause malaria in humans, namely: *Plasmodium falciparum (the most common), P. ovale, P. vivax, P. malariae and P. knowlesi*. Serious malarial infections are usually due to *P. falciparum* which may result in severe disease.

- Malaria is one of the leading causes of illness and death in many African countries. In most parts of Africa malaria transmission is highly seasonal. In areas of high transmission in Africa malaria is mainly a disease of children less than 5 years old and pregnant women. However, some countries have witnessed a dramatic reduction of malaria transmission and in such countries malaria has become a disease of all age groups and malaria epidemics are likely to occur.

- The incubation period from the time of being bitten to onset of symptoms is approximately 10 to 14 days. The incubation period may be longer, with non- *P. falciparum* species.

Surveillance goal

- Detect malaria cases promptly in areas of high transmission and to detect epidemics promptly in epidemic prone areas or in areas with a large population at risk.

Standard case definition: Malaria

Uncomplicated malaria: Uncomplicated *P. falciparum* malaria is highly variable and mimics that of many other diseases. Although fever is common, it is often intermittent and may even be absent in some cases. The fever is typically irregular initially and commonly associated with chills. Rigors are unusual in acute falciparum malaria. The patient commonly complains of fever, headache, aches and pains elsewhere in the body and occasionally abdominal pain and diarrhoea. In a young child, there may be irritability, refusal to eat and vomiting. On physical examination, fever may be the only sign. In some patients, the liver and spleen are palpable. This clinical presentation is usually indistinguishable clinically from those of influenza and a variety of other common causes of fever. Unless the condition is diagnosed and treated promptly, a patient with falciparum malaria may deteriorate rapidly. Therefore, any person living in an area at risk of malaria with fever or history of fever within the previous 24 hours; without signs of severe malaria, who tests positive for malaria by either rapid diagnostic test or microscopy should be considered a case of uncomplicated malaria **(NB WHO presently recommends that all malaria cases should be confirmed by RDT or microscopy)**.

Severe malaria: Severe malaria is defined by clinical or laboratory evidence of vital organ dysfunction. Nearly all deaths from severe malaria result from infections with *P. falciparum*. Strict definitions of severe malaria have been published for epidemiological and research purposes, but, in practice, there should be a low threshold for starting parenteral treatment in any patient about whom a health care worker is concerned. Even if some of the laboratory measures are not available immediately, this should not delay the start of intensive treatment. A general overview of the features of severe malaria include:

- impaired consciousness (including unarousable coma);
- prostration, i.e. generalized weakness so that the patient is unable to sit, stand or walk without assistance;
- multiple convulsions: more than two episodes within 24h;
- deep breathing and respiratory distress (acidotic breathing);
- acute pulmonary oedema and acute respiratory distress syndrome;
- circulatory collapse or shock, systolic blood pressure
- < 80mm Hg in adults and < 50mm Hg in children;
- acute kidney injury;
- clinical jaundice plus evidence of other vital organ dysfunction; and abnormal bleeding

Note: These manifestations can occur singly or, more commonly, in combination in the same patient.

Respond to alert threshold: Malaria

If there is an unusual increase in the number of malaria cases or deaths as compared to the same period in previous non-epidemic years:

Report suspected epidemic to the next level,
Treat with appropriate anti-malarial drugs according to national treatment guidelines
Investigate the cause for the increase in cases
Make sure cases in children age 2 months up to 5 years are managed according to IMCI guidelines.
Conduct community education for prompt detection of cases and access to health facilities.

Respond to action threshold

If the number of cases exceeds the upper limit of cases seen in a previous non-epidemic period in previous years:

Evaluate and improve, as needed, prevention strategies, such as use of insecticide treated nets (ITNs) and indoor residential spraying (IRS) for all at risk of malaria.

Ensure appropriate case management

Ensure adequate supplies and drugs are available in the health facilities

Analyse and interpret data

Time: Graph the number of cases by month/week. Construct an epidemic curve during epidemics.

Place: Plot location of households for new cases and deaths.

Person: Count the number of new malaria cases and deaths by month and analyse by age group and time of onset.

Laboratory confirmation: Malaria	
Diagnostic test	▪ Microscopy: Presence of malarial parasites in blood films for suspected cases ▪ Malaria rapid diagnostic test (RDT): Presence of malarial antigen.
Specimen	Blood Usually finger-stick sample for all ages or other accepted method for collecting blood from very young children
When to collect	*For blood smear:* prepare blood film for all suspected cases admitted to inpatient facility, or according to national malaria case management guidelines
How to prepare, store, and transport	*Blood smear:* ▪ Collect blood directly onto correctly cleaned and labelled microscope slides and prepare thick and thin smears. ▪ Allow smears to dry thoroughly ▪ Stain using the appropriate stain and technique ▪ Store stained and thoroughly dried slides at room temperature out of direct sunlight. *For rapid diagnostic test:* ▪ *Collect specimen and perform test according to manufacturers' instructions.*
Results	Thick and thin smear results can be available the same day as preparation. Microscopic examination of malarial slides may also reveal the presence of other blood-borne parasites. RDT result is obtained immediately. Note:
Reference	
▪ *Malaria epidemics: Detection and control, forecasting and prevention*. Geneva. World Health Organization. WHO/MAL/98.1084 ▪ *Basic Laboratory Methods in Medical Parasitology*, WHO, Geneva, 1991	

Malaria Continued...

Note: Setting an epidemic threshold:

In areas with endemic malaria, the national Malaria Control Program can assist districts and health centres with determining appropriate thresholds for detecting possible epidemics. In the absence of a threshold set by the national program, the following method can be used to determine the threshold level for a malaria epidemic. The threshold is determined using the median and the 3rd quartile of a period of time (for example, 5-year data from a health facility or district by month/week):

1. Look at the number of malaria cases at a specific health facility or district by month/week for the past 5 years.
2. Determine the median for each month/week (for example, each January for the last 5 years). Rank the monthly/weekly data for each month/week for the five years in ascending order. Identify the number in the middle of each month's/week's series for the five years. This is the median. Repeat this process for each month/week in the five years.
3. Determine the 3rd quartile for the monthly/weekly series by identifying the 4th highest number from the bottom in each data series (since data is ranked in ascending order). This is the 3rd quartile representing the upper limit of the expected normal number of malaria cases.
4. Plot the 3rd Quartile for each data series by month/week for the five year period and join the points with a line. The line represents the upper limit of the expected number of cases.
5. Plot the median for each data series by month/week for the five year period and join the points with a line. This line represents the lowest limit of expected number of cases.
6. The area between the two lines (the median and the 3rd quartile) represents the "normal channel". If the number of currently observed cases of malaria falls between the two lines, the number of new cases for that month/week is assumed to be "normal". If the number is above the 3rd quartile (upper limit), this is an indication of a possible malaria epidemic.
   Note: Please note that to ensure early detection and control of malaria epidemics; it is preferable to use weekly surveillance data in Malaria epidemic prone areas.

In areas in malaria pre-elimination or elimination phases a single case of locally transmitted malaria should lead to proactive interventions, including active case search in the locality where the case originated.

Source: WHO/AFRO Regional Malaria Program

Malnutrition

Background

- Globally, maternal and child under-nutrition are underlying causes for 3·5 million deaths, including 35% of the disease burden in children younger than 5 years. Of the 40 countries with a child stunting prevalence of 40% or more, 23 are in Africa.
- Severe malnutrition may act as a direct cause of death or an indirect cause by increasing dramatically the number of deaths in children suffering from common childhood illnesses such as diarrhoea and pneumonia.
- Despite the above, the burden of child mortality due to severe malnutrition remains largely absent from the international health agenda and few countries, even in high prevalence areas, have specific national policies aimed at addressing it comprehensively.
- The most vulnerable are children under five and pregnant and lactating women. The poor nutritional status and nutritional intake of pregnant women may contribute to newborns with low birth weight (a weight measured immediately after birth). A newborn weighing less than 2500 grams (2.5 kg or 5.5 Ib) is considered a newborn with low birth weight (LBW). LBW is a major determinant of death, illness and disability in infancy and childhood and also impacts health outcomes in adult life.
- Socio-economic conditions, poor water and sanitation, mothers' nutritional education on how to feed babies and young children, and repeated infections are the main causes of malnutrition.
- Programmes elaborated to eradicate malnutrition are on food security, water and sanitation, promotion of infant and young children feeding practices, micronutrient supplementation programmes, management of severe cases of malnutrition in the communities and in the health facilities, management of infections mainly diarrhoeal disease.

Surveillance goal

- Early warning and problem identification.
- Policy-making and planning.
- Programme management and evaluation.
- Assess effectiveness of public health response that address causes of low birth weight, malnutrition in children and malnutrition in pregnant women

Standard case definition: Malnutrition

Low birth weight new-borns:

Any new born with a birth weight less than 2500 g (or 5.5 lbs)

Severe malnutrition in children under five years:

Severe acute malnutrition is defined by a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional (bilateral pitting) oedema

Malnutrition in pregnant women:

Pregnant women given 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).

Response to alert threshold

If more than 20% of children are underweight: Programme emphasis on

- Breastfeeding support
- Nutrition education
- Supplementation of child and mother
- Prevention and treatment of diarrhoea
- Prevention and treatment of severe malnutrition
- Socio-economic support

As soon as one case with MUAC less than 11.5 cm is detected or presence of bilateral oedema identified: Alert, further investigation should be conducted. In addition, referral of the child to a therapeutic feeding programme.

If more or equal than 15% of low birth weight are less than 2.5 Kg:

Targeting interventions for improved antenatal care for women and neonatal care of infants including nutritional care (anti-smoking and anti-alcohol campaigns, nutritional care for women before and during antenatal and during lactating period, malaria prophylaxis, new-born care facilities, etc.) to those at risk of poor pregnancy outcomes and treat new born to prevent morbidity and death.

Analyse and interpret data: Malnutrition

Time: Graph cases monthly to analyse trends and weekly in emergency **Place:** Plot location of households/community with cases

Person: Count monthly/weekly cases and analyse age and gender distribution

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- *Black R.E. et al. Maternal and Child Undernutrition: global and regional exposures and health consequences. The Lancet, Volume 371, Issue 9608, Pages 243 – 260.*
- *Gross R, Webb P, Wasting time for wasted children: severe child undernutrition must be resolved in non-emergency settings. Lancet 2006 ; 367: 1209-1211.*
- *Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series, 1995, No 854: 81, 128-130, 198-208.*
- *WHO child growth standards and the identification of severe acute malnutrition in infants and children. A Joint Statement by the World Health Organization and the United Nations Children's Fund*

Maternal Deaths

Background

- Deaths of women during pregnancy, childbirth or termination of pregnancy, and deaths up to 6 weeks (42 days) after childbirth or termination of pregnancy related to pregnancy are considered Maternal Deaths. (NB. Those due to accidental or incidental causes are not considered as maternal deaths)
- Globally, about 80% of maternal deaths are due to; severe bleeding (mostly bleeding postpartum), infections (also mostly soon after delivery), hypertensive disorders in pregnancy (eclampsia) and obstructed labor. Complications after unsafe abortion cause 13% of maternal deaths.
- Across the developing world, maternal mortality levels remain too high, with more than 500,000 women dying every year as a result of complications during pregnancy and childbirth. About half of these deaths occur in sub-Saharan Africa where a woman's lifetime risk of maternal death is 1 in 22, compared with 1 in 8,000 in industrialized countries.
- Haemorrhage is the leading cause of maternal death in sub-Saharan Africa, and unattended births are a particular risk, especially in rural areas where transport to health care facilities is a problem.
- Sustainable Development Goals (SDG) reporting in 2030 demands active surveillance, and counting of maternal deaths. The report is no longer proportionate as was in the Millenium Development Goals (MDGs) (reduce by 75%), Rather countries will report pegged on an actual number - in that no country should have a maternal mortality ratio (MMR) >70 deaths/ 100 000 live births
- Review of progress towards MDG 5 indicates that most African countries were not able to meet MDG by 2015. Intensified actions and increased investments are required to improve the coverage and quality of maternal health care services and addressing issues and factors contributing to these deaths are key if we are to achieve SDG

Surveillance goal

- Active surveillance for improved and accurate identification and reporting of maternal deaths at community and facility level
- Estimate and monitor maternal mortality rates.
- Identify underlying causes and contributing factors and high-risk areas for maternal mortality to inform program decisions.
- Evaluate programs aimed at reducing maternal mortality.

Standard case definition

The death of a woman while pregnant or within 42 days of the delivery or termination of the 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.

Respond to alert threshold: Maternal death

- After determining that the death of a woman occurred during pregnancy or within 42 days of its termination, the initial notification of the suspected death should be done immediately (within 24 hours), by the fastest means possible
- Every maternal death is significant and this puts the alert threshold at ONE (1)
- The health facility should contact the district authority and provide information about the IDSR Case Alert form. Moreover, the health facility maternal death review committee is required to review the case within 7 days
- The initial notification should be followed by a written report using a maternal death review form; and this should be shared with the district/ regional MDR coordinator
- MDR should be anonymous and unlinked; and the reports should not be used for disciplinary of litigation

Recommended public health action

- Every death of a woman of reproductive health should be investigated to rule out pregnancy status and thereby establish whether it is a maternal death or not
- Surveillance for maternal deaths should be conducted not just in the labour wards, but in the community, and all service areas where women are seen or die.
- Monitor trends and respond to any maternal death based on recommendations from the Maternal death review
- Increase availability and use of antenatal care, and skilled birth attendance
- Implement evidence based high impact essential interventions for maternal health
- Educate and engage communities on emergency preparedness and complication readiness; including evidence based nutrition and dietary interventions for safe pregnancy and childbirth
- Address socio cultural norms and practices that negatively impact on maternal health
- Ensure emergency obstetric care (EmOC) coverage of >80 % with recommended signal functions provided by level of care

Analyse and interpret data

Time: Graph cases to construct an epidemic curve throughout the year in order to identify trends.

Place: Plot the location of cases and analyse the distribution.

Person: Analyse the distribution of cases by age and other demographic factors.

Laboratory confirmation
Routine laboratory confirmation for surveillance is not required.

Reference: Maternal death
WHO Maternal Mortality http://www.who.int/making pregnancy safer/topics/maternal mortality/en/index.html; ICD MM; *http://apps.who.int/iris/bitstream/handle/10665/70929/9789241548458_eng.pdf;jsessionid=862B3C6054CED65E30EDE6605FFAEDF4?sequence=1* *WHO Technical guidance for MDSR; MEBC guidance* *UNICEF http://www.unicef.org/index.php*

Measles

Background

- Measles is a febrile rash illness due to paramyxovirus (*Morbillivirus)* transmitted human-to-human via airborne droplet spread. It is the fourth leading cause of death in children less than 5 years of age in many African countries.
- The incubation period is 7 to 18 days from exposure to onset of fever.
- Among children with vitamin A deficiency and malnutrition, measles may result in severe illness due to the virus itself and associated bacterial infections, especially pneumonia; only the minority of cases are severe.
- Measles is among the most transmissible of human infections. Large outbreaks occur every few years in areas with low vaccine coverage and where there is an accumulation of persons who have never been infected or vaccinated. The true incidence of measles far exceeds reported cases.

Surveillance goal

- Detect outbreaks of fever with rash illness promptly:

In the African Region of the WHO, in line with the Regional measles elimination goal: immediate case-based reporting of suspected cases and deaths of fever with rash illness; confirm all suspected measles cases with laboratory test (serum IgM).

Standard case definition

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.

Respond to alert threshold

If an outbreak is suspected:

- Report suspected case to the next level.
- Collect blood sample for confirming the outbreak.
- Treat cases with oral rehydration, vitamin A, and antibiotics for prevention of bacterial super-infection. Use airborne isolation precautions where feasible.
- Investigate the case or outbreak to identify causes for outbreak.

Respond to action threshold: Measles

If an outbreak is confirmed:

- Improve routine vaccine coverage through the EPI, and lead supplemental vaccination activities in areas of low vaccine coverage.
- Mobilize the community early to enable rapid case detection and treatment.
- Provide Vitamin A:
- Dose 1: immediately, Dose 2: next day

Analyse and interpret data

Time: Graph weekly cases and deaths. Construct epidemic curve for outbreak cases.

Place: Plot location of case households.

Person: Count total cases and analyse by age group and immunization status.

Laboratory confirmation

Diagnostic test: Presence of IgM antibodies to measles virus in serum.

Specimen: Serum

Whole blood, gingival fluid, throat swab

When to collect the specimen

- Collect specimens between the 3rd day of the rash and 28th day after onset of rash.
- Collect blood samples on 5 suspected measles cases when the number of cases exceeds the measles outbreak threshold (usually more than 5 cases in a district in a month).
- In countries with an elimination target:

- Collect specimen from every suspected case of measles
- Collect serum for antibody testing at first opportunity or first visit to the health facility

How to prepare, store and manage the specimen

- For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer.
- Separate blood cells from serum. Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube.
- If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning.
- If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle). Pour off serum into a clean tube.
- Store serum at 4°C.
- Transport serum samples using appropriate packaging to prevent breaking or leaks during transport.

Results: The specimen should arrive at the laboratory within 3 days of being collected. Results are usually available after 7 days.

If as few as 2 out of 5 suspected measles cases are laboratory confirmed, the outbreak is confirmed.

Avoid shaking of specimen before serum has been collected.

To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile, just clean.

Transport the serum in an EPI hand vaccine carrier to 4ºC to 8ºC to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.

Reference

- "Response to measles outbreaks in measles mortality reduction settings" http://apps.who.int/iris/bitstream/10665/70047/1/WHO_IVB_09.03_eng.pdf
- WHO–recommended standards for surveillance of selected vaccine-preventable diseases (2018). http://www.who.int/immunization/monitoring_surveillance/burden/vpd/WHO_SurveillanceVaccinePreventable_11_Measles_R1.pdf?ua=1
- World Health Organization. Regional Office for Africa. African Regional guidelines for measles and rubella surveillance- Revised April 2015. http://www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=10814&Itemid=2593

MonkeyPox

Background

- Monkeypox is a rare, viral, zoonotic orthopoxvirus disease that has a similar but milder disease presentation as (now eradicated) smallpox in humans. It is usually a self-limiting disease but the case-fatality rate can be up to 10%, particularly among children.
- Monkeypox primarily occurs in the rain forests in West and Central Africa. The primary animal reservoir is unknown but it has been detected in a range of small mammal species, particularly rodents, and monkeys. Animal species in which evidence of *monkeypox virus* has been found include *C. gambianus* (Gambian pouched rat), different squirrel species of the genus *Funisciurus* and *Heliosciurus, G. kelleni* (African dormice) and various species of non-human primates.
- Communities living in the West and Central African rainforest regions need to be educated about avoiding direct contact with animals, especially wild species. Efforts to prevent transmission in endemic regions should focus on thoroughly cooking all animal products (blood, meat) before eating.
- Human-to-human transmission is limited (no evidence that this mode of transmission alone can sustain monkeypox in human populations) and occurs via prolonged contact with respiratory droplets and contact with lesions or bodily fluids that contain the virus. Household members and health care workers are at highest risk during an outbreak.
- Monkeypox is an emerging disease which has become the most prevalent orthopoxvirus since the global eradication of smallpox that was declared by the World Health Assembly in 1980. This is partly because smallpox vaccination which was cross-protective for other orthopoxviruses was discontinued at the time which means younger people no longer have vaccine-induced immunity.
- Human monkeypox was first identified in humans in 1970 in the Democratic Republic of Congo which remains the country that routinely reports the highest number of cases (>1,000) annually since 2005. Other countries that have reported human cases since 1970 include Sierra Leone, Liberia, Cote d'Ivoire, Nigeria, Cameroon, Gabon, Republic of Congo, Central African Republic and Sudan (in an area that is now South Sudan). Since late 2016 there have been increasing reports of monkeypox cases from countries that have not seen any for the past 40 years.
- Clinical recognition, particularly differential diagnosis with other rash and fever illnesses such as chickenpox, laboratory-based diagnosis and prevention remain critical challenges in endemic areas. Two distinct clades or subtypes have been identified. It is believed that infection with a West African strain of monkeypox virus causes a less severe infection, fewer deaths, and lower rates of human-to-human transmission as compared to outbreaks involving Central African strains.
- The incubation period of monkeypox is 6-16 days (range 5–21). The infection can be divided into two periods: (1) **invasion period** (0-5 days) characterized by fever, intense headache, lymphadenopathy (swelling of the lymph node), back pain, myalgia (muscle ache) and an intense asthenia (lack of energy); and (2) **skin eruption period** (1-3 days after appearance of fever) where the various stages of the rash appears, often beginning on the face and then spreading elsewhere on the body.
- The most distinguishing symptom of monkeypox is lymphadenopathy. The face (in 95% of cases), and palms of the hands and soles of the feet (75%) are most affected by the rash. Evolution of the rash from maculo-papules (lesions with a flat bases) to vesicles (small fluid-filled blisters), pustules, followed by crusts occurs in approximately 10 days. Three weeks might be necessary before the complete disappearance of the crusts.
- Varicella (chickenpox) is often confused with monkeypox but can be distinguished from monkeypox

and smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities, and by the development of successive crops of lesions in the same area. Fever and rash occur simultaneously in chickenpox and develop more rapidly; with death being a rare complication. Coinfection with both, varicella and monkeypox virus, has been reported. However the frequency of this phenomenon, relationship and impact between the viruses' pathogenesis and epidemiology is not clear.

Surveillance goal

- To detect and immediately respond to any suspected case of monkeypox.

Standard case definition

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.

Respond to alert threshold: MonkeyPox

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Ensure patient is isolated Implement airborne infection control precautions, and, if possible, allow health personnel vaccinated against smallpox to attend patients.
- Treat and manage the patient with supportive care and symptom-specific management.
- Collect and transfer specimen (prefer swab of rash) under strict safety conditions to confirm the case.
- Implement risk communication, community engagement, contact tracing and contact management.
- Conduct active surveillance to identify additional cases.
- Notify WHO.

Respond to action threshold: Monkeypox
If a single case is confirmed: • Maintain strict infection control measures practices throughout the duration of the outbreak. • Mobilize the community for early detection and care. • Conduct community education about the confirmed case, how the disease is transmitted, and how to implement infection control in the home care setting and during funerals. • Conduct active searches for additional cases. • Request additional help from national and international levels.
Analyse and interpret data
Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve. **Place**: Map location of case households. **Person**: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases (including suspected and confirmed) and deaths. Analyse age and sex distribution. Assess risk factors (contact with wild animals or another active confirmed case) immediately.

Laboratory confirmation: MonkeyPox	
Diagnostic test	Polymerase chain reaction (PCR) assay identification of monkeypox DNA in a clinical specimen – *preferred* **Or** Note: Level C or D laboratories only.
Specimen	Optimal specimens: vesicular swabs of lesion exudate or crusts that can be in the following forms: 1) Biopsy specimens* 2) Scabs*, 3) Vesicular fluid swab* 4) Lesion skin (roof)* 5) Pustule material* Blood/serum samples – mostly for serology because viremia is short-lived. Requires detailed case and illness dates and information for appropriate interpretation Note: blood samples from person where severe, dense rash may be difficult to draw as the skin may slough off. A central line may be needed for access in cases where a peripheral blood draw is difficult. * preferred specimens for diagnosis of acute illness during rash phase
When to collect	A suspected case of monkeypox is a public health and medical emergency. Collect samples from every suspected case at earliest available times to achieve specimen types recommended.

Laboratory confirmation: MonkeyPox	
How to prepare, store, and transport	Typical practices associated with collection of patient specimens are appropriate for collection of orthopoxvirus lesions as well. These include wearing personal protective equipment, including gloves and sanitizing the site prior to collection. If alcohol is used to prepare the lesion for collection it is important to allow the lesion to dry before it is collected. **Biopsy specimens:** Aseptically place two to four portions of tissue into a dry, sterile, leakproof, freezable container. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. *Note: package non-formalin lesion biopsy for shipping on dry ice, leave formalin fixed biopsy at room temperature. Do not freeze formalin fixed biopsy sample.* **Scabs:** Aseptically place scrapings/material into a dry, sterile, leak-proof, freezable container. No viral transport media. Storage - 20 °C to - 70 °C. Transport ~6h at 4 °C. **Vesicular fluid:** Collect fluid from separate lesions onto separate sterile swabs. Be sure to include cellular material from the base of each respective vesicule. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. No viral transport media.
Results	Diagnostic services for monkeypox are not routinely available at present. Advance arrangements are usually required for monkeypox laboratory diagnostic services. Contact the appropriate national authority or WHO.
Reference	
WHO Fact Sheet on Monkeypox: http://www.who.int/mediacentre/factsheets/fs161/en/	

Neonatal and Non-neonatal tetanus

Background

- A neuromuscular toxin-mediated illness caused by the anaerobic spore-forming soil bacterium *Clostridium tetani*. The disease is transmitted when spores enter open wounds (injections, cutting the umbilical cord) or breaks in the skin.
- While tetanus may occur in adults, infection primarily affects newborns. Neonatal tetanus has decreased dramatically in countries with improved maternal tetanus immunization rates. Maternal and neonatal tetanus is targeted for elimination in the WHO African Region, aiming to achieve neonatal tetanus incidence rates of less than 1 case per 1000 live births.
- Incubation period is 3 to 21 days, with an average of approximately 6 days.

Surveillance goal

- Detect cases of neonatal tetanus immediately to confirm the case and prevent additional cases by immunizing at least pregnant women in area around the confirmed case.
- Identify high risk areas and target tetanus toxoid campaigns to women of childbearing age.

Standard case definition

Suspected case:

Neonatal Tetanus--Any new-born 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.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the next level.
- Conduct an investigation to determine the risk for transmission
- Treat and manage the case according to national recommendations, usually with supportive care and, if feasible, in intensive care. No routine isolation precautions are needed.

Respond to action threshold: Neonatal and Non-neonatal tetanus

If a case is confirmed through investigation:

- Immunize the mother and other pregnant women in the same locality as the case with at least 2 doses of tetanus toxoid.
- Conduct a supplemental immunization activity for women of childbearing age in the locality.
- Improve routine vaccine coverage through EPI and maternal immunization program activities.
- Educate birth attendants and women of childbearing age on the need for clean cord cutting and care. Increase the number of trained birth attendants.

Analyse and interpret data: Neonatal tetanus

Time: Graph cases and deaths monthly.

Place: Plot location of case households and location of birth attendants.

Person: Count monthly cases and deaths. Analyse each case of NNT by district, maternal characteristics (age, parity), place of delivery, cord care practices.

Laboratory confirmation: Neonatal tetanus

Laboratory confirmation is not required.

Reference

WHO–recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01 *http://apps.who.int/iris/bitstream/10665/68334/1/WHO_V-B_03.01_eng.pdf?ua=1*

New HIV/AIDS Cases

Background

- AIDS is an infection of human lymphocytes (types of white blood cells) and other organs. It is caused by a retrovirus, human immunodeficiency virus (HIV). Sexual intercourse, needle injections, transfusions, trans-placental or trans-vaginal routes, breast milk or other direct contact with infected human body fluids transmits the virus from human to human.

- Acquired immunodeficiency syndrome (AIDS) results in late-stage HIV infection and immuno-suppression, with reduced numbers and function to T-lymphocytes. Primary HIV-related organ involvement and a variety of opportunistic infections result in death unless the growth of the virus is stopped by drugs that can kill the virus (antiretroviral therapy). When HIV infection progresses to illness, the symptoms are usually due to the failure of the immune system to resist other infectious diseases called opportunistic infections (OI). These include tuberculosis, bacterial pneumonia or sepsis, oro-pharyngeal candidiasis, chronic diarrhoea, chronic skin infections, recurrent herpes zoster, and others.

- Close to twenty-six million Africans, close to one in ten adults between the ages of 15 and 49 years of age, are living with HIV/AIDS. The impact of the epidemic is already measurable in greatly increased adult and child morbidity and mortality. HIV/AIDS is now the leading cause of adult mortality in the African Region.

- Incubation period is approximately 1 to 3 months from the time of infection to the time that antibodies can be detected in a laboratory process. The time from HIV infection to the onset of AIDS is generally 7 to 9 years.

- Risk factors: populations at high risk of acquiring HIV are commercial sex workers with or without other sexually transmitted infections (STIs). Some STIs may increase HIV transmission. Others at risk include intravenous drug users (IDU), recipients of unscreened blood products and neonates born to HIV-infected mothers.

- Tuberculosis, visceral leishmaniasis, trypanosomiasis, and other subacute or chronic bacterial, parasitic, and viral infections may cause similar syndromes.

Surveillance goal

- Monitor the impact of HIV/AIDS interventions in trends of incidence and prevalence of HIV infections, AIDS and STIs through sentinel sites, surveys and special studies (according to guidelines for second generation surveillance of HIV/AIDS).
- Estimate the burden of HIV/AIDS in the district using available information from HIV sentinel populations so that each new AIDS case is counted.
- Monitor local STI epidemiology as possible cofactor for HIV transmission.
- Monitor local opportunistic infection epidemiology, including TB
- Improve percentage of suspected HIV/AIDS cases confirmed via serology.
- Improve HIV/AIDS screening.

Standard case definition: New HIV/AIDS Cases

WHO/AFRO recommends that countries use either Bangui or Abidjan HIV/AIDS 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.

Public health actions

- Monitor local STI and opportunistic infections, including TB, as possible cofactor for HIV.
- Improve percentage of suspected HIV/AIDS cases confirmed via serology.
- Monitor use of condoms by commercial sex workers.
- Provide voluntary counselling and testing services at district and sub-district levels.
- Treatment of individual cases with antiretroviral therapy is not yet widely available in most African countries. Rapid diagnosis and treatment of AIDS-related opportunistic infection (OI) may prolong life expectancy but this has not been widely evaluated in developing countries.
- Promote condom use, especially among high-risk individuals.
- Treat STIs, especially syphilis, chancroid diseases, and other ulcerative processes.
- Mobilize non-paid blood donors and promote appropriate use of blood.
- Promote good infection control practices within health facilities in the district.
- Educate patients and their sexual partners to refrain from donating blood, tissues, semen or breast milk.

Analyse and interpret data

Time: Count new HIV/AIDS cases and report monthly. Analyse by number of cases confirmed with serology. At the end of the year, calculate the total number of cases and include trends for HIV sero-surveillance, STI surveillance and results of any special studies (socio-behavioural studies, drug sensitivity to antimicrobial agents, and so on).

Laboratory confirmation: New HIV/AIDS Cases

Diagnostic test	**Adults and children 18 months or older:** HIV infection is diagnosed based on: - Positive HIV antibody testing (rapid or laboratory- based enzyme immunoassay). This is confirmed by a second HIV antibody test (rapid or laboratory-based enzyme immunoassay) relying on different antigens or of different operating characteristics; AND/ OR - Positive virological test for HIV or its components (HIV-RNA or HIV-DNA or ultrasensitive HIV p24 antigen assay) confirmed by a second virological test obtained from a separate determination **Children younger than 18 months:** HIV infection is diagnosed based on positive virological test for HIV or its components (HIV-RNA or HIV-DNA or ultrasensitive HIV p24 antigen) confirmed by a second virological test obtained from a separate determination taken more than four weeks after birth.
Specimen	Serum
When to collect the specimen	Obtain specimens according to national HIV/AIDS program strategy for clinical or epidemiological sampling.
How to prepare, store, and transport the specimen	Use universal precautions to minimize exposure to sharps and any body fluid. *ELISA:* Collect 10 ml of venous blood. ▪ Let clot retract for 30 to 60 minutes at room temperature or centrifuge to separate serum from red blood cells. ▪ Aseptically pour off serum into sterile, screw capped tubes. ▪ Store serum at 4°C. Transport serum samples using appropriate packaging to prevent breakage or leakage.
Results	HIV testing is highly regulated with strict controls on release of information. Results are usually available within one week from arrival in the laboratory

Reference

- *Guidelines for Sexually Transmitted Infections Surveillance*. Geneva. UNAIDS and World Health Organization. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E
- WHO Case definitions of HIV for surveillance and revised clinical staging and immunological classification of HIV-Related disease in adults and children.
- *WHO Recommended Surveillance Standards* WHO/CDS/CSR/ISR/99.2
- *Guidelines for Second Generation HIV Surveillance*, WHO and UNAIDS, 2000 WHO/CDC/CSR/EDC/2000.5
- *Consultation on technical and operational recommendations for clinical laboratory testing harmonization and standardization*, Jan 2008, WHO, CDC

Noma

Background

- Noma (*cancrum oris, stomatitis gangrenosa*) is an opportunistic bacterial infection affecting children 1–4 years characterized by quickly spreading orofacial gangrene, evolving from a gingival inflammation.

