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

Section 11: Summary guidelines for Specific Priority Diseases Section
Section 11
Summary guidelines for Specific Priority Diseases

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FOREWORD

In 1998, the World Health Organization (WHO) Regional Office for Africa (AFRO) together with technical partners adopted a strategy for developing and implementing comprehensive public health surveillance and response systems in African countries, initially called integrated disease surveillance (IDS). However, to highlight the linkage between surveillance and response, the strategy was later re-named integrated disease surveillance and response (IDSR). The first edition of the IDSR technical guidelines (2002) was widely adopted by Member States. Although progress towards a coordinated, integrated surveillance system was variable, almost every country in the region, invested human and material resources to strengthen capacities for public health surveillance systems in order to prevent, timely detect, and respond appropriately to public health threats.

The coming into force, in 2007, of the International Health Regulations (IHR 2005), the emergence of new diseases, conditions and events and the formulation of strategies for disaster risk management (DRM) resulted in the need to revise the first edition of the IDSR technical guidelines. There was also the need to address the increasing burden of non-communicable diseases. Furthermore, there was the need to strengthen community-based surveillance for early detection, rapid confirmation and response to public health threats. Moreover, alignment with broader system strengthening objectives was required. Hence, in 2010, the second edition of the IDSR guidelines was developed.

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

Following my election in January 2015 as Regional Director, after internal and external consultations in May 2015, I unveiled the transformation agenda of the WHO secretariat in the African region for 2015 to 2020. One of the five interrelated and overlapping priorities in the transformation agenda is improving health security.

I am glad to unveil the third edition of the IDSR technical guidelines that has been prepared by the WHO Health Emergency (WHE) programme in the WHO African region with active participation and involvement of all clusters. In addition, there was active involvement of the WHO Headquarters, the Inter Country Support teams, the hubs, the WHO country offices, Member states, as well as, the U.S. Centers for Disease Control and Prevention (CDC) and other relevant stakeholders.

It is worth noting that, many public health events (PHEs) and emergencies and their associated risk factors could be prevented or their effects mitigated. However, the health systems in most countries remain inadequate. To avert and mitigate the effects of future health security risks and emergencies, all Member States should implement these IDSR technical guidelines. These
guidelines recommend thresholds for action for priority diseases, conditions, public health events and responding to alerts. Using these action thresholds can be lifesaving. Therefore, I urge all Member States to fully implement this third edition of the IDSR technical guidelines everywhere in the WHO Africa region because they explicitly describe what needs to be established at each level of the health system in order to detect, confirm and respond to diseases, condition and health events that are responsible for all preventable illness, death and disability in local communities.

The cost of good public health surveillance as a public health good is relatively very low compared to many other strategies. I appeal to all Member States, national, regional and international partners and funders that we should begin the hard work now. Let us all embrace these IDSR technical guidelines to strengthen capacities for preparedness, alert and response for health security in every place in the WHO Africa region.

The guidelines should be used by:
- health workers at all levels (including surveillance officers, clinicians, laboratory personnel and public health workers)
- provincial/regional and district health teams
- data managers
- IHR National Focal Point and other sectors implementing IHR
- competent authorities at points of entry
- veterinary and wildlife health officers
- environmental health officers
- health training institutions
- supply chain officers
- other public health experts, including NGOs

The guidelines are intended for use as:
- general reference for surveillance activities at all levels
- set of standard definitions for threshold levels that initiate action for responding to specific diseases
- stand-alone reference for level-specific responsibilities
- resource for developing training, supervision, monitoring and evaluation of surveillance activities

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

Dr. Matshidiso Moeti
WHO Regional Director for Africa
ACKNOWLEDGMENTS

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

The purpose for revising these IDSR technical guidelines was to:

- align with the current situation and needs of the Member States;
- align with the objectives, targets and elements of the WHO Africa region’s strategy for health security and emergencies 2016 to 2020;
- update the technical guidelines with contemporary information, taking into consideration new developments such as: emerging and re-emerging priority diseases, conditions and events;
- incorporate recent recommendations from expert panels on strengthening the IHR, 2005 that are underpinned on the One Health approach;
- holistically address disaster risk management (DRM) strategies;
- take into account lessons learnt from the unprecedented EVD outbreak in West Africa, polio eradication and other humanitarian crises;
- take advantage of technology advancement and utilize the opportunities offered by the internet and mobile phones to scale up the implementation of real time community event based surveillance (CEBS), with robust geographical information system (GIS) platforms;
- scale up other electronic surveillance systems and incorporate new ways for capacity building using the IDSR eLearning tools.

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

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

The revision of the technical guidelines was supported through a cooperation grant from the United States Agency for International Development, Bureau for Africa (USAID/AFR), Washington, D.C.
WHO-AFRO is grateful to the following who contributed to the preparation of this revised document by reviewing early drafts and providing constructive comments:

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<td>Dr Pierre Nabeth, CPI/WHE</td>
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<td>Dr Anne Nakinsinge, Uganda</td>
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<td>AAR</td>
<td>After Action Reviews</td>
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<td>AEFI</td>
<td>Adverse Events Following Immunization</td>
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<td>AFP</td>
<td>Acute Flaccid Paralysis</td>
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<tr>
<td>AFRO</td>
<td>WHO Regional Office for Africa</td>
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<td>AWD</td>
<td>Acute Watery Diarrhoea</td>
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<td>CDC</td>
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<td>Community Based Information System</td>
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<td>CEBS</td>
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<td>CFR</td>
<td>Case Fatality Rate</td>
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<td>Community Health Volunteer</td>
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<td>EBS</td>
<td>Event Based Surveillance</td>
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<td>eDEWS</td>
<td>Electronic Disease Early Warning System</td>
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<td>EOC</td>
<td>Emergency Operations Centre</td>
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<td>EPI</td>
<td>Expanded Program on Immunization</td>
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<td>EPR</td>
<td>Emergency Preparedness and Response</td>
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<td>Description</td>
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<td>EVD</td>
<td>Ebola Virus Disease</td>
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<td>HCF</td>
<td>Healthcare Facility</td>
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<td>HCW</td>
<td>Healthcare Worker</td>
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<tr>
<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome</td>
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<tr>
<td>HMER</td>
<td>Health Management Information Systems, Monitoring and Evaluation and Research Units</td>
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<td>HMIS</td>
<td>Health Management Information System</td>
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<td>HPO</td>
<td>Health Promotion Officer</td>
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<td>IDSR</td>
<td>Integrated Disease Surveillance and Response</td>
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<td>IBS</td>
<td>Indicator Based Surveillance</td>
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<td>IMS</td>
<td>Incident Management System</td>
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<td>IEC</td>
<td>Information, Education and Communication</td>
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<td>IMC</td>
<td>International Medical Corps</td>
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<td>IOM</td>
<td>International Organization for Migration</td>
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<td>IPC</td>
<td>Infection Prevention and Control</td>
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<td>IHR 2005</td>
<td>International Health Regulations (2005)</td>
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<td>International Rescue Committee</td>
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<td>JEE</td>
<td>Joint External Evaluation</td>
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<td>LISGIS</td>
<td>Liberian Institute of Statistics and Geo-Information Services</td>
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<td>MACV</td>
<td>Meningococcal Conjugate Vaccine</td>
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<td>MCH</td>
<td>Maternal Child Health</td>
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<td>MDR</td>
<td>Multi Drug Resistance</td>
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<td>MEF</td>
<td>Monitoring and Evaluation Framework</td>
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<td>Ministry of Health</td>
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<td>Ministry of Agriculture</td>
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<td>MTI</td>
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<td>NGO</td>
<td>Non-Government Organization</td>
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<td>NSTCC</td>
<td>National Surveillance Technical Coordination Committee</td>
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<td>Abbreviation</td>
<td>Description</td>
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<td>OIC</td>
<td>Officer in Charge</td>
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<td>PCI</td>
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<td>PHE</td>
<td>Public Health Events</td>
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<td>PoE</td>
<td>Points of Entry</td>
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<td>PHEIC</td>
<td>Public Health Emergency of International Concern</td>
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<td>PHEMC</td>
<td>Public Health Emergency Management Committee</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
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<td>RRT</td>
<td>Rapid Response Team</td>
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<td>Road Traffic Accident</td>
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<td>SARS</td>
<td>Severe Acute Respiratory Syndrome</td>
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<td>SCI</td>
<td>Save the Children International</td>
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<td>SFP</td>
<td>Surveillance Focal Point</td>
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<td>SIMEX</td>
<td>Simulation Exercise</td>
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<td>STI</td>
<td>Sexually Transmitted Infections</td>
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<td>UNICEF</td>
<td>United Nations Children’s Emergency Fund</td>
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<td>VHF</td>
<td>Viral Haemorrhagic Fever</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>XDR</td>
<td>Extensively drug-resistant</td>
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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 WHO/AFRO. 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/events/conditions.