- Noma results from complex interactions between risk factors such as poor sanitation, malnutrition, recurrent illnesses, and compromised immunity. Diseases that commonly precede noma include measles, malaria, severe diarrhea, and necrotizing ulcerative gingivitis.

- Noma occurs worldwide, but is most common in sub-Saharan Africa. In 1998, WHO estimated that worldwide 140 000 children contract noma each year, and 79% of them die from the disease and associated complications.

- In Africa the highest prevalence of Noma occurs in countries bordering the Sahara desert, where a recent report estimates an annual incidence of 25,000. However, Noma can occur wherever there is extreme poverty.

- Early detection and treatment with antibiotics is key to preventing severe disfigurement or death. In the acute stage, death can be prevented with high doses of penicillin; however disfigurement can only be treated with costly surgery.

- Prevention should focus on education and awareness of the disease, improved nutrition and household hygiene, promotion of exclusive breastfeeding in the first 3–6 months of life, access to prenatal care, and immunizations against common childhood diseases.

- Clinical features include soreness of the mouth, pronounced halitosis (bad smelling breath), fetid taste, tenderness of the lip or cheek, cervical lymphadenopathy, a foul-smelling purulent oral discharge, and a blue-black discoloration of the skin and swelling in the affected area.

- Health workers should recognize risk factors for Noma:

    - Severe growth failure in first 6 months of life
    - Evidence of malnutrition and poor dietary habits;
    - Persistent diarrhea
    - Oral ulcers in children from high risk areas
    - Prominent bad smelling breath

Surveillance goal

- Early detection and treatment of cases
- Identification of high risk communities and families

- Estimation of disease incidence and identification of risk factors

Standard case definition: 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.

Recommended public health action: Noma

When a suspected case is detected:

- Treat the case with nationally recommended antibiotic
- Conduct health promotion activities in the community for:
  - Awareness of Noma among the community and in the household
  - Improved environmental sanitation and personal hygiene
  - Separation of livestock from areas where humans live
  - Exclusive breast feeding for the first 6 months of life
  - Improved nutrition and food preparation techniques
- Increase vaccination coverage in the district
- Improve sources of drinking water in at-risk communities
- Train public health personnel on early recognition of oral lesions that can lead to Noma.

Analyse and interpret data

Time: Monitor number of cases detected in time for treatment and use of standardized treatment. Monitor cases over time to estimate burden of disease and identify trends.

Place: Plot the location of case households and analyze the distribution.

Person: Analyse the distribution of cases by age and other demographic factors.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference: Noma

- *Enwonwu, C. (2006). Noma--the ulcer of extreme poverty. New England Journal of Medicine, The **354**(3): 221-224*
- *Enwonwu, C., W. Falkler, et al. (2006). Noma (cancrum oris). The Lancet **368**(9530): 147-156.*
- *Fieger, A., K. Marck, et al. (2003). An estimation of the incidence of noma in north-west Nigeria. Tropical medicine & international health **8**(5): 402-407.*
- *Enwonwu, C. O. (1995). Noma: a neglected scourge of children in sub-Saharan Africa. Bulletin of the World Health Organization **73**(4): 541-545.*
- *Enwonwu, C. O., W. A. Falkler, et al. (1999). Pathogenesis of cancrum oris (noma): confounding interactions of malnutrition with infection. The American journal of tropical medicine and hygiene **60**(2): 223-232.*

Onchocerciasis

Background

- Filarial infection of the skin and eye caused by *Onchocerca volvulus* transmitted by the bite of female *Simulium* black flies.
- Nearly all of the world's estimated 18 million infected persons (of whom more than 250 000 are blind) live within 26 African countries. Onchocerciasis is the second leading infectious cause of blindness worldwide. It causes debilitating skin problems, leading to significant decreases in productivity in areas where it is endemic. Entire villages have relocated away from the fertile lands near rivers where black flies breed.
- Incubation period is years to decades since repeated infection is necessary for disease manifestations. Clinical illness is unusual in children even in endemic areas.

Surveillance goal

- Early detection with goal of reducing the recurrence of transmission of the parasite in areas where it has been eradicated (zones covered by the Onchocerciasis Program).
- Conduct periodic surveillance in sentinel villages: screen using diethylcarbamzaine (DEC); in case of a positive reaction to DEC, confirm with a microscopic examination of a skin biopsy from each suspected case.

Standard case definition

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).

Respond to alert threshold

If a suspected case is detected:

- Report the case according to national guidelines
- Collect specimen for confirming the case
- Investigate the case to determine the cause of the case
- Treat the case according to national guidelines.

Respond to action threshold: Onchocerciasis	
If a case is confirmed: ▪ Conduct a migration investigation to identify the origins of infection and initiate control activities. ▪ Carry out vector control activities according to OCP guidelines. ▪ Conduct periodic mass treatment with ivermectin in areas with endemic onchocerciasis during the last 10 years. ▪ Conduct active case finding via population-based surveys and skin snips.	
Analyse and interpret data	
Time: Graph cases quarterly. **Place:** Plot distribution of patients' household and workplaces **Person:** Count quarterly cases and analyse age distribution.	
Laboratory confirmation	
Diagnostic test	Microscopy. Laboratory criteria for confirmation: One or more of the following: - presence of microfilariae in skin snips taken from the iliac crest - presence of adult worms in excised nodules presence of typical ocular manifestations, such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body
Specimen	Skin snips from: - Nodule fluids - Iliac crests Scapula area
When to collect	Take snips and nodule fluids from suspected cases 1hour after administration of Diethyl carbomazine
How to prepare, store, and transport the specimen	Put the sample in a general container. Add a few drops of normal saline. Close it tightly before transporting it to the laboratory. Transported at ambient temperature.
Results	Result should be ready within 1 day.

Reference

- *WHO Recommended Surveillance Standards. Second edition*. WHO/CDS/CSR/ISR/99.2

Perinatal (Stillbirths and Neonatal) Deaths

Background

The Global Strategy for Women's and Children's and Adolescents' Health with its three objectives of Survive, Thrive and Transform sets targets for the coming 15 years which Member States have agreed and committed to achieve. This includes reducing neonatal mortality to less than 12 deaths per 1,000 births and stillbirths to less than 12 per 1,000 total births, in line with the multi-stakeholders' action plan "Every Newborn: an action plan to end preventable deaths" (ENAP), which encompasses two goals: ending preventable newborn deaths and stillbirths.

Globally there are 2.7 million neonatal deaths annually, of these 1 million take place in the African Region. Three main causes of neonatal deaths make up about 80% of the deaths: birth asphyxia, prematurity and neonatal infections. Equally, there are about 2.6 million annual stillbirths globally, of which 98 percent occur in developing countries. About half of all stillbirths occur in the intrapartum period, representing the greatest time of risk. Causes of stillbirths may be a consequence of maternal conditions and diseases like pre-eclampsia, obesity, diabetes, malaria, syphilis and HIV. There are however no available global estimates on causes of stillbirths.

The reduction of neonatal mortality reached 38% in the African Region during the MDG era. However, the reduction has been much slower than that of the under-5 mortality of 54%. Achieving the set SDG target for the reduction of both stillbirths and neonatal deaths will require up to a seven-fold reduction of the current neonatal and stillbirth mortality rates in the African Region. This will require addressing current challenges for the efficient delivery of high quality services for mothers and newborns, but also efforts of strengthening the health information systems to understand the real number of deaths and the causes of deaths.

Surveillance goal

The primary goal is to eliminate preventable stillbirths and neonatal deaths by:

counting every stillbirths and neonatal death through an active identification and reporting at community and facility levels to permit an assessment of the true magnitude of stillbirths and neonatal mortality and the impact of actions to reduce them;

Identifying underlying causes, contributing factors and high risk areas for stillbirths and neonatal deaths to effectively guides immediate as well as longer term actions and to inform program decisions to reduce these deaths

Standard case definitions: Perinatal and Neonatal Deaths

Perinatal death includes 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 perinatal death is usually reported either as a stillbirth or early neonatal death. Neonatal deaths comprises of both early and late neonatal deaths

- **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 7 complete days of life. Day 1 is clinically considered the first day of life.

Late neonatal death is defined as any death of live newborn occurring from day 8 through day 28

Respond to alert threshold

After determining that a perinatal death has occurred, the initial notification should be done immediately (within 24 hours), by the fastest means possible

The health facility should contact the district authority and provide information about the IDSR Case Alert form. Moreover, the health facility or the district perinatal death review committee is required to review the case within seven (7) days

PDR should be anonymous.

It should be linked to the maternal condition where applicable

The reports should not be used for disciplinary of litigation

Recommended public health action

- In many low-income countries, it is not possible to review all perinatal deaths given the large numbers of deaths and the limited capacity in human resources and time. However, it is important to accurately capture and classify the causes of those deaths
- Selected perinatal death should be reviewed and investigated to ascertain the cause.
- Surveillance for perinatal deaths should be conducted not just in the labour wards, but in the community, and all service areas where they occur.
- Response to any perinatal death is based on recommendations from the perinatal death review.
- Findings from review of the selected perinatal death should lead to actions to prevent similar deaths by identifying gaps that should be addressed at policy level and in both health facilities and communities.
- Monthly, quarterly or semi-annual analysis of aggregated data at larger health facilities and at district level can lead to a more comprehensive approach to address a particular problem across multiple facilities or communities or a problem in particular geographical areas where they are occurring in greater numbers. These should be conducted alongside those for maternal deaths by the MPDSR committee.

Analyse and interpret data: Perinatal (Stillbirths and Neonatal) Deaths

Measures of magnitude

Number of stillbirths (SBR)

Number of early neonatal deaths (NMR)

Causes of stillbirths

Causes of early neonatal deaths

% of stillbirths and neonatal deaths due to avoidable factors

Descriptive analysis by person, place and time:

Gestational age at time of death,

Socioeconomic status of family, educational levels of parents

Time and date of death, weekday or weekend. Graph cases to construct a curve throughout the year in order to identify trends. Where family lived or where women died.

Analyse the distribution of the cases.

Place of birth – facility or community

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Review committee

This should be the same committee as that for maternal deaths and can be renamed maternal and perinatal deaths surveillance and response (MPDSR) committee

Reference

- *WHO Every Newborn Action Plan http://www.EveryNewborn.org;*
- *WHO Application of ICD-10 to deaths during the perinatal period: ICD- PM; 2016;* http://www.who.int/maternal_child_adolescent/en
- ICD 10 PM: http://apps.who.int/iris/bitstream/handle/10665/249515/9789241549752-eng.pdf?sequence=1

Bubonic Plague

Background

- Zoonotic systemic bacterial infection caused by *Yersinia pestis* (plague bacillus) usually transmitted to humans by rodent fleas or by handling an infected animal
- Main disease forms: bubonic, pneumonic, and septicemic; large-scale epidemics may occur in urban or rural settings. If not treated, bubonic plague could lead to pneumonic or septicemic plague
- Human to human transmission only occurs with the pneumonic form of plague by infectious droplets
- Incubation period is 2 to 6 days
- Case fatality rate (CFR) may exceed 50-60% in untreated bubonic plague and is nearly 100% in untreated pneumonic or septicaemic plague. However, it is usually <1% with appropriate and timely treatment
- Risk factor: Exposure to infected populations of wild or domesticated rodents and their fleas in plague endemic areas.

Surveillance goal

- Detect all cases of plague promptly, including bubonic cases, as a single case can be the origin of an outbreak

Standard case definition

Suspected case of **bubonic plague**:

–very painful swelling of lymph nodes – buboes

And

–Fever (or history of fever) or at least 3 of the following: headache or chills or generalized or severe asthenia

and

– consistent epidemiological features, such as exposure to infected animals and/or evidence of flea bites and/or residence in or travel to a known endemic area within the previous 10 days.

Confirmed case of **bubonic plague**:

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

Respond to alert threshold: <u>Bubonic Plague</u>

If a single case is suspected:

- Report case-based information to the next level
- Collect specimen (blood or aspirate from bubo for confirming the case.
- Treat the patient with gentamicin and fluoroquinolones (Levofloxacin, Ciprofloxacin, Moxifloxacin), chloramphenicol, Doxycycline.
- Duration of treatment is 10 to 14 days, or until 2 days after fever subsides.
- Important to treat patients quickly to prevent pneumonic or septicemic plague which have higher case fatalities. ----
- Children and pregnant women have recommended lower doses. All recommended antibiotics for plague have relative contraindications for use in children & pregnant wo men; however, use is justified in life-threatening situations.

Respond to action threshold

If the suspected bubonic case is confirmed:

- Reduce sporadic and outbreak-related cases via improved control or rodent populations (remove trash, food sources, and rat harbourages) and protect against fleas with insect repellent on skin and clothing and environmental flea control (especially in homes and seaports and airports).

- Monitor cases and treatment status of patients

Analyse and interpret data

Time: Graph monthly trends in cases, treatment success, and death

Place: Plot the location of case households.

Person: Immediate case-based reporting of cases and deaths for routine surveillance. Count weekly cases and deaths for outbreaks. Analyze age distribution and assess risk factors to improve control of sporadic disease and outbreaks.

Laboratory confirmation: Bubonic Plague	
Diagnostic test	Isolation of *Yersinia pestis* from bubo aspirate or blood, or sputum. Specific seroconversion to *Y. pestis* F1 antigen from serum. Rapid diagnostic test detecting Ag F1
Specimen	Aspirate of buboes Blood for serological tests
When to collect the specimen	Collect specimen from all suspected plague cases, if possible before the administration of antibiotics. However, the treatment must not be delayed. Serum should be drawn within 5 days of onset then again after 2-3 weeks.
How to prepare, store, and transport the specimen	▪ Specimens should be collected using aseptic techniques. Materials for culture should be sent to the laboratory in Cary Blair transport media. Unpreserved specimens should reach the laboratory the same day. ▪ Liquid specimens (aspirates) should be absorbed with a sterile cotton swab and placed into Cary-Blair transport medium. Refrigerate. ▪ If transport will require 24 or more hours and Cary Blair transport is not available, freeze the specimen and transport it frozen with cool packs.
Results	Rapid Diagnostic Tests (RDT) can be performed by properly trained clinicians at the site. Clinical specimens should properly packaged and shipped to only laboratory with known plague diagnostic capabilities or to a WHO Collaborating Centre for Plague. Plague culture results will take a minimum of 5 working days from reception in the laboratory. Antibiotic treatment should be initiated as soon as possible. Plague patients seroconvert to the F1 *Y. pestis* antigen 7-10 days after onset.
Reference	

- *Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte. WHO/CDS/CSR/EDC/99.2*
- *Laboratory Manual of Plague Diagnostic tests. CDC/WHO publication, 2000, Atlanta, GA*
    - *https://www.cdc.gov/plague/resources/Recommended-antibiotics-for-plague-web-site-rev-Jan2018-P.pdf*

Pneumonic Plague

Background

- Zoonotic systemic bacterial infection caused by *Yersinia pestis* (plague bacillus) usually transmitted to humans by rodent fleas or by handling an infected animal.
- Main disease forms: bubonic, pneumonic or septicemic. large-scale epidemics may occur in urban or rural settings. If not treated, bubonic plague could lead to pneumonic or septicemic plague
- Human to human transmission only occurs with the pneumonic form of plague by infectious droplets
- Incubation period is 1 to 3 days
- Case fatality rate (CFR) is nearly 100% in untreated pneumonic or septicaemic plague. However, it is usually <1% with appropriate and **timely** treatment
- Risk factor:
    - Close contacts with pneumonic plague cases,
    - Exposed to endemic plague areas - populations of wild or domesticated rodents and their fleas in plague endemic areas particularly where there are limited health care services to provide timely treatment

Surveillance goal

- Detect all cases of plague promptly, including bubonic cases, as a single case can be the origin of an outbreak
- Report cases to National and international authorities (if outbreak starts) quickly

Standard case definition

***Suspected case of* pneumonic plague**:

– Anyone, of any age, with coughs of less than 5 days with one of the following signs:

Striated sputum from blood or dyspnea or chest pain

and

Fever (or history of fever) or at least 3 of the following: headache or chills or generalized or severe asthenia

and

Epidemiological context (contact with suspect or confirm pneumonic plague case, etc)

Suspicious death of plague:
Anyone who died suddenly without apparent cause but with an epidemiological link to plague established and without biological sampling

Probable case of plague:
Any suspected case of plague alive or deceased with F1 rapid diagnostic test (RDT)
Or
Positive PCR alone

***Confirmed case of* pneumonic plague**:

Any suspected case of plague in which Yersinia pestis has been isolated in culture
Or
Suspect plague case with positive F1 rapid diagnostic test (RDT)
and positive PCR
Or
Seroconversion or increase in IgG antibody titre by 4 to 15 d

IMPORTANT: F1 rapid diagnostic test (RDT) positive alone is **not** a confirmed cases. Culture and PCR tests need to done at the appropriate facility.

Respond to alert threshold: Pneumonic Plague

If a single case is suspected:

- Report case-based information to the next level. Isolate the patient if suspicion of pneumonic plague with precautions against airborne spread (the patient and the staff managing the patient must wear appropriate masks)
- Collect specimen (sputum, blood) for confirming the case.
- Investigate the case including identifying all known contacts and conduct history of exposure.
- Begin treatment as soon as patient is suspected with gentamicin and fluoroquinolones (Levofloxacin, Ciprofloxacin, Moxifloxacin), chloramphenicol, Doxycycline.
- Duration of treatment is 10 to 14 days, or until 2 days after fever subsides.
- Important to treat patients quickly to prevent pneumonic or septicemic plague which have higher case fatalities. Children and pregnant women have recommended lower doses. All recommended antibiotics for plague have relative contraindications for use in children & pregnant wome n; however, use is justified in life-threatening situations.

Respond to action threshold

If the suspected case is confirmed:

- Isolate patients with pneumonic plague with precautions against airborne spread (the patient and the staff managing the patient must wear masks) until at least after 48 hours of appropriate antibiotic therapy. Respect of the IPC standards.
- Mobilize community to enable rapid case detection and treatment
- Identify high risk population groups through person, place, and time analysis.
- Reduce sporadic and outbreak-related cases via improved control or rodent populations (remove trash, food sources, and rat harbourages) and protect against fleas with insect repellent on skin and clothing and environmental flea control (especially in homes and seaports and airports).
- Disseminate awareness and risk reduction communication materials

Analyse and interpret data

Time: Graph monthly trends in cases, deaths and treatment outcomes. Construct epidemic curve for outbreak cases.

Place: Plot the location of case households.

Person: Immediate case-based reporting of cases and deaths for routine surveillance. Count weekly cases and deaths for outbreaks. Analyse age distribution and assess risk factors to improve control of sporadic disease and outbreaks.

Laboratory confirmation: Pneumonic Plague

Diagnostic test	Isolation of *Yersinia pestis* from or blood, or sputum. Specific seroconversion to *Y. pestis* F1 antigen from serum. Culture (gold standard); or PCR **AND** Rapid diagnostic test detecting Ag F1(only properly trained clinicians can provide the test on clinical diagnosis suspects and must be able to get) good sputum sample; or Seroconversion or increase in IgG antibody titre by 4 to 15 d
Specimen	blood, sputum, or autopsy materials for culture and blood for serological tests
When to collect the specimen	Collect specimen from all suspected plague cases, if possible before the administration of antibiotics. However, the treatment must not be delayed & properly monitored for severe adverse effects. Serum should be drawn within 5 days of onset then again after 2-3 weeks.

How to prepare, store, and transport the specimen	▪ Specimens should be collected using aseptic techniques. Materials for culture should be sent to the laboratory in Cary Blair transport media. Unpreserved specimens should reach the laboratory the same day. ▪ If transport will require 24 or more hours and Cary Blair transport is not available, freeze the specimen and transport it frozen with cool packs.
Results	Clinical specimens should only be sent to a laboratory with known plague diagnostic capabilities or to a WHO Collaborating Centre for Plague. Plague culture results will take a minimum of 5 working days from reception in the laboratory. Antibiotic treatment should be initiated as soon as possible. Plague patients seroconvert to the F1 *Y. pestis* antigen 7-10 days after onset.

Reference

- *Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte. WHO/CDS/CSR/EDC/99.2*
- *Laboratory Manual of Plague Diagnostic tests. CDC/WHO publication, 2000, Atlanta, GA*
- *https://www.cdc.gov/plague/resources/Recommended-antibiotics-for-plague-web-site-rev-Jan2018-P.pdf*

Poliomyelitis (Acute flaccid paralysis)

Background

- Poliovirus (genus Enterovirus) serotypes 1, 2, and 3 are transmitted from person-to-person via faecal-oral spread.
- Incubation period is 7 to 14 days for paralytic cases and the range is approximately 3 to 35 days. The virus may be shed for several years by immuno-compromised persons.
- Infection is usually asymptomatic, but may cause a febrile syndrome with or without meningitis. In less than 5% of infections paralysis results, often of a single leg.
- Polio infection occurs almost exclusively among children. Infection may occur with any of 3 serotypes of Poliovirus. Immunity is serotype-specific and lifelong.
- Paralytic polio, though not fatal, has devastating social and economic consequences among affected individuals.
- The Polio Eradication Program has nearly halted ongoing wild-type polio transmission worldwide through use of oral poliovirus (OPV) vaccine.
- Areas with low vaccine coverage may allow ongoing wild-type transmission.
- Other neurological illnesses may cause AFP, for example, Guillain-Barré syndrome and transverse myelitis.

Surveillance goal

- Immediate case-based reporting of all poliomyelitis cases. Weekly summary reporting of cases for routine surveillance and outbreaks.
- Detect cases of acute flaccid paralysis (AFP) and obtain laboratory confirmation of the aetiology of all suspected cases. Obtain two or more stool specimens within 14 days of the onset of paralysis for viral isolation.
- Surveillance for AFP is used to capture all true cases of paralytic poliomyelitis. Target for surveillance performance to provide certification of polio eradications is 1 case of AFP per year per 100 000 population aged less than 15 years.
- The ultimate objective of AFP surveillance is the eradication of the poliovirus.

Standard case definition

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.

Respond to alert threshold: Poliomyelitis (Acute flaccid paralysis)

If a single case is suspected:

- Report the suspected case immediately according to the national polio eradication program guidelines.
- Conduct a case-based investigation. Include a vaccination history for the patient.
- Collect two stool specimens. Collect the first one when the case is investigated. Collect the second one from the same patient 24 to 48 hours later. See laboratory guidelines for information on how to prepare, store and transport the specimen.
- Obtain virological data from reference laboratory to confirm wild-type poliomyelitis or vaccine-associated paralytic poliomyelitis (VAPP).

Respond to action threshold

If a case is confirmed:

- If wild polio virus is isolated from stool specimen, refer to national polio eradication program guidelines for recommended response actions. The national level will decide which actions to take. They may include the following:
  - Specify reasons for non-vaccination of each unvaccinated case and address the identified deficiencies.
  - Immediately conduct "mopping-up" vaccination campaign around the vicinity of the case.
  - Conduct surveys to identify areas of low OPV coverage during routine EPI activities, and improve routine vaccine coverage of OPV and other EPI antigens.
  - Lead house-to-house vaccination in supplemental vaccination campaigns during National Immunization Days (NIDs) or Sub-National Immunization Days (SNIDs). Focus supplemental vaccination activities in areas of low vaccine coverage during EPI.

Analyse and interpret data

Time: Graph weekly cases, or by date of onset

. Evaluate the percent of suspected cases reported within 48 hours and the percentage with adequate laboratory specimen collection.

Place: Plot location of case households. Investigate the circumstances of poliovirus transmission in each

case thoroughly. Examine the possibility of other potential areas of transmission.

Person: Count cases. Analyse age distribution and number of polio vaccine doses received. Assess risk factors for low vaccine coverage.

Laboratory confirmation: Poliomyelitis (Acute flaccid paralysis)	
Diagnostic test	Isolation of polio virus from
Specimen	Stool
When to collect the specimen	Collect a sample from every suspected AFP case. Collect the first specimen when the case is investigated. Collect a second specimen on the same patient 24 to 48 hours later.
How to prepare, store, and transport the specimen	▪ Place stool in clean, leak-proof container and label clearly. ▪ Immediately place in refrigerator or cold box not used for storing vaccines or other medicines. ▪ Transport specimens so they will arrive at designated polio laboratory within 72 hours of collection When there is a delay, and specimen will not be transported within 72 hours, freeze specimen at -20□C or colder. Then transport frozen specimen with dry ice or cold packs also frozen at -20□C or colder.
Results	Confirmed results are usually available within 21 after receipt of specimen by the laboratory. If wild or vaccine derived polio virus is detected, the national program will plan appropriate response actions

Reference

▪ *Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication. World Health Organization.*

▪ *WHO global action plan for laboratory containment of wild polio viruses. WHO/V&B/99.32, Geneva, 1999*

▪ *Manual for the virological investigation of polio, WHO/ EPI/GEN/97.01, Geneva, 2004*

▪ *Supplement to the Manual for the virological investigation of Polio. WHO/EPI 2007*

Rabies (Human)

Background

- Rabies is a zoonotic disease (a disease that is transmitted to humans from animals) that is caused by a virus.
  Rabies infects domestic and wild animals, and is spread to people through close contact with infected saliva (via bites or scratches).
- The rabies virus infects the central nervous system, causing disease in the brain and, eventually, death. Early symptoms in people include: fever, headache, and general weakness or discomfort. As the disease progresses, symptoms include; insomnia, anxiety, confusion,slight or partial paralysis,excitable b
- In unvaccinated humans, rabies is almost always fatal if post-exposure prophylaxis is not administered before the onset of severe symptoms. Death usually occurs within days of the onset of neurological symptoms.
- Dogs are the main carrier of rabies in Africa and are responsible for most (approximately 97%) of the human rabies deaths worldwide.
- WHO estimates approximately 55,000 human deaths worldwide due to rabies each year; in Africa the annual death toll is 24,000.

Surveillance goal

- Detect and respond promptly and appropriately to cases and outbreaks of rabies.
- Identify high-risk areas
- Estimation of disease burden
- Immediate reporting of cases and routine monthly summary reports

Standard case definition

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

Recommended Public Health Action: Rabies (Human)

For a single case:

- Post exposure prophylaxis to prevent rabies
- Isolate patient if rabies develops to prevent infection of others
- Immunize contacts if patient develops rabies
- Vaccinate local dogs and cats to prevent outbreaks

General preventive measures:

- Promote public awareness of rabies
- Target immunization campaign for domestic or wild animals in high-risk areas
- Maintain active surveillance of rabies in animals

Analyse and interpret data

Time: Plot cases monthly.

Place: Plot the location of case households and animal exposures.

Person: Analyse distribution of cases by age, exposing animal, and circumstances of infection. Assess risk

Laboratory confirmation

Diagnostic test	Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem) ▪ Detection by FA on skin or corneal smear (collected ante mortem) ▪ FA positive after inoculation or brain tissue, saliva or CSF in cell culture, in mice or in suckling mice ▪ Detectable rabies-neutralizing antibody titre in the CSF of an unvaccinated person ▪ Identification of viral nucleic acid by reverse transcriptase PCR on fixed tissue collected post mortem or in a clinical specimen (brain tissue or skin, cornea or saliva) ▪ Isolation of rabies virus from clinical specimens and confirmation of rabies viral antigens by direct FA testing.

Specimen	▪ Brain tissue (collected post mortem) ▪ Skin biopsy (usually from the neck) ▪ Corneal ▪ Saliva ▪ CSF ▪ Head of suspected rabid animal (dogs)
When to collect the specimen	When a person is bitten by a pet that appears sick or by a wild animal, the biggest concern is rabies. No test can determine whether the rabies virus has been transmitted to the person immediately after the bite. So, the animal is evaluated to determine whether the person requires treatment. A wild animal that has bitten a person is killed if possible, so that its brain can be examined. If a person who has been bitten by an animal becomes increasingly confused and agitated or paralyzed, the diagnosis is probably rabies. At this point, tests can detect the rabies virus. Post mortem: within 4-6hrs after death of patient, as soon as the suspected animal dies or is killed
How to prepare, store, and transport the specimen	Safety precautions in handling rabies virus should be taken to avoid infection. Remove the head of the suspected animal, wrap head completely such that no blood is oozing out. Where possible, request a veterinarian to assist in the collection and preservation of the specimen. Sample should be sent to Reference Laboratory for Rabies virus.
Results	The treatment should never await the results of laboratory diagnosis. A laboratory diagnosis may be delayed for a variety of reasons. Results can be obtained from the reference lab within 1-2days.

Reference: Rabies (Human)

- *WHO Recommended Surveillance Standards. WHO/CDS/CSF/ISR/99.2*
- *Laboratory techniques in rabies, Fourth Edition, WHO, edited by F-X. Meslin et al*
- *World Health Organization Rabies Fact Sheet. http://www.who.int/mediacentre/factsheets/fs099/en/*
- *Council of State and Position Statement. Territorial Epidemiologists (CSTE). National Surveillance for Human Rabies. CSTE 09-ID-70. Atlanta: CSTE; June 2009. Available from: http://www.cste.org*

- *Centers for Disease Control and Prevention (CDC). Human Rabies Prevention — United States, 2008:*
- *Recommendations of the Advisory Committee on Immunization Practices. MMWR 2008; 57(RR03):1–26, 28. Available from: http://www.cdc.gov/mmwr/*
- *Bleck TP, Rupprecht CE. Chapter 160 – Rhabdoviruses. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practice of Infectious Diseases, 6th edition. Philadelphia: Churchill Livingstone; 2005*

Rift Valley Fever (RVF)

Background

- Rift Valley Fever (RVF) is a viral disease that affects mainly animals and occasionally humans. The virus is a member of the *Phlebovirus* genus, one of the five genera in the family *Bunyaviridae*. The disease is frequently reported following heavy rainfall and floods. It was first isolated in Rift Valley Province of Kenya in 1930. The disease was reported in Kenya after the El Nino flooding of 1997/98 and more recently in 2006 to 2007. In 2007 and 2010, Tanzania and South Africa respectively were also affected. Other outbreaks have previously been reported in Somalia, Egypt, Saudi Arabia and Yemen.

- RVF is mainly transmitted from animals (sheep, cattle, goats, camels) to humans through close contact with infected animals (such as handling meat and body fluids and consumption of raw milk). During established RVF outbreaks in animals, humans can also get infected through bites of infected mosquitoes and other biting insects.

- The incubation period of RVF varies from 2 to 6 days. The clinical symptoms include an influenza-like illness, with sudden onset of fever, headache, myalgia and backache. These symptoms usually last from 4 to 7 days. Most of the infected people recover on their own. However, a small proportion (about 1%) get complications such as vomiting blood, nose bleeding and passing bloody stool. Other severe types of the disease are eye disease and meningo-encephalitis. Because the symptoms of Rift Valley fever are varied and non-specific, clinical diagnosis is often difficult, especially early in the course of the disease. Rift Valley fever is difficult to distinguish from other viral haemorrhagic fevers as well as many other diseases that cause fever, including malaria, shigellosis, typhoid fever, and yellow fever.

- Management of RVF in humans is mainly supportive as there is no definitive treatment for RVF. Early detection and management of the disease is important. Human control of RVF is through control of the disease in animals through a sustained vaccination program and limiting human-animal contact. Use of insecticide treated nets and mosquito repellents can also reduce infections in human. In addition to human suffering and death, RVF has far reaching economic implications to the Livestock industry. In outbreak settings, the disease manifestation includes non-haemorrhagic febrile syndromes, and laboratory testing should be considered among persons with milder symptoms suggestive of viral illness.

- Immediate Notification to WHO is formally required by IHR (Annex 2)

Standard case definition: Rift Valley Fever (RVF)

Suspected case:

Early disease:

- 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:
  - Direct contact with sick or dead animal or its products **AND / OR**:
  - 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:**
  - Abrupt onset of any 1 or more of the following: exhaustion, backache, muscle pains, headache (often severe), discomfort when exposed to light, and nausea/vomiting **AND / OR**:
  - Nausea/vomiting, diarrhoea OR abdominal pain with 1 or more of the following: - Severe pallor (or Hb < 8 gm/dL)
    - Low platelets (thrombocytopenia) as evidence by presence of small skin and mucous membrane
      haemorrhages (petechiae) (or platelet count < 100x109 / dL)
    - Evidence of kidney failure (edema, 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

- Patients who have experienced, in the preceding month a flu-like illness, with clinical criteria, who additionally develop the following:
  - CNS manifestations which resemble meningo-encephalitis **AND/OR:**
  - Unexplained visual loss **OR**
  - 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).

Respond to alert threshold: Rift Valley Fever (RVF)

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Enhance the usual standard precautions throughout the health care setting.
- Treat and manage the patient with supportive care.

Collect specimen safely to confirm the case.

Respond to action threshold

If a single case is confirmed:

- Mobilize the community for early detection and care.
- Initiate line list/register for cases
- Conduct community education about the confirmed case, how the disease is transmitted, and how to prevent contact with tissues of infected animals and avoid mosquito bites.
- Provide information about prevention in the home and when to seek care.
- Provide supportive treatment to all cases identified
- Request additional help from national levels as needed.
- Collaborate with the animal health specialists to search and document cases among animals as well.

Analyse and interpret data

Time: Graph cases and deaths monthly. Construct an epidemic curve during the outbreak.

Place: Plot location of case households and work sites using precise mapping.

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyse age and sex distribution. Assess risk factors immediately and consider request for assistance to improve outbreak control.

Laboratory confirmation: Rift Valley Fever (RVF)	
Diagnostic test	Acute RVF can be diagnosed using several different methods. Serological tests such as ELISA may confirm the presence of specific IgM antibodies to the virus. The virus itself may be detected in blood during the early phase of illness or in post-mortem tissue using a variety of techniques including, antigen detection tests by ELISA, RT-PCR, virus propagation (in cell cultures), Immunohistochemistry in formalin-fixed tissues. ELISA IgG can be used for retrospective diagnostic.

Specimen	ELISA (serology) ▪ Whole blood ▪ Serum or plasma ▪ Whole blood or clot ▪ Tissues (fresh or frozen) RT-PCR – Virus isolation ▪ Blood ▪ Serum/plasma ▪ Liver biopsy from fatal cases Pathology ▪ Tissue biopsy from fatal cases Identical specimens can be collected from animal
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.
How to prepare, store, and transport the specimen	Laboratory workers are at risk. Samples taken from suspected human cases of RVF for diagnosis should be handled by trained staff and processed in suitably equipped laboratories. ELISA/PCR/ISOLATION ▪ Preparation and storage (freeze of refrigerate/as cold as possible) ▪ Shipping: frozen on dry ice or ice packs or both *Note: if dry ice or ice packs are not available, sample may be shipped at room temperature and still provide valid results in most cases.* **Immunohistochemistry:** ▪ Preparation and storage: Fix in formalin (can be stored up to 6 weeks) ▪ Shipping: Room temperature (do not freeze). *Same shipping conditions for animal specimens*
Results	Diagnostic services for RVF are not routinely available. Advance arrangements are usually required for RVF diagnostic services. Contact the appropriate National authority or WHO. Contact national Veterinary Services for animal diagnostic
Reference	

- *WHO/EMC Infection control for VHF in the African health care setting, WHO, 1998.*
- *WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2*
- *Fact sheet Nº207 Revised September 2007.*
- *Infection Control for VHF in the African Health Care Setting /CDC (Annexes 11-12)*

Severe Acute Respiratory Infections (SARIs)

Background

- Severe acute respiratory infections (SARIs) are a significant cause of infectious disease morbidity and mortality worldwide. It is estimated, as of December 2017, that annually 290 000 to 650 000 deaths are associated with seasonal influenza. The mortality rates are particularly high among vulnerable population such as children, elderly, chronically ill patients etc.
- An improved understanding of the epidemiology and seasonality of SARIs in Africa is essential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals for prophylaxis and treatment, infection control).
- The threat of SARIs due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness. Respiratory disease events that may constitute a public health emergency of international concern1 include human influenza caused by a new subtype, Middle East respiratory syndrome coronavirus (MERS-CoV), pneumonic plague, severe acute respiratory syndrome (SARS), and novel agents that can cause large-scale SARI outbreaks with high morbidity and mortality.

Surveillance goals

- To detect, in a timely manner, unusually severe morbidity and mortality caused by both known and unknown respiratory pathogens that have the potential for large-scale epidemics or pandemics.
- To characterize and monitor trends in illnesses and deaths attributable to SARIs.

Standard case definition

An acute respiratory infection with:

- history of fever or measured fever of ≥ 38 C°;
- and cough;
- with onset within the last 10 days;
- and requires hospitalization.

Respond to an alert threshold

Please refer to the *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018,* if there is an unusual event (clusters of acute respiratory infections or of atypical respiratory infections, a cluster of deaths, for example) of respiratory infection.

Respond to an action threshold

Please refer to the *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018,* if a single case of pandemic-prone acute respiratory disease is suspected.

Analyse and interpret data

Time: Frequency of reporting: Epidemiological and virological data collected from the sentinel sites should be analysed **on a weekly basis**. Graph cases and deaths weekly. Construct an epidemic curve throughout the year and describe transmission patterns and changes in the level of respiratory activity compared to the previous week(s), year(s)

Place: Cases should be mapped by geographical location; for example, by village, by home or by location in a health-care facility. Describe possible exposures.

Person: For individual SARI patients tested for influenza viruses, the **minimum data to be collected and analysed for each patient**, especially if a specimen is collected, is : Unique identifier (to link laboratory and epidemiological data, and for tracking patient if necessary), Sex, Age, History of fever and body temperature at presentation, Date of symptom onset, Date of hospitalization (SARI patients only), Patient outcome (death, survival), Date of specimen collection, Antiviral use for present illness at the time of specimen collection, Pregnancy status., Presence of chronic pre-existing medical illness(es) (Chronic respiratory disease, Asthma, Diabetes, Chronic cardiac disease, Chronic neurological or neuromuscular disease, Haematological disorders, HIV). Data on SARI can be aggregated by age groups to facilitate analysis and reporting. Recommended **major age groupings** for analysing are: 0 to <2 years, 2 to <5 years, 5 to <15 years, 15 to <50 years, 50 to <65 years, ≥ 65 years.

For the laboratory data, as a minimum, it is recommended that the following data should be collected:

- The number of samples tested for influenza during the week.
- The proportion of samples that were positive for influenza for SARI
- Types and subtypes of viruses detected during the week.
- Results from antiviral resistance testing (if applicable).

At the end, the following **indicators or aggregated data should be collected and reported from each sentinel site:**

1. The number of new SARI cases from whom specimens were collected during the week, grouped by standard age groups, and the proportion of each of these that were positive for influenza.
2. The total number of new SARI cases reported during the week, grouped by standard age groups (this includes cases that were not tested and/or did not have detailed data collected).
3. The number of total new hospital admissions reported during the week in the sentinel hospital where SARI surveillance is being conducted, ideally grouped by the recommended age groups.
4. The number of SARI deaths occurring in the healthcare facility sentinel site reported during the week, grouped by standard age groups.
5. The proportion of cases having each of the chronic pre-existing medical illnesses for influenza
6. positive SARI cases, reported separately.

Further technical information on the role of laboratory can be found in the

- WHO Global Epidemiological Surveillance Standards for Influenza, 2014. *https://www.who.int/influenza/resources/documents/influenza_surveillance_manual/en/*
- AFR Generic protocol for influenza sentinel surveillance: *https://afro.who.int/publications/protocol-national-influenza-sentinel-surveillance*

Laboratory testing: Severe Acute Respiratory Infections (SARIs)

1- For the influenza virus:

- Specimens can be positive seven days or more after the onset of illness but ability to detect virus drops off notably after five to seven days, depending on the test used.
- Reverse transcriptase-polymerase chain reaction (RT-PCR) is the most sensitive method for detecting influenza virus and is the recommended influenza surveillance assay for most laboratories.
- Virus culture is also needed on at least a subset of specimens in order to allow detailed antigenic and genetic characterization of the virus.
- Antiviral resistance testing should be considered for high-risk patients if capacity exists in the laboratory in addition to taking a sample from non-high-risk patients

Further technical information on the role of laboratory can be found in the

- WHO Global Epidemiological Surveillance Standards for Influenza, 2014. *https://www.who.int/influenza/resources/documents/influenza_surveillance_manual/en/*
- WHO Manual for the laboratory diagnosis and virological surveillance of influenza, 2011. https://www.who.int/influenza/gisrs_laboratory/manual_diagnosis_surveillance_influenza/en/

References

- *WHO Global Epidemiological Surveillance Standards for Influenza, 2014.*
- *AFR generic protocol for influenza sentinel surveillance 2015* https://afro.who.int/publications/protocol-national-influenza-sentinel-surveillance
- *Protocol for the investigation of acute* respiratory illness outbreaks of unknown aetiology
- *https://afro.who.int/publications/protocol-investigation-acute-respiratory-illness-outbreaks-unknown-etiology*
- *WHO Fact Sheet on Seasonal Influenza, 2018*
- *WHO protocol to investigate non-seasonal influenza and other emerging acute respiratory diseases, 2018*
- *WHO Infection prevention and control of epidemic-and pandemic prone acute respiratory infections in health care guidelines, 2014*
- *WHO Manual for the laboratory diagnosis and virological surveillance of influenza, 2011*
- *WHO Operational guidance on sharing seasonal influenza viruses with WHO Collaborating Centres (CCs) under the Global Influenza Surveillance and Response System (GISRS)*
- *WHO Operational guidance on sharing influenza viruses with human pandemic potential (IVPP) under the Pandemic Influenza Preparedness (PIP) Framework*
- *WHO Standard guidance for the clinical management of influenza infections, expected publication in 2019*
- *Influenza WHO health topic page: (http://www.who.int/influenza/en/)*

Severe Acute Respiratory Syndrome (SARS)

Background

- Severe acute respiratory syndrome (SARS) was first recognized as a global threat in 2003 when international spread resulted in 8,098 SARS cases in 26 countries, with 774 deaths.
- Nosocomial transmission of SARS-CoV was a striking feature of the SARS outbreak.
- The majority of the cases were adults. The case fatality ratio of SARS is estimated to range from 0% to more than 50% depending on the age group affected and reporting centre, with a crude global CFR of approximately 9.6%.
- The mean incubation period is 5 days, with the range of 2-10 days. Patients initially develop influenza-like prodromal symptoms including fever, malaise, myalgia, headache and rigors. Cough (initially dry), dyspnoea and diarrhoea may be present in the first week but more commonly reported in the second week of illness. Severe cases develop rapidly progressing respiratory distress. Up to 70% of the patients develop diarrhoea.
- Disease transmission occurs mainly during the second week of illness.
- The SARS coronavirus (SARS-CoV) which causes SARS is believed to be an animal virus that crossed the species barrier to humans recently.

Surveillance goals

- Early detection and investigation of individuals with clinically apparent SARS-CoV.

Standard case definition

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.

Severe Acute Respiratory Syndrome (SARS)

Respond to suspected case

- Report case-based information immediately to the appropriate levels.
- Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential immediately and enhance Standard Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect and transport laboratory specimens from case-patient and from symptomatic contacts and arrange for laboratory testing.
- Review clinical history and exposure history during 2-10 days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Conduct active searches for additional cases.
- Expedite the diagnosis.*(WHO will assist in the investigation of SARS alerts as appropriate, including facilitating access to laboratory services)*

Respond to alert threshold

Response to SARS alert is same as response to suspected case (see above). **SARS ALERT:**

An individual with clinical evidence of SARS **AND** with an epidemiological risk factor for SARS-CoV infection in the 10 days before the onset of symptoms **OR**
Two or more health-care workers with clinical evidence of SARS in the same health-care unit and with onset of illness in the same 10-day period **OR**
3 Three or more persons (health-care workers and/or patients and/or visitors) with clinical evidence of SARS with onset of illness in the same 10-day period and epidemiologically linked to a health-care facility.

Analyse and interpret data

Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve during the outbreak.

Place: Plot locations of case households and work sites using precise mapping.

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and

Laboratory confirmation: Severe Acute Respiratory Syndrome (SARS)	
Diagnostic test	Confirmed positive PCR for SARS virus: (Note: Testing meets the requirements for the laboratory diagnosis of SARS and almost always involves two or more different tests or the same assay on two or more occasions during the course of the illness or from different clinical sites) ▪ At least 2 different clinical specimens (eg nasopharyngeal and stool) OR ▪ The same clinical specimen collected on 2 or more days during the course of the illness (e.g. 2 or more nasopharyngeal aspirates) OR ▪ 2 different assays or repeat PCR using the original clinical sample on each occasion of testing Seroconversion by ELISA or IFA: ▪ Negative antibody test on acute serum followed by positive antibody test on convalescent serum OR ▪ Four-fold or greater rise in antibody titre between acute and convalescent phase sera tested in parallel. Virus isolation: Isolation in cell culture of SARS-Cov from any specimen; plus PCR confirmation using a validated method
Specimen	Nasopharyngeal wash/aspirate specimen of choice for respiratory viruses. Nasopharyngeal swabs or oropharyngeal swabs Stool Serum
When to collect	The respiratory tract specimen can be collected at any time, but are best taken during the acute phase of illness. The time collection of paired blood samples is very important: ▪ Collect an acute illness sample at first contact withthe patient at days 7, 14, 28 a 90 after onset where possible. ▪ Collect blood on discharge if collection of a convalescent sample is unlikely.

How to prepare, store, and transport	▪ SARS specimens should be handled according to appropriate biosafety practices in order to avoid laboratory-related infections and spread of disease to close contacts. ▪ Clinical samples from patients should be collected by trained personnel. Nasopharyngeal wash/aspirate: have the patient sit with the head titled slightly backward. Instil 1.5 ml non-bacteriostatic sterile saline (Ph 7.0) into one nostril. Flush a plastic catheter or tubing (e.g. mucus trap tubing) with 2-3 ml of saline. Insert the tubing into the nostril parallel to the palate. Aspirate nasopharyngeal secretions. Repeat for the other nostril. Collect aspirates in sterile vial or mucus trap. Remove tubings and discard in plastic bag.
Results	Diagnostic services for SARS are not routinely available. Advance arrangements are usually required for SARS diagnostic services. Contact the appropriate National authority or WHO. If there is a high level of suspicion, WHO will support countries to contact a reference laboratory if necessary.

Reference

- *WHO Guidelines for the Global Surveillance of SARS, Updated Recommendations, October 2004*
- *WHO Interim Guidelines, Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Diseases in Health Care, June 2007. WHO/CDS/EPR/2007.6.*
- *Use of laboratory methods for SARS diagnosis, WHO*
- *WHO Biosafety guidelines for handling of SARS specimens*

Severe Pneumonia in Children under 5 years of age

Background

- Infection of the lower airways caused by bacteria or viruses transmitted person-to-person via aerosolized respiratory droplet spread. The main bacterial causes of pneumonia among children are *Streptococcus pneumoniae* (the pneumococcus) and *Haemophilus influenzae* type b (Hib).
- Acute respiratory infections (ARIs) and pneumonia represent the number one cause of mortality among children less than 5 years of age.
- Incubation period is usually less than 7 days, depending on the aetiology.
- WHO and UNICEF recommend use of Integrated Management of Childhood Illness (IMCI) strategy to reduce morbidity and mortality attributable to childhood pneumonia. Early antimicrobial therapy has been shown to reduce mortality.
- Resistance of the pneumococcus and Hib to beta-lactams (for example, ampicillin), sulfonamides (for example, trimethoprim-sulfamethoxazole) and other antimicrobials is increasing.

Surveillance goal

- Early identification of pneumonia cases and epidemics using clinical definitions.
- Monitor antimicrobial resistance routinely and during outbreaks.
- Reducing the proportion of severe pneumonia cases compared to non-severe pneumonia cases to monitor quality of interventions.

Standard case definition

Clinical case definition (IMCI) for pneumonia:

A child presenting with cough or difficult breathing and:

- 50 or more breaths per minute for infant age 2 months up to 1 year
- 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 with 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.

Severe Pneumonia in Children under 5 years of age

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:

Report the problem to the next level.
Investigate the cause for the increase and identify the problem.
Make sure that cases are managed according to IMCI guidelines.
Treat cases appropriately with recommended antimicrobial drugs

Respond to action threshold

If the number of case or deaths increases to two times the number usually seen during a similar period in the past:

- Assess health worker practices of IMCI guidelines for assessing, classifying and treating children with pneumonia and severe pneumonia.
- Identify high risk populations through analysis of person, place and time.
- Conduct community education about when to seek care for pneumonia.

Analyse and interpret data

Time: Conduct month-to-month analysis for unexpected or unusual increases. Graph cases and deaths by month. Construct epidemic curve for outbreak cases. Plot month-to-month data and compare to previous periods.

Place: Plot location of case households.

Person: Count monthly pneumonia and severe pneumonia cases. Count pneumonia deaths. Analyze age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- *Integrated Management of Childhood Illnesses*. World Health Organization. WHO/CDR/95.14.1

Sexually transmitted infections

Background

- Infections of the human genito-urinary and reproductive systems transmitted via human sexual contact (sexually transmitted disease, STIs). The most common causes of male urethral discharge are a) the gonococcus *Neisseria gonorrhoea* and b) *Chlamydia trachomatis*. The most common causes of male and female genital ulcer are c) syphilis (*Treponema pallidum*), d) herpes simplex virus (HSV1 or 2) and e) chancroid *(Haemophilus ducreyi*).
- STIs are endemic in most countries of the world, including countries in Africa. Multiple simultaneous STIs are common (for example, gonorrhoea plus *Chlamydia*). STIs may be most highly prevalent in areas where HIV occurs and may facilitate HIV transmission. STIs may be primary or from repeated attacks of urethral discharge.
- STIs are a leading cause of abortion and stillbirth, prematurity, and congenital infections. They may lead to pelvic inflammatory disease (PID), a major cause of decreased fertility.
- Incubation periods for gonorrhoea are 2 to 7 days; *Chlamydia* 7 to 14 days (or longer); syphilis, 10 days to 12 weeks (usually around 3 weeks), and chancroid, 3 to 14 days.
- STIs may be more commonly diagnosed in men, in whom clinical evidence of infection may be more readily apparent.

Surveillance goal

- Early detection and treatment of STI reduces transmission rates. Active efforts to diagnose latent syphilis may prevent significant disability.
- Improve early and effective treatment of STIs using simple algorithms based on syndromic diagnosis for index cases and partners.
- Carry out laboratory-based anti-microbial sensitivity monitoring and modify treatment guidelines accordingly at the national level.

Standard case definition

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: *Urethral discharge syndrome*: A suspected case confirmed by a laboratory method (for example Gram stain showing intracellular Gram-negative diplococci).

Sexually transmitted infections

Public health action

- Conduct active case finding for specific target groups.
- Conduct primary prevention activities such as promotion of safer sexual behaviours and provision of condoms.
- Assess use of algorithms for detection and treatment of STIs. And improve health worker practice with algorithms.
- Include STI prevention and care services in maternal and child health, and family planning services.
- Target acceptable and effective STI prevention and care services to populations identified as vulnerable to STI transmission.
- Promote early STI health seeking behaviour.

Analyse and interpret data

Time: Graph cases each quarter.

Place: No recommendation for analysis of place.

Person: Count quarterly cases and analyse age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Routine laboratory confirmation for surveillance is not required.

Reference

- *Guidelines for Sexually Transmitted Infections Surveillance*. Geneva. UNAIDS and World Health Organization.
  WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E

Smallpox (Variola)

NOTE: Smallpox was eradicated worldwide in 1980 and there has been no disease in humans since 1977. Information in this section is provided to educate public health professionals to enable detection of re-emergence and to differentiate smallpox from similar diseases.

Background

- Smallpox is an acute contagious disease caused by *Variola virus*, a member of the *Orthopoxvirus* genus, *Poxviridae* family. Other members of the genus that can cause disease in humans include *Cowpox virus*, *Camelpox virus*, and *Monkeypox virus*. Monkeypox virus has caused the most recent human poxvirus infections.
- Smallpox killed up to 30% of those infected and left survivors scarred and sometimes blind. In 1967, when WHO launched an intensified programme to eradicate smallpox, annually there were 10-15 million cases and 2 million deaths globally.
- **The global eradication of smallpox was certified by a commission of eminent scientists in December 1979 and subsequently endorsed by the World Health Assembly in 1980.**
- The incubation period of smallpox is 12–14 days (range 7–17) during which there is no evidence of viral shedding i.e. the person is not infectious. During this period, the person looks and feels healthy and cannot infect others.
- The disease presents as sudden onset of high fever and other symptoms such as malaise, headache, backache, nausea, vomiting. Two to three days later, the temperature falls and the patient feels somewhat better, at which time the characteristic rash appears, first on the face, hands and forearms and then after a few days progressing to the trunk. Lesions also develop in the mucous membranes of the nose and mouth, and ulcerate very soon after their formation, releasing large amounts of virus into the mouth and throat. The centrifugal distribution of lesions, more prominent on the face and extremities than on the trunk, is a distinctive diagnostic feature of smallpox and gives the trained eye cause to suspect the disease. Lesions progress from macules to papules to vesicles to pustules. All lesions in a given area progress together through these stages. From 8 to 14 days after the onset of symptoms, the pustules form scabs which leave depressed depigmented scars upon healing.
- Smallpox had two main forms: variola major and variola minor (the latter was less common). The disease followed a milder course in variola minor, which had a case-fatality rate of less than 1 per cent. The fatality rate of variola major was around 30%. There are two rare forms of severe smallpox: haemorrhagic and malignant. In the former, invariably fatal, the rash was accompanied by haemorrhage into the mucous membranes and the skin. Malignant smallpox was characterized by lesions that did not develop to the pustular stage but remained soft and flat. It was almost invariably fatal.
- Varicella (chickenpox) is often confused with smallpox and can be distinguished from smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities,

and by the development of successive crops of lesions in the same area. Fever and rash occur simultaneously in chickenpox and develop more rapidly; with death being a rare complication.

- Prior to the eradication of smallpox, human monkeypox virus infections were first reported in human populations in 1970 and may have been misdiagnosed as smallpox due to the similarity of cutaneous presentation and progression. The clinical features of smallpox and human monkeypox are similar; however, smallpox patients do not develop lymphadenopathy which is a prominent clinical sign of monkeypox. The disease progression through the incubation period, pre-eruptive stage and rash are also similar between the two diseases. Human monkeypox is milder with a lower case fatality ratio (up to 10 %) compared to smallpox (up to 30 %).

- Smallpox is transmitted from person to person by infected aerosols and air droplets spread in direct and fairly prolonged face-to-face contact with an infected person after fever has begun, especially if symptoms include coughing. The disease can also be transmitted by contaminated clothes and bedding, though the risk of infection from this source is much lower.

- The most infectious period is when face-to-face contact occurs with a patient after fever has begun and during the first week of rash, when the virus is released via the respiratory tract. The most at-risk settings are households and health care settings with active cases but spread in the community is low because sick people are bedridden.

- In the absence of immunity induced by vaccination, humans appear to be universally susceptible to infection with the smallpox virus. Since vaccination with smallpox vaccine was discontinued globally after the eradication of smallpox in 1980, most of the world's population under 40 years of age are not immune and the older age groups have waning immunity.

- WHO maintains smallpox vaccine emergency stockpiles to be deployed in the event of a smallpox re-emergence in order to contain the outbreak. First responders are prioritized to receive the vaccine. Vaccine administered up to 4 days after exposure to the virus, and before the rash appears, provides protective immunity and can prevent infection or ameliorate the severity of the disease.

- Immediate Notification of the occurrence of smallpox cases to WHO is formally required by IHR (2005). The risk of emergence of smallpox is extremely low as the remaining global live variola virus stocks are held in two high security laboratory facilities in Russia and the US and the disease has no animal reservoir.

Surveillance goal

To detect and immediately respond to a potential re-emergence or any suspected case of smallpox.

Standard case definition: Smallpox (Variola)

Suspected case: An acute illness with sudden onset of high fever > 38.3 C (101 F) followed by a characteristic rash (macules, vesicles, pustules, cursts) with centrifugal distribution 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.

Respond to alert threshold: Smallpox (Variola)

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Ensure patient is isolated and personnel attending have been vaccinated with smallpox vaccine.
- Implement airborne infection control precautions.
- Treat and manage the patient with supportive care. (Antiviral agent for treatment of smallpox, tecovirimat, was approved in July 2018)
- Collect and transfer specimen (prefer swab of rash) under strict safety conditions to confirm the case.
- Implement contact tracing and contact management.
- Conduct active surveillance to identify additional cases.
- Notify WHO

Respond to action threshold

If a single case is confirmed:

- Maintain strict infection control measures practices throughout the duration of the outbreak.
- Mobilize the community for early detection and care.
- Conduct community education about the confirmed case, how the disease is transmitted, and how to implement infection control in the home care setting and during funerals.
- Conduct active searches for additional cases.
- Request additional help from national and international levels.
- Establish isolation ward to handle additional cases that may be admitted to the health facility.

Analyse and interpret data

- Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve.
- Place: Map location of case households.
- Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyse age and sex distribution. Assess risk factors (contact with another active confirmed case) immediately.

Smallpox (Variola)

Laboratory confirmation	
Diagnostic test	Isolation of smallpox (Variola) virus from a clinical specimen Or Polymerase chain reaction (PCR) assay identification of Variola DNA in a clinical specimen Note: Level C or D laboratories only.
Specimen	Biopsy specimens* Scabs*Vesicular fluid swab* Lesion skin (roof)* Pustule material* Blood samples *Note: blood samples from person where severe, dense rash may be difficult to draw as the skin may slough off. A central line may be needed for access in cases where a peripheral blood draw is difficult.* * preferred specimens for diagnosis of acute illness during rash phase
When to collect	A suspected case of smallpox is a public health and medical emergency. Collect samples from every suspected case at available times to achieve specimen types recommended.

How to prepare, store, and transport	Typical practices associated with collection of patient specimens are appropriate for collection of orthopoxvirus lesions as well. These include wearing personal protective equipment, including gloves and sanitizing the site prior to collection. If alcohol is used to prepare the lesion for collection it is important to allow the lesion to dry before it is collected. **Biopsy specimens:** Aseptically place two to four portions of tissue into a sterile, leakproof, freezable container. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. *Note: package non-formalin lesion biopsy for shipping on dry ice, leave formalin fixed biopsy at room temperature. Do not freeze formalin fixed biopsy sample.* **Scabs:** Aseptically place scrapings/material into a sterile, leakproof, freezable container. Storage - 20 °C to - 70 °C. Transport ~6h at 4 °C. **Vesicular fluid:** Collect fluid from separate lesions onto separate sterile swabs. Be sure to include cellular material from the base of each respective vesicule. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. **Blood:** Draw 10 cc of blood into a plastic marble-topped tube, or a plastic yellow-topped serum separator tube. *Note: approval must be obtained prior to the shipment of potential smallpox patient clinical specimens to a Reference laboratory.*
Results	Diagnostic services for smallpox are not routinely available. Advance arrangements are usually required for smallpox diagnostic services. Contact the appropriate National authority or WHO.
Reference	
WHO Fact Sheet, Smallpox. http://www.who.int/mediacentre/factsheets/smallpox	

Trachoma

Background

- Trachoma is the leading cause of preventable blindness worldwide. It is caused by infection with *Chlamydia trachomatis* bacteria, and is both treatable and preventable.
- Infections often begin during infancy or childhood and can become chronic. If left untreated, the infection eventually causes the eyelid to turn inwards, which in turn causes the eyelashes to rub on the eyeball, resulting in intense pain and scarring of the front of the eye. This ultimately leads to irreversible blindness, typically between 30 and 40 years of age.
- Trachoma is easily spread through direct personal contact, shared towels and cloths, and flies that have come in contact with the eyes or nose of an infected person.
- WHO estimates that approximately 6 million cases of blindness due to trachoma and 11 million cases of trichiasis occur worldwide each year. Prevalence of active disease in children varies from 10-40% in some African countries.
- The infection primarily affects young children, with blindness occurring later in life. Females are three times more likely than males to suffer from trichiasis, the in-turning of the eyelashes that can lead to blindness. People are most at risk for trachoma infection in areas where there is poor sanitation, lack of latrines, poor sources of clean water, and the presence of flies.
- Primary interventions advocated for preventing trachoma infection include improved sanitation, reduction of fly breeding sites and increased facial cleanliness (with clean water) among children at risk of disease. The scaring and visual change for trachoma can be reversed by a simple surgical procedure performed at village level which reverses the in-turned eyelashes.

Surveillance goal

- Prevention of blindness by early detection
- Identification of high risk areas and epidemiologic trends
- Estimation of disease burden
- Monitoring of control programs

Standard case definition

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**. (see reference below).

Recommended public health action: Trachoma

The World Health Organization has developed a series of interventions to control trachoma known by the acronym SAFE: Surgery, Antibiotics, Facial cleanliness, and Environmental improvement.

Effective Trachoma control has four main components:

- Eye lid surgery for those at immediate risk of blindness
- Antibiotics to treat individual cases and to reduce infection in a community

Analyse and interpret data

Time: Monitor epidemiologic trends over time.

Place: Plot the location of case households and analyse the distribution.

Person: Analyse the distribution of cases by age and other demographic factors.

Lab confirmation

Routine laboratory confirmation for surveillance is not required.

Diagnostic test	Detection of specific antigen. Nucleic acid tests and tissue culture techniques. Occasionally, in epithelial cells in Giemsa or iodine stained smears by direct microscopy.
Specimen	Collection of conjunctival scrapings
How to prepare, store, and transport the specimen	After anaesthetizing the conjonctiva with anesthetic eye drops, blot away any discharge and using a spatula with a thin blunt end, scrape the whole of the conjuctiva. Spread the specimen evenly on a slide. As soon as the preparation is air-dried, fix it with methanol for 2-3 minutes if the preparation is to be Giemsa stained
Results	Outside of specialist laboratories, most ocular infection is diagnosed clinically (see annex 8 on the recommended case definition for the confirmed case) or immunologically.

Reference: Trachoma

- *WHO Trachoma Page*
  http://www.who.int/topics/trachoma/en/
- *World Health Organization. Trachoma control: A guide for program managers. Geneva: World Health Organization, 2006.*
  http://www.who.int/blindness/publications/tcm%20who_pbd_get_06_1.pdf
- *World Health Organization. Achieving Community Support for Trachoma Control. Geneva: World Health Organization, 1993.*
  http://www.who.int/blindness/achieving_en.pdf
- *World Health Organization. Primary Health Care Level Management of trachoma. Geneva: World Health Organization, 1993.*
  http://www.who.int/blindness/publications/trachoma_english.pdf
- World Health Organization. Trachoma epidemiologic survey protocol. Geneva: World Health Organization, 1993.
  http://www.who.int/blindness/prevalence_protocol_trachoma_english.pdf
- CDC Trachoma
  http://www.cdc.gov/healthywater/hygiene/disease/trachoma.html
- The Carter Center
  http://www.cartercenter.org/health/trachoma/index.html

Tuberculosis

Background

- Infection of the lungs and other organs usually caused by Mycobacterium tuberculosis transmitted person-to-person by droplet infection through coughing, sneezing or spitting. Clinically, the pulmonary form of the disease is more common than the extra-pulmonary form. The cardinal symptoms of pulmonary TB are chronic cough, weight loss, fever, loss of appetite and night sweats.

- Tuberculosis (TB) is a leading cause of infectious illness and death worldwide with over 8 million new cases and 3 million deaths per year. In African countries, approximately 1.6 million of the new cases and over 600 000 cases occur each year. It is also estimated that between 30 and 50% of all new TB cases detected are infected with HIV and 40% of all AIDS deaths are due to TB. Those who are at highest risk of dying from TB include people with HIV/AIDS, malnutrition and other immuno-compromising conditions, the very young, and the very old.
- The global HIV pandemic has been a major cause of increasing TB cases, especially in African countries.
- Incubation period is approximately 1 to 3 months.