*When adapting these guidelines each country will create its list of priority diseases/events/conditions depending on the local epidemiological situation. The priority list could vary from country to country depending on national policy and resources.*

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**

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<td>In this sub-section, you will find general information about:</td>
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<tr>
<td>• The disease or event, the causative agent, geographic range affected and other epidemiologic information.</td>
</tr>
<tr>
<td>• Transmission routes such as person-to-person, unprotected contact with infectious body fluids or contaminated materials, vector-borne, and so on.</td>
</tr>
<tr>
<td>• 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,</td>
</tr>
<tr>
<td>• General and specific risk factors in African countries.</td>
</tr>
<tr>
<td>• Any additional background information that might serve the district surveillance team.</td>
</tr>
</tbody>
</table>

**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.

Analyze and interpret data


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.
<table>
<thead>
<tr>
<th><strong>Laboratory confirmation: Acute haemorrhagic fever syndrome</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
</tbody>
</table>
| **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) theoretically can be performed in any healthcare 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. |
### Acute haemorrhagic fever syndrome

<table>
<thead>
<tr>
<th>How to prepare, store, and transport the specimen</th>
<th>HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE FULL PPE.</th>
</tr>
</thead>
</table>
| **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.** |
| **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

- 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 Surveillance Standards WHO/CDS/CSR/ISR/99.2
- Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting WHO/EMC/ESR/98.2
Acute and chronic viral hepatitis

Background

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.
# Acute and Chronic Viral Hepatitis

## Surveillance Goal

### Acute viral hepatitis
- Detect hepatitis outbreaks.
- Identify areas/populations at high risk to target prevention and control measures.
- Estimate burden of disease.
- If countrywide surveillance is not possible, surveillance in sentinel areas or hospitals may provide useful information on potential sources of infection.

### Chronic viral hepatitis
- Estimate burden of chronic viral hepatitis B and C
- Measure the impact of control measures/treatment on mortality reduction. To this effect, data is captured on persons diagnosed with hepatocellular carcinoma or cirrhosis

## Viral Hepatitis Case Definitions:

### I) 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

### II) 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.
### Acute and Chronic Viral Hepatitis

#### 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.

#### Respond to action threshold

**If hepatitis cases are confirmed**

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

#### Analyse 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:** Analyse 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
### Acute and Chronic Viral Hepatitis

<table>
<thead>
<tr>
<th>Laboratory confirmation: Acute Viral Hepatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td><strong>Hepatitis A:</strong> anti-HAV IgM positive</td>
</tr>
<tr>
<td><strong>Hepatitis B:</strong> Hepatitis B surface antigen (HBsAg) positive or anti-HBc IgM positive</td>
</tr>
<tr>
<td><strong>Hepatitis C:</strong> Anti-HCV Ab positive</td>
</tr>
<tr>
<td><strong>Hepatitis D:</strong> HBsAg positive (or anti-HBc IgM positive) plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)</td>
</tr>
<tr>
<td><strong>Hepatitis E:</strong> anti-HEV IgM positive and/or anti-HEV IgG positive</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td>Whole blood, Serum or stool (for hepatitis A and E viruses)</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
</tr>
<tr>
<td>Specimens should be collected from suspected patients.</td>
</tr>
<tr>
<td>IgM anti-HAV becomes detectable 5-10 days after exposure.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td><strong>How to prepare, store and transport the specimen</strong></td>
</tr>
<tr>
<td>Use universal precautions to minimize exposure to sharps and body fluids.</td>
</tr>
<tr>
<td>Collect 5-10 ml of venous blood.</td>
</tr>
<tr>
<td>- Let clot retract for 30 to 60 minutes at room temperature or centrifuge to separate serum from red blood cells.</td>
</tr>
<tr>
<td>- Aseptically pour off serum into sterile, screw capped tubes.</td>
</tr>
<tr>
<td>- Store serum at 4°C.</td>
</tr>
<tr>
<td>- For storage &gt;5 days, samples are held at -20°C.</td>
</tr>
<tr>
<td>Transport serum samples using appropriate packaging to prevent breakage or leakage.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td>Results are usually available within one to 3 days from arrival in the laboratory.</td>
</tr>
</tbody>
</table>
# Acute and Chronic Viral Hepatitis

## 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.
Acute and Chronic Viral Hepatitis

References:

- 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
### 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
# Anthrax (human)

## Background

- Anthrax is a widespread zoonotic disease caused by the spore-forming bacterium *Bacillus anthracis*, a Gram positive rod-shaped bacterium. 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
<table>
<thead>
<tr>
<th>Standard case definition: Anthrax (Human)</th>
</tr>
</thead>
</table>

**Suspected case**

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

- **(e) 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.

- **(f) Gastro-intestinal:** Any person with abdominal distress characterized by nausea, vomiting, anorexia and followed by fever.

- **(g) Pulmonary (inhalation):** any person with brief prodromal resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnoea and high temperature, with X-ray evidence of mediastinal widening.

- **(h) 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.

<table>
<thead>
<tr>
<th>Confirmed case</th>
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</thead>
</table>

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:

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

- **(d) 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.
<table>
<thead>
<tr>
<th><strong>Analyse and interpret data: Anthrax (Human)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time:</strong> Graphs of number of suspected / probable / confirmed cases by date.</td>
</tr>
<tr>
<td><strong>Place:</strong> Map of suspected and confirmed human and animal cases by geographical area (district)</td>
</tr>
<tr>
<td><strong>Person:</strong> Table showing the number of suspected / probable / confirmed cases by date, age and sex</td>
</tr>
<tr>
<td>Laboratory confirmation: Anthrax (Human)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
</tr>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td>Isolation of <em>Bacillus anthracis</em> from a clinical specimen (e.g. blood, lesions, discharges)</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Specimen</th>
<th>Cutaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. For vesicular lesions, two swabs of vesicular fluid from an unopened vesicle</td>
</tr>
<tr>
<td></td>
<td>2. For eschars, the edge should be lifted and two swab samples rotated underneath</td>
</tr>
<tr>
<td></td>
<td>3. For ulcers, the base of the lesion should be sampled with two saline moistened swabs</td>
</tr>
<tr>
<td></td>
<td>Blood cultures obtained prior to antimicrobial therapy, if the patient has evidence of systemic symptoms.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>6. In patients not on antibiotic therapy or on therapy for &lt;24 hours, a second biopsy specimen</td>
</tr>
<tr>
<td></td>
<td>7. Acute and convalescent serum samples for serologic testing.</td>
</tr>
<tr>
<td>Gastro-intestinal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Blood cultures obtained prior to antimicrobial therapy.</td>
</tr>
<tr>
<td></td>
<td>2. Ascites fluid for culture and PCR.</td>
</tr>
<tr>
<td></td>
<td>3. Stool or rectal swab for culture and PCR.</td>
</tr>
<tr>
<td></td>
<td>4. Oropharyngeal lesion, if present, for culture and PCR.</td>
</tr>
<tr>
<td></td>
<td>5. Acute and convalescent serum samples for serologic testing.</td>
</tr>
<tr>
<td></td>
<td>6. Autopsy tissues from fatal cases for histopathology.</td>
</tr>
<tr>
<td>Inhalation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blood cultures obtained prior to antimicrobial therapy.</td>
</tr>
<tr>
<td></td>
<td>Pleural fluid, if present, for culture and PCR.</td>
</tr>
<tr>
<td></td>
<td>CSF in patients with meningeal signs, for culture and PCR.</td>
</tr>
</tbody>
</table>
### Anthrax (human)