- WHO recommends the Directly Observed Therapy, Short-course (DOTS) strategy to maximize compliance and treatment efficacy and to reduce development of drug-resistant strains. The DOTS strategy has been implemented by at least 40 of 46 Member States in the African Region. Varying degrees of success have been achieved in controlling TB where resources and motivation for diagnosis, treatment, and patient follow up are adequate.

- Clinically, bacterial pneumonia, malaria, trypanosomiasis, HIV/AIDS and a variety of other bacterial, parasitic, and viral infections may cause similar syndromes of fever, cough, fatigue, and weight loss, or may themselves precipitate active TB in an already infected individual. Abdominal or other extra-pulmonary sites of infection may occur after ingestion of un-pasteurized cow's milk (M. bovis).

Surveillance goal

- Early detection of persons with infectious lung disease to improve chances of clinical improvement and reduce transmission of TB.
- Improve percentage of TB cases confirmed by microscope

Standard case definition: 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.

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:

- Report observed trends to the next level, or according to national guidelines.
- Treat individual cases with direct observation (DOTS) including a treatment supporter.
- Where feasible, isolate persons using respiratory infection control practices, especially if multi-drug resistant TB is suspected.

Respond to action threshold

If the number of cases or deaths increases to two times the number usually seen in a similar period in the past:

- Assess health worker performance with detection and treatment of smear-positive PTB and improve practices as needed.
- Assess DOTS program and take action to make identified improvements.
- Conduct drug susceptibility tests to establish patterns of resistance.

Analyse and interpret data

Time: Graph cases and deaths monthly.

Place: Plot distribution of case households and workplaces.

Person: Count monthly cases and deaths. Analyse age and sex distribution quarterly.

Laboratory confirmation: Tuberculosis	
Diagnostic test	Microscopy: Presence of acid fast bacillus (AFB) in Ziehl Neelsen (ZN) stained smears Culture and identification Drug susceptibility test: Anti-tuberculosis drug resistance occurs when a strain of *Mycobacterium tuberculosis* isolate is resistant to one or more antimicrobial agents as evidenced by internationally recommended methods for susceptibility tests) MDR =Resistance to Isoniazid and Rifampicin; X-DR= Resistance to Isoniazid and Rifampicin (MDR); plus additional resistance to a fluoroquinolone and a second-line injectable agent
Specimen	Deep-chest sputum Aspirates
When to collect the specimen	Collect sputum (not saliva) for direct smear microscopy and examine at least two stained specimens taken on different days.
How to prepare, store, and transport the specimen	Smear should be examined at health facility where the specimen is taken. TB cultures should be packaged in leak proof containers, wrapped in cotton wool. Transport in waterproof container to reference lab.
Results	TB microscopy is read daily. Quantification of observed mycobacterium are reported using various reporting methods. Refer to the criteria used by the examining laboratory. Culture: after 6-8 weeks Anti-tuberculosis drug resistance: The national reference laboratory should be linked to an Supranational reference laboratory by strain exchange to ensure quality control
Reference	
▪ *Treatment of Tuberculosis: Guidelines for National Programs. WHO/TB/97.230* ▪ *Policy Statement of Prevention Therapy Against TB in People Living with HIV, WHO/TB/98.255* ▪ *Laboratory Services in Tuberculosis Control, Parts I, II and III. WHO publications WHO/TB/98.258*	

Typhoid Fever

Background

- Typhoid fever is a bacterial disease, caused by Salmonella typhi. Symptoms usually develop 1–3 weeks after exposure, and may be mild or severe. They include high fever, malaise, headache, constipation or diarrhoea, rose-coloured spots on the chest, and enlarged spleen and liver. Healthy carrier state may follow acute illness.

- Typhoid fever remains a serious public health problem throughout the world, with an estimated 16–33 million cases and 500 000 to 600 000 deaths annually.

- In virtually all endemic areas, the incidence of typhoid fever is highest in children from 5–19 years old. The disease is almost exclusively transmitted by food and water contaminated by the faeces and urine of patients and carriers.

- Polluted water is the most common source of typhoid transmission. In addition, shellfish taken from sewage-contaminated beds, vegetables fertilized with night-soil and eaten raw, contaminated milk and milk products have been shown to be a source of infection.

- Typhoid fever has been virtually eliminated in most areas of the industrialized world with the advent of proper sanitary facilities. Most cases in developed countries are imported from endemic countries.

- People can transmit the disease as long as the bacteria remain in their body; most people are infectious prior to and during the first week of convalescence, but 10% of untreated patients will

Surveillance goal

- Detect Typhoid Fever sporadic cases and outbreaks promptly, and seek laboratory verification
- Identify areas/population at high risk in order to improve prevention of the disease by taking hygienic measures

Standard case definitions

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.

Typhoid Fever

Respond to alert threshold

If Typhoid fever cases are suspected:

- Arrange for laboratory testing of stool specimens or rectal swabs of suspected cases, especially in situations where food- or waterborne transmission is suspected.
- Report and investigate all suspected outbreaks of typhoid. Search for case/carrier that is the source of infection and for the vehicle (water or food) through which infection is being transmitted.
- Treat typhoid fever patients with antibiotics. Severe cases should be provided supportive measures such as oral or intravenous hydration, the use of antipyretics, and appropriate nutrition.

Respond to action threshold

If Typhoid Fever cases are confirmed

- Initiate a line list/register for cases
- Identify areas/populations at high risk to identify source(s) and mode(s) of transmission in order to prevent and control the disease.
- Conduct health education programmes on hygiene with simple messages on safe water, safe food handling practices, hygiene and handwashing.
- Work with water authorities to support provision of clean water and proper sanitation to affected population(s). Chlorinate suspected water supplies. All drinking water should be chlorinated or boiled before use.
- More than 90% of patients can be managed at home with oral antibiotics, reliable care and close medical follow-up for complications or failure to respond to therapy. Patients with persistent vomiting, severe diarrhoea and abdominal distension may require hospitalization and parenteral antibiotic therapy.

Analyse and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks.

Place: Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths.

Report summary totals monthly.

Laboratory confirmation: Typhoid Fever	
Diagnostic test	Culture: Isolation of *salmonella spp.* from stool or blood of a patient The WIDAL Test should not be used for diagnostic purpose
Specimen	Blood Stool
When to collect	Collected samples preferably before antibiotics are administrated
How to prepare, store, and transport	5-10 ml of blood distributed in a blood culture bottle. Stool in stool container Store specimens at 4-8 C or ambient temperature away from heat and direct sunlight.
Results	Blood culture 4 days to 2 weeks Stool 3-4 days.

Reference

- *The Diagnosis, Treatment and Prevention of Typhoid Fever; WHO/V&B/03.07*
- *Weekly Epidemiological Record; N° 1, 2005, 80, 1-8; http//www.who.int/wer*
- *WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2*

Unexplained Cluster of Health Events or Deaths

Background

- Many public health events that have shaped history started at the local level as an outbreak, spread with travel, and were due to unknown causes until they were later explained. It is the willingness to call an alert about uncertain and worrying events that is the sign of a functional public health system.
    - By their nature these events cannot be precisely described but scenarios have been used to help illustrate what might raise concern. The IHR regulations contain a "decision instrument" to guide WHO members (Refer to **Section 2** of these guidelines). A "yes" answer to any two of the following four questions means that an event potentially constitutes a public health emergency of international concern that the WHO member must notify to WHO: (1) Is the public health impact of the event serious? (2) Is the event unusual or unexpected? (3) Is there a significant risk of international spread? (4) Is there a risk of restrictions on international travel or trade?
- The report that there is a possible outbreak or unusual event may come from different sources including:
    - routine analysis of surveillance data (e.g. from routine reporting indicates an unexpected increase in cases of a notifiable disease
    - a health worker (doctor, nurse or CHA, Environmental health Technician (EHT)) who reports a cluster of patients with a certain disease at their HCF or in the community
    - a community leader who notices an unusual health event in their community and reports it to the authorities
- Continued reporting of these events from the local level are contingent on the willingness of the district, County/Regional and National levels to listen and give credibility to the local levels. The responsiveness of the system to these alerts will define the likelihood that they will be reported and vigilance continues.
- A literature review into the important obstacles for reporting Public Health Events of International concern found the following:
- Lack of knowledge among clinicians of the reporting process, including not knowing what diseases are reportable and not knowing what to report. Often there is confusion over who is responsible for reporting between the hospital and laboratory as well as confusion over whether laboratory confirmation is required prior to reporting.
- A lack of understanding of how information acquired through reporting is used and a perception that reporting diseases is a useless endeavour.
- The effect of actual or perceived negative consequences associated with reporting, such as extra work, intrusive requests for further information, media attention, judgment, punishment or blame, was stressed as an obstacle by multiple respondents.
- Strategies to enhance completeness of notifiable disease reporting and IHR events include the following:
    - Provide clear information to frontline staff about
    - Why report unusual events?
    - What events are reportable?
    - How to report an unusual event?
    - What happens after you report?

- Examples of event reporting:
    - Strengthen the ability to ask questions and get immediate feedback between clinicians and other key partners to encourage more complete reporting, such as by providing access to public health professionals in the case of emergencies and establishing a 24-hour toll free phone number for reporting.
    - More frequent field visits or phone conferences can help as well.
    - Feedback to clinicians and others in the reporting chain, showing them that preventative action is being taken as a result of their notification, helps emphasize the need for timely and complete reporting. Providing feedback to those reporting could increase trust and transparency in the exchange of information about unusual events, improve the perception of how reported information is used and demonstrate the consequences of not reporting
    - All surveillance is built on good personal relationships or knowledge of the individuals involved in reporting. Encourage relationship building.

- <u>How reported information is handled:</u>
    - The IHR has national focal points that contact their counterparts at WHO regional Offices. These regional offices enter epidemiological and other information necessary for risk analysis and management into an event management system that stores the information and makes it available. Feedback to countries through a national IHR focal point completes the reporting link and, if countries require support in outbreak response, a request is transmitted back to the WHO.
    - This most recent guidance from WHO/AFRO focuses on Public Health Events (PHE) of initially unknown aetiology, which are PHEs for which the cause has not yet been determined. For such events, the One Health approach is recommended, where the ministry of health works in close collaboration with other ministries and multi-sectoral partners to enhance teamwork and improve efficiencies in preparedness, response, and monitoring and evaluation (M&E).

Surveillance goal

- The assessment of whether an event may potentially be of international significance occurs at the national level, guided by Annex 2 of the IHR (2005) which is not intended to be used sub-nationally.
- In this definition of an “event” or death sensitivity is prioritized to facilitate reporting and to reduce delays, emphasizing the fact that there should be no negative consequences f\or a potentially false signal.
- Detect cases.
- Immediate case-based reporting of all cases. Weekly summary reporting of cases for routine surveillance and outbreaks.

Unexplained Cluster of Health Events or Deaths

Standard case definition

These events are not well detailed or standardized at this time. In the IHR 2005 two events were chosen to help guide the surveillance functionality and allow early detection and response.

- Unexplained deaths
- Clusters of illness

Community Alert Triggers

Unknown health problems grouped together. Any health problem that you don't know about that is happening to many people or animals in the same community.
Examples include:

- any outbreak or cluster: A group of people are sick (or die) with similar symptoms in one place (community, school, or health facility) at the same time
- any unusual death or cluster of deaths: two or more people die of unknown cause after suffering from similar symptoms in one place (e.g. village, school, or HCF) at the same time
- a group of people that become sick or have another unusual reaction after consuming the same food or drinking from the same water source
- any person that becomes sick with symptoms that have not seen before or not seen for a long time (e.g. an emerging infectious disease is suspected)
- community member(s) become sick around the time that animals are sick or die in
- their village
- Sick or dead animals of unknown cause

Health Facilities

The proposed definition for events to be reported by clinicians and **health care facilities** is: "Any outbreak of disease, OR any uncommon illness of potential public health concern, OR any infectious or infectious-like syndrome considered unusual by the clinician, based on frequency, circumstances of occurrence, clinical presentation, or severity".

Any infectious or infectious-like syndrome considered unusual by the clinician based on:

- Frequency- e.g., a sudden unexplained, significant increase in the number of patients, especially when it occurs outside the normal season.
- Circumstances of occurrence – e.g., many patients coming from the same location or participating in similar activities.
- Clinical presentation- e.g., a patient's health rapidly deteriorating out of proportion to the presenting symptoms and diagnosis.
- Severity – e.g., a number of patients failing to respond to treatments.
- Patient with history of exposure to animals (wild or domestic) that presents with unusual clinical presentation

Unexplained Cluster of Health Events or Deaths

Standard case definition

The proposed definition of a reportable event for **laboratories** is:

- "Any situation considered unusual related to received samples (frequency, circumstances of occurrence or clinical description) OR test results (unexpected number of the same species/subspecies, strain type/subtype or antimicrobial resistance pattern, or failure/uncertainty in diagnostics)".

Respond to alert threshold

If a single unexplained death or cluster of deaths or illness is suspected:

- Report the suspected case or cases immediately using IDSR alert form
- Begin active surveillance
- Conduct a case-based investigation.
- Notify events that cluster by person, place or time that are of concern.

Respond to action threshold

If a case is validated by district/County or Regional or National level will decide which actions to take. They may include the following response measures for routine outbreaks until Public Health Emergency RRT's may be involved. See **Section 6** of these IDSR guidelines.

- Infection control measures using standard precautions among cases and with health workers.
- Safe and dignified burial
- If animals are involved, communicate and coordinated with County Livestock Officer or Ministry of Agriculture official

Analyze and interpret data

Time: Track onset of illness or symptoms and time (date) of death.

Place: Plot location of cases by household and community. Investigate the circumstances and possible modes of transmission in each case thoroughly. Examine the possibility of other involved areas. Look for environmental associations. Establish if there is a travel history. Plot cases on a map and look for clusters or relationships between the location of the cases and the health event being investigated

Person: Count cases and track demographic factors. Analyze age distribution, occupational association and recent exposures. Assess risk factors.

Laboratory confirmation

Diagnosis of public health events of international concern including unexplained death and Clusters of illness are made by their appearance or after considering other more familiar options. There is no specific test that can be done.

References

- MacDonald et al.: Detection of events of public health importance under the international health regulations: a toolkit to improve reporting of unusual events by frontline healthcare workers. BMC Public Health 2011. 11:713.
- International Health Regulations 2005 http://www.who.int/ihr/9789241596664/en/ 2nd edition. ISBN: 9789241580410
- Public health events of initially unknown aetiology: A framework for preparedness and response in the African Region. WHO Regional Office for Africa, 2014. ISBN: 978 929 023 2476 (NLM Classification: WA 105)

West Nile Fever

Background

- West Nile Fever is a febrile illness resulting from a mosquito-borne arbovirus in the *Flavivirudae* family. It is a zoonotic disease transmitted from birds to humans and other animals. Serological evidence suggests that the infection is present throughout practically the entire African continent. West Nile Fever most likely emerged in Africa and is now found world-wide. Outbreaks occur in humans, birds and horses.
- Most cases are mild and may not come to the attention of the health system. Patients seeking health care usually present with flu-like symptoms such as fever, headache and body aches. Occasionally patients present with a skin rash on the neck, trunk, arms or legs.
- People of all ages and conditions may be affected. However, those who are above age 50 years or who have had an organ transplant are at increased risk of severe illness.
- Very severe cases include signs of encephalitis, meningo-encephalitis or meningitis. Symptoms include high fever, headache, neck stiffness, stupor, tremors, convulsions, flaccid paralysis and coma.
- The case fatality rate in patients with neurological involvement ranges from 4% to 14% and as high as 29% in elderly patients.
- West Nile Fever can be prevented by avoiding mosquito bites especially at dusk when mosquitoes are most active. Insect repellents, wearing long sleeves and trousers, staying indoors and draining breeding sites like pools of standing water can reduce exposure to mosquitoes.

Surveillance goal

- Identify risk factors for infection and determine high-risk populations for targeted prevention activities
- Identify geographic areas for targeted prevention and control activities
- Identify most severe cases for referral to hospitalized care

Standard case definition

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

West Nile Fever

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

Respond to action threshold

If a single case is confirmed:

- Treat and manage the patient with supportive care
- Mobilise the community through education in order to promote adoption of behaviours that reduce disease risk such as protection against mosquito bites and reduction of mosquito breeding sites
- Conduct community education on how WNV is transmitted and on how to prevent being infected

Analyse and interpret data

Time: Construct an epidemic curve during the outbreak.

Place: Plot location of case residence and worksite.

Person: Immediate case-based reporting of cases and deaths. During an outbreak, count and report cases and deaths. Analyse age and sex distribution. Assess risk factors immediately and consider request for assistance to improve outbreak control.

Laboratory confirmation: West Nile Fever	
Diagnostic test	Presence of IgM antibodies against West Nile Fever

Specimen	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.
How to prepare, store, and transport the specimen	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-20C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* ▪ Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. Store at room temperature. Formalin-fixed specimens may be transported at room
Results	Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

Reference: West Nile Fever

- *Global Alert and Response; West Nile Fever epidemic updates http://www.who.int/csr/don/archive/disease/west nile fever/en/*
- *Pedro N. A and Boris Szyfres. Zoonoses and Communicable Diseases Common to Man and Animals. Third edition, Volume II. Chlamydioses, Rickettsioses and Viroses, Part II: Viroses Pages 372-376. Pan American Health Organization, WHO*
- *Epidemic/Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention and*
- *Control. http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-aug-2003.pdf*
- *Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting WHO/EMC/ESR/98.2*
- *Evans, A.S. (ed). Viral Infections of Humans; Epidemiology and Control. 1989. Plenum Medical Book Company, New York*
- *Evans, A.S. (ed). Viral Infections of Humans; Epidemiology and Control. 1989. Plenum Medical Book Company, New York*

Yellow fever

Background

- Yellow fever virus is an RNA that belongs to the genus Flavivirus and is related to West Nile, St. Louis encephalitis, and Japanese encephalitis viruses. It is transmitted human-to-human via the domestic species of *Aedes* mosquitoes (Urban epidemics) or to humans from primate reservoir via a forest mosquito species (Sylvatic cycle).
- Large scale outbreaks occur every 3 to 10 years in villages or cities in the absence of large scale immunisation. Sporadic cases can occur regularly in endemic areas. Resurgence of disease in Africa since mid-1980s. True incidence far exceeds reported cases.
- Incubation period 3 to 6 days after the bite from an infected mosquito. About 15% of infections progress to fever and jaundice.
- While only the minority of cases are severe, case fatality rate may be 25% to 50% among patients with syndrome of haemorrhage, jaundice, and renal disease.
- Risk factor: sporadic cases often linked to occupation or village location near woods or where monkeys are numerous. Also non-vaccinated persons.
- International reporting to WHO required within 24 hours.
- Viral haemorrhagic fevers (VHF) and other parasitic, viral, or bacterial diseases such as malaria, Dengue Chikungunya, leptospirosis, hepatitis A-E, Epstein-Barr virus, West Nile, Q fever, anthrax, rickettsial diseases, etc. and toxic exposures may mimic yellow fever.
- Infection and disease can be prevented by vaccination. With a vaccine efficacy > 95% and duration of immunity is life time

Surveillance goal

- Seek confirmation of yellow fever and rule out other possible aetiologies of fever with jaundice
- Provide information in order to adopt appropriate control measures
- Identify populations at risk of yellow fever
- Monitor the epidemiology of the disease and the impact of control measures
- Support operational research and innovation

Standard case definition: 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

AND

One of the following

- Epidemiological link to a confirmed case or an outbreak
- Positive post-mortem liver histopathology

Confirmed case: A probable case

AND

One of the following

- Detection of YF-**specific*** IgM
- Detection of four-fold increase in YF IgM and/or IgG antibody titres between acute and convalescent serum samples
- Detection of YFV-**specific*** neutralizing antibodies

***YF-specific means that antibody tests (such as IgM or neutralizing antibody) for other prevalent flavivirus are negative. This testing should include at least IgM for Dengue and West Nile and may include other flavivirus depending on local epidemiology.*

OR

One of the following

- Detection of YF virus genome in blood or other organs by PCR
- Detection of yellow fever antigen in blood, liver or other organs by immunoassays Isolation of the yellow fever virus

Laboratory confirmation: Yellow fever	
Diagnostic test	1. ELISA for the presence of yellow fever Specific IgM and IgG antibodies. 2. Exclusion of Dengue, West Nile virus and other locally prevalent flavivirus will be necessary for the confirmation of yellow fever. 3. PCR, YF specific seroneutralization, virus isolation or histopathology
Specimen	Serum in the acute and convalescent phases of the illness; In the event of death, post-mortem liver specimen
When to collect the specimen	Within 14 days of onset of first symptoms Collect specimen from at least the first to 10th suspected cases of yellow fever. Collect specimen from last cases (based on epidemic curves) to decide on the end of the epidemic.
How to prepare, store, and transport the specimen	▪ Collect 10 ml of venous blood from adults, 1-5 ml from children, in a capillary tube, microtainer, or if necessary in a standard glass test tube. ▪ Separate blood cells from serum: o Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. o If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. o If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pipette serum into a labelled tube for transport and storage. ▪ Store serum at 4°C. Transport serum samples using appropriate packaging to prevent breaking or leaks during transport. Avoid glass tubes for shipment and transport if possible. The specimen should arrive at the laboratory within 3 days of being collected. Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile – just clean. Transport the serum in an EPI hand vaccine carrier at 4°C-8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.
Results	Laboratory results should be received within 7 days of reception of the specimen in the laboratory.

Reference: Yellow fever

- *WHO–recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01 http://apps.who.int/iris/bitstream/10665/68334/1/WHO_V-B_03.01_eng.pdf?ua=1*
- *Yellow Fever. 1998. WHO/EPI/Gen/98.11*
- *Recommendation of Expert Meeting on Yellow Fever Surveillance and Response in Africa. Brazzaville, Congo, from 13 to 15 October 2010*

Zika virus disease

I. Background

- Zika virus is a flavivirus that is transmitted primarily through the bite of an infected mosquito, primarily *Aedes aegypti*, and also *Aedes albopictus*, the same mosquitoes that transmit dengue, chikungunya, and yellow fever.
- Zika virus can also be transmitted *in-utero* from mother to foetus, and through sexual contact, blood transfusion, and organ transplantation.
- Zika virus infections are usually asymptomatic. When symptoms occur, they tend to be mild and include mild fever, rash, conjunctivitis, and muscle and joint pain that last for 2 to 7 days. There is no specific treatment but symptoms can be treated with common fever medicines, rest and drinking fluids.
- Zika virus infection during pregnancy can result in preterm birth, foetal loss, stillbirth, and congenital malformations including microcephaly, limb contractures, eye abnormalities, brain calcifications, and other manifestations of Congenital Zika Syndrome.
- Zika virus is also associated with an increased risk of Guillain-Barré syndrome, and other neurological complications requiring close medical management and possibly intensive care and mechanical ventilation.

History

- Zika virus was first identified in 1947 in a rhesus monkey the Zika forest of Uganda, and was first identified in humans in 1952 in Uganda and the United Republic of Tanzania. Over the following decades, Zika virus caused rare, sporadic cases of disease in Africa and Asia, generally causing mild and self-limited illness of fever, rash, malaise, and other mild symptoms.
- The first outbreaks were reported in Yap Island (Federated States of Micronesia) in 2007 and French Polynesia in 2013. The virus subsequently spread to other Pacific islands including New Caledonia, Cook Islands, Vanuatu and Easter Island (Chile), Fiji, Samoa, Solomon Islands, and Vanuatu. Zika virus was not known to cause severe disease until the 2013-2014 outbreak in French Polynesia, where increased incidence of Guillain-Barré Syndrome was first reported.
- The Zika virus outbreak in the Region of the Americas began in Brazil in 2015; in July 2015, Brazil reported an association between Zika virus infection and Guillain-Barré syndrome (GBS) and few months later, in October 2015, an association between Zika virus infection and microcephaly.
- Since 2015, outbreaks of Zika virus disease have now been recorded in Africa, the Americas, Asia and the Pacific; to date, 86 countries and territories have confirmed evidence of mosquito-borne Zika transmission. Since 2017, Zika virus transmission in the Americas has waned, but transmission continues with intermittent areas of emergence and re-emergence.
- In the African Region, only rare, sporadic Zika virus infection had been reported until 2015. Since 2015, outbreaks of Zika virus have been reported in Cabo Verde, Guinea-Bissau, and Angola.
- There are two strains of Zika virus known as the African and Asian strains. The Asian strain was associated with the outbreaks in the Pacific and in the Americas. The Asian strain was also identified in the Cabo Verde outbreak and in Angola. In Angola, a cluster of microcephaly was reported in

2017-2018, and introduction of the epidemic (Brazilian) Asian strain was confirmed, including among infants born with microcephaly. To date, microcephaly has only been identified following infection with the Asian strain. Little information is available on the spectrum of disease and pregnancy risk associated with the African strain.

- *Aedes* mosquitoes that transmit Zika, dengue, yellow fever, and chikungunya primarily bite during daylight hours. *Aedes sp.* breed in small collections of water such as in trash, used tyres, flower pots, and open water storage containers. Efforts to prevent transmission focus on elimination of these breeding sites around homes and near other areas of human-vector contact such as around schools and work sites. Other prevention strategies include use of personal protection measures such as use of protective clothing, insect repellent, and screens on windows and doors.

II. Surveillance goals

The goal of surveillance is to develop, strengthen and implement integrated surveillance systems at all levels for Zika virus disease, its complications, and other arboviral diseases and their vectors, in order to provide up-to-date and accurate epidemiological and entomological information to guide response.

Existing surveillance systems should be enhanced for early detection and reporting of Zika virus and unusual clusters of neurological disorders or birth defects.

Timely notification of any event compatible with Zika virus is important, and in particular any associated with neurological disorders and neonatal malformations through established channels, including IHR.

The establishment or strengthening of event-based or syndromic surveillance should be supported, potentially targeting specific groups for surveillance, such as pregnant women through antenatal and postnatal care, sentinel based surveillance systems for birth defects and Guillain-Barré syndrome, and existing lab-based disease specific surveillance systems (e.g. measles, polio) to facilitate detection of Zika virus infection and associated disorders. Given the common vector and epidemiologic transmission patterns of dengue, Zika, and chikungunya calls for an integrated arbovirus surveillance.

III. Standard case definitions

Suspected Case:

A person presenting with rash and/or fever and at least one of the following signs or symptoms:

- arthralgia; or
- arthritis; or
- 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 (e.g. saliva, urine, tissue, whole blood); or
- IgM antibody against Zika virus positive and $PRNT_{90}$ for Zika virus with titre ≥20 and Zika virus $PRNT_{90}$ titre ratio ≥ 4 compared to other flaviviruses; and exclusion of other flaviviruses.

These case definitions may change based on new knowledge.

IV. Response to Zika virus disease

If Zika virus cases are suspected:

- Immediately report suspected cases to the next level using the case-based reporting form.
- Collect specimens for laboratory confirmation of cases
- Conduct active search for additional cases.
- Strengthen event-based surveillance to detect the emergence of clusters of cases presenting with rash and febrile syndrome of unknown aetiology.
- Conduct an investigation to determine risk factors for transmission.
- Manage and treat cases with supportive care.

If Zika virus cases are confirmed:

Coordination and leadership

- Develop a national contingency plan for the prevention and control of Zika virus transmission and disease.
- Reinforce the Incident Management System to strengthen their coordination [including emergency operations center (EOC)] to include the preparedness to respond to Zika, dengue, chikungunya and yellow fever.
- Actively engage other sectors (e.g., environment, agriculture, tourism) to respond to Zika virus through a multi-sectoral approach (One Health approach).

Surveillance, data management and laboratory

- Notify WHO through Ministry of Health using the IHR decision instrument.
- Enhance surveillance of Zika virus disease and of the conditions that may be associated with it, including microcephaly and congenital Zika syndrome and Guillain-Barré syndrome (GBS).
- Enhance surveillance at prenatal and postnatal clinics to monitor possible congenital infections and complications.
- Conduct active search for additional cases.
- Ensure the rapid and timely reporting and sharing of information of Zika virus disease using the IDSR/IHR tools.
- Ensure proper collection, transport, and storage of specimens for laboratory diagnostic testing.
- Conduct community-based assessments to determine the abundance of vector mosquitoes, identify the

most productive larval habitats, promote and implement plans for appropriate vector control.
- Report any identified unusual increase in the incidence of congenital neurological malformations including microcephaly in neonates and adverse pregnancy outcomes not explained through alternate causes, to the relevant public health authorities using IDSR framework.

Vector control and personal protection: Zika virus disease

- Intensification of efforts to reduce mosquito populations including elimination of potential breeding sites (e.g., removal of trash and standing water sites around homes, covering home water storage containers, and use of larvicides) and adult mosquito control methods.
- Promotion of personal protection measures such as use of light-coloured protective clothing (long sleeves and pants), insect repellent, and physical barriers such as screens, closed doors and windows, and sleeping under mosquito nets including during the day when *Aedes* mosquitoes are most active.
- All operators and other persons involved in vector control, such as larvicide application and indoor residual spraying, should be given protective measures including personal protective equipment.

Social mobilization, community engagement and communication

- Develop risk communication messages to address population concerns, enhance community engagement, improve reporting, and ensure application of vector control and personal protective measures targeting reduction of contact with the vector.
- Provide women of childbearing age and particularly pregnant women with the necessary information and materials on family planning and to reducing risk of exposure.
- Provide clinical and psychosocial support services for affected children and families.

Transmission prevention and case management

- Engage community health workers to inform them of the disease and risks and to build capacity
- Reinforce preventative measures for pregnant women through targeted interventions (including primary antenatal, postnatal and neonatal health care settings).
- Pregnant women who feel they may have been exposed to Zika virus may wish to consult with their health-care providers for laboratory testing for Zika virus infection, ultrasound assessment, and close monitoring throughout pregnancy, labor, delivery, and the post-natal period.
- After delivery, all infants should have head circumference measured and be examined for evidence of congenital malformations, including microcephaly, eye abnormalities, limb contractures, and other anomalies associated with congenital Zika syndrome.
  http://apps.who.int/iris/bitstream/10665/204475/1/WHO_ZIKV_MOC_16.3_eng.pdf?ua=1
- Zika can be transmitted through blood and blood products. Precautions already in place for ensuring safe blood donations, transfusions, and prevention of blood borne pathogens should be followed.
- Zika can be transmitted sexually. Men and women need to get counselling on safer sexual practices, and be offered condoms and full range of contraceptive methods.

- Ensure that pregnant women who have been exposed to Zika virus be counselled and followed for birth outcomes based on the best available information and national practice and policies.
- Refer most severe cases with complication to hospitalized cares.

Operational research

- Evaluate methods for practical, sustainable surveillance for Zika virus transmission, including strategies for integrated arbovirus surveillance.
- Conduct studies including case-control studies to investigate disease outcomes of infants exposed *in-utero* to Zika virus infection.
- Promote research in the areas of vaccines, drugs, diagnostics, vector biology and appropriate mosquito control methods.
- Entomological surveillance of *Aedes* mosquitoes is used for operational research purposes to determine changes in geographical distribution, for monitoring and evaluating control programmes, for obtaining relative measurements of the vector population over time, and for facilitating appropriate and timely decisions regarding interventions. Sampling of *Aedes* mosquitoes, pupae and oviposition should be conducted.
- As part of entomological surveillance, insecticide resistance monitoring in field populations of Aedes should be conducted to identify and select the appropriate insecticides.

NB: Application of strategic intervention in different country contexts:

The described interventions will be packaged and applied in countries depending on the context. In countries where there is the spread of Zika virus as well as the associated complications, a full suite of strategies will be applied from enhanced surveillance, engaging communities, vector control and personal protective measures, care for people with complications and public health research to better understand risk and evaluate mitigation measures.

For countries are already experiencing widespread Zika transmission or presence of *Aedes* vectors, enhanced surveillance should be put in place, communities engaged, and vector control and personal protective measures enhanced.

For all other countries, risk communications for the public regarding trade and travel will be the main line of engagement. Table 1 below outlines the application of the strategies in the varying country context.

Table 1: Application of strategies to country context

Country Context	**Engage communities communicate risks**	**Monitor for Zika virus transmission and disease**	**Control transmission and prevent exposure**	**Manage complications associated with Zika virus**	**Investigate associated risks**

***Aedes* + Zika virus + associated complications**	✓	✓	✓	✓	✓
***Aedes* + Zika virus**	✓	✓	✓		
Aedes	✓	✓	✓		
Other	✓				

V. Analysis and interpretation of data

Time: Graph cases of Zika virus infection, Guillain-Barré syndrome, and deaths weekly, by date of onset of symptoms. Graph cases of microcephaly and congenital Zika syndrome by date of birth. Construct an epidemic curve during the outbreak.

Place: Plot location of case households and worksites using precise mapping.

Person: Report case-based information for cases including Zika virus associated complications, hospitalizations, and deaths. Analyze age and sex distributions and rates of associated complications. Assess risk factors to improve prevention of outbreaks and to better understand the rate of neurological complications among those infected with Zika virus.

NB: Entomological Analysis

In affected and high risk areas map infected and uninfected mosquito populations, breeding sites and case households

VI. Laboratory confirmation

Diagnostic tests	– Reverse transcriptase-polymerase chain reaction (RT-PCR) for viral RNA – Serology for IgM detection – Plaque reduction neutralization test (PRNT)
Specimens	– RT-PCR: serum, whole blood, or urine collected in a dry tube

	within 7 days of onset of symptoms – Serology (IgM): whole blood or serum collected in a dry tube >7 days after onset of symptoms. Whenever possible, a convalescent specimen should be collected at least 2-3 weeks after first specimen for IgG
How to prepare, store and transport specimen	Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens. – Keep refrigerated (2-8 °C) if specimen will be tested within 48 hours of collection. – If testing will be done >48 hours, separate and freeze serum at -20 °C and store for up to 7 days. – If storage >7 days, serum specimens should be stored at -70 °C. – All types of specimens may be kept frozen at -20oC for up to 7 days, or at -70oC if >7 days. Samples can be preserved for extended periods. – Repeated freezing and thawing of specimens should be avoided. – Temperature should be monitored and recorded regularly to diminish risk of temperature fluctuations. *Aedes* mosquitoes for testing should be frozen and transported dry using standardized protocols.
Results	Diagnostic services for Zika virus are not routinely available. Contact the appropriate National authority or WHO for the assigned reference laboratory within the EDPLN.

VII. References

1. Information note to the WHO representatives on prevention and response to Zika virus in the WHO African region, February 2016
2. Microcephaly/Zika virus disease talking points, 2 February 2016.
3. WHO statement on the first meeting of the International Health Regulations (2005) (IHR (2005) Emergency Committee on Zika virus and observed increase in neurological disorders and neonatal malformations
4. The 2010 IDSR second edition; http://www.afro.who.int/en/clusters-a-programmes/dpc/integrated-disease-surveillance/features/2775-technical-guidelines-for-integrated-disease-surveillance-and-response-in-the-african-region.html
5. Zika virus Fact sheet, Updated July 2018; http://www.who.int/mediacentre/factsheets/zika/en/
6. Laboratory testing for Zika virus infection: interim guidance, March 2016. http://apps.who.int/iris/bitstream/handle/10665/204671/WHO_ZIKV_LAB_16.1_eng.pdf?sequence=1&isAllowed=y

Annexes to Section 11

The following annexes are program specific forms that are used in Sierra Leone for case based investigations.

ANNEX 11A: Acute Flaccid Paralysis case investigation form

Annex 11B: Acute Jaundice Syndrome Case Investigation Form

Annex 11C: Acute Haemorrhagic Fever Case Investigation Form

ANNEX 11D: Sample reporting forms for adverse events following immunization (AEFI)

ANNEX 11E: Adverse event following immunization investigation form

Annex 11F: Animal Bite /Rabies Case Investigation Form

Annex 11G: Animal bite (Snake bite) Case Investigation Form

Annex 11H: Anthrax Case Investigation Form

Annex 11I: Bacterial Meningitis Case Investigation form and Decisional tree

Annex 11J: Buruli Ulcer Case Investigation form

Annex 11K: Chikungunya Case Investigation Form

ANNEX 11L: Cholera case-based investigation form

Annex 11M: Dysentery Case Investigation Form

Annex 11N: Influenza Case Investigation Form

Annex 11O: Measles Case Based Investigation Form

Annex 11P: Monkey Pox Case Investigation Form

Annex 11Q: Maternal Death Investigation Form

Annex 11R: Perinatal Death Investigation Form

Annex 11S: Neonatal Tetanus Case Investigation Form

Annex 11T: Small Pox Case Investigation Form

Annex 11U: Yellow Fever Case Investigation Form

ANNEX 11V: Guinea worm disease case investigation form

ANNEX 11W: Tuberculosis (MDR and XDR TB) case-based reporting form

ANNEX 11X: Viral haemorrhagic fever case reporting form

ANNEX 11Y: Acute or Chronic Viral Hepatitis case investigation form

Annex 11Z: Unusual serious medical condition investigation form

Annex 11AA: Unusual serious event investigation form

Annex 11AB: IDSR Case Based Notification Form

Annex 11AC: Laboratory Request Form

Annex 11AD: Laboratory Result form

Annex 11AE: IDSR Weekly reporting form

Annex 11AF: IDSR Outbreak line list

ANNEX 11AG: Contact listing forms

ANNEX 11AH: Community alert reporting form

ANNEX 11AJ: Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet

Annex 11A: Acute Flaccid Paralysis case investigation form

GOVERNMENT OF SIERRA LEONE

ACUTE FLACCID PARALYSIS CASE INVESTIGATION FORM

Official Use Only: EPID Number: _____-_____-_____-_____-_____
Country Region/Prov. Districts Year onset Case Number

Received: ____/_____/_____
by the Programme at National level

IDENTIFICATION
District:_____ Region/Province: _____ **Name nearest** Health Facility: _____
Address:_____ Village:_____ City: _____

AFP case coordinates (*WGS 1984 format*) : Longitude :_____ Latitude :_____

Patient name: _____ Father/Mother:_____

Date of Birth (DOB)___/_____/_____ Age: _____ years _____months (If DOB Unknown) Sex: ☐ M=Male ☐ F=Female

NOTIFICATION/INVESTIGATION:
Notified by:_____ Date of Notification____/_____/_____ Date of Investigation: ____/_____/_____

HOSPITALIZATION Hospitalized: ☐ 1=Y 2=N Date of admission to hospital, if applicable: _____/_____/_____

Hospital record #:_____ Name of hospital/Address:_____

CLINICAL HISTORY
Fever at the onset of paralysis? ☐ 1=Y, 2=N, 99=Unknown
Progressive Paralysis ≤ 3 days? ☐ 1=Y, 2=N, 99=Unknown
LA ☐☐ RA
Date of onset: of paralysis: ___/_____/_____
Is Paralysis flaccid and acute? ☐ 1=Y, 2=N, 99=Unknown
Asymmetric? ☐ 1=Y, 2=N, 99=Unknown
Site of Paralysis LL ☐☐ RL

Paralysed limb (s) Sensitive to pain: Yes/No
Was there any injection just before onset of paralysis: Yes/No

If yes mention the site of injection in the table below

	Arm	Fore-arm	Buttocks	Thigh	Leg
Right					
Left					

PROVISIONAL DIAGNOSIS----------

AFTER INVESTIGATION, WAS THIS A TRUE AFP? ☐ 1=Y 2=N If not, do not fill the rest of the form and record 6 under final classification

IMMUNIZATION HISTORY

Total Number of Polio vaccine doses ☐ Exclude dose at birth 99=Unknown

OPV dose at birth _____/_____/____ 2nd _____/_____/____ 4th ____/_____/____ If > 4
1st _____/_____/____ 3rd _____/_____/____ Last _____/_____/____ dose

Total OPV (bOPV/mOPV2) doses received through SIA: ☐ 99=Unknown Total OPV (bOPV/mOPV2) doses received through RI: ☐ 99=Unknown

Total IPV doses received through RI and/or SIA: ☐ 99=Unknown Date of last IPV dose received through RI or SIA:____/___/_____

STOOL SPECIMEN COLLECTION:

_____/_____/_____ Date 1st specimen

_____/_____/_____ Date 2nd specimen

_____/_____/_____ Date specimen sent to the to the national level

_____/_____/_____ Date specimen received at the national level

_____/_____/_____ Date specimen sent inter-county/national Laboratory

---

STOOL SPECIMEN RESULTS:

____/_____/_____ Date specimen received at inter country (I-C)/national Lab

☐ 1= Adequate 2=Not adequate
Status of specimen at Reception at the lab

___/_____/_____ Date combined Cell Culture Results available

____/_____/_____ Date Results sent to national EPI

____/_____/_____ Date Results received at national EPI

Final cell Culture Results ☐
1=Suspected poliovirus
2= Negative
3=NPENT
4-Suspect poliovirus + NPENT

____/_____/_____ Date sent from I-C/National Laboratory to regional lab

____/_____/_____ Date I-T differentiation results sent to EPI

____/_____/_____ Date I-T differentiation results received at EPI

Final Lab Results

W1	W2	W3	Discordant Sabin	SL1	SL2	SL3	(R) NPENT	NEV
1=Y, 2=N			Type 1,2,3	1=Y, 2=N			1=positive, 2=Negative	

____/_____/_____ Date isolate sent for sequencing

____/_____/_____ Date seq results sent to program

FOLLOW-UP EXAMINATION

____/_____/_____ Date of Follow-up exam.

Residual Paralysis? LA ☐☐ RA LL ☐☐ RL

Results of exam ☐
1 = Residual Flaccid Paralysis
2=No residual paralysis
3= Lost follow-up
4=Died before follow-up
5= Residual Spastic Paralysis

Immunocompromised status suspected: ☐ 1=Y, 2=N, 99=Unknown

FINAL CLASSIFICATION

☐ 1=Confirmed Polio
2=Compatible
3=Discarded
6=Not an AFP case

☐ 7=cVDPV
8=aVDPV
9=iVDPV

☐ Sero-type (1, 2, 3)

Fill in this section before signing the form

Where has the child been seeking help for this problem before presenting at present place (in sequence of visits)?

(1). Place: _____ Duration: months____ days____ (2) Place:_____ Duration: months____ days____

INVESTIGATOR: Name_____ Title_____

Unit:_____Address_____ Tel:_____

ADDITIONAL ACUTE FLACCID PARALYSIS (AFP) CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Additional Demographic Information

Level of Education: No Education/Preschool /Primary /Secondary.

Workplace/School Name: _____

Workplace/School Physical Address: _____

Workplace/School Village/Town/City: _____

Workplace/School Contact Phone: _____

Name of Parent/Guardian/Next of Kin: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Investigation Information

*****DATE OF INVESTIGATION: _____/_____/_____

Was this case/condition/event detected by a health worker? Yes/No

Where was the case/condition/event detected? Health Facility/Community/Laboratory

Location where symptom started (Address): _____

Residential Village/Town/City where symptom started: _____

Residential Chiefdom/Zone where symptom started: _____

Annex 11B: Acute Jaundice Syndrome Case Investigation Form

GOVERNMENT OF SIERRA LEONE

ACUTE JAUNDICE SYNDROME CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Symptoms and Signs

Fever		Vomiting		Joint pain		Tender abdomen	
Jaundice (eyes, skin)		Anorexia		Pale stool		Swollen abdomen	
Diarrhoea		Fatigue		Dark Urine		Abdominal pain or cramps	
Nausea		Malaise		Oedema		Difficult breathing	

Onset date of Fever: _____/_____/_____

Health Worker

*Patient is a health worker: Yes/No/Unknown

Cadre: Doctor/CHO/SRN/SECHN/CHA/MCH Aide/Nursing Aide/Lab personnel/Pharmacy Personnel/ Ambulance driver/Porter/Nutritionist/EHO/Midwife/Other

Staff Position (Specify): _____

Staff work station : _____

Risk Factors

Have you ever had unprotected sex? Yes/No/Unknown/Not Applicable

Have you ever been treated for sexually transmitted diseases? Yes/No/Unknown/Not Applicable

Have you ever received blood or tissues? Yes/No/Unknown/Not Applicable

Have you ever engaged in body piercing, tattoo application or scarification? Yes/No/Unknown/Not Applicable

Have you ever injected drugs, share needles or other drugs paraphernalia? Yes/No/Unknown/Not Applicable

Have you ever undergone dialysis (haemodialysis) or peritoneal? Yes/No/Unknown/Not Applicable

Have you ever had occupational exposure like needle stick? Yes/No/Unknown/Not Applicable

Have you ever share accommodation with a confirmed case of Hepatitis (B or C)? Yes/No/Unknown/Not Applicable

Have you ever consumed possibly contaminated meal/food/beverage within 3 months of the onset of Jaundice? Yes/No/Unknown

Have you ever consumed under cooked meat or raw shellfish within 3 months of the onset of Jaundice? Yes/No/Unknown

Has there been floods in your residence in the past 3 months? Yes/No/Unknown

Have you ever traveled from your residence in the last 3 months? Yes/No/Unknown

If yes, Village/Town/City travelled to: _____

Chiefdom/Zone travelled to: _____

Travelled out of the Country: Yes/No/Unknown

If yes, Country travelled to (Address/Village/ town/ City): _____

Date Travelled (dd/mm/yyyy): _____/_____/_____

Date Returned (dd/mm/yyyy): _____/_____/_____

Prior Treatment/Self Medication: _____

Vaccination

Have you ever taken Hepatitis B vaccine? Yes/No/Unknown/Not Applicable

Case Investigator Assessment

*Does the alert meet case definition for Hepatitis Diseases? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg /Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B/Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

*****These are compulsory variable and must be completed.

Annex 11C: Acute Haemorrhagic Fever Case Investigation Form

GOVERNMENT OF SIERRA LEONE

VIRAL HAEMORRHAGIC FEVER (VHF) CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*****DATE OF INVESTIGATION: _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin: _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Contact and Household Information

*Patient was a followed contact: Yes/No/Unknown

Head of Household: _____

Head of Household mobile phone number: _____

*Information provided by category of person: Patient/Proxy

Information provided by - Name: _____

Information provided by - Relation to patient: _____

Number of Household Contacts: _____

Number of Other Contact: _____

Health Worker

*Patient is a health worker: Yes/No/Unknown

Cadre: Doctor/CHO/SRN/SECHN/CHA/MCH Aide/Nursing Aide/Lab personnel/Pharmacy Personnel/ Ambulance driver/Porter/Nutritionist/EHO/Midwife/Other

Staff Position (Specify): _____

Staff work station : _____

Current Illness

*Location where symptoms developed – Town/Village/neighbourhood/Street: _____

Location where symptoms developed – District/ Chiefdom: _____

SIGNS AND SYMPTOMS

Fever: ☐

Vomiting/nausea: ☐

Diarrhoea: ☐

Conjunctivitis (red eyes): ☐

Intense fatigue/weakness: ☐

Anorexia/Loss of appetite: ☐

Abdominal ☐ pain:

Muscle pain:

Joint pain: ☐

Headache:

Difficulty breathing:

Difficulty swallowing:

Skin rash:

Hiccups:

Unexplained bleeding:

Unexplained bleeding (specify): _____

Other:

Hospitalisation

*Patient is in Isolation or Treatment Unit: Yes/No/Unknown

Date of admission to Isolation Unit or Treatment Unit: _____/_____/_____

Name Health Facility Patient Admitted: _____

Patient admitted or visit anyone at the Health Facility before becoming Ill: Yes/No/Unknown

If yes, name of health facility:_____

Previous admission or Visiting date: _____/_____/_____

Date of Previous Discharge from the Hospital: _____/_____/_____

Prior Treatment/Self Medication: _____

Traditional Healer

*Traditional Healer Visited/consulted 3 weeks before becoming ill: Yes/No/Unknown

Traditional Healer's Name: _____

Village/Town/City where the Patient visited the Traditional Healer: _____

Chiefdom/Zone: _____

Date seen: _____/_____/_____

Contact with Suspected or Confirmed VHF

*Contact with suspected or confirmed VHF case within 1 month before onset: Yes/No/Unknown

Type of contact: Same room or vehicle/ Same household / Frequent direct contact/ same community

Name of suspected or confirmed VHF case: _____

Relation to Patient: _____

Date of Last Contact: _____/_____/_____

Village/neighbourhood/town: _____

Chiefdom/ Zone: _____

Vital status of the suspected or confirmed VHF case: Alive/Dead/Unknown

If death, date of Death: _____/_____/_____

Funerals

*Did patient attend a funeral within 1 month before onset of Illness: Yes/No/Unknown

Name of Deceased Person : _____

Relation to patient: _____

Date of funeral: _____/_____/_____

Village/neighbourhood/town: _____

Chiefdom/ Zone: _____

Patient carried/touched the deceased: Yes/No/Unknown

Wild Animals or Animal Products

*Patient have had contact with any Wild Animal or wild animal products in the past one month: Yes/No/Unknown

Type of Wild Animal the patient had contact with: Bat/ monkeys/ chimpanzees /gorillas /baboons /duikers / squirrel/ others

If others specify:_____

Village/Town/City where the patient had contact with Wild Animal : _____

Chiefdom/Zone: _____

Date of contact: _____

Travel History

*Did patient travel outside home area in the last one month: Yes/No/Unknown

Village/Town/City visited: _____

Chiefdom/Zone visited: _____

Travelled out of the Country? Yes/No/Unknown

If yes, Country travelled to (Address/Village/ town/ City): _____

Date travelled: _____/_____/_____

Date returned Date: _____/_____/_____

Vaccination

Ebola Vaccine received:

Ebola Vaccine received date: : _____/_____/_____

Case Investigator Assessment

*Does the alert meet case definition for Acute Viral Haemorrhagic Fever? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion: _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa

Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B/Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death: _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11D: Sample reporting forms for adverse events following immunization (AEFI)

AEFI reporting ID number:

REPORTING FORM FOR ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI)

***Patient Name*:** ***Patient's full Address*:** Telephone: Sex: ☐ M ☐ F ***Date of birth* : _ _ /_ _ /_ _** *OR Age at onset:* ☐☐ *Years* ☐☐ *Months* ☐☐☐ *Days* *OR Age Group at onset:* ☐ *<1 Year* ☐ *1 to 5 Years* ☐ *>5 Years*	***Reporter's Name*:** Institution: Designation & Department: Address: Telephone & E-mail: Date patient notified event to health system: _ _ /_ _ /_ _ Today's date : _ _ /_ _ /_ _

Health facility (place or vaccination centre) name & address:

Vaccine						***Diluent (if applicable)***			
Name of vaccine	***Date of vaccination***	***Time of vaccination***	Dose (1st, 2nd, etc.)	***Batch /Lot number***	Expiry date	Name of diluent	***Batch /Lot number***	Expiry date	Date and time of reconstitution

Adverse event(s):

☐ Severe local reaction ☐ *>3 days* ☐ *beyond nearest joint*

☐ Seizures ☐ *febrile* ☐ *afebrile*

☐ Abscess
☐ Sepsis
☐ Encephalopathy
☐ Toxic shock syndrome
☐ Thrombocytopenia
☐ Anaphylaxis
☐ Fever ≥38°C
☐ Other (specify).....

Date AEFI started : _ _ /_ _/_ _

Time __ __:__ __

Describe AEFI (Signs & Symptoms):

Serious: Yes / No; ➔ If Yes ☐ Death ☐ Life threatening ☐ Persistent or significant disability ☐ Hospitalization ☐ Congenital anomaly
☐ Other important medical event (specify).....

Outcome: ☐ Recovering ☐ Recovered ☐ Recovered with sequelae ☐ Not Recovered ☐ Unknown

☐ Died If Died, date of death : _ _ /_ _ /_ _ Autopsy done: ☐Yes ☐No ☐Unknown

Past medical history (including history of similar reaction or other allergies), concomitant medication and other relevant information (e.g. other cases). *Use additional sheets if needed:*

First Decision making level to complete:

Investigation needed: ☐ Yes ☐ No	If Yes, date investigation planned : _ _ /_ _ /_ _

National level to complete:

Date report received at National level _ _ /_ _ /_ _	AEFI worldwide unique ID :
Comments:	

Compulsory field

AEFI INVESTIGATION FORM

(Only for Serious Adverse Events Following Immunization – Death / Disability / Hospitalization / Cluster)

Section A — Basic details

Province/State **District** **Case ID**

Place of vaccination (✓): ☐ Govt. health facility ☐ Private health facility ☐Other (specify) _____
Vaccination in (✓): ☐ Campaign ☐ Routine ☐ Other (specify) _____

Address of vaccination site:

Name of Reporting Officer:

Date of investigation: __ __ / __ __ / __ __ __ __
Date of filling this form: __ __ / __ __ / __ __ __ __

Designation / Position:

This report is: ☐ *First* ☐ *Interim* ☐ *Final*

Telephone # landline (with code): Mobile: e-mail:

Patient Name Sex: ☐M ☐ F

(use a separate form for each case in a cluster)

Date of birth (DD/MM/YYYY): __ __ / __ __ / __ __ __ __

OR *Age at onset:* __ __ *years* __ __ *months* __ __ __ *days* ***OR*** *Age group:* ☐ *< 1 year* ☐ *1–5 years* ☐ *> 5 years*

Patient's full address with landmarks *(Street name, house number, locality, phone number etc.)*:

Name of vaccines/diluent received by patient	Date of vaccination	Time of vaccination	Dose (e.g. 1st, 2nd, etc.)	Batch/Lot number	Expiry date
				Vaccine	Vaccine
				Diluent	Diluent
				Vaccine	Vaccine
				Diluent	Diluent
				Vaccine	Vaccine
				Diluent	Diluent
				Vaccine	Vaccine
				Diluent	Diluent
				Vaccine	Vaccine
				Diluent	Diluent

Type of site (✓) ☐ Fixed ☐ Mobile ☐ Outreach ☐ Other _____

Date of first/key symptom *(DD/MM/YYYY)*: __ __ / __ __ / __ __ __ __ Time of first symptom *(hh/mm)*: __ __ / __ __
Date of hospitalization *(DD/MM/YYYY)*: __ __ / __ __ / __ __ __ __
Date first reported to the health authority *(DD/MM/YYYY)*: __ __ / __ __ / __ __ __ __

Status on the date of investigation (✓): ☐ Died ☐ Disabled ☐ Recovering ☐ Recovered completely ☐Unknown

If died, date and time of death *(DD/MM/YYYY)*: __ __ / __ __ / __ __ __ __ *(hh/mm)*: __ __ / __ __
Autopsy done? (✓) ☐ Yes (date)_____ ☐ No ☐ Planned on (date)_____ Time_____
Attach report (if available)

Section B — Relevant patient information prior to immunization

Criteria	Finding	Remarks (If yes provide details)
Past history of similar event	Yes / No / Unkn	
Adverse event after previous vaccination(s)	Yes / No / Unkn	
History of allergy to vaccine, drug or food	Yes / No / Unkn	
Pre-existing illness (30 days) / congenital disorder	Yes / No / Unkn	
History of hospitalization in last 30 days, with cause	Yes / No / Unkn	
Patient currently on concomitant medication? (If yes, name the drug, indication, doses & treatment dates)	Yes / No / Unkn	
Family history of any disease (relevant to AEFI) or allergy	Yes / No / Unkn	

For adult women
- Currently pregnant? Yes (weeks) _____ / No / Unknown
- Currently breastfeeding? Yes / No

For infants
The birth was ☐ full-term ☐ pre-term ☐ post-term. Birth weight:

Delivery procedure was ☐ Normal ☐ Caesarean ☐ Assisted (forceps, vacuum etc.) ☐ with complication (specify)

Section C Details of first examination** of serious AEFI case

Source of information (✓ *all that apply*): ☐ **Examination by the investigator** ☐ **Documents** ☐ **Verbal autopsy** ☐ **Other**_____ *If from verbal autopsy, please mention source* _____

Name of the person who first examined/treated the patient:_____
Name of other persons treating the patient: _____
Other sources who provided information (specify): _____

Signs and symptoms in chronological order from the time of vaccination:

Name and contact information of person completing these clinical details:	Designation:	Date/time

****Instructions – Attach copies of ALL available documents (including case sheet, discharge summary, case notes, laboratory reports and autopsy reports) and then complete additional information NOT AVAILABLE in existing documents, i.e.**

- ***If patient has received medical care*** – attach copies of all available documents (including case sheet, discharge summary, laboratory reports and autopsy reports, if available) and write only the information that is not available in the attached documents below
- ***If patient has not received medical care*** – obtain history, examine the patient and write down your findings below (add additional sheets if necessary)

Provisional / Final diagnosis:

Section D Details of vaccines provided at the site linked to AEFI on the corresponding day

Number immunized for each antigen at session site. Attach record if available.										
	Vaccine name									
	Number of doses									

a)	When was the patient immunized? (✓ the ☐ below and respond to ALL questions)	
	☐ Within the first vaccinations of the session ☐ Within the last vaccinations of the session ☐ Unknown	
	In case of multidose vials, was the vaccine given ☐ within the first few doses of the vial administered? ☐ within the last doses of the vial administered? ☐ unknown?	
b)	Was there an error in prescribing or non-adherence to recommendations for use of this vaccine?	Yes* / No
c)	Based on your investigation, do you feel that the vaccine (ingredients) administered could have been unsterile?	Yes* / No / Unable to assess
d)	Based on your investigation, do you feel that the vaccine's physical condition (e.g. colour, turbidity, foreign substances etc.) was abnormal at the time of administration?	Yes* / No / Unable to assess
e)	Based on your investigation, do you feel that there was an error in vaccine reconstitution/preparation by the vaccinator (e.g. wrong product, wrong diluent, improper mixing, improper syringe filling etc.)?	Yes* / No / Unable to assess
f)	Based on your investigation, do you feel that there was an error in vaccine handling (e.g. break in cold chain during transport, storage and/or immunization session etc.)?	Yes* / No / Unable to assess
g)	Based on your investigation, do you feel that the vaccine was administered incorrectly (e.g. wrong dose, site or route of administration, wrong needle size, not following good injection practice etc.)?	Yes* / No / Unable to assess
h)	Number immunized from the concerned vaccine vial/ampoule	
i)	Number immunized with the concerned vaccine in the same session	
j)	Number immunized with the concerned vaccine having the same batch number in other locations. Specify locations: _____	
k)	Is this case a part of a cluster?	Yes* / No / Unkn
i.	If yes, how many other cases have been detected in the cluster?	
a.	Did all the cases in the cluster receive vaccine from the same vial?	Yes* / No / Unkn
b.	If no, number of vials used in the cluster (enter details separately)	

*_**It is compulsory for you to provide explanations for these answers separately**_

Section E Immunization practices at the place(s) where concerned vaccine was used

(Complete this section by asking and/or observing practice)

Syringes and needles used:

• Are AD syringes used for immunization?	Yes / No / Unkn

If no, specify the type of syringes used: ☐ Glass ☐ Disposable ☐ Recycled disposable ☐ Other _____

Specific key findings/additional observations and comments:

Reconstitution: (complete only if applicable, ✓ NA if not applicable)

	Status		
• Reconstitution procedure (✓)			
Same reconstitution syringe used for multiple vials of same vaccine?	Yes	No	NA
Same reconstitution syringe used for reconstituting different vaccines?	Yes	No	NA
Separate reconstitution syringe for each vaccine vial?	Yes	No	NA
Separate reconstitution syringe for each vaccination?	Yes	No	NA
• Are the vaccines and diluents used the same as those recommended by the manufacturer?	Yes	No	NA

Specific key findings/additional observations and comments:

Section F Cold chain and transport

(Complete this section by asking and/or observing practice)

Last vaccine storage point:	
• Is the temperature of the vaccine storage refrigerator monitored?	Yes / No
○ If "yes", was there any deviation outside of 2–8° C after the vaccine was placed inside?	Yes / No
○ If "yes", provide details of monitoring separately.	
• Was the correct procedure for storing vaccines, diluents and syringes followed?	Yes / No / Unkn
• Was any other item (other than EPI vaccines and diluents) in the refrigerator or freezer?	Yes / No / Unkn
• Were any partially used reconstituted vaccines in the refrigerator?	Yes / No / Unkn
• Were any unusable vaccines (expired, no label, VVM at stages 3 or 4, frozen) in the refrigerator?	Yes / No / Unkn
• Were any unusable diluents (expired, manufacturer not matched, cracked, dirty ampoule) in the store?	Yes / No / Unkn
Specific key findings/additional observations and comments:	
Vaccine transportation:	
• Type of vaccine carrier used	
• Was the vaccine carrier sent to the site on the same day as vaccination?	Yes / No / Unkn
• Was the vaccine carrier returned from the site on the same day as vaccination?	Yes / No / Unkn
• Was a conditioned ice-pack used?	Yes / No / Unkn
Specific key findings/additional observations and comments:	

Section G Community investigation (Please visit locality and interview parents/others)

Were any similar events reported within a time period similar to when the adverse event occurred and in the same locality?
Yes / No / Unknown If yes, describe:

If yes, how many events/episodes?