| 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 ≤2 h at room temperature.  
**Stool**: collect 5-10 g in a clean sterile leak-proof container. Store for ≤24 h at 4°C. Transport ≤1 h at room temperature.  
**Blood**: collect per institution’s procedure for routine blood culture. Collect 10 ml of blood in EDTA tube for PCR. Transport ≤2 h 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 Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- 2003 WHO Manual for Laboratory Diagnosis of Anthrax ([http://www.searo.who.int/en/Section10/Section17/Section58/Section909.htm](http://www.searo.who.int/en/Section10/Section17/Section58/Section909.htm))
- Anthrax Information for Health Care Providers, CDC ([http://emergency.cdc.gov/agent/anthrax/hcp-factsheet.asp](http://emergency.cdc.gov/agent/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](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/quadrivalent polysaccharide vaccine (A, C, W135, 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

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Microscopic examination of CSF for Gram negative diplococci Culture and isolation of <em>N. meningitidis</em>, <em>Streptococcus pneumoniae</em>, and <em>Haemophilus influenzae b</em> from CSF or blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-PCR</td>
<td>(national reference laboratory)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Cerebrospinal fluid (CSF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

| 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

- 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
- 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)
### 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).
### Buruli ulcer (Mycobacterium ulcerans disease)

<table>
<thead>
<tr>
<th>Laboratory Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td><em>Mycobacterium ulcerans</em>: Smears and biopsy specimens can be sent to the laboratory for confirmation by:</td>
</tr>
<tr>
<td>Ziehl-Neelsen stain for acid-fast bacilli</td>
</tr>
<tr>
<td>Culture</td>
</tr>
<tr>
<td>PCR</td>
</tr>
<tr>
<td>Histopathology</td>
</tr>
<tr>
<td>Mycolactone detection in lesion (new)</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td>Smears</td>
</tr>
<tr>
<td>Fine needle aspirations (FNAs)</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
</tr>
<tr>
<td>Specimens should be collected from suspected patient with clinical symptoms (nodule, plaque, ulcer, osteomyelitis ...)</td>
</tr>
<tr>
<td>Specimen should be collected before any antibiotic is given. Another specimen should be collected at the end of the treatment (in case the treatment is not efficacious or surgery is indicated)</td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport the specimen</strong></td>
</tr>
<tr>
<td>Collection of specimen: it is important to avoid cross contamination between the collection of samples</td>
</tr>
<tr>
<td>Materials: Dry swabs and recipients.</td>
</tr>
<tr>
<td>Types of specimens: No ulcerative forms, ulcerative forms, bone: Store at 4°C</td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td>Buruli ulcer is usually diagnosed clinically and by finding acid fast bacilli (AFB) in smears from infected ulcers and tissue biopsies. It can also be identified using PCR.</td>
</tr>
<tr>
<td>M ulcerans can be cultured in a reference laboratory using the same culture media used to grow M. tuberculosis.</td>
</tr>
<tr>
<td>The organism grows very slowly, usually requiring several weeks to provide visible colonies.</td>
</tr>
<tr>
<td>Diagnostic services are not routinely available. Contact the appropriate National authority or WHO.</td>
</tr>
</tbody>
</table>
References: BU


- *Provisional guidance on the role of specific antibiotics in the management of Mycobacterium ulcerans disease (Buruli ulcer)* WHO/CDS/CPE/GBUI/2004.10

- Buruli ulcer: First programme review meeting for West Africa – Summary report. WHO, WER, 6; 2009 : 43-48

- *Control of Communicable Diseases Manual*, 18th Edition

- *District Laboratory Practice in Tropical Countries*, Cambridge

- Ulcere de Buruli, prise en charge de l’infection a *Mycobacterium ulcerans*
## 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
- Clinical criterion: Fever $>38.5\degree C$ (101.3\degree F) and joint pain \(^a\) (usually incapacitating \(^b\)) with acute onset AND
- Epidemiological criterion: resident or visitor in areas with local transmission of Chikungunya on the last 15 days (suspected case for epidemiological surveillance) OR
- 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 $\leq 3$ years, joint pain is expressed as inconsolable crying, irritability, rejection to mobilization and/or walking.

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**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

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**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.
<table>
<thead>
<tr>
<th>Laboratory confirmation: Chikungunya</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td>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)</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td>Serum</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
</tr>
<tr>
<td>Collect specimen from the first suspected case (s). Suspected CHIK cases occur in clusters.</td>
</tr>
<tr>
<td>Collect representative specimens from suspected cases. If outbreak is confirmed, collect more specimens from cases and also mosquitoes from the affected homes for testing.</td>
</tr>
<tr>
<td><strong>Type of Specimen</strong></td>
</tr>
<tr>
<td>- Acute-phase blood (0-10 days after onset)</td>
</tr>
<tr>
<td>- Convalescent-phase blood (7 - 21 days after onset)</td>
</tr>
<tr>
<td><strong>Time of collection:</strong></td>
</tr>
<tr>
<td>When patient presents; collect second sample during convalescence. Between days 7 and 21 after onset.</td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport the specimen</strong></td>
</tr>
<tr>
<td>Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens (WHO, 1997).</td>
</tr>
<tr>
<td>For ELISA:</td>
</tr>
<tr>
<td>▪ Refrigerate at 2º to 8º C serum or clot for testing within 24 hour. If kept for longer store at -80ºC.</td>
</tr>
<tr>
<td>For virus isolation and RT-PCR</td>
</tr>
<tr>
<td>▪ Store frozen at -20ºC for short-term storage or at -70ºC or transport in fully charged dry shipper.</td>
</tr>
<tr>
<td>Mosquitoes for testing should be transported in fully charged dry shipper. Focus on <em>Aedes</em> species</td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>▪ Preliminary results are ready within 24 hours after samples arrive in the laboratory. Confirmatory results are ready within a week from sample reception.</td>
</tr>
</tbody>
</table>
**Reference: Chikungunya**

- Weekly Epidemiological Record N° 1, 2005, 80, 1-8; http://www.who.int/wer
- United States, Centers for Disease Control http://www.cdc.gov/ncidod/dvbid/chikungunya/
### 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
- 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; petechiae, 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.