Of those effected, how many are
- Vaccinated:_____
- Not vaccinated:_____
- Unknown:_____

Other comments:

Section H Other findings/observations/comments

Annex 11E: Adverse event following immunization investigation form

AEFI Investigation	
An adverse event following immunization (AEFIs) is 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. Programmes providing immunization services should include a system for AEFI detection and reporting, investigation and management, data analysis, corrective action, relevant communication and evaluation of the system. The ultimate goal of an investigation is to determine whether the vaccine or immunization process is responsible for the reported event (s) or to find another cause and correct it if possible, and reassure the public. **Further resources:** Definition and application of terms for vaccine pharmacovigilance. Report of CIOMS/WHO Working Group on Vaccine Pharmacovigilance. Geneva, Council for International Organizations of Medical Sciences, 2012 Global Manual on Surveillance of Adverse Events Following Immunization" http://www.who.int/vaccine_safety/publications/Global_Manual_revised_12102015.pdf?ua=1	
1.	**Be prepared (Steps to take before an event occurs)** • Read the resource documents on reporting, management and investigation of AEFIs. • Develop standards: case definitions for reportable AEFIs, use of reporting forms and investigation procedures. • Designate and train staff to conduct an AEFI investigation using the investigation form. • Train staff on how to collect specimens. • Establish procedure, criteria and designated person for notifying WHO and UNICEF • (if UN- supplied vaccine) or other relevant party depending on procurement mechanism • Establish a National Technical Advisory Committee with representation from major medical organizations • Identify a spokesperson for public communications.
2.	**Receiving a report** • Ensure immediate reporting of most serious events and rapid attention to reports received • Verify the information in the report and classify and assess the AEFI using established case definitions. Decide whether it needs further investigating. • If investigation is warranted, travel to the location of the AEFI, or delegate responsibility to another trained person

3.	**Investigate and collect data** Ask about the patient Ask about the vaccine and other drugs potentially received Ask about other vaccines Ask about immunization services Observe the service in action Ask about cases in unvaccinated persons Establish a more specific case definition if needed Formulate a hypothesis as to what caused the AEFI **Collect specimens if appropriate:** from the patient the vaccine (and diluent if applicable) the syringes and needles
4.	**Dispatch specimens** to appropriate testing facility (laboratory, regulatory authority, etc.)
5.	**Analyse the data** Review epidemiological, clinical, and laboratory findings Summarize and report findings
6.	**Take action** • Communicate with health staff • Communicate findings and action to the parents and public • Correct problem (based on the cause) by improving training, supervision, and/or distribution of vaccines/injection equipment • Replace vaccines if indicated

Annex 11F: Animal Bite /Rabies Case Investigation Form

GOVERNMENT OF SIERRA LEONE

HUMAN RABIES CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

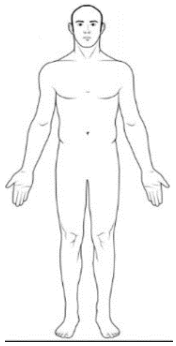
Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS /CLINICAL FEATURES

The presenting signs and symptoms *(Tick on the box provided if sign or symptom is present)*

Muscle spasm		Aerophobia (fear of air)	
Seizures		Hydrophobia (fear of water)	
Dysphasia (poor speech and comprehension)		Ataxia (gait abnormality)	
Localised pain (numbness/burning)		Altered Mental Status/Confusion	
Localised weakness (paralysis)		Delirium (Confused state)	
Aggressiveness		Autonomic Instability (Fainting or dizziness upon standing)	
Hyperactivity		No signs and symptoms seen	
Hypersalivation			

EXPOSURE HISTORY



Was the patient bitten, scratched, or licked by dog? Yes/No/Unknown

What is the living status of the dog? Owned/Stray/Unknown

The circumstance that caused the dog to bite or scratch the patient: Accidental/Lactating dog/dog was threatened/dog protecting owner/dog was eating/Unprovoked/Not Applicable /Other/Unknown;

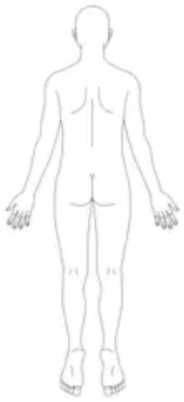
Other circumstance Specify: _____

*Was the dog observed for 14 days: Yes/No/Unknown

*Is the dog still alive after 14 days of the bite/scratched: Yes/No/Unknown;

*Is the dog dead: Yes/No/Unknown

Date dog died (dd/mm/yyyy): _____/_____/_____



*Cause of dog death: Killed/Natural Cause/Unknown

*Has the dog been vaccinated for rabies: Yes/No/Unknown

Date dog vaccinated: _____/_____/_____

Has specimen from the dog been tested for rabies: Yes/No/Unknown

Results of dog test: Negative/Positive/Indeterminate

Date dog test result released (dd/mm/yyyy): _____/_____/_____

*Do you suspect the dog that bite or scratched the patient to have rabies: Yes/No/Unknown

Nature of the exposure: Multiple injuries/Single injury/No Injury

Nature of injury: Superficial without bleeding/ Superficial with bleeding/Deep injury

Date of exposure (dd/mm/yyyy): _____/_____/_____

Site of Injury: Head/Face/Neck/Upper arms/Palms/Tips of fingers/Chest/Genitalia/thigh/foot/toes

Circle affected body site:

PROPHYLAXIS/VACCINATION/TREATMENT (time of bite or scratch)

*Did the patient seek medical care after bite, lick or scratch: Yes/No/Unknown

Was the wound washed with soap and water for 10 minutes or cleaned with 70% alcohol or povidone iodine: Yes/No/Unknown

Was antibiotic administered: Yes/No/Unknown

Was Tetanus Toxoid administered: Yes/No/Unknown

*Was Anti-Rabies Vaccine given: Yes/No/Unknown

Number of Anti-Rabies Vaccine doses given: 1 / 2 / 3 / 4 / 5

Date of First Dose (dd/mm/yyyy): _____/_____/_____

Date of Second Dose (dd/mm/yyyy): _____/_____/_____

Date of Third Dose (dd/mm/yyyy): _____/_____/_____

Was Immunoglobulin administered: Yes/No/Unknown;

Date immunoglobulin administered (dd/mm/yyyy): _____/_____/_____

Was the wound treated on the same day of exposure: Yes/No/Unknown

Health Facility that provide the prophylaxis/treatment: _____

HOSPITALIZATION

*Was the patient hospitalised for the illness: Yes/No/Unknown

Health Facility hospitalised: _____

Date hospitalized (dd/mm/yyyy): _____/_____/_____

Clinician name: _____

Facility phone number : _____

Prior Treatment/Self Medication: _____

WEEKLY FOLLOW-UP

Weekly follow up for signs and symptoms (Tick against week if signs and symptoms present)

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Muscle spasm														
Seizures														
Dysphasia(poor speech & comprehension)														
Localised pain/paresthesia														
Localised weakness														
Aggressiveness														
Hyperactivity														
Hypersalivation														
Aerophobia														
Hydrophobia (fear of water)														
Ataxia (gait abnormality)														
Confusion/ Agitation/ Anxiety														
Delirium														
Autonomic Instability														
No signs and symptoms seen														

Case Investigator Assessment

*Does the alert meet case definition for Rabies/Dog Bite? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

Designation: _____

Contact Phone number: _____

NB: District Livestock Officer should be alerted for **all Dog Bite cases**

*These are compulsory variable and must be completed.

Annex 11G: Animal bite (Snake bite) Case Investigation Form

GOVERNMENT OF SIERRA LEONE

SNAKE BITE CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____ **Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS /CLINICAL FEATURES

Bruising		Weakness		Fast heart rate	
Localised bleeding		Sweating		Dizziness	
Localised swelling		Numbness (mouth, face, limbs)		Blur vision	
Localised pain		Difficult breathing		Slurred Speech	
Fever		Salivating		Anaphylaxis	
Nausea		**Conjunctivitis**		Shock	
Vomiting		Local necrosis		Ptosis (droopy eyelid)	

Is there signs of envenom (the presence of three or more symptoms and signs)? Yes/No

EXPOSURE HISTORY

Was the patient bitten by a snake? Yes/No/Unknown

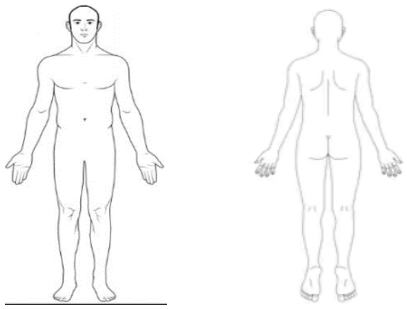
Where did the bite occur? _____

Is there any sign of fans marks (two punctured wounds)? Yes/No

Was the patient wearing protective clothing at the time of bite? Yes/No

Site of bite: Head/Face/Neck/Upper arms/Palms/Tips of fingers/Chest/Genitalia/thigh/foot/toes/Stomach

Circle affected body site:



_____

PROPHYLAXIS/TREATMENT

Did the patient seek medical care after bite? Yes/No/Unknown

What is the distance from the location of the bite to the health facility (Km)? _____

Was the patient immobilised immediately after the bite? Yes/No/Unknown

Was the patient put in recovery position during transportation? Yes/No/Unknown

Was antivenom administered to the patient after the bite? Yes/No/Unknown

When was the antivenom administered: _____/_____/_____

Was antibiotic administered: Yes/No/Unknown

Was Tetanus Toxoid administered: Yes/No/Unknown

Did the patient seek traditional care after bite? Yes/No/Unknown

How many days has the patient being treated with traditional medicine? _____

Prior Treatment/Self Medication: _____

HOSPITALIZATION

*****Was the patient hospitalised for the incident: Yes/No/Unknown

Health Facility hospitalized: _____

Date hospitalised (dd/mm/yyyy): _____/_____/_____

Clinician name: _____

Facility phone number : _____

Case Investigator Assessment

*Does the alert meet case definition for Snake Bite? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____ *Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11H: Anthrax Case Investigation Form

MINISTRY OF HEALTH & SANITATION SIERRA LEONE

ANTHRAX CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION: _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: Child/No Education /Primary /Secondary/Tertiary;

Marital Status: Child/Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS (tick what is applicable)

Fever		Unproductive cough		Severe Malaise	
Nausea		Haemoptysis		Pharyngitis	
Vomiting		Stiff Neck		Convulsion	
Diarrhoea		Photophobia		Altered mental status	
Bloody Diarrhoea		Difficult Breathing		Coma	
Headache		Muscles Pain			

Chest pain		Joint Pain			
Abdominal Pain		Fatigue			

Eschar: Yes/No/Unknown

Eschar location: _____

Oedema: Yes/No/Unknown

Oedema location: _____

Lymphadenopathy: Yes/No/Unknown

Lymphadenopathy location: _____

Other skin lesions/rashes: Yes/No/Unknown

Health Worker

*Patient is a health worker: Yes/No/Unknown

Cadre: Doctor/CHO/SRN/SECHN/CHA/MCH Aide/Nursing Aide/Lab personnel/Pharmacy Personnel/ Ambulance driver/Porter/Nutritionist/EHO/Midwife/Other

Staff Position (Specify): _____

Health Care Worker Facility: _____

Exposure/Source - Symptomatic persons

*have you had contact with a person of similar symptoms and signs 6 weeks prior to Illness: Yes/No/Unknown

Number of people with similar symptoms and Signs: _____

Type of Contact with Symptomatic Case: -Direct Contact/ Social Contact (Indirect)

Village/Town/City of contact with symptomatic case: _____

Chiefdom/Zone of contact with symptomatic Case: _____

Exposure/Source - Animals

*Have you had Contact with Animals, animals body fluids, animals skins, furs, wool, hides, hair or animal bone products, 6 weeks Prior to Illness: Yes/No/Unknown

Have you slaughtered animal within the last 6 weeks: Yes/No/Unknown

Type of Animal Exposure: Pets/Livestock/Wild mammals/Animals body fluids/Unknown

Contact animals' disposition: Live/dead/both/Unknown

Contact with any sick animal or their product (hair, wool, skin, hides, etc.): Yes/No/Unknown

Patient consume raw meat or undercooked meat: Yes/No/Unknown

Village/Town/City of contact with animal: _____

Chiefdom/Zone of contact with animal: _____

Last date of contact with animal: _____/_____/_____

Exposure/Source - Gatherings

*Patient attended gathering within 6 weeks prior to onset of illness: Yes/No/Unknown

Type of gathering attended: _____

The date of gathering: _____

Village/Town/City of gathering: _____

Chiefdom/Zone of gathering: _____

Travel History

*Travelled within 6 weeks prior to onset of illness: Yes/No/Unknown

Village/Town/City travelled to: _____

Chiefdom/Zone travelled to: _____

Travelled out of the Country? Yes/No/Unknown

If yes, Country travelled to (Address/Village/ town/ City): _____

Date travelled: _____/_____/_____

Date returned: _____/_____/_____

Treatment and Vaccination

*Was the Patient Hospitalised: Yes/No/Unknown

Reason for hospitalization: Complication/Severity/Precautionary/Isolation/Other

Hospital/Facility name: _____

Date Hospitalized: _____

Date Discharged: _____

Patient received Anthrax Vaccine: Yes/No/Unknown

Type of Anthrax vaccine received: Post Exposure/Pre Exposure/Both

Vaccines doses received: 1/2/3/4/5/>5

Date first dose: _____

Date second dose: _____

Date third dose: _____

Manifest Inhalation Anthrax during admission	
Manifest Gastrointestinal/Oropharyngeal Anthrax during admission	
Manifest Cutaneous Anthrax during admission	
Manifest Injection Anthrax during admission	
Manifest Meningeal Anthrax during admission	

Prior Treatment/Self Medication: _____

Case Investigator Assessment

*Does the alert meet case definition for Anthrax? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion: _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/ Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/ Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case
Final Patient Vital Status: Alive/Dead/Unknown
Date of death: _____/_____/_____
General Comments: _____

INVESTIGATOR

*Name: _____
Designation: _____
Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11I: Bacterial Meningitis Case Investigation form and Decisional tree

GOVERNMENT OF SIERRA LEONE

BACTERIAL MENINGITIS CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SIGNS AND SYMPTOMS (tick what is applicable)

Fever		Convulsion	
Headache		Irritability	
Nausea		Paralysis	
Vomiting		Photophobia (Sensitivity to Light)	
Cough		Tremors (Trembling)	
Poor Feeding/Sucking		Drowsy/Abnormal Sleepy/Lethargy	
Skin Rash - Purpura /Petechiae		Altered Mental Status/ Confusion	
Bulging Fontanelles (Infant)		Coma/Unconscious/Unresponsive	

Meningeal Signs (Neck Stiffness/ Kerning's Sign)			

Other (specify): _____

Risk Factor – Health Worker

*Patient is a health worker: Yes/No/Unknown

Cadre: Doctor/CHO/SRN/SECHN/CHA/MCH Aide/Nursing Aide/Lab personnel/Pharmacy Personnel/ Ambulance driver/Porter/Nutritionist/EHO/Midwife/Other

Staff Position (Specify): _____

Staff work station : _____

Risk Factor – Symptomatic Person

*Contact with a Person of Similar Signs and Symptoms 14 days Prior to Illness: Yes/No/Unknown

Onset Date of Symptomatic Case (dd/mm/yyyy): _____/_____/_____

Village/Town/City of contact: _____

Chiefdom/District of contact with symptomatic case:_____

Start Date of Contact with Symptomatic Case (dd/mm/yyyy): _____/_____/_____

Last Date of Contact with Symptomatic Case (dd/mm/yyyy): _____/_____/_____

Risk Factor - Gathering

*Attended a gathering 14 days prior to the Illness: Yes/No/Unknown

Type of Gathering: _____

Village/Town/City of gathering: _____

Chiefdom/District of gathering: _____

Date of Gathering (dd/mm/yyyy): _____/_____/_____

Living in an institution (shelter/prison etc.) Yes/No/Unknown

Risk Factor - Travel

*Patient Travel 3 weeks prior to illness onset: Yes/No/Unknown

Village/Town/City visited: _____

Chiefdom/Zone visited: _____

Travelled out of the Country? Yes/No/Unknown

If yes, Country travelled to (Address/Village/ town/ City): _____

Date travelled (dd/mm/yyyy): _____/_____/_____

Date returned Date (dd/mm/yyyy): _____/_____/_____

Hospitalization and Treatment

*Was the Patient Hospitalized: Yes/No/Unknown

Name of Hospital/Health Facility admitting patient: _____

Date of Admission (dd/mm/yyyy): _____/_____/_____

Name of Additional Antibiotics (1) Administered to the Patient: _____

Name of Additional Antibiotics (2) Administered to the Patient: _____

Name of Additional Antibiotics (3) Administered to the Patient: _____

Prior Treatment/Self Medication: _____

Vaccination

Pneumococcal doses received: _____

Pentavalent/Hexavalent total doses received: _____

Patient has a vaccination card: Yes/No/Unknown

Patient is fully immunized: Yes/No/Unknown

Meningococcal dose received: Yes/No/Unknown

Chemoprophylaxis received: Yes/No/Unknown

Case Investigator Assessment

*Does the alert meet case definition for Meningococcal Meningitis? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

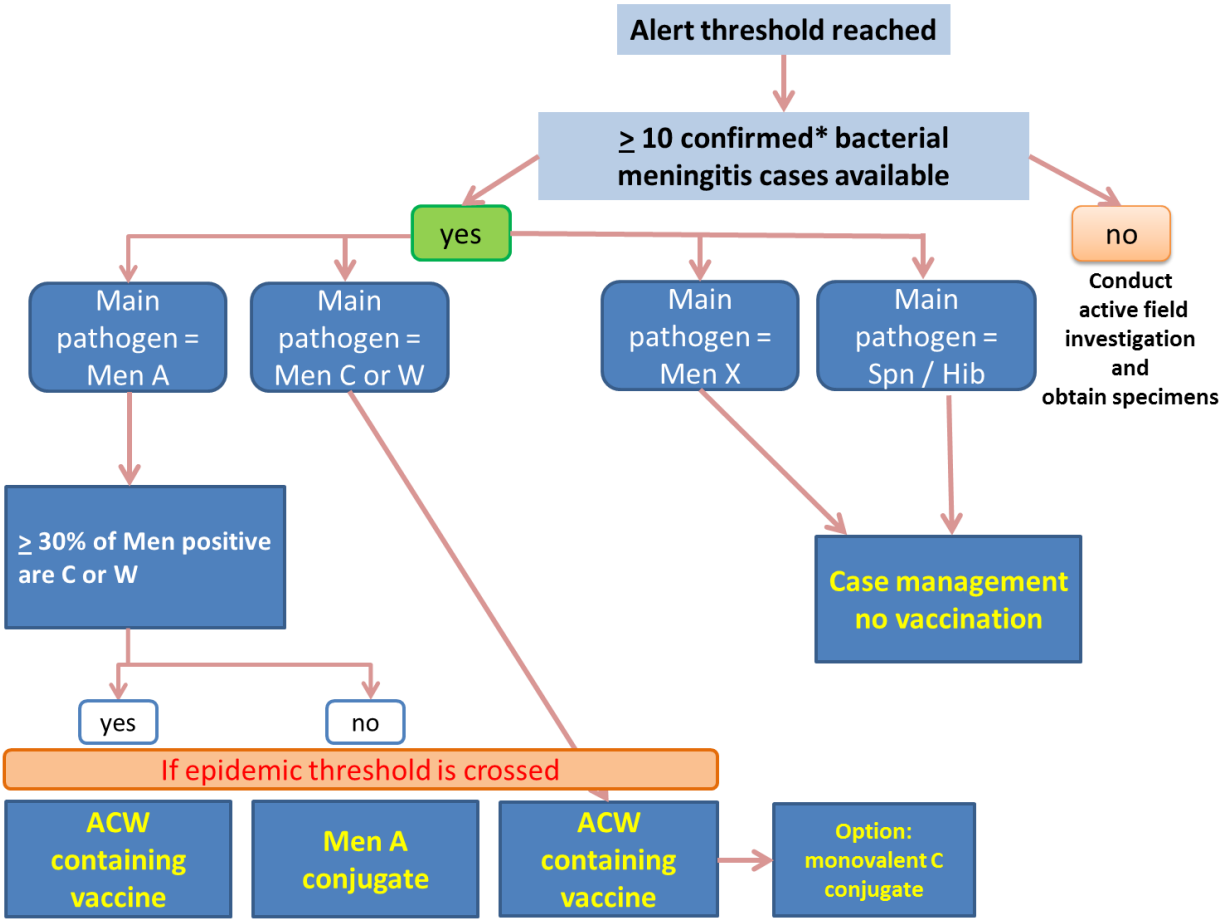
*Name: _____

*Designation: _____

*Contact Phone number: _____

These are compulsory variable and must be completed.

Decisional tree for Meningitis Vaccine Choice in a Reactive Vaccination Campaign



Annex 11J: Buruli Ulcer Case Investigation form

GOVERNMENT OF SIERRA LEONE

BURULI ULCER CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS

Nodules (Non Ulcerative + Small + Firm and painless swelling)	
Oedema (Non Ulcerative + Large and painless swelling)	
Plaques (Non Ulcerative + large + firm and painless swelling)	
Characteristics Ulcer - usually painless with loose edges and cotton wool like slough in the centre	
Lesion on Critical Sites - Eye/Breast/Genitalia	
Category 1: A Single Lesion <=5 cm	
Category 2: A single Lesion 5-15 cm in Diameter	
Category 3: A Single Lesion >15 cm in Diameter OR Multiple Lesion OR Lesions at Critical Sites or Osteomyelitis	

Exposure/Source - Water Bodies

Case Classification: New case/Recurrent Case/Unknown

Living closer to Lakes/Dams/Rivers/Swamps or other water bodies**:** Yes/No/Unknown

Name the Water Body the Patient is Living Closer to**:** _____

Exposure/Source - Travel (BU)

*Did the patient travel to areas where the Disease is Present: Yes/No/Unknown

Village/Town/City visited: _____
Chiefdom/Zone visited: _____
Travelled out of the Country? Yes/No/Unknown
If yes, Country travelled to (Address/Village/ town/ City): _____
Date travelled (dd/mm/yyyy): _____/_____/_____
Date returned Date (dd/mm/yyyy): _____/_____/_____

Treatment

Name of Additional Antibiotics (1) Administered to the Patient: _____

Name of Additional Antibiotics (2) Administered to the Patient: _____

Name of Additional Antibiotics (3) Administered to the Patient: _____

Dressing of the Wound: Yes/No/Unknown;

Surgery/Skin Grafting was Performed to the Patient: Yes/No/Unknown

Limitation of Joint Movement: Yes/No/Unknown

How long have you had the wound? Less than 3 weeks/ 3 weeks – 3 months/ more than 3 months

Prior Treatment/Self Medication: _____

Case Investigator Assessment

*Does the alert meet case definition for Acute Viral Haemorrhagic Fever? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____
Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype /Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other
Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case
Final Patient Vital Status: Alive/Dead/Unknown
Date of death (dd/mm/yyyy): _____/_____/_____
General Comments: _____

INVESTIGATOR

*Name: _____
*Designation: _____
*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11K: Chikungunya Case Investigation Form

GOVERNMENT OF SIERRA LEONE

CHIKUNGUNYA CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS (tick what is applicable)

Fever		Bloody diarrhoea		Skin Rash (big maculopapular rash)	
Chills		Severe Headache		Conjunctivitis	
Vomiting		Nausea		Muscle weakness	
Muscles pain		Fatigue		Increased secretion (sweating, drooling)	
Acute watery diarrhoea		Joint pain		Bleeding	
Stiff Neck		Joint Swelling			

Travel History

*Have you travelled within two weeks prior to onset of illness? Yes/No/Unknown

Village/Town/City patient Travelled to: _____

Chiefdom/Zone Travelled to: _____

Travelled out of the Country? Yes/No/Unknown

If yes, Country travelled to (Address/Village/ town/ City): _____

Date travelled from home: _____

Date Returned: _____

Other Risk Factors

Did the patient receive blood, blood products, or organ/tissue in the last 30 days? Yes/No/Unknown

Date blood, blood products, or organ/tissue received: _____

Has the patient been in contact with a confirmed case? Yes/No/Unknown

Prior Treatment/Self Medication: _____

Case Investigator Assessment

*Does the alert meet case definition for Chikungunya? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11L: Cholera case-based investigation form

GOVERNMENT OF SIERRA LEONE

CHOLERA CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Patient clinical information

Are you living in camps or sheltered homes: Yes/No

People staying with in the same household: _____

Date last dose was administered (dd/mm/yyyy): _____/_____/_____

Potential Vibrio vehicles - Drinking water

Drinking water source 1: _____

Drinking water source 2: _____

Drinking water source 3: _____

Drinking water source 4: _____

Potential Vibrio vehicles - Non-drinking water

Non drinking water source 1: _____

Non drinking water source 2: _____

Non drinking water source 3: _____

Non drinking water source 4: _____

Potential Vibrio vehicles - Food items

Food items 1: _____

Food items 2: _____

Food items 3: _____

Food items 4: _____

Bacteriology Lab findings

Drinking water found infected by vibrio: Yes/No

Food items found infected by vibrio: Yes/No

Non drinking water found infected by vibrio: Yes/No

Exposure to the identified hazards prior onset of the disease

Drink from water source 1 three days prior to the onset of the disease: Yes/No

Drink from water source 2 three days prior to the onset of the disease: Yes/No

Drink from water source 3 within three days prior to the onset of the disease: Yes/No

Drink from water source 4 three days prior to the onset of the disease: Yes/No

Food item 1 eaten in 3 days prior to the onset of the disease: Yes/No

Food item 2 eaten in 3 days prior to the onset of the disease: Yes/No

Food item 3 eaten in 3 days prior to the onset of the disease: Yes/No

Food item 4 eaten in 3 days prior to the onset of the disease: Yes/No

Funerals attended in 3 days prior to the onset of the disease: Yes/No

Other Social events attended in 3 days prior to the onset of the disease: Yes/No

*****Does the alert meet case definition: Yes/No/Unknown

Case Investigator Assessment

*Does the alert meet case definition for Cholera? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/ Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/ Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____
*Designation: _____
*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11M: Dysentery Case Investigation Form

GOVERNMENT OF SIERRA LEONE

DYSENTERY CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

This form can only be completed only if specimen are taken

Investigation Information

***DATE OF INVESTIGATION** (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS

Fever		Joint Pain	
Abdominal Pain		Fatigue/Weakness	
Bloody diarrhoea		Nausea	
Mucus in Stool		Vomiting	

Dehydration		Tenesmus		
Muscles pain		Other Specify:		

Exposure/Source - Symptomatic cases in Community

*Has anyone else in your community has bloody diarrhoea in the last one week? Yes/No/Unknown

How many people do you know who may have bloody diarrhoea? _____

Exposure/Source – Drinking Water (tick possible sources of water for the patient)

Rain water	
Unprotected Well (No lining/Not covered and within 15m to any toilet)	
Protected well (Lining/Covered and at least 15m away from any toilet)	
Trucked Water Source	
Piped Water Source	
Packet (Sachet) Water Source	
Bottled Water Source	
Open Water Source (Rivers/Streams/Lakes)	

Other Water Source (Specify): _____

*Floods within a month of Illness Onset: Yes/No/Unknown

Exposure/Source - Sanitation

*Do you have a toilet facility in the household: Yes/No/Unknown

If yes, type of toilet available: Pit latrine/Ventilated pit latrine/ Flush toilet

Does the toilet has a hand washing facility: Yes/No

If there is no toilet facility in the household, how do you disposed human waste? Neighbour toilet /Public toilet/ Open disposal

Exposure/Source - Food

*Consumed possibly contaminated or expired meal/food/beverage within 7 days of illness Onset: Yes/No/Unknown

Specify contaminated or expired meal/food/beverage consumed: _____

Village/Town/City contaminated or expired meal/food/beverage consumed: _____

Chiefdom/Zone contaminated or expired meal/food/beverage consumed: _____

Other high risk food consumed within 7 days of illness: _____

*Ate from a public eatery place 7 days prior to illness onset: _____

Type of public eatery (Street vendor/Restaurant etc): Street Vendor/Barfa (small stall)/Restaurant/Hotel

List the kind of food consumed from the public eatery place: _____

Village/Town/City of public eatery place: _____

Chiefdom/Zone of public eatery place: _____

Exposure/Source - Gatherings

*Did the patient eat/participate in a gathering within 7 Days of Illness Onset: Yes/No/Unknown

Type of gathering where the patient ate/participated: _____

Date of gathering (dd/mm/yyyy): _____/_____/_____

Village/Town/City of gathering: _____

Chiefdom/Zone of gathering: _____

Food consumed at the Gathering: _____

Travel History

*Did the patient travel 7 Days prior to illness onset: Yes/No/Unknown

Village/Town/City travelled to: _____

Chiefdom/Zone travelled to: _____

Travelled out of the country? Yes/No/Unknown

If yes, country travelled to (Address/Village/ town/ City): _____

Date travelled (dd/mm/yyyy): _____/_____/_____

Date returned (dd/mm/yyyy): _____/_____/_____

Case Investigator Assessment

*Does the alert meet case definition for Dysentery: Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever /Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact phone number: _____

These are compulsory variable and must be completed.

Annex 11N: Influenza Case Investigation Form

GOVERNMENT OF SIERRA LEONE

INFLUENZA CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*****DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Underlying Medical Condition (tick what is applicable)

Heart Disease		Cancer		Kidney Disease	
HIV Infection		Chronic Lung Disease			
Asthma		Diabetes Mellitus			

Other Underlying Medical Condition: _____

SYMPTOMS AND SIGNS

(tick what is applicable)

Fever		Diarrhoea		Nausea	
Runny Nose		Conjunctivitis (Red Watery Eyes)		Vomiting	
Nasal Congestion		Chills		Skin rash	
Cough		Headache		Seizures	

Difficult Breathing		Muscles pain		Haemoptysis (vomiting blood)	
Sore Throat		Joint Pain		Pneumonia	

Evidence of Secondary Bacterial Infection: Yes/No/Unknown

Other Symptoms and Signs: _____

Exposure - Human Source

Living in an institution (Prison, boarding school, Orphanage, Shelter home): Yes/No/Unknown

*Contact with a person of similar symptoms and signs 2 Weeks Prior to Illness: Yes/No/Unknown

Last date of contact (dd/mm/yyyy): _____/_____/_____

Village/Town/City of Contact: _____

Chiefdom/Zone of Contact: _____

Exposure – Animal Source

*Contact with animal(s) 2 weeks prior to illness (Poultry/Wild Bird/Pig/Other): Yes/No/Unknown

Type of animal: _____

Type of contact with animal: Petting/Handling/Receive animal bite/Receive animal scratch/Butchering/ Unknown/Other

Last date of contact (dd/mm/yyyy): _____/_____/_____

Animal was sick: Yes/No/Unknown

Exposure – Travel

*Travelled 2 weeks prior to onset of illness? Yes/No/Unknown

Village/Town/City travelled to: _____

Chiefdom/Zone travelled to: _____

Travelled out of the Country? Yes/No/Unknown

If yes, country travelled to (Address/Village/ town/ City): _____

Date travelled (dd/mm/yyyy): _____/_____/_____

Date returned (dd/mm/yyyy): _____/_____/_____

Hospitalization/Treatment

*Patient hospitalized for the Flu illness: Yes/No/Unknown

Hospital/Facility name: _____

Date admitted (dd/mm/yyyy): _____/_____/_____

Date discharged (dd/mm/yyyy): _____/_____/_____

Specify Antiviral Medication (1) Received: _____

Specify Antiviral Medication (2) Received: _____

Other Treatment Administered to the Patient: _____

Prior Treatment/Self Medication: _____

Vaccination

*Recent Influenza vaccine dose received: Yes/No/Unknown

Date of Influenza vaccine dose received (dd/mm/yyyy): _____/_____/_____

Pneumococcal vaccine dose received: Yes/No/Unknown

Date of Pneumococcal vaccine dose (dd/mm/yyyy): _____/_____/_____

Case Investigator Assessment

*Does the alert meet case definition for Influenza sub new type: Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/ Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/ Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11O: Measles Case Based Investigation Form

Epid Numb: _____ - _____ - _____ -_____ - _____ Received: ____/____/____
Country Province District Year Onset Case Number

IDENTIFICATION

District: _____ _____ **Province:** _____

City/Town/ Village: _____ Nearest Health Facility (PHU): _____

Patient's Name(s): _____ Father/Mother: _____

DOB: _____/_____/_____ (If DOB Unknown) Age: in Years _____ OR month_____ Sex: ☐ M = Male F = Female

NOTIFICATION/INVESTIGATION

Case notified by: _____

Date Notified _____/_____/_____ Date Case Investigated: _____/_____/_____ Date of Rash Onset ____/_____/_____

HOSPITALISATION

Admitted to Hospital: ☐ 1=Yes 2=No, 99=unknown Admission Date: _____/_____/_____

VACCINATION HISTORY

No. of valid measles doses ☐ 99 = unknown (doses above 9mth of age) Date of Last Measles Vaccination: _____/_____/_____

SPECIMEN COLLECTION

Date of specimen collection: _____/_____/_____ Date specimen sent to lab: _____/_____/_____

Date specimen received by lab: _____/_____/_____ Date results received by EPI: _____/_____/_____

RESULTS

Indirect IgM Measles: ☐ **1=positive** 2=negative 3=intermediate

RUBTEST Rubella IgM: ☐ **1=positive** 2=negative 3=intermediate

CLASSIFICATION

Final Classification: ☐ **1=Confirmed** 2= Suspected/Compatible/Clinical=(clinical signs but no blood specimen taken) 3= Discarded

POSITIVE INVESTIGATION

If measles IgM capture positive, was community investigation done? If yes, describe result of the investigation:

INVESTIGATION RESULT:_____

_____

_____

ADDITIONAL MEASLES CASE-BASED INVESTIGATION FORM

FACILITY: _____

Tracking Number:_____

(Health Facility Code -Current Year – Case Number)

Additional Demographic Information

*****DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Investigation Information

*****DATE OF INVESTIGATION: _____/_____/_____

Was this case/condition/event detected by a health worker? Yes/No

Where was the case/condition/event detected? Health Facility/Community/Laboratory

Location where symptom started (Address): _____

Residential Village/Town/City where symptom started: _____

Residential Chiefdom/Zone where symptom started: _____

Case Investigator Assessment

*Does the alert meet case definition for Acute Viral Haemorrhagic Fever? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: _____

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

Designation: _____

Contact Phone number: _____

*****These are compulsory variable and must be completed.

Annex 11P: Monkey Pox Case Investigation Form

GOVERNMENT OF SIERRA LEONE

MONKEY POX CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION** (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Symptoms and Signs (tick what is applicable)

Fever: Yes/No/Unknown

Highest Temperature Recorded: _____

Onset date of fever (dd/mm/yyyy): _____/_____/_____

Patient had fever prior to onset of rash: Yes/No/Unknown

Patient presented with rash: Yes/No/Unknown

Headache		Vesicular - Fluid-Filled Blisters	
Muscles pain		Pustular-Cloudy/Pus-Filled Blisters	
Joint PAIN		Umbilicated - Dimpled Pustules	
Fatigue/Weakness		Drying - Flattening Pustules	
Macular - Flat/Red Spots		Scabbing (Dry rough skin)	