**Analyze 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°C  
- Freeze (-20°C 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. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Results</td>
<td>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.</td>
</tr>
<tr>
<td>Reference</td>
<td></td>
</tr>
</tbody>
</table>
- *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 \( \geq 7 \) mmol/L (126 mg/dl) or capillary glucose \( \geq \)

Any person with a non-fasting glucose \( \geq 11.1 \) mmol/L or venous plasma glucose measurement of \( \geq 11.1 \) mmol/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**

<table>
<thead>
<tr>
<th><strong>Diagnostic test</strong></th>
<th>Measuring glucose in capillary blood using a reagent strip test and reference meter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measuring glucose in plasma using a glucose-oxidase colorimetric test method</td>
</tr>
<tr>
<td></td>
<td>laboratory case definition (see section 8.0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Specimen</strong></th>
<th>Plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Capillary blood</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>When to collect</strong></th>
<th>Blood glucose measurements must be carried out on the day and at the time requested.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fasting specimen: for adult the fasting time is usually 10 to 16 hours. For children the fasting time is 6 hours.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>How to prepare, store, and transport</strong></th>
<th>Specimen should be examined as soon as possible (before 2 hours) at health facility where the specimen is taken.</th>
</tr>
</thead>
</table>

| **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
- WHO, Preventing chronic diseases: A vital investment, Geneva, World Health Organization, 2005
- 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.
<table>
<thead>
<tr>
<th>Laboratory confirmation: Diarrhoea with blood (Shigella)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td>Isolate <em>Shigella dysenteriae</em> type 1 (SD1) in culture to confirm a shigella outbreak. If SD1 is confirmed, perform antibiotic sensitivity tests with appropriate drugs.</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td>Stool or rectal swab.</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
</tr>
<tr>
<td>For each new area affected by the outbreak, a laboratory confirmation should be done.</td>
</tr>
<tr>
<td>Collect sample when an outbreak is suspected. Collect stool from 5-10 patients who have bloody diarrhoea and:</td>
</tr>
<tr>
<td>• Onset within last 4 days, and</td>
</tr>
<tr>
<td>• Before antibiotic treatment has started.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>If stool cannot be collected, obtain a rectal swab sample with a clean, cotton swab.</td>
</tr>
</tbody>
</table>
## Diarrhoea with blood (Shigella)

| 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
  
  CDC, Atlanta, GA, USA
<table>
<thead>
<tr>
<th>Background</th>
</tr>
</thead>
</table>
| ▪ 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. |

<table>
<thead>
<tr>
<th>Surveillance goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard case definition</th>
</tr>
</thead>
</table>
| **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

<table>
<thead>
<tr>
<th>Time</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Plot location of case households.</td>
</tr>
<tr>
<td>Person</td>
<td>Report monthly totals due to diarrhoea with some dehydration and also for diarrhoea with severe</td>
</tr>
</tbody>
</table>

### 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
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 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.\(^2\)

---

2 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

<table>
<thead>
<tr>
<th>Time</th>
<th>Graph cases monthly.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Plot distributions of localities (communities) from which cases have been reported.</td>
</tr>
<tr>
<td>Person</td>
<td>Count monthly cases and analyse age distribution. Use data to forecast interventions. Report monthly to next levels.</td>
</tr>
</tbody>
</table>

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

- *Control of Communicable Diseases Manual*, 18th Edition
- *District Laboratory Practice in Tropical Countries*, Cambridge
## 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.
### Standard case definition: Ebola or Marburg virus diseases

<table>
<thead>
<tr>
<th>Routine Surveillance:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suspected case:</strong> 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.</td>
</tr>
<tr>
<td><strong>Confirmed case:</strong> A suspected case with laboratory confirmation (positive IgM antibody, positive PCR or viral isolation), or epidemiologic link to confirmed cases or outbreak.</td>
</tr>
</tbody>
</table>

### 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.
<table>
<thead>
<tr>
<th>Laboratory confirmation: Ebola or Marburg virus diseases</th>
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</thead>
</table>

| 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 to 10 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

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</tbody>
</table>

## 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.
- 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.
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.
<table>
<thead>
<tr>
<th>Standard case definition: Epilepsy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suspected case:</strong> Any person with one epileptic seizure</td>
</tr>
<tr>
<td><strong>Suspected new case:</strong> Report only the first diagnostic of the case in the health centre</td>
</tr>
<tr>
<td><strong>Confirmed case:</strong> 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 <em>status epilepticus.</em></td>
</tr>
</tbody>
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<thead>
<tr>
<th>Respond to alert threshold</th>
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<tbody>
<tr>
<td><strong>Suspected cases</strong></td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ Once diagnosed, search for underlying and associated causes. Check for abnormal increases on number of cases and propose appropriate environmental measures if needed.</td>
</tr>
<tr>
<td><strong>Confirmed cases</strong></td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respond to action threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All cases:</strong> Information and education measures on epilepsy and risk factors at community level</td>
</tr>
<tr>
<td><strong>Analyse and interpret data</strong></td>
</tr>
<tr>
<td><strong>Person:</strong> Analyse sex and age distribution (by age group from 6 years onwards) <strong>Time:</strong> Graph quarterly cases</td>
</tr>
<tr>
<td><strong>Place:</strong> Plot the distribution by area of residence</td>
</tr>
</tbody>
</table>
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:
**Foodborne Illnesses**

<table>
<thead>
<tr>
<th><strong>Background</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ Most people with a foodborne illness do not seek medical care, so cases and outbreaks of foodborne illness usually are neither recognized nor reported.</td>
</tr>
<tr>
<td>▪ The first symptoms often occur in gastrointestinal tract. Nausea, vomiting, abdominal cramps and diarrhoea are frequent symptoms of foodborne diseases.</td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
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<table>
<thead>
<tr>
<th><strong>Surveillance Goal</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ To promptly identify any unusual cluster of disease potentially transmitted through food, which may need a public health investigation or response.</td>
</tr>
<tr>
<td>▪ Monitor the magnitude of foodborne illnesses</td>
</tr>
<tr>
<td>▪ Identify high risk foods or food practices.</td>
</tr>
<tr>
<td>▪ Monitor risk factors to inform public health interventions and health promotion for targeted foods or food practices.</td>
</tr>
</tbody>
</table>
### 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 health 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 handwashing 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**
# 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

- *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.who.int/chp/steps/en/)
- [http://www.afro.who.int/dnc/databases/afro infobase/index.html](http://www.afro.who.int/dnc/databases/afro infobase/index.html)
- [http://www.cdc.gov/bloodpressure/](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 immediately 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 >38°C) 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].
  - Close contact (within 1 metres) 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 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

---

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

Whose non-seasonal influenza virus test results are accepted by WHO as confirmatory.

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:  

- Link of the WHO H7N9 case definitions:  

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 hemagglutinin 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 $\geq 38\, {^\circ}C$ 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**

**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.

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 °C
- 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)

I- 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


Reference

- 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.

<table>
<thead>
<tr>
<th>Respond to alert threshold</th>
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<tbody>
<tr>
<td>- Promote primary prevention by supporting interventions to address risk factors</td>
</tr>
<tr>
<td>- Review and monitor care and services provided to injured persons</td>
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<tr>
<td>- Review arrangements for mass casualty management</td>
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</table>

<table>
<thead>
<tr>
<th>Respond to action threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Step up enforcement of measures to address risk factors</td>
</tr>
<tr>
<td>- Activate mass casualty management system</td>
</tr>
</tbody>
</table>

**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**
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 VHF. 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

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Presence of IgM antibodies against CCHF, or Lassa Fever</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specimen</strong></td>
<td>For ELISA: Whole blood, serum or plasma</td>
</tr>
<tr>
<td></td>
<td>For PCR: Whole blood or blood clot, serum/plasma or tissue</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
<td>Collect specimen from the first suspected case.</td>
</tr>
<tr>
<td></td>
<td>If more than one suspected case, collect until specimens have been collected from 5 to 10 suspected cases.</td>
</tr>
</tbody>
</table>
| 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 (-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. |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Results</td>
<td>Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.</td>
</tr>
</tbody>
</table>
References: Lassa and Crimean-Congo Haemorrhagic Fevers

- *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, clofazimine 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 prevalence rate was reduced to 0.25 cases per 10 000 population and less 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

## 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

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
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<tbody>
<tr>
<td>Night blood smear</td>
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<tr>
<td>Filarial antigen test</td>
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### Specimen

<table>
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<tr>
<th>Specimen</th>
<th>Description</th>
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<tbody>
<tr>
<td>Blood smear</td>
<td>Blood smear</td>
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<td>Blood</td>
<td>Blood</td>
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</tbody>
</table>

### 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. 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 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.
<table>
<thead>
<tr>
<th>Laboratory confirmation: Malaria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td>- Microscopy: Presence of malarial parasites in blood films for suspected cases</td>
</tr>
<tr>
<td>- Malaria rapid diagnostic test (RDT): Presence of malarial antigen.</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td>Blood</td>
</tr>
<tr>
<td>Usually finger-stick sample for all ages or other accepted method for collecting blood from very young children</td>
</tr>
<tr>
<td><strong>When to collect</strong></td>
</tr>
<tr>
<td><em>For blood smear:</em> prepare blood film for all suspected cases admitted to inpatient facility, or according to national malaria case management guidelines</td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport</strong></td>
</tr>
<tr>
<td><em>Blood smear:</em></td>
</tr>
<tr>
<td>- Collect blood directly onto correctly cleaned and labelled microscope slides and prepare thick and thin smears.</td>
</tr>
<tr>
<td>- Allow smears to dry thoroughly</td>
</tr>
<tr>
<td>- Stain using the appropriate stain and technique</td>
</tr>
<tr>
<td>- Store stained and thoroughly dried slides at room temperature out of direct sunlight.</td>
</tr>
<tr>
<td><em>For rapid diagnostic test:</em></td>
</tr>
<tr>
<td>- Collect specimen and perform test according to manufacturers’ instructions.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td>Thick and thin smear results can be available the same day as preparation.</td>
</tr>
<tr>
<td>Microscopic examination of malarial slides may also reveal the presence of other blood-borne parasites.</td>
</tr>
<tr>
<td>RDT result is obtained immediately.</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td><strong>Reference</strong></td>
</tr>
</tbody>
</table>
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 lb) 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.
<table>
<thead>
<tr>
<th>Standard case definition: Malnutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low birth weight new-borns:</strong></td>
</tr>
<tr>
<td>Any new born with a birth weight less than 2500 g (or 5.5 lbs)</td>
</tr>
<tr>
<td><strong>Malnutrition in children:</strong></td>
</tr>
<tr>
<td>- Children under five who are underweight (indicator: weight for age&lt;-2 ZScore)</td>
</tr>
<tr>
<td>- Children 6 to 59 months with mid-upper arm circumference (MUAC) &lt;11.5 cm (high risk of mortality)</td>
</tr>
<tr>
<td>- Bilateral pitting oedema</td>
</tr>
<tr>
<td><strong>Malnutrition in pregnant women:</strong></td>
</tr>
<tr>
<td>Pregnant women given birth to low birth weight babies (birth weight &lt; 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).</td>
</tr>
<tr>
<td><strong>Response to alert threshold</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>If more than 20% of children are underweight:</th>
<th>Programme emphasis on</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Breastfeeding support</td>
<td></td>
</tr>
<tr>
<td>▪ Nutrition education</td>
<td></td>
</tr>
<tr>
<td>▪ Supplementation of child and mother</td>
<td></td>
</tr>
<tr>
<td>▪ Prevention and treatment of diarrhoea</td>
<td></td>
</tr>
<tr>
<td>▪ Prevention and treatment of severe malnutrition</td>
<td></td>
</tr>
<tr>
<td>▪ Socio-economic support</td>
<td></td>
</tr>
</tbody>
</table>

| 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. |

<table>
<thead>
<tr>
<th>If more or equal than 15% of low birth weight are less than 2.5 Kg:</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>
### 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


## 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.

<table>
<thead>
<tr>
<th>Respond to alert threshold: Maternal death</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>• Every maternal death is significant and this puts the alert threshold at ONE (1)</td>
</tr>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>• MDR should be anonymous and unlinked; and the reports should not be used for disciplinary of litigation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recommended public health action</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>• 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.</td>
</tr>
<tr>
<td>• Monitor trends and respond to any maternal death based on recommendations from the Maternal death review</td>
</tr>
<tr>
<td>• Increase availability and use of antenatal care, and skilled birth attendance</td>
</tr>
<tr>
<td>• Implement evidence based high impact essential interventions for maternal health</td>
</tr>
<tr>
<td>• Educate and engage communities on emergency preparedness and complication readiness; including evidence based nutrition and dietary interventions for safe pregnancy and childbirth</td>
</tr>
<tr>
<td>• Address socio cultural norms and practices that negatively impact on maternal health</td>
</tr>
<tr>
<td>• Ensure emergency obstetric care (EmOC) coverage of &gt;80 % with recommended signal functions provided by level of care</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analyse and interpret data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time:</strong> Graph cases to construct an epidemic curve throughout the year in order to identify trends.</td>
</tr>
<tr>
<td><strong>Place:</strong> Plot the location of cases and analyse the distribution.</td>
</tr>
<tr>
<td><strong>Person:</strong> Analyse the distribution of cases by age and other demographic factors.</td>
</tr>
<tr>
<td>Laboratory confirmation</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>Routine laboratory confirmation for surveillance is not required.</td>
</tr>
</tbody>
</table>
Reference: Maternal death

http://apps.who.int/iris/bitstream/handle/10665/70929/9789241548458_eng.pdf;jsessionid=862B3C6054CED65E30EDE6605FFAEDF4?sequence=1
WHO Technical guidance for MDSR; MEBC guidance
### 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 4°C to 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.

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
  http://www.who.int/immunization/surveillance/burden/vpd/WHO_SurveillanceVaccinePreventable_11_Measles_R1.pdf?ua=1
  http://www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=10814&Itemid=2593
Middle East respiratory syndrome (MERS)

**Background**

- Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (Middle East respiratory syndrome coronavirus, or MERS-CoV) that was first identified in Saudi Arabia in 2012.
- Coronaviruses are a large family of viruses that can cause diseases ranging from the common cold to Severe Acute Respiratory Syndrome (SARS) and death.
- Typical MERS symptoms include fever, cough and shortness of breath. Pneumonia is common, but not always present. Gastrointestinal symptoms, including diarrhoea, have also been reported. Some laboratory-confirmed cases of MERS-CoV infection are reported as asymptomatic, meaning that they do not have any clinical symptoms, yet they are positive for MERS following a laboratory test. Most of these asymptomatic cases have been detected following aggressive contact tracing of a laboratory-confirmed case.
- Approximately 35% of reported patients with MERS have died.
- Dromedary camels are the major reservoir host for MERS-CoV and humans are infected from direct or indirect unprotected contact with infected dromedary camels. However, the exact role of dromedaries in transmission of the virus and the exact route(s) of transmission are unknown.
- The virus does not seem to pass easily from person to person unless there is close unprotected contact, such as occurs when providing care to a patient. Health care associated outbreaks have occurred in several countries, with the largest outbreaks seen in Saudi Arabia, United Arab Emirates, and the Republic of Korea.
- Approximately half of human cases of MERS have been attributed to human-to-human infections in health care settings.

**Surveillance Goal**

- To detect early cases of MERS-CoV infection and any evidence of sustained human-to-human transmission
- To determine the geographic risk areas for infection with the virus

**Standard case definition**


The following people should be investigated and tested for MERS-CoV (From: Surveillance for human infection with Middle East respiratory syndrome coronavirus (MERS - CoV))

1. A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, who requires admission to hospital, with no other aetiology that fully
explains the clinical presentation\(^2\) (clinicians should also be alert to the possibility of atypical presentations in patients who are immunocompromised);

AND any of the following:

a. the person resides in the Middle East\(^3\), in particular where human infections have been reported, and in countries where MERS-CoV is known to be circulating in dromedary camels;

b. the patient is part of a cluster\(^4\) of acute respiratory illness that occurs within a 14 day period, without regard to place of residence or history of travel;

c. the disease occurs in a health care worker who has been working in an environment where patients with severe acute respiratory infections are being cared for, without regard to place of residence or history of travel;

d. the person develops an unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, without regard to place of residence or history of travel, even if another aetiology has been identified that fully explains the clinical presentation.

2. A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, and who has travelled within 14 days before onset of illness to the Middle East\(^2\) or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred.