Pruritic Rash (Itchy)		Haemorrhagic Black Fluid Blisters; Similar to Clotted Blood	
Papular - Red/Raised Bumps		Lymphadenopathy (Swelling of the Lymph Nodes)	

Specify other rash type present: _____

Date of rash onset (dd/mm/yyyy): _____/_____/_____

Maximum Number of Lesions Observed During Patient's Illness: _____

Lesions on the palm (insert on top)		Lesions on the Chest	
Lesions on the Abdomen		Lesions on the Face	
Lesions on the Arms		Lesions on the Legs	
Lesions on the Back		Lesions on the Neck	

Was the patient hospitalised: _____

Reason for hospitalisation: Complication/Severity/Precautionary/Isolation/Other

Possible Exposure

Contact with animal: Yes/No/Unknown
Contact with suspected/confirmed human case: Yes/No/Unknown
Patient had blood transfusion: Yes/No/Unknown
Other potential source of infection: Yes/No/Unknown
Other potential source of infection specify: _____

Exposure - Animal Contact

*The Patient had Contact with Animals 3 Weeks Prior to Illness: Yes/No/Unknown

Type of Animal: _____

Type of contact with animal: Petting/Handling/Receive animal bite/Receive animal scratch/Butchering/ Unknown/Other

State of Animal at the time of contact: Alive and well/Alive and ill/Dead/Unknown

Village/Town/City of Animal Contact: _____

Chiefdom/Zone of Animal Contact: _____

Start Date of Animal Contact (dd/mm/yyyy): _____/_____/_____

Last Date of Animal Contact (dd/mm/yyyy): _____/_____/_____

Human Contact

*Contact with a Person of similar symptoms and signs 3 weeks prior to illness? Yes/No/Unknown

Type of human contact: Direct body contact/Social Contact (Indirect contact)

Last Date of Contact with symptomatic case (dd/mm/yyyy): _____/_____/_____

Village/Town/City of contact: _____
Chiefdom/Zone of contact: _____

Blood Contact

*Have you received blood within 3 week of illness onset: Yes/No/Unknown

Date blood was received (dd/mm/yyyy): _____/_____/_____

Hospital/Health Facility where blood received: _____

Travel History (include country as well) Streamline to the same wording as previous forms

*Patient travel 3 weeks prior to illness onset: Yes/No/Unknown

Village/Town/City Patient Travelled to: _____

Chiefdom/Zone Patient Travelled to: _____

Travelled out of the Country? Yes/No/Unknown
If yes, Country travelled to (Address/Village/ town/ City): _____
Date travelled (dd/mm/yyyy): _____/_____/_____

Date returned (dd/mm/yyyy): _____/_____/_____

Investigator Assessment

*****Does the alert meet case definition for Monkey Pox: Yes/No/Unknown

Patient Final Outcome

Date of final outcome (dd/mm/yyyy): _____/_____/_____
Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other
Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case
Final Patient Vital Status: Alive/Dead/Unknown
Date of death (dd/mm/yyyy): _____/_____/_____
General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11Q: Maternal Death Notification and Investigation Form

Appendix I: Identification and Notification form (all women of reproductive age) – Sierra Leone

I. Notification

1. Name of the deceased: _____
2. Age of the deceased:_____
3. Name of head of the household:_____
4. Household address:
   a. District_____
   b. Chiefdom/Ward_____
   c. Section/Village/Street_____
5. Date of the women's death:_____
6. Time of Death: _____
7. Who informed the death of the woman?
   1. Community Health Worker/TBA
   2. Section chief/Religious leader
   3. Community member/Family member
   4. Others (specify)_____
8. Date of Notification:_____

Name of the Reporter: _____Telephone number of Reporter: _____Signature: ___

II. Screening (to be filled by IDSR focal/CRVS/DSO/MDSR Coordinator/Health Worker etc)

1. Age of the woman: _____
2. Did she die while pregnant? 1. Yes 2. No
3. Did she die with 42 days of termination of pregnancy? 1. Yes 2. No
4. Has she missed her menses before she dies? 1. Yes 2. No
5. Date of death_____
6. Time of death_____
7. Place of death:
   i. Home
   ii. On the way to Health Facility
   iii. Health Facility
8. Suspected maternal death: 1. Yes 2. No

NB: If yes to questions 2-4, it is suspected maternal death and proceeds to fill the maternal death investigation tool for

Name of reporter: _____Facility/DHMT_____Date:_____Signature:_____

APPENDIX 11: Maternal Death Investigation Form – Sierra Leone

ADMINISTRATIVE

File Number……

District where death occurred……

Chiefdom where death occurred……

Health facility where death occurred ……

Type of facility where death occurred ……

Date notified ……

Date MD investigated ……

Demographic

Mother's Date of Birth …… Current Age …… Age at marriage ……Marital Status …… Tribe/Ethnicity …… Educational Level (None, Primary, Secondary, Tertiary) ……Occupation …… Religion……

Obstetric/Maternal (All mothers)

Gravidity ……Parity …… Abortion …… Induced Abortions…… Previous still births ……Living children…… Contraception use just prior to pregnancy (Yes/No) ……Place for last child delivery (Home/Health Facility) ……What type of contraception (e.g. Pill, DMPA, IUD) ……

ADMISSION INFORMATION

Date of admission……Time of admission ……Condition on admission (Stable, critically ill, dead (in transit) ……Other condition specify …… Status of pregnancy on admission (Trimester 1, 2, 3)……

Reasons for admission

……

……

……

Referral (Yes, No) …… If referred from where……

If referred, time from identification of a problem to transfer to health facility 1 ……

If referred from one facility to another, time from planned transfer from facility 1 to facility 2 ……

Comments about referral process – include comments about communication, transportation used and any problems noted:

……

……

……

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……

Differential diagnosis at admission: ……

Comment on admission

……

……

……

.....

VITAL SIGNS (For mothers admitted or seen in health facility)

Heart rate .....Temp (Celsius) ..... Systolic Blood Pressure ..... Diastolic Blood Pressure ..... Respiratory rate.....Height .....Weight.....Date vital sign taken if not admitted .....

PREEXISTING MEDICAL PROBLEMS

- Hypertension (Yes/No) .....
- Anemia (Yes/No) .....
- Diabetes (Yes/No) .....
- HIV positive (Yes/No) .....
- Cardiac problem (Yes/No) .....
- Malaria (Yes/No) .....
- Tuberculosis (Yes/No) .....
- Hepatitis (Yes/No) .....
- Other (Specify) .....

If yes to one of the conditions, was she on treatment/treated (Yes/No) ..... If no, what were the three mains reasons for not seeking care ....., ..., ...

Comment on pre-existing medical condition

.....

.....

.....

.....

ANTENATAL CARE

Received antenatal care (Yes/No) ..... If yes, number of antenatal visits .....

If yes, where did she receive care? (list all) (…), health centre, district hospital, national referral hospital, private, other:

.....

.....

If yes, who provided care? (list all) Ob/Gyn Specialist, medical officer/general practitioner, MCH Aide, midwife, SECHN, CHO, CHAs other:

.....

.....

Was the following care given during the ANC visits?

- Investigations done
    - RPR
    - Hgb
    - Blood group
    - HIV status
    - Ultrasound
- BP measurement during the last visit
- Fefol supplementation
- TT immunization

Other (Specify)

Comment on previous ANC care

.....

.....

……

……

ANTENATAL RISK FACTORS

- Hypertension (Yes/No) ……
- Placenta Previa (Yes/No) ……
- Previous C/S (Yes/No) ……
- Multiple gestation(Yes/No) ……
- Abnormal lie (Yes/No) ……
- Proteinuria (Yes/No) ……
- Glycosuria (Yes/No) ……
- Urinary tract infection (Yes/No) ……
- HIV positive (Yes/No) ……
- Undesired pregnancy(Yes/No) ……
- Anaemia (Yes/No) ……
- Ectopic pregnancies (Yes/No) ……
- Previous pregnancy complications (Yes/No) ……

- Other ante partum risk factors (specify) omments on antenatal care – list any medications

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……

……

……

PHYSICAL EXAM ON ADMISSION GENERAL PHYSICAL EXAM

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……
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ABDOMINAL EXAM

Fundal height (cm) ……Fundal height to gestational age discrepancy:

Presentation …… ……

Other abdominal abnormalities: ……

……

Comment on Abdominal exam

.....

.....

.....

.....

PELVIC EXAM

Stage of labour if in labour.....

Any pelvic abnormality noted.....

Comment on pelvic examination

.....

.....

.....

.....

LABORATORY WORK-UP

Blood type (Yes/No) .....

RH (Yes/No) .....

Haematocrit(Yes/No) .....

Haemoglobin(Yes/No) .....

VDRL (Yes/No) .....

Blood Chemistry(Yes/No) .....

RPR (Yes/No) .....

HIV (Yes/No) .....

Rubella (Yes/No) .....

Urinalysis(Yes/No) .....

Other Specify .....

Comments on laboratory

.....

.....

ANTEPARTUM ADMISSION COMPLICATIONS

PROM (Yes/No) .....

Abruption (Yes/No) .....

Placenta praevia (Yes/No) .....

Pre-eclampsia (Yes/No) .....

Eclampsia (Yes/No) .....

IUFD (Yes/No) .....

Pyelonephritis (Yes/No) .....

Sepsis (Yes/No) .....

Malaria (Yes/No) .....

Preterm labour (Yes/No) .....

Other ante partum admission complications:

Comments on complications

.....

.....

DELIVERY, PUERPERIUM, NEONATAL INFORMATION

Did labour occur (Yes/No) .....If labour occurred, was a partograph used? (Yes/No) ..... If labour occurred, duration of labour: Labour phase .....Active phase .....Second stage .....Third stage .....Length of ruptured membranes .....Was placenta complete? (Yes/No) .....

Date labour started.....Time labour started.....

DELIVERY

Date of delivery.....Time of delivery.....Who attended delivery.....Place of delivery .....Mode of delivery.....Estimated gestational age at delivery.....

Any complication during delivery?

Intrapartum haemorrhage(Yes/No) .....

Intrapartum infection(Yes/No) .....

Intrapartum-eclampsia/pre-eclampsia(Yes/No) .....

Obstructed labour (Yes/No) .....

Prolonged labour (Yes/No) .....

Was appropriate care provided?

.....

.....

Comments on labour and delivery:

.....

.....

Puerperium

Attended PNC.....Number of post-natal check-ups..... Was there active management of third stage of labour? ..... Was the placenta removed?.....if yes, method employed.....

Any complication during the postpartum period?

Postpartum haemorrhage (Yes/No) .....

Postpartum infection (Yes/No) .....

Postpartum pre-eclampsia/eclampsia (Yes/No) .....

Retained placenta(Yes/No) .....

Neonate

Outcome ..... Birth weight (grams) ..... Apgar (1 min) ..... Apgar (5 min)

Was appropriate care provided during the postpartum period?

.....

.....

Comments on puerperium:

.....

.....

.....

INTERVENTIONS (MARK YES/NO)

Early pregnancy	Antepartum	Intrapartum	Postpartum
Evacuation.....	Transfusion.....	Instrumental delivery.....	Evacuation.....
Laparotomy.....	Version.....	Symphysiotomy.....	Laparotomy.....
Hysterectomy.....	Labour induction.....	Caesarean.....	Transfusion.....
Transfusion.....	Magnesium Sulfate.....	Hysterectomy	Hysterectomy.....
Antibiotics.....	Magnesium Sulfate.....	Magnesium Sulphate.....	
		Transfusion.....	Transfusion.....
		Antibiotics.....	Antibiotics.....
			Oxytocin.....
			Misoprostol.....

Other intervention

General Anaesthesia	yes ☐ no ☐	
Epidural	yes ☐ no ☐	Other interventions
Spinal	yes ☐ no ☐	.....
Local	yes ☐ no ☐	.....
ICU ventilation	yes ☐ no ☐	.....
Invasive monitoring	yes ☐ no ☐	.....

Comment on interventions

.....

.....

.....

.....

Contributory Factors

.....

.....

.....

Barriers to Care and Remediable Factors

(were any of these factors present (yes/no)

Delay I Was there a delay by the women seeking care? yes ☐ no ☐

Socio-cultural norms and beliefs yes ☐ no ☐

Did women or family failed to recognise there was a problem? yes ☐ no ☐

Family financial problem? yes ☐ no ☐

Comment on Delay I- Include personal, family oriented, and community oriented problems including social and financial:

.....

.....

.....

Delay II- delay in reaching to the health facility

Problem with transportation (lack, poor roads, distances)? yes ☐ no ☐

Cost of transportation yes ☐ no ☐

Delay in referral from lower level health facility yes ☐ no ☐

Comment on delay II

.....

.....

.....

Delay III: Was there a delay in receiving care at the facility?

Lack of personnel or unskilled personnel Yes ☐ no ☐

Lack of equipment or supplies Yes ☐ no ☐

Delay in providing care Yes ☐ no ☐

Poor or none adherence to protocol/guideline Yes ☐ no ☐

Comment of delay III

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.....

Was there a problem in the medical care received at the facility? Yes ☐ no ☐

If yes, was the problem antenatal? Yes ☐ no ☐

If yes, was the problem intra-partum? Yes ☐ no ☐

If yes, was the problem postpartum? Yes ☐ no ☐

If yes, was the problem with resuscitation? Yes ☐ no ☐

If yes, was the problem with anaesthesia? Yes ☐ no ☐

If yes, was the problem unprofessional conduct? Yes ☐ no ☐

Comments on potential avoidable factors, missed opportunities and substandard care:

.....

.....

ACTION ITEMS

Preventable (Avoidable) death yes ☐ no ☐

What have you and your facility learned from this case?

.....

.....

How will what you learned change your practice?

.....

.....What recommendations and actions will you take in the future?

.....

.....

.....

.....

.....

Death Summary

Date of death .....Time of death.....Stage of death (During Pregnancy, During Delivery, After Delivery) .....Did death occur on a holiday?.....

Place of death (community, facility, in transit) .....

Status of pregnancy at death (Delivered, undelivered) .....Gestation at death or at delivery (weeks) if died after delivery .....

Days since pregnancy ended (either by delivery, miscarriage, ectopic) .....

Category of Death (Direct/Indirect) .....

Immediate cause of death (ICD-10) .....

Underlying cause of death (ICD-10) .....

Contributory Condition #1 (ICD-10) .....

Contributory Condition #2 (ICD-10) .....

Contributory Condition #3 (ICD-10) .....

Autopsy ..... If autopsy done, please attach report

Preventable (Avoidable) death (Yes/No) .....

Annex 11R: Perinatal Death Investigation Form

GOVERNMENT OF SIERRA LEONE

PERINATAL DEATH INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____

(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Pregnancy Progress and Care (Perinatal death history and risk factors)

Mother's age (in years): _____

Type of pregnancy: singleton/twin/higher multiples

Did the mother receive any antenatal care? Yes/No/Unknown

If yes, how many visits? _____

Did the mother have malaria? Yes/No/Unknown

If yes, did the mother receive treatment? Yes/No/Unknown

Did the mother have pre-eclampsia? Yes/No/Unknown

If yes, did the mother receive any treatment? Yes/No/Unknown

Did the mother have severe anaemia (HB≤7g/dl)? Yes/No/Unknown

If yes, did the mother receive any treatment? Yes/No/Unknown

Did the mother have recommended maternal immunizations (e.g. tetanus toxoid)? Yes/No/Unknown

Did the mother have Rhesus factor (Rh) or ABO incompatibility? Yes/ No/Unknown

If Rhesus factor is positive, did the mother receive Anti-D injection during this baby's pregnancy? Yes/ No/Unknown

Did the deceased present in an abnormal Lie (including breech presentation)? Yes/ No/Unknown

What was the HIV status of the mother? "HIV+/HIV-/ Unknown HIV status

What was the status of the syphilis test of mother? Positive (+)/ negative (-)/Unknown

Labour, Birth, Puerperium

Date of birth (day/month/year): _____/_____/_____

Gestational age (in weeks): _____

Method of estimation of gestational age: Ultrasound /Last Menstrual Period/Fundal height

Last Menstrual Period (DD/MM/YY): _____

Attendance at delivery: Nurse/midwife/doctor/other

If other, specify: _____

Sex of the baby: male/female/ambiguous

Birth weight in kilograms: _____

Was fetal heart rate present on admission? Yes/No/Unknown

What type of delivery was it? Spontaneous vaginal delivery/Vacuum/forceps/Caesarean section

What was the baby status at birth? Alive/Stillborn

If alive did the baby died within 7 days of birth? Yes/No

If the deceased baby was born alive what was the APGAR Score? _____

Was the baby resuscitated with a bag and mask? Yes/No/Unknown

Was the baby referred to any health facility or hospital? Yes/No/Unknown

Did the baby receive any other medical care beyond resuscitation? Yes/No/Unknown

If yes, specify types of treatment received: I.V. Fluids; Blood/Plasma transfusion; Antibiotics; Oxygen; Other medical treatment;

If stillbirth, type: fresh stillbirth/macerated stillbirth

Did the mother have premature rupture of membranes (PROM)? Yes/No/Unknown

Did the mother have foul smelling liquor? Yes/No/Unknown

How long (hours) was the duration of labour: _____

Cause of Death

Primary cause of death: _____

Secondary cause of death: _____

Maternal condition (if applicable): _____

Any physical malformation noted on the deceased? Yes/No

If yes, type of birth defect (with full description): _____

Case Investigator Assessment

*Does the alert meet case definition for Perinatal Death? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

Annex 11S: Neonatal Tetanus Case Investigation Form

GOVERNMENT OF SIERRA LEONE

NEONATAL TETANUS CASE INVESTIGATION FORM

Official use Only Epid number_____-_____-_____-_____-_____- Received: ____/____/____

Country Province District Year onset Case No.

IDENTIFICATION

District*_____Province*_____

City/Town_____Village/Neighbourhood_____

Address:_____

Name of patient*_____ Sex: ☐ 1 = Male, 2=female

Mother's Name:_____ Father's Name:_____

Nearest Health Facility to Village:_____

NOTIFICATION/INVESTIGATION

Notified by: _____Date Notified_____/_____/_____

Date Case Investigated_____/____/____

MOTHER'S VACCINATION HISTORY

Mother vaccinated with TT? Number of Doses ☐ Have Card? ☐ 1=Y, 2=N, 99=Unknown

1st ____/____/____ 2nd ____/____/____ 3rd ____/____/____ 4th ____/____/____ 5th ___/____/___

If>5, Date of Last dose ____/____/____

Vaccination status of Mother prior to delivery ☐ 1=up to date 2=not up to date 99=unknown

BIRTH OF INFANT

Date of birth:____/___/___ Location ☐ 1=Hospital 2=Health Centre 3=House trained attendant 4=House untrained birth attendant 5=House no attendant 6=unknown

Attended by Doctor or Nurse ☐ 1=Y 2=N 99=unknown

Attended by trained TBA or midwife ☐ 1=Y 2=N 99=unknown

Cut cord with a sterile blade? ☐ 1= yes 2= No 99=unknown

Cord treated with anything? ☐ 1= yes 2= No 99= Unknown

Mother received antenatal care? ☐ 1= yes 2= No 99=unknown

How many prenatal visits _____

INITIAL CLINICAL HISTORY (For each of the following questions enter 1=Yes, 2= No, 99=Unknown)

Was baby normal at birth? ☐ Baby have normal cry and suck during first 2 days? ☐

Stopped sucking after 2 days? ☐

Onset of symptoms___/___/___ Age of onset _____ Days

Stiffness? ☐ Spasms or Convulsions? ☐ Arched back? ☐ Complications? ☐

☐

Baby died?

TREATMENT

Seen in OPD: ☐ 1=Y 2=N 99=Unknown Admitted ☐ 1=Y 2=N 99=Unknown Date of Admission____/____/____

Medical record No._____ Health Facility address_____

COMMENTS_____

RESPONSE

Mother given protective dose of TT within 3 months of report ? ☐ 1=Y 2=N 9=Unknown

Date of response____/____/____

Supplemental Immunisation within same locality as the case? ☐ 1=Y 2=N 9=Unknown

Details of response:_____

FINAL CLASSIFICATION OF THE CASE: Neonatal Tetanus ☐ 1=Yes 2=No, 9=Unknown

INVESTIGATOR

Name_____Title_____

Unit_____Address_____Phone_____

ADDITIONAL NEONATAL TETANUS CASE INVESTIGATION FORM

FACILITY: _____ DISTRICT: _____

Tracking Number:_____

(Health Facility Code -Current Year – Case Number)

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Investigation Information

***DATE OF INVESTIGATION: _____/_____/_____

Was this case/condition/event detected by a health worker? Yes/No

Where was the case/condition/event detected? Health Facility/Community/Laboratory

Location where symptom started (Address): _____

Residential Village/Town/City where symptom started: _____

Residential Chiefdom/Zone where symptom started: _____

Case Investigator Assessment

*Does the alert meet case definition for Neonatal Tetanus? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: _____

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11T: Small Pox Case Investigation Form

GOVERNMENT OF SIERRA LEONE

SMALLPOX CASE INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

*****DATE OF INVESTIGATION (dd/mm/yyyy): _____/_____/_____

Is the case/condition detected by a health worker: Yes/No/Unknown

Where is the case/condition detected: Health Facility/Community/Laboratory

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Health Worker

*Patient is a health worker: Yes/No/Unknown

Cadre: Doctor/CHO/SRN/SECHN/CHA/MCH Aide/Nursing Aide/Lab personnel/Pharmacy Personnel/ Ambulance driver/Porter/Nutritionist/EHO/Midwife/Other

Staff Position (Specify): _____

Staff work station : _____

SYMPTOMS AND SIGNS (tick what is applicable)

Fever		Sore throat		Bleeding	
Chills		Macules (flat spots)		Cough	
Nausea		Papules (solid bumps)		Bronchitis (Inflammation of the bronchi)	
Vomiting		Vesicles (fluid-filled blisters)		Pneumonia	

Abdominal pain		Pustules (Pus-filled blisters)		Arthralgia	
Headache		Lesions		Osteitis (Inflammation of the bone)	
Backache		Crusts		Shock	

Rash Characteristics

Date of rash onset (dd/mm/yyyy): _____/_____/_____
Was the rash acute (sudden) in onset? Yes/No/Unknown;
Was a black scar (eschar) present before or at the time of appearance of the rash? Yes/No/Unknown;
Was the rash generalized (multiple parts of the body) or focal (only one part of the body)? Generalized/Focal
Where is the rash first noted? Face/Legs/Trunk/Inside the Mouth/Other
Where is the rash most concentrated? Face/Legs/Trunk/Inside the mouth/Other
Is any of the lesions at the macules (flat spots) stage now? Yes/No/Unknown;
Is any of the lesions at the pustules (blisters filled with pus) stage now? Yes/No/Unknown;
Is any of the lesions at the papules (solid bumps) stage now? Yes/No/Unknown;
Is any of the lesions at the crusts stage now? Yes/No/Unknown;
Is any of the lesions at the vesicles (fluid-filled blisters) stage now? Yes/No/Unknown;
Which kind of lesion is now the most common? Macules/Pustules/Papules/Crusts/Vesicles
Are the lesions superficial (on top of the skin) or deep seated (feel embedded deeply in the skin) now? Superficial /Deep /Neither
How many lesions are present, please estimate? <25/25-99/100-499/500 and more
On any one part of the body (e.g., face or arm), are all the lesions in the same state of development? Yes/No
How big are most of the lesions? Small (1-5mm)/Large (6-10 mm)/Neither
Have any lesions crusted? Yes/No
If *Yes*, how many days did it take for the first lesions to crust? _____
How itchy is the rash? Not at all/Somewhat/Very/Unknown
Does the patient have lymphadenopathy (Swollen lymph nodes)? Yes/No/Unknown
Is the patient toxic or moribund now? Yes/No/Unknown

Source of Exposure

Is chickenpox (varicella) occurring in the community? Yes/No/Unknown
Has the patient had contact with a person with chickenpox or shingles 10-21 days before rash onset? Yes/No/Unknown
Has the patient been in contact with a person with any other rash illness within 3 weeks before onset of illness? Yes/No/Unknown
If *Yes*, please specify the date of first contact? (dd/mm/yyyy): _____/_____/_____
Also specify the type of contact with the case? Direct contact/Social contact (indirect)
If *Yes*, please provide date the patient travel within the 3 weeks before the onset of illness?
_____/_____/_____
The date the patient return home within the 3 weeks before the onset of illness?
_____/_____/_____
Village/town or city the patient travel to:_____
Chiefdom/Zone travelled to: _____

Vaccination

Has the patient received chickenpox (varicella) vaccine? Yes/No/Unknown
Has the patient ever received smallpox vaccine? Yes/No/Unknown
If *Yes*, when was the most recent vaccination? (dd/mm/yyyy): _____/_____/_____

Medical History

Has the patient ever had chickenpox or shingles? Yes/No/Unknown

Was Chickenpox vaccines given? Yes/No/Unknown
If *Yes*, when did the patient have Chickenpox vaccines? (dd/mm/yyyy): _____/_____/_____
Is the patient immunocompromised (Having impaired immune system)? Yes/No/Unknown
If *Yes*, specify type of illness *(e.g., cancer, HIV/AIDS)?* _____
Does the patient have any other serious underlying chronic medical illnesses? Yes/No/Unknown
If *Yes*, please name the underlying medical illness:_____
Is the patient sexually active? Yes/No/Unknown

Medication

Is the patient on medications that suppress the immune system *(e.g., steroids, chemotherapy, radiation)?* Yes/No/Unknown
If *Yes*, name medication the patient is taking:_____
Is the patient taking antiviral medications: Yes/No/Unknown
If *Yes*, name the antiviral medication: _____
Prior Treatment/Self Medication: _____

Case Investigator Assessment

*Does the alert meet case definition for Smallpox? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____
Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other
Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case
Final Patient Vital Status: Alive/Dead/Unknown
Date of death (dd/mm/yyyy): _____/_____/_____
General Comments: _____

INVESTIGATOR

*Name: _____
*Designation: _____
*Contact Phone number: _____

These are compulsory variable and must be completed.

Annex 11U: Yellow Fever Case Investigation Form

GOVERNMENT OF SIERRA LEONE

YELLOW FEVER CASE INVESTIGATION FORM

Official use Only Epid number_____-_____-_____-_____-_____ Received: ____/____/____

Country Province District Year onset Case No

IDENTIFICATION

DISTRICT*_____PROVINCE*_____

Town/ City_____ Village/ Neighbourhood_____

Nearest Health Facility to Village:_____

Address:_____

Name of patient*_____Father/Mother:_____

Date of Birth _____/_____/_____ (If Date of birth. Unknown) Age:_____years or_____month Sex: ☐ M=Male F=Female

NOTIFICATION/INVESTIGATION

Notified by:_____Date Notified____/____/____ Date Case Investigated____/____/____

HISTORY

History of Fever ☐ 1=Yes, 2=No, 99=Unknown Date of first onset of fever _____/_____/_____

Jaundice ☐ 1=Yes, 2=No, 99=Unknown Date of first appearance of jaundice _____/_____/_____

Sign of Haemorrhage ☐ 1=Yes, 2=No, 99=Unknown Date of first appearance of haemorrhage _____/_____/_____

Died ☐ 1=Yes, 2=No, 99=Unknown At least one dose of yellow fever vaccine ☐ 1=Yes, 2=No, 99=Unknown

Date of last yellow fever vaccination (If known) ____/_____/____

List districts where patient visited in the last 2 weeks 1._____2._____
3._____4._____

Were there other cases of Fever & Jaundice in the district of this case or other district where the patient visited? ☐ 1=Yes, 2=No, 99=Unknown

BLOOD SPECIMEN

Date of blood specimen collection _____/____/_____ Date specimen received at the lab _____/_____/_____

Results of IgM test ☐ 1=positive 2= Negative 3= Intermediate Date results received_____/____/_____

Malaria Microscopy ☐ 1= positive 2= negative 3=Intermediate

Date results sent to referring clinician _____/_____/_____

Results of other lab studies (other specimens collected on selected patients only)

Date 1st blood specimen ___/___/____Date second specimen taken ___/___/___ Virus isolated? ☐ 1=Yes, 2=No, 99=Unknown

FINAL CLASSIFICATION OF THE CASE:

☐

1=Confirmed 2=Suspected/Compatible/Clinical (clinical signs but no blood specimen taken) 3 =Discarded

INVESTIGATOR

Name_____Title_____

Unit_____Address_____Phone_____

PLEASE SEND A COPY OF THIS COMPLETED FORM IMMEDIATELY TO THE DIRECTORATE OF HEALTH SECURITY AND EMERGENCY UNIT-FREETOWN

YELLOW FEVER ADDITIONAL CASE INVESTIGATION FORM

FACILITY: _____ DISTRICT: _____

Tracking Number:_____

(Health Facility Code -Current Year – Case Number)

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Current Residential Coordinates: Latitude: _____Longitude: _____

Investigation Information

***DATE OF INVESTIGATION: _____/_____/_____

Was this case/condition/event detected by a health worker? Yes/No

Where was the case/condition/event detected? Health Facility/Community/Laboratory

Location where symptom started (Address): _____

Residential Village/Town/City where symptom started: _____

Residential Chiefdom/Zone where symptom started: _____

Case Investigator Assessment

*Does the alert meet case definition for Yellow Fever? Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____

Final Diagnosis: _____

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*****Name: _____

*****Designation: _____

*****Contact Phone number: _____

*******These are compulsory variable and must be completed.*

Annex 11V: Guinea worm disease case investigation form

[COUNTRY NAME] GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

Epid No:_ _ _-_ _ _ -_ _ _-_ _-_ _ _ _

To be completed in triplicate

C O U-R E G-D I S-Y R-C A S E

I. Reporting/Investigation Information

Reporting Village:_____Zone:_____District:_____
Region: _____
Date Case Reported: (dd/mm/yyyy)___/___/_____ Reported by:_____Position:_____
Date Case Investigated: / / Investigated by: Position:

II. Patient Information and Place of Residence

Name:_____ Father's Name/Landlord's Name:_____
Age:_____Sex:_____Occupation:_____Ethnicity_____
Resident Address: Village:_____ Zone:_____
Area/Sub District:_____ District:_____Region:_____
Setting: Urban/Rural_____ Land Marks:_____

Place of residence is same as the reporting village: **YES/NO** Residence since when (in months):_____
(If the number of months stated for "Residence since when" is less than 10 months, then please fill BOX "III. Place stayed in the last 10-14 months ….".)

III. Place stayed in the last 10-14 months if not the same as above.

Village:_____ Zone:_____ Area/Sub District:_____

District:_____Region:_____ Country:_____

IV. Travel History of patient in the last 10-14 months

Date From:	Date To:	Village:	Sub District	District:	Region:
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Possible water sources that the patient might have contaminated with location details and GPS:

Name	Latitude	Longitude	Type	Source	Check box if Treated with Abate and Date
_____	_____	_____	_____	_____	☐ _____
_____	_____	_____	_____	_____	☐ _____
_____	_____	_____	_____	_____	☐ _____
_____	_____	_____	_____	_____	☐ _____

V. Sign and symptom

What was the first sign/symptom before the emergence of worm? Blister/Itching/Swelling/Others, Specify_____
Emergence of guinea worm: YES/NO No of Worms:_____ Is this the first guinea worm emerged this year? YES/NO
Date of the First guinea worm emerged:___/___/_____ Was the case detected before worm emerged? YES/NO

VI. Final Case Classification

Final Classification:_____ (1-Indigenous Case 2-Imported Case 3- Not a Guinea worm Case)
If **Not a Guinea-worm disease** please specify the final diagnosis:_____
If IMPORTED case, type of importation: **LOCAL/INTERNATIONAL.** If imported case. Cross notification done: **YES/NO**
Please attach the imported case form if case was imported from other country. For internal importation, please send a copy of this form to district it was imported.