3. Individuals with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures (Note: see section on Recommendations for testing in clusters associated with health care settings):

a. close physical contact\(^5\) with a confirmed or probable case of MERS-CoV infection, while that patient was ill;

b. a healthcare facility in a country where hospital-associated MERS-CoV infections have been reported;

c. direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS-CoV is known to

\(^2\) Testing should be according to local guidance for management of community-acquired pneumonia. Examples of other aetiologies include Streptococcus pneumoniae, Haemophilus influenzae type B, Legionella pneumophila, other recognized primary bacterial pneumonias, influenza, and respiratory syncytial virus.

\(^3\) For a map of the Middle East, see: http://www.un.org/Depts/Cartographic/map/profile/mideastr.pdf

\(^4\) A ‘cluster’ is defined as two or more persons 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.

\(^5\) ‘Close contact’ is defined as:

- Health care associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a MERS-CoV patient.

- Working together in close proximity or sharing the same classroom environment with a with MERS-CoV patient

- Traveling together with MERS-CoV patient in any kind of conveyance

- Living in the same household as a MERS-CoV patient.

The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.
be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission.

4. Countries in the Middle East\(^2\) are also strongly encouraged to consider adding testing for MERS-CoV to current testing algorithms as part of routine sentinel respiratory disease surveillance and diagnostic panels for pneumonia.

**WHO case definitions for MERS-CoV** can be found here

**Confirmed case definition**
A person with laboratory confirmation of MERS-CoV infection,\(^1\) irrespective of clinical signs and symptoms.

**Probable case definition**
- A febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome)
  - Direct epidemiologic link\(^2\) with a laboratory-confirmed MERS-CoV case
  - Testing for MERS-CoV is unavailable, negative on a single inadequate specimen\(^3\) or inconclusive\(^4\)
- A febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome) that cannot be explained fully by any other aetiology
  - The person resides or travelled in the Middle East, or in countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred
  - Testing for MERS-CoV is inconclusive\(^4\)
- An acute febrile respiratory illness of any severity
  - Direct epidemiologic link\(^2\) with a confirmed MERS-CoV case
  - Testing for MERS-CoV is inconclusive\(^4\)

**Notes**
\(^1\) A case may be laboratory confirmed by detection of viral nucleic acid or serology. The presence of viral nucleic acid can be confirmed by either positive results for nucleic acid amplification assays, such as reverse transcription polymerase chain reaction (RT-PCR), for at least two specific genomic targets or a single positive target with sequencing of a second target.
A case confirmed by serology requires demonstration of sero-conversion in 2 samples ideally taken at least 14 days apart, by a screening (ELISA, IFA) and a neutralization assay.

However, the interim recommendations for laboratory testing for MERS-CoV should be consulted for the most recent standard for laboratory confirmation (http://www.who.int/csr/disease/coronavirus_infections/en/)

2 A direct epidemiological link with a confirmed MERS-CoV patient may include:

- Health care associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a individuals infected with MERS-CoV.
- Working together in close proximity or sharing the same environment with individuals infected with MERS-CoV.
- Traveling together with individuals infected with MERS-CoV in any kind of conveyance.
- Living in the same household as individuals infected with MERS-CoV.
- The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.

3 An inadequate specimen would include a nasopharyngeal swab without an accompanying lower respiratory specimen, a specimen that has had improper handling, is judged to be of poor quality by the testing laboratory, or was taken too late in the course of illness.

4 Inconclusive tests may include:

- A positive test by nucleic acid amplification assay for a single target without further testing.
- Evidence of sero-reactivity by a single convalescent serum sample ideally taken at least 14 days after exposure by a screening assay (ELISA or IFA) and a neutralization assay, in the absence of molecular confirmation from respiratory specimens.

**Inconclusive testing:** Patients with an inconclusive initial testing should undergo additional virologic and serologic testing to determine if the patient can be classified as a confirmed MERS case. It is strongly advised that multiple lower respiratory tract specimens such as sputum, endotracheal aspirate, or bronchoalveolar lavage fluid be collected and tested when possible. If patients do not have signs or symptoms of lower respiratory tract disease and lower tract specimens are not available or clinically indicated, both nasopharyngeal and oropharyngeal swab specimens should be collected. If initial testing of a nasopharyngeal swab is negative in a patient who is strongly suspected to have MERS-CoV infection, patients should be retested using a lower respiratory specimen tract or a repeat nasopharyngeal specimen with additional oropharyngeal specimen if lower respiratory tract specimens are not possible, and appropriately timed paired acute and convalescent sera. Other types of clinical specimens could also be considered for molecular testing if necessary, including blood/serum, urine and stool. These generally have lower titres of virus than respiratory tract specimens but
have been used to confirm cases when other specimens were inadequate or unobtainable. Laboratories which obtain discordant PCR testing results and have limited experience in detecting MERS-CoV should consider referring their specimens to laboratories with greater experience for confirmation.

Refer to the WHO case reporting form (available in [English](https://www.who.int/csr/disease/coronavirus_infections/technical-guidance-infection/en/)) and [French](https://www.who.int/csr/disease/coronavirus_infections/technical-guidance-infection/fr/)

Responding to an alert

**If a single case/cluster or outbreak is suspected:**

- All health care workers who collect specimens from patients suspected or confirmed with MERS-CoV must wear appropriate personal protective equipment, and
  - Standard and droplet infection control precautions are sufficient when collecting biological samples from suspected patients.
  - Additional precautions are required when aerosol-generating procedures are performed on a patient
- All those involved in collection and transporting specimens should be trained in safe handling practices and spill decontamination procedures.
- WHO requests that probable and confirmed cases be reported within 24 hours of classification, through the regional contact point for International Health Regulations at the appropriate WHO regional office.

- Proper and respectful burial or cremation (if practiced) of dead bodies (humans)
- Conduct community education about the confirmed case, how the disease is transmitted, and how to use infection control in the home care setting (see [http://www.who.int/csr/disease/coronavirus_infections/technical-guidance-infection/en/]​)
- Efforts to identify additional cases beyond close contacts are critical for prevention and control of infection, and to determine the total extent of transmission in the community. Active case finding in the area under investigation should focus on:
  - Patients currently admitted to health care facilities in the community where the confirmed MERS-CoV case was discovered. Any patients currently in the hospital with unexplained SARI should be considered for testing for MERS-CoV.
  - Health care providers in the community; health workers should be interviewed about recent cases of unexplained pneumonia and notified to immediately report any patients who have signs and symptoms that meet the case definition developed for the investigation as described above in section 3.4.1. Patients meeting the case definition should be tested for MERS-CoV.
Patients who recently died of an unexplained illness consistent with the case definition developed for the investigation should be tested for MERS-CoV infection if appropriate clinical specimens are available.

- Close contacts of confirmed or probable cases should be identified and monitored for the appearance of respiratory symptoms for 14 days after last exposure to the confirmed or suspected case, while the case was symptomatic. Any contact that becomes ill in that period of time should be tested for MERS-CoV. If feasible, all contacts especially healthcare workers and other inpatient hospital contacts, regardless of the development of symptoms should be tested for MERS-CoV.

- Request additional help from national levels, as needed.

**Analyse and interpret data**

- **Time:** Graphs of number of suspected / probable / confirmed cases by date (epidemic curve).
- **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**

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

**Laboratory guidance for MERS-CoV**


**Recommendations for specimen collection**

Lower respiratory specimens have a higher diagnostic value than upper respiratory tract specimens for detecting MERS-CoV infection. Upper respiratory tract samples have yielded negative results in some symptomatic close contacts of confirmed cases, who later developed pneumonia and tested positive on lower respiratory specimens. It is WHO has strongly advised that lower respiratory specimens such as sputum, endotracheal aspirate, or bronchoalveolar lavage be collected for MERS-CoV testing where possible. If patients do not have signs or symptoms of lower respiratory tract disease and the collection of lower tract specimens is not possible or clinically indicated, upper respiratory tract specimens such as a nasopharyngeal aspirate or combined nasopharyngeal and oropharyngeal swabs should be collected.

If initial testing is negative in a patient who is strongly suspected to have MERS-CoV infection, the patient should be resampled and specimens collected from multiple respiratory tract sites. Paired acute and convalescent sera for antibody detection should also be collected. Virus has also been demonstrated in body fluids such as blood, urine, and stool, but usually at lower titres than in respiratory tract specimens. Such specimens
may be collected when good quality respiratory tract specimens are unavailable, or to monitor the presence of virus in different body compartments.

Table 1. Specimens to be collected from symptomatic patients and asymptomatic contacts

<table>
<thead>
<tr>
<th>Patient</th>
<th>Test</th>
<th>Type of sample</th>
<th>Timing</th>
<th>Storage and transportation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic</td>
<td>Nucleic acid amplification test (NAAT)</td>
<td>Lower respiratory tract</td>
<td>Collect on presentation. To confirm clearance of the virus, sample collection to be repeated until the results are negative on 2 sequential samples.</td>
<td>If the specimen will reach the laboratory in less than 72 hours, store and ship at 4°C. If the specimen will reach the laboratory in more than 72 hours, store at -20°C or ideally -80°C and ship on dry ice or liquid nitrogen.</td>
<td>Follow national regulations for in-country shipping and WHO guidance for international movement of specimens including the use of triple package systems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lower respiratory tract - sputum - aspirate - lavage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper respiratory tract - naso pharyngeal and oro pharyngeal swabs - naso pharyngeal wash/naso pharyngeal aspirate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptomatic</td>
<td>Serology</td>
<td>Serum for serological testing.</td>
<td>Paired samples are necessary for confirmation with the initial sample collected in the first week of illness and the second ideally</td>
<td>As above, with storage and shipping at -20°C being sufficient.</td>
<td>As above.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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collected 3-4 weeks later. If only a single serum sample can be collected, this should occur at least 3-4 weeks after onset of symptoms for determination of a probable case.

<table>
<thead>
<tr>
<th>Asymptomatic Contact</th>
<th>NAAT</th>
<th>Nasopharyngeal and oropharyngeal swabs; lower respiratory tract specimens if possible.</th>
<th>Within 14 days of last documented contact.</th>
<th>As above for NAAT.</th>
<th>As above.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serology</td>
<td>Serum</td>
<td>Baseline serum taken as early as possible within 14 days of contact and convalescent serum taken 3-4 weeks after last contact. If only a single sample is possible, collect at least 3-4 weeks after last documented contact</td>
<td>As above for serology.</td>
<td>As above.</td>
<td>As above.</td>
</tr>
</tbody>
</table>

See reference for detailed laboratory algorithm
Reference: MERS

**Surveillance** (link)

**WHO Guidance**

- Case definition for reporting MERS-CoV confirmed cases to WHO (link)
- Surveillance for human infection with MERS-CoV (link)
- Investigation of cases of human infection with MERS-CoV (link)
- MERS-CoV Initial Interview questionnaire of cases (link)
- Case Summary Form for rapid reporting of MERS-CoV probable & confirmed cases to WHO (link)
- The latest WHO MERS-CoV global summary and risk assessment and archives (link)

**Investigation Tools**

- Cross-sectional seroprevalence study of MERS-CoV infection in presumed high-risk populations (link)
- Case-control study to assess potential risk factors related to human illness caused by MERS-CoV (link)
- Assessment of potential risk factors of infection of MERS-CoV among health care personnel in a health care setting (link)
- Sero epidemiological investigation of contacts of MERS-CoV patients (link)
- Update on MERS-CoV transmission from animals to humans, and interim recommendations for at-risk groups

**Laboratory**

- WHO Guidance; Laboratory testing for Middle East respiratory syndrome coronavirus (MERS-CoV) (link)

**Case Management and IPC:**

- WHO Guidance. Clinical management of severe acute respiratory infections when MERS-CoV is suspected (link)
- Home care for patients with MERS-CoV infection presenting with mild symptoms and management of contacts Infection prevention and control during health care for probable or confirmed cases of MERS-CoV infection (link)
- Management of asymptomatic persons who are RT-PCR positive for MERS-CoV (link)

**Additional resources**

- Infection prevention and control of epidemic-and pandemic prone acute respiratory infections in health care
- Natural ventilation for infection control in health-care settings (link)
- EMRO preventative measures (posters and videos) for general public; healthcare workers; hajj and umrah pilgrims
Travel

- WHO Guidance: Travel advice on MERS-CoV for pilgrimages and considerations for mass gathering events and MERS-CoV (link)
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

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Polymerase chain reaction (PCR) assay identification of monkeypox DNA in a clinical specimen – preferred Or Note: Level C or D laboratories only.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen</td>
<td>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</td>
</tr>
<tr>
<td>When to collect</td>
<td>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.</td>
</tr>
</tbody>
</table>
## 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, freezeable 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, freezeable 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

# 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 immunosuppression, 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.

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When to collect the specimen</strong></td>
<td>Obtain specimens according to national HIV/AIDS program strategy for clinical or epidemiological sampling.</td>
</tr>
</tbody>
</table>
| **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

- 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
- *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.


**Onchocerciasis**

<table>
<thead>
<tr>
<th>Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Filarial infection of the skin and eye caused by <em>Onchocerca volvulus</em> transmitted by the bite of female <em>Simulium</em> black flies.</td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ Incubation period is years to decades since repeated infection is necessary for disease manifestations. Clinical illness is unusual in children even in endemic areas.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surveillance goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ 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).</td>
</tr>
<tr>
<td>▪ Conduct periodic surveillance in sentinel villages: screen using diethylcarbamazine (DEC); in case of a positive reaction to DEC, confirm with a microscopic examination of a skin biopsy from each suspected case.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard case definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suspected case:</strong> In an endemic area, any person with fibrous nodules in subcutaneous tissues.</td>
</tr>
<tr>
<td><strong>Confirmed case:</strong> 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).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respond to alert threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If a suspected case is detected:</strong></td>
</tr>
<tr>
<td>▪ Report the case according to national guidelines</td>
</tr>
<tr>
<td>▪ Collect specimen for confirming the case</td>
</tr>
<tr>
<td>▪ Investigate the case to determine the cause of the case</td>
</tr>
<tr>
<td>▪ Treat the case according to national guidelines.</td>
</tr>
</tbody>
</table>
**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**

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Microscopy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory criteria for confirmation: One or more of the following:</td>
<td></td>
</tr>
<tr>
<td>- presence of microfilariae in skin snips taken from the iliac crest</td>
<td></td>
</tr>
<tr>
<td>- presence of adult worms in excised nodules</td>
<td></td>
</tr>
<tr>
<td>presence of typical ocular manifestations, such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Skin snips from:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Nodule fluids</td>
<td></td>
</tr>
<tr>
<td>- Iliac crests</td>
<td></td>
</tr>
<tr>
<td>Scapula area</td>
<td></td>
</tr>
</tbody>
</table>

| When to collect | Take snips and nodule fluids from suspected cases 1 hour 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**

## 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 (Stillbirths 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 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.