Epid No:_ _ _-_ _ _-_ _ _-_ _-_ _ _ _ _

C O U-R E G-D I S-Y R-C A S E

To be completed in triplicate

VII. Case Containment Measures and Guinea-worm registry

Received any health education: **YES/NO** Patient entered any water source: **YES/NO**

Place Managed: **CCC/Home/Health Centers/Hospital**

Name of Health Facility/Health Center/Other Centers if patient was hospitalized:________________________________

Admission Date: ___/____/______ ` Discharged Date: ___/____/______

SN.NO.	Location of worm	Date worm detected emergence	Date of guinea-worm by supervisor:	Date confirmed	Date of guinea-worm completely expelled	Regular bandaging	Extracted
_____	________________	___/____/______	___/____/______	___/____/______	___/____/______	☐	☐
_____	________________	___/____/______	___/____/______	___/____/______	___/____/______	☐	☐
_____	________________	___/____/______	___/____/______	___/____/______	___/____/______	☐	☐
_____	________________	___/____/______	___/____/______	___/____/______	___/____/______	☐	☐
_____	________________	___/____/______	___/____/______	___/____/______	___/____/______	☐	☐
_____	________________	___/____/______	___/____/______	___/____/______	___/____/______	☐	☐

VIII. Specimen Handling

Was a specimen (worm) saved and preserved in alcohol? **YES/NO** If No Why?__________________________________

Date sent to Region:______________________ Received By: ______________________Date Received by:________________________

Date sent to National: ____________________Received By: ______________________Date Received by:________________________

<u>For National Secretariat Only:</u>

Did you send it for confirmation? Yes/No Date sent: ___________________________Sent To:__________________________________

Date Result Received____________________

Result:____

____

IX. Other Information

Use of cloth filter: YES/NO Frequency of changing filters 1-rarely; 2-sometimes; 3-always; 4-never

Remarks:____

Person who completed this form:

____________________________________ ________________ _______________ __________

NAME POSITION CELL PHONE NO SIGNATURE

Disease Control or Surveillance Officer:

____ ________________ _______________ _________________

NAME POSITION CELL PHONE NO SIGNATURE

Annex 11W: Tuberculosis (MDR and XDR TB) case-based reporting form

Case based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form																																
Country:						**Year:**																										
Quarter:						**Month:**			**Drug Susceptibility Test Results (S=sensitive; R=Resistant; I=intermediate; U=unknown)**																							
Case unique Identifier (Detection year-Country code-Number in Tb Register)	**Sex** (F/M)	**Age** (Yrs)	**Date of Diagnosis** (dd/mm/yyyy)	**Type of Notification** (MDR-TB* or XDR-TB**)	**TB Site** (Pulmonary or extra Pulmonary)	**Type of TB Case** (New /Relapse /After default /After failure of first treatment /After failure of re-treatment	**Patient Treatment Status** (On treatment /Not on treatment /Don't Know)	**HIV Status** (positive /negative /Unknown)	**H**	**R**	**E**	**Z**	**S**	**T**	**A**	**K**	**C**	**Cf**	**Of**	**Lf**	**Mf**	**Gf**	**Gf**	**Pt**	**Et**	**Cs**	**PAS**	**Other (Specify)**

*** Multi-drug Resistant TB =** Resistance to at least Isoniazid and Rifampicin

****Extensively Drug Resistant TB =** MDR-TB plus: Resistance to any fluoroquinolone such as Ciprofloxacin, Oxfloxacin, etc, and Resistance to at least one of the three second line injectable anti-TB drugs (Capreomycin, Kanamycin and Amikacin).

First-line drugs: H = Isoniazid R = Rifampicin E = Ethambutol Z = Pyrazinamide S = Streptomycin Th = Thioacetazone

Second-line drugs: Am=Amikacin Km=Kanamycin Cm=Capreomycin Cfx=Ciprofloxacin Ofx=Ofloxacin Lfx=Levofloxacin Mfx=Moxifloxacin Gfx=Gatifloxacin Pto=Protionamide Eto=Ethionamide Cs=Cycloserine PAS=P-aminosalicylic acid

Annex 11X: Viral haemorrhagic fever case reporting form

IDSR Viral Haemorrhagic Fever Case Report Form		
Variables / Questions		**Answers**
1	Detection day (ddmm/yyyy)	
2	Detection place (Health facility or Community)	
3	Patient identification number (yyyy-week-CCC-PPP-DDD-Reporting site-nnn)	
4	Patient surname or last name	
5	Patient first name(s)	
6	Age (years)	
7	Sex (F/M)	
8	Number of people in same household	
9	Number of other contacts	
10	Patient's residencial adress	
11	Village/Town	
12	Neighborhood	
13	District	
14	Province	
15	Country	
16	Date of first symptoms onset (dd/mm/yyyy)	
17	Observed Symptoms and Clinical signs	
18	Was patient exposed to any known risk factor for this disease? (Yes/No)	
19	If yes, specify risk factor(s)	
20	Lab results	
21	Final Classification (Not a case, Suspect, Probable, Confirmed by Lab, Confirmed by epidemiological link, Pending)	
22	Outcome (Died, Survived, Unknown)	
23	End of latest contact followed-up (dd/mm/yyyy)	
24	Other Notes and Observations	
25	Date latest update of this record (dd/mm/yyyy)	

Annex 11Y: Acute or Chronic Viral Hepatitis case investigation form

Acute or Chronic Viral Hepatitis case investigation form		
No.	Variable/Description	Answer
General characteristics – identification		
1	Epid. Number (e.g. Country code-RRR-DDD-YY-NNN)	Country code- _ _ _ - _ _ _ - _ _ - _ _ _
2	GPS coordinates*:* Latitude; Longitude	
3	Reporting Region /Province	
4	Reporting District	
5	Reporting health facility	
6	Patient Health Facility Identification Number	
7	Date seen at health facility (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
8	Date health facility notified district (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
9	Patient Surname	
10	Patient Other Names	
11	Name of mother/father/ Care taker if child ≤12 years	
12	Date of birth (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
13	Country of Birth	
14	Age (Completed Years, Months, Days)	☐ Years ☐ Months ☐ Days
15	Sex: M=Male F=Female	
16a	Patient's residential Address: (House Number, Location, Community of residence)	
16b	Telephone number	
16c	Occupation	
16d	Place of work	
17	Urban/Rural	
18	Sub-district of Residence	
19	District of Residence	
20	Region of Residence	
21	Country of Residence	
Clinical characteristics and testing circumstances		
22	Clinical diagnosis	Acute ☐ Chronic ☐
23	Acute Onset	Yes ☐ No ☐
24	If Acute, Onset Date (first symptoms) (dd/mm/yyyy)	
25	If Chronic, answer 25a and 25b below.	
25a	Systematic testing (Screening)	Yes ☐ No ☐
25b	Chronic liver disease screening (eg liver cirrhosis and/or tumour)	Yes ☐ No ☐
27	In-patient or Out-patient?	

Acute or Chronic Viral Hepatitis case investigation form

No.	Variable/Description	Answer
28	If In-patient, date of admission (dd/mm/yyyy)	
29	Clinical Signs and Symptoms	Jaundice: Yes ☐ No ☐ Others:
Prior Diagnosis and Treatment History		
30a	Previously identified with chronic HBV infection	Yes ☐ No ☐ Unknown ☐
30b	Previously identified with chronic HCV infection	Yes ☐ No ☐ Unknown ☐
31a	Patient on specific anti-viral therapy for HBV	Yes ☐ No ☐ Unknown ☐
31 b	Patient on specific anti-viral therapy for HCV	Yes ☐ No ☐ Unknown ☐
Hepatitis Vaccination History		
32	Has the person ever received at least one dose of hepatitis A vaccine?	Yes ☐ (_____doses) No ☐
33a	Has the person ever received Hepatitis B Birth dose	Yes ☐ (_____doses) No ☐
33b	Has the person ever received at least one dose of hepatitis B vaccine?	Yes ☐ (_____doses) No ☐
34	Has the person ever received at least one dose of hepatitis E vaccine?	Yes ☐ (_____doses) No ☐
35	Date of last vaccination (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
General Exposures		
36	Is the person health-care worker exposed to blood through patient care?	Yes ☐ No ☐ Unknown ☐
37	Is the person a man who has sex with other men?	Yes ☐ No ☐ Unknown ☐
38	Does the person undergo chronic haemodialysis?	Yes ☐ No ☐ Unknown ☐
39	Does the person inject recreational drugs?	Yes ☐ No ☐ Unknown ☐
40	Is the person involved in a reported, identified outbreak?	Yes ☐ No ☐ Unknown ☐
Possible exposures in the 2–6 weeks before onset (acute hepatitis only)		
41	Was there contact with patient(s) with the same symptoms?	Yes ☐ No ☐ Unknown ☐
42	Did the person drink water from a well or other unsafe water source?	Yes ☐ No ☐ Unknown ☐
43	Did the person eat unwholesome food e.g. raw, uncooked shellfish?	Yes ☐ No ☐ Unknown ☐
44	Is the person a child or a staff member in a day-care centre?	Yes ☐ No ☐ Unknown ☐
45	Did the person travel to an area highly endemic for hepatitis A?	Yes ☐ No ☐ Unknown ☐
Possible exposures in the 1–6 months before onset (acute hepatitis only)		
46	Did the person receive injections in a health-care setting?	Yes ☐ No ☐ Unknown ☐
47	Was the person hospitalized?	Yes ☐ No ☐ Unknown ☐
48	Did the person undergo surgery?	Yes ☐ No ☐ Unknown ☐
49	Did the person receive a blood transfusion?	Yes ☐ No ☐ Unknown ☐
50	Did the person go to the dentist?	Yes ☐ No ☐ Unknown ☐
51	Was there sexual contact with someone with hepatitis B?	Yes ☐ No ☐ Unknown ☐
52	Was there household contact with someone with hepatitis B?	Yes ☐ No ☐ Unknown ☐
		☐ ☐ ☐
		☐ ☐ ☐

Acute or Chronic Viral Hepatitis case investigation form		
No.	Variable/Description	Answer
53	Was there unprotected sex with non-regular partner(s)?	Yes No Unknown
54	Skin piecing and tattooing	Yes No Unknown
55a	Outcome (1=Alive; 2=Dead; 3=Unknown)	
55b	If dead, Date of death (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
56	Final classification (1=Lab Confirmed; 2=Confirmed by Epidemiological linkage; 3=Discarded (lab negative);	
57	Date form sent to district (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
58	Date received form at district (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
59	Person completing form: Name, Designation, Tel No. E-mail address, Signature Name of Head of Health Facility, Tel No., E-mail	
Viral Hepatitis Laboratory Reporting Form		
Part I. Referring health worker to complete this form and send a copy to the lab with the specimen		
	Variable	Answer
1	Date sample collected (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
2	Date sample sent to Laboratory (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
3	Type of sample (specify)	
4	Date laboratory received sample (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
5	Epid Number (e.g. GHA-GAR-DDD-YY-NNN) **	GHA- _ _ _ - _ _ _ - _ _ - _ _ _
6	Patient name(s)	
7	Sex: (M= Male F= Female)	
8	Age (Completed Years, Months, Days)	☐ Years ☐ Months ☐ Days
9	Person sending sample: Name, Designation, Tel No., E-mail	
Part II. Laboratory Officer to complete this section and return the form to district and clinician		
	Laboratory Name and location	
10	Sample condition 1=adequate (good) 2=not adequate (not good)	

Acute or Chronic Viral Hepatitis case investigation form		
No.	Variable/Description	Answer
11	Lab Results: Hepatitis A: Anti-HAV IgM Hepatitis B: HBsAg or IgM anti-HBc Hepatitis C: Anti-HCV Hepatitis D: HBsAg or IgM anti-HBc plus anti-HDV Hepatitis E: IgM anti-HEV and/or IgG anti-HEV	Anti-HAV IgM Pos Neg Unknown Anti-HBc IgM Pos Neg Unknown HBsAg Pos Neg Unknown Anti-HCV Pos Neg Unknown HCV RNA Pos Neg Unknown HCV core Ag Pos Neg Unknown
12	Other lab results	
13	Date laboratory sent results to Clinician (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
14	Date laboratory sent results to District (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
15	Date district received laboratory results (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
16	Name of Lab Personnel completing form Phone number Signature E-mail address	

Annex 11Z: Unusual serious medical condition investigation form

GOVERNMENT OF SIERRA LEONE

UNUSUAL SERIOUS MEDICAL CONDITION INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION** (dd/mm/yyyy): _____/_____/_____

Is the condition/event detected by a health worker: Yes/No/Unknown

Where is the condition/event detected: Health Facility/Community/Laboratory

If it is an event, specify the type: _____

Additional Demographic Information

PREGNANT: Yes/No/Unknown;

LACTATING: Yes/No/Unknown;

Level Of Education: No Education /Primary /Secondary/Tertiary;

Marital Status: Single/Married/Living with partner/Divorce/Widow/Widower/Not applicable

Work/Occupation: _____

Workplace/Nursery/School/College Name: _____

Workplace/Nursery/School/College Physical Address: _____

Workplace/Nursery/School/College Village/Town/City: _____

Workplace/Nursery/School/College Contact Phone: _____

Name of Parent/Guardian/Next of Kin : _____

Location when symptom started (Address): _____

Residential Village/Town/City when symptom started: _____

Residential Chiefdom/Zone when symptom started: _____

Current Residential Coordinates: Latitude: _____Longitude: _____

SYMPTOMS AND SIGNS (tick what is applicable)

Fever		Difficult Breathing		Signs of Bleeding	
Headache		Muscles pain		Bleeding Location	
Nausea		Joint Pain		Seizures	
Vomiting		Dizziness		Altered Consciousness	
Diarrhoea		Skin Rash		Coma	
Abdominal Pain		Pruritic Rash (Itchy)			

Record the Highest Temperature Reading: _____

Describe how the Rash is Presenting: _____

Other Symptoms and Signs 1 (specify): _____

Other Signs and Symptoms 2 (specify): _____

Other Signs and Symptoms 3 (specify): _____

Other Signs and Symptoms 4 (Specify): _____

Health Worker

*Patient is a health worker: Yes/No/Unknown

Cadre: Doctor/CHO/SRN/SECHN/CHA/MCH Aide/Nursing Aide/Lab personnel/Pharmacy Personnel/ Ambulance driver/Porter/Nutritionist/EHO/Midwife/Other

Staff Position (Specify): _____

Staff work station : _____

Exposure/Source - Symptomatic persons

*Contact with a Person of Similar Signs and Symptoms 1 Month Prior to Illness: Yes/No/Unknown

Type of Contact with Symptomatic Case: Direct Body Contact/ Social Contact (Indirect)

Number of people with similar signs and symptoms: _____

Village/Town/City of Contact with Symptomatic Case: _____

Chiefdom/Zone of Contact with Symptomatic Case: _____

Exposure/Source - Animals

*The Patient had Contact with Animals 1 Month Prior to Illness: Yes/No/Unknown
Type of Animal(s): _____
Type of Contact with Animal: Petting/Handling/Receive animal bite/Receive animal scratch/Butchering/ Unknown/More than one contact source/Other
Contact animals' disposition: Live/dead/both/Unknown
Contact with any sick animal: Yes/No/Unknown
Contact with any sick animal product (Meat, milk, hair, wool, skin, hides, etc.): Yes/No/Unknown
Village/Town/City of Contact with Animal: _____
Chiefdom/District of Contact with Animal: _____
Last Date of Contact with Animal: _____/_____/_____

Exposure/Source - Environmental

Is the patient source of drinking water likely to be contaminated with human or animal waste? Yes/No/Unknown
Has there been Agricultural activities in the environment where the patient lives? Yes/No/Unknown
What type of Agricultural activities are carried out in the environment? Subsistence farming /Commercial farming
Has there been mining activities in the environment where the patient lives? Yes/No/Unknown
What are the substance mined? _____
What type of mining activities are carried out in the environment? Small Scale/Large Scale
Has there been industrial activities in the environment where the patient lives? Yes/No/Unknown
What industrial activities are carried out in the patient's environment? Small industries/ Large industries
Has there been possible chemical spilled or contamination in the environment where the patient lives? Yes/No/Unknown
What possible chemicals spilled or contamination are in the environment? _____
Was the patient's illness or death likely the cause of deliberate poisoning? Yes/No/Unknown
What poison was likely the cause of the patient illness or death? _____
Was the patient illness or death likely the cause of air pollution? Yes/No/Unknown
What was likely the cause of air pollution? _____
Was the patient illness or death likely the cause of food poisoning? Yes/No/Unknown
What foodstuff was likely the cause of the food poisoning? _____

Was the patient illness or death likely the cause of eating wild fruits? Yes/No/Unknown
What wild fruits were likely the cause of illness or death? _____
Was the cause of illness or death due to circulating superbug (AMR)? Yes/No/Unknown
What superbug (AMR) is likely the cause of the illness or death? _____

Exposure/Source - Gatherings

*Patient attended gathering within 1 Month prior to onset of illness: Yes/No/Unknown
Type of Gathering the Patient attended: _____
Date of gathering: _____/_____/_____
Village/Town/City of Gathering: _____
Chiefdom/Zone of Gathering: _____

Travel History

*Travel within 1 month prior to onset of illness: Yes/No/Unknown
Village/Town/City Patient Travel to: _____
Chiefdom/District Travel to: _____
Travelled out of the Country? Yes/No/Unknown
If yes, Country travelled to (Address/Village/ town/ City): _____
Date Travelled from Home: _____/_____/_____
Date Returned: _____/_____/_____

Hospitalisation

*Was the Patient Hospitalised: Yes/No/Unknown
Reason for hospitalisation: Complication/Severity/Precautionary/Isolation/Other
Hospital/Facility name: _____
Date Hospitalised: _____/_____/_____
Date Discharged: _____/_____/_____
Prior Treatment/Self Medication: _____

Exposure/Source - Other

Specify Other High Risk Factor: _____

Case Investigator Assessment

*Does the alert meet the criteria for unusual serious medical condition? Yes/No/Unknown
Is subject area expert follow-up required: Yes/No/Unknown
If yes what expert follow-up required? _____
Is animal health follow-up recommended: Yes/No/Unknown
Is crop protectionist follow-up recommended: Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____
Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/ Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Yellow Fever/Zika/Other
Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case
Final Patient Vital Status: Alive/Dead/Unknown
Date of death (dd/mm/yyyy): _____/_____/_____
General Comments: _____

INVESTIGATOR

*Name: _____
*Designation: _____*Contact Phone number: _____

Annex 11AA: Unusual serious event investigation form

GOVERNMENT OF SIERRA LEONE

UNUSUAL SERIOUS EVENT INVESTIGATION FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Investigation Information

***DATE OF INVESTIGATION** (dd/mm/yyyy): _____/_____/_____

Is the condition/event detected by a health worker: Yes/No/Unknown

Where is the condition/event detected: Health Facility/Community/Laboratory

If it is an event, specify the type: _____

Event Details

What is the cause of the event? Floods/Fire/Landslides/Explosions/Chemical spills/ Radiation accidents/Others
If others, specify: _____
Does the event affect humans? Yes/No
If yes, how many are likely to be affected by the event? _____
How many children under 5 years are affected? _____
How many 5 to 18 years are affected? _____
How many pregnant women are affected? _____
How many women, 18 – 60 years are affected? _____
How many old people above 60 years are affected? _____
Does the event result to hospitalization? Yes/No/Unknown
If yes, how many people affected are estimated to have been hospitalised? _____
Does the event result to displacement? Yes/No/Unknown
If yes, how many people affected are estimated to have been displaced? _____
Does the event result in death? Yes/No/Unknown
If yes, how many people are estimated to have died? _____
Does the event affect animals? Yes/No
If yes, how many are likely to be affected? _____
Does the event result in death of animals? Yes/No/Unknown
If yes, how many animals are estimated to have died? _____

Exposure/Source - Other

Specify Other High Risk Factor: _____
_____

Case Investigator Assessment

*Does the alert meet the criteria for unusual serious event? Yes/No/Unknown
Is subject area expert follow-up required: Yes/No/Unknown
If yes what expert follow-up required? _____
Is animal health follow-up recommended: Yes/No/Unknown
Is crop protectionist follow-up recommended: Yes/No/Unknown

Conclusion of Investigation

Date of conclusion (dd/mm/yyyy): _____/_____/_____
Final Diagnosis: Anthrax/Bacterial Meningitis/Buruli Ulcer/Chikungunya/Cholera/ Dog bite/Ebola/ Lassa Fever/

Marburg/ Dengue Fever/Shigellosis/Amoebic Dysentery/ Salmonellosis/ Influenza new subtype/Hepatitis A/ Hepatitis B /Hepatitis C/ Maternal death/Measles/Monkey Pox/Neonatal Tetanus/Non Neonatal Tetanus/ Perinatal death/ Plague /Polio virus/ Rabies/Rift Valley Fever/Smallpox/Snake bite/Typhoid/Unusual Serious Event/Yellow Fever/Zika/Other

Final Case Classification: Confirmed by Laboratory/Confirmed by Clinicians/Probable/Suspect/Not a case

Final Patient Vital Status: Alive/Dead/Unknown

Date of death (dd/mm/yyyy): _____/_____/_____

General Comments: _____

INVESTIGATOR

*Name: _____

*Designation: _____

*Contact Phone number: _____

Annex 11AB: IDSR Case Based Notification Form

GOVERNMENT OF SIERRA LEONE

IDSR NOTIFICATION FORM (CASE-BASED REPORTING)

Health Facility: _____ **District :** _____

***Date Seen at Health Facility (dd/mm/yyyy)**: _____/_____/_____

***Date Health Facility Notified District (dd/mm/yyyy)**: _____/_____/_____

Referred by CHW/CAHW?: ☐ Yes_CHW ☐ Yes_CAHW ☐ No ☐ Unknown

Tracking Number:_____

(Health Facility Code -Current Year – Case Number)

***Disease/Condition/Event** Notified:

☐ Acute Haemorrhagic Fever Syndrome	☐ Dengue Fever	☐ Neonatal Tetanus
☐ Acute Jaundice Syndrome	☐ Diarrhoea With Blood (Shigella)	☐ Onchocerciasis
☐ Adverse Events Following Immunization (AEFI)	☐ Dracunculiasis (Guinea Worm	☐ Plague
☐ Animal Bites (Dog Bite)	☐ Human Influenza Due To aNew Subtype	☐ Poliomyelitis (AFP)
☐ Animal Bites (Snake Bite)	☐ Human Rabies	☐ Saris
☐ Anthrax	☐ Leprosy	☐ SARS
☐ Bacterial Meningitis	☐ Lymphatic Filariasis	☐ Smallpox
☐ Buruli Ulcer	☐ Maternal Deaths	☐ Typhoid Fever
☐ Chikungunya	☐ Measles	☐ Yellow Fever
☐ Cholera	☐ Monkey Pox	☐ Zika Virus Disease
☐ Other (Specify) _____		

PROFILE

***Patient First Name:** _____

***Surname:** _____

***Date of Birth (dd/mm/yyyy)**: _____/_____/_____ Age: ___ Years ___ Months ___ Days

*Sex: ☐ Male ☐ Female

Residential Address (House number, street or village): _____

***Residential Village/Town/City:** _____

***Residential Chiefdom/Zone:** _____

Phone Number (Patient/Parent/Guardian/Next of Kin): _____

CASE DIAGNOSIS AND TREATMENT

***Date of ONSET /Event (dd/mm/yyyy)**: _____/_____/_____

Any Lab test done prior to this notification, e.g. Malaria RDT, etc.? ☐ Yes ☐ No ☐ Unknown

If lab test done, what test: _____

Result of the test done: ☐ Positive ☐ Negative ☐ Indeterminate ☐ Unknown

Treatment Given: _____

PATIENT CURRENT STATUS

Patient Current Category: Inpatient/Outpatient

Unit/Ward Name: _____

Admission Date **(dd/mm/yyyy)**: _____/_____/_____ Referred: ☐ Yes ☐ No ☐ Unknown

Facility Referred to: _____

Date Referred **(dd/mm/yyyy)**: _____/_____/_____

Outcome of the patient at the time of report: ☐ Alive ☐Dead

Date of Death **(dd/mm/yyyy)**: _____/_____/_____

NOTIFIER DETAILS

***Name:** _____

***Designation:** _____ ***Contact Phone:** _____

Annex 11AC: Laboratory Request Form

GOVERNMET OF SIERRA LEONE

IDSR LABORATORY REQUEST FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____
(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

Suspected Disease or Condition:_____

General Information

*Is Laboratory test required: Yes/No (only relevant for the electronic version)

*Laboratory specimen taken BEFORE antibiotics given: Yes/No/Unknown

* Laboratory specimen sent to : _____

*Specimen type: Stool/Whole blood/Serum/Plasma/Sputum /CSF/ Urine/Rectal Swab/Naso. Swab/Aspirate/ Tissue Biopsy/skin snip/Skin scraping/Others

*Date/time 1st specimen collected (dd/mm/yyyy): _____/_____/_____ _____:_____

Date/time 2nd specimen collected (dd/mm/yyyy): _____/_____/_____ _____:_____

*Date/time specimen sent to lab (dd/mm/yyyy): _____/_____/_____ _____:_____

Person Completing the form

Name:** _____Designation:** _____

*Contact Phone: _____

Annex 11AD: Laboratory Result form

GOVERNMENT OF SIERRA LEONE

LABORATORY RESULT FORM

FACILITY: _____ **DISTRICT:** _____

Tracking Number:_____

(Health Facility Code -Current Year – Case Number)

Patient First Name: _____**Surname**:_____

Date of Birth (dd/mm/yyyy): _____/_____/_____ **Sex:** Male/Female

General Information

*Name of laboratory: _____

*Date/time lab received specimen (dd/mm/yyyy): _____/_____/_____ _____:_____

*Specimen type: Stool/Whole blood/Serum/Plasma/Sputum /CSF/ Urine/Rectal Swab/Nasal Swab/Aspirate/ Tissue Biopsy/ skin snip/Skin scraping/Other(specify)

Lab decision on specimen: Accepted/Rejected

If sample rejected, reason for rejection: _____

Date of Rejection (dd/mm/yyyy): _____/_____/_____

EPID Number: _____

(Country – Province – District – Year Onset – Case Number)

Lab Reference Number: _____

Specimen referred out of the country: Yes/No

Name of referral laboratory sample sent: _____

Date specimen referred out of the country (dd/mm/yyyy): _____/_____/_____

First Test Result

Specimen test 01 – type: _____

Specimen test 01 – Pathogen tested for: _____

Specimen test 01 – result: Negative/Positive/Indeterminate

Specimen test 01 – additional info: _____

Specimen test 01 – result released date (dd/mm/yyyy): _____/_____/_____

Second Test Result

Specimen test 02 – type: _____

Specimen test 02 – Pathogen tested for: _____

Specimen test 02 – result: Negative/Positive/Indeterminate

Specimen test 02 – additional info: _____

Specimen test 02 – result released date: _____/_____/_____

Antimicrobial Sensitivity Test

Drugs to which the pathogen is sensitive: _____

Drugs to which the pathogen is resistant: _____

Laboratory Staff

***Name: _____*Designation: _____

*Contact Phone: _____

****These are compulsory variable and must be completed.***

Note that a single laboratory is able to provide up to 10 different results in one stage but if another laboratory is providing the results for the same case it should be entered in another lab result form.

Annex 11AE: IDSR Weekly reporting form

Government of Sierra Leone

IDSR Weekly Reporting Form (WRF)

Health Facility		**District**	
Chiefdom/Zone		**Epi Week Number**	
Start of week from Monday _____/_____/_____to end of week, Sunday _____/_____/_____ (day) (month) (Year) (day) (month) (Year)			

1. Record below the total number of cases and deaths for each disease/condition for the current week.

S/NO	Disease/Condition/Event		<5years old		>5years old		Totals	
			Cases	Deaths	Cases	Deaths	Cases	Deaths
1	Acute Flaccid Paralysis (Poliomyelitis)							
2	Acute Jaundice Syndrome							
3	Acute Haemorrhagic fever syndrome							
4	Adverse events following immunization (AEFI)							
5	Animal Bite	Dog						
		Snake						
6	Anthrax							
7	Bacterial Meningitis							
8	Buruli ulcer							
9	Cholera							
10	Dengue Fever							
11	Diarrhoea with severe dehydration in children under 5 years of age							
12	Dracunculiasis (Guinea worm)							
13	Diarrhea with blood (Shigella)							
14	Measles							
15	Severe malnutrition (MUAC <11.5 cm, Z-score < -3 and or bilateral oedema)							
16	Malaria	Total clinical Malaria cases						
		Total malaria tested						
		Total malaria positive						
17	Maternal Death							
18	Monkeypox							
19	Neonatal Tetanus (Aged 3 – 28 days)							
20	Non-Neonatal Tetanus (Aged 29 days and above)							
21	Perinatal and Neonatal Deaths	Stillbirth (≥ 28th week gestation)						
		Early neonatal death (first 7 days of life)						
		Late neonatal deaths (8 to 28 days of life)						
22	Plague							
23	Severe Pneumonia							
24	Typhoid fever							
25	Yellow fever							
26	Unusual Serious Medical Condition							
	Unusual Serious Event (Specify events)							

Date Sent by HF: _____/_____/_____ **TIME** sent by HF:_____:_____

Sent by: _____ **Designation:** _____Tel: _____

Annex 11AF: IDSR Outbreak line list

A line list captures the relevant information from each reported case for analysis and action. Listing each case and their information will help provide the data needed to assess characteristics of cases to help guide response activities. This is an important tool to collect information and analyse quickly.

During an outbreak, the line list must be established and used as a primary data collection tool. The columns under the IDSR Line List should be changed based on the situation. The information from each reported case should be added to a single row in the spreadsheet. This paper form should be routinely incorporated in the IDSR Routinely Reported Database to facilitate comprehensive analysis and reporting to next level daily as well as on weekly basis.

Sample line List:

Sno	Name of Patient	District or Councils	Ward/Chiefdom	Locality/Village	Age	Age type	Age group	Sex M = Male or F = Female	Occupation	Date of Onset	Date seen at HF	Diarrhoea Yes/No	Vomiting Yes/No	Sever Dehydration Yes/No	Specimen	Results	Hospitalized Yes/No	Place of Admission	Treatment given	Outcome	Date of Discharge or Death	Comments
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						

Annex 11AG: Contact recording form

Contacts[1] Recording Sheet filled in by _____

Case name_____ Case number (if assigned)_____

Case's Village/neighbourhood _____ Chief or Community leader _____

District/Town _____Chiefdom _____

Date of symptom onset_____ Hospitalized/Found in the community_____

If hospitalized, Hospital _____Date of Admission: _____

Surname	Other name	Relationship with the case	Health worker (Y/N) , if yes which facility ?	Age (years)	Sex (M/F)	Phone number	Head of household	Village/ neighbourhood	Chief or Community leader	District/ Town	Type of Contact (1, 2 or 3, list all)	Date of last contact	Last date for follow-up	First Visit	Outcome

[1]**Contacts are defined as persons who:**

1. sleep in the same household with a suspected case;
2. have direct physical contact with the case (dead or alive);
3. have touched the linen or body fluids of the case;
4. have eaten or touched a sick or dead animal.

Annex AH: Contact Tracing/Follow Up Form

Contact Tracing Form – by Village Team .....

Volunteer's name.....

Village _____

Chief or Community leader

Chiefdom.....

District/Town .....

CN	Family Name	First Name	Age	Sex	Date of last Contact	Day of Follow-up																				
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Record "O" if the contact has not developed fever or bleeding

Record "X" if the contact has died or developed fever and/or bleeding (complete Case Investigation Form and, if alive, refer to the hospital)

Annex 11AI: Community alert reporting form

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/Signal (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?	

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/signals that is not captured by the given case definition*

NB: This form can be used to capture and notify/report the country's priority diseases (Indicator-based surveillance) and events/signals (event-based surveillance) occurring at the community level. This can be carbonated in the form of a 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/signals to assist in detection at the community level.

Annex 11AJ: Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet

This form is a summary of all the diseases/events identified during the month. It is completed by the community 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: This form can be 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

Sample pictorial CBS register/note book

Code	Cases/Conditions/Events/Signals to be reported	Image
01	Any person with headache and stiff neck	*Insert pictures/images describing the Case/Conditions/Events/Signals to assist in detection at the community level*
02	Any person with fever and rash	
03	Two or more persons presenting with similar signs/symptoms from the same community, school, or workplace within one week	
04	A cluster of unexplained deaths of animals within one week	
05	Any person presenting with new or rare signs/symptoms	