**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](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](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](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 septicemic 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: Bubonic Plague**

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 women; 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 harbours) 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

<table>
<thead>
<tr>
<th><strong>Diagnostic test</strong></th>
<th>Isolation of <em>Yersinia pestis</em> from bubo aspirate or blood, or sputum. Specific seroconversion to <em>Y. pestis</em> F1 antigen from serum. Rapid diagnostic test detecting Ag F1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specimen</strong></td>
<td>Aspirate of buboes</td>
</tr>
<tr>
<td></td>
<td>Blood for serological tests</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
| **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**       | |

- Laboratory Manual of Plague Diagnostic tests. CDC/WHO publication, 2000, Atlanta, GA

# 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)

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

4. **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 women; 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 harbours) 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

**Analyze 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

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Isolation of <em>Yersinia pestis</em> from or blood, or sputum. Specific seroconversion to <em>Y. pestis</em> F1 antigen from serum.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen</th>
<th>blood, sputum, or autopsy materials for culture and blood for serological tests</th>
</tr>
</thead>
</table>

**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.
<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical specimens should only be sent to a laboratory with known plague diagnostic capabilities or to a WHO Collaborating Centre for Plague.</td>
</tr>
<tr>
<td>Plague culture results will take a minimum of 5 working days from reception in the laboratory.</td>
</tr>
<tr>
<td>Antibiotic treatment should be initiated as soon as possible. Plague patients seroconvert to the F1 <em>Y. pestis</em> antigen 7-10 days after onset.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ <em>Laboratory Manual of Plague Diagnostic tests. CDC/WHO publication, 2000, Atlanta, GA</em></td>
</tr>
</tbody>
</table>
### 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 eradication 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

<table>
<thead>
<tr>
<th>Time:</th>
<th>Graph weekly cases, or by date of onset</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>. Evaluate the percent of suspected cases reported within 48 hours and the percentage with adequate laboratory specimen collection.</td>
</tr>
<tr>
<td>Place:</td>
<td>Plot location of case households. Investigate the circumstances of poliovirus transmission in each case thoroughly. Examine the possibility of other potential areas of transmission.</td>
</tr>
<tr>
<td>Person:</td>
<td>Count cases. Analyse age distribution and number of polio vaccine doses received. Assess risk factors for low vaccine coverage.</td>
</tr>
<tr>
<td>Laboratory confirmation: Poliomyelitis (Acute flaccid paralysis)</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Diagnostic test</strong></td>
<td>Isolation of polio virus from</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
<td>Stool</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
<td>Collect a sample from every suspected AFP case.</td>
</tr>
<tr>
<td></td>
<td>Collect the first specimen when the case is investigated.</td>
</tr>
<tr>
<td></td>
<td>Collect a second specimen on the same patient 24 to 48 hours later.</td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport the specimen</strong></td>
<td>▪ Place stool in clean, leak-proof container and label clearly.</td>
</tr>
<tr>
<td></td>
<td>▪ Immediately place in refrigerator or cold box not used for storing vaccines or other medicines.</td>
</tr>
<tr>
<td></td>
<td>▪ Transport specimens so they will arrive at designated polio laboratory within 72 hours of collection</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Confirmed results are usually available within 21 after receipt of specimen by the laboratory.</td>
</tr>
<tr>
<td></td>
<td>If wild or vaccine derived polio virus is detected, the national program will plan appropriate response actions</td>
</tr>
<tr>
<td></td>
<td>▪  <em>WHO global action plan for laboratory containment of wild polio viruses. WHO/V&amp;B/99.32, Geneva, 1999</em></td>
</tr>
<tr>
<td></td>
<td>▪  <em>Manual for the virological investigation of polio. WHO/ EPI/GEN/97.01, Geneva, 2004</em></td>
</tr>
<tr>
<td></td>
<td>▪  <em>Supplement to the Manual for the virological investigation of Polio. WHO/EPI 2007</em></td>
</tr>
</tbody>
</table>
### 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 behaviour, hallucinations, increase in saliva, difficulty swallowing, and fear of water.

- 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

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Detection by FA on skin or corneal smear (collected ante mortem)</td>
</tr>
<tr>
<td></td>
<td>- FA positive after inoculation or brain tissue, saliva or CSF in cell culture, in mice or in suckling mice</td>
</tr>
<tr>
<td></td>
<td>- Detectable rabies-neutralizing antibody titre in the CSF of an unvaccinated person</td>
</tr>
<tr>
<td></td>
<td>- 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)</td>
</tr>
<tr>
<td></td>
<td>- Isolation of rabies virus from clinical specimens and confirmation of rabies viral antigens by direct FA testing.</td>
</tr>
</tbody>
</table>
### 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

- Centers for Disease Control and Prevention (CDC). Human Rabies Prevention — United States, 2008;
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 °C or oral temperature of >38.0°C) 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 < 100x10^9 / 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).
<table>
<thead>
<tr>
<th><strong>Respond to alert threshold: Rift Valley Fever (RVF)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>If a single case is suspected:</strong></td>
</tr>
<tr>
<td>▪ Report case-based information immediately to the appropriate levels.</td>
</tr>
<tr>
<td>▪ Enhance the usual standard precautions throughout the health care setting.</td>
</tr>
<tr>
<td>▪ Treat and manage the patient with supportive care.</td>
</tr>
<tr>
<td>Collect specimen safely to confirm the case.</td>
</tr>
<tr>
<td><strong>Respond to action threshold</strong></td>
</tr>
<tr>
<td><strong>If a single case is confirmed:</strong></td>
</tr>
<tr>
<td>▪ Mobilize the community for early detection and care.</td>
</tr>
<tr>
<td>▪ Initiate line list/register for cases</td>
</tr>
<tr>
<td>▪ 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.</td>
</tr>
<tr>
<td>▪ Provide information about prevention in the home and when to seek care.</td>
</tr>
<tr>
<td>▪ Provide supportive treatment to all cases identified</td>
</tr>
<tr>
<td>▪ Request additional help from national levels as needed.</td>
</tr>
<tr>
<td>▪ Collaborate with the animal health specialists to search and document cases among animals as well.</td>
</tr>
<tr>
<td><strong>Analyse and interpret data</strong></td>
</tr>
<tr>
<td><strong>Time:</strong> Graph cases and deaths monthly. Construct an epidemic curve during the outbreak.</td>
</tr>
<tr>
<td><strong>Place:</strong> Plot location of case households and work sites using precise mapping.</td>
</tr>
<tr>
<td><strong>Person:</strong> 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.</td>
</tr>
</tbody>
</table>
### 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.

<table>
<thead>
<tr>
<th>Specimen</th>
<th>ELISA (serology)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>▪ Whole blood</td>
</tr>
<tr>
<td></td>
<td>▪ Serum or plasma</td>
</tr>
<tr>
<td></td>
<td>▪ Whole blood or clot</td>
</tr>
<tr>
<td></td>
<td>▪ Tissues (fresh or frozen)</td>
</tr>
<tr>
<td>RT-PCR – Virus isolation</td>
<td>▪ Blood</td>
</tr>
<tr>
<td></td>
<td>▪ Serum/plasma</td>
</tr>
<tr>
<td></td>
<td>▪ Liver biopsy from fatal cases</td>
</tr>
<tr>
<td>Pathology</td>
<td>▪ Tissue biopsy from fatal cases</td>
</tr>
<tr>
<td>Identical specimens can be collected from animal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When to collect the specimen</th>
<th>Collect specimen from the first suspected case.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If more than one suspected case, collect until specimens have been collected from 5 to 10 suspected cases.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How to prepare, store, and transport the specimen</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELISA/PCR/ISOLATION</td>
<td>▪ Preparation and storage (freeze of refrigerator/as cold as possible)</td>
</tr>
<tr>
<td></td>
<td>▪ Shipping: frozen on dry ice or ice packs or both</td>
</tr>
<tr>
<td><strong>Note:</strong> if dry ice or ice packs are not available, sample may be shipped at room temperature and still provide valid results in most cases.</td>
<td></td>
</tr>
<tr>
<td>Immunohistochemistry:</td>
<td>▪ Preparation and storage: Fix in formalin (can be stored up to 6 weeks)</td>
</tr>
<tr>
<td></td>
<td>▪ Shipping: Room temperature (do not freeze).</td>
</tr>
<tr>
<td><em>Same shipping conditions for animal specimens</em></td>
<td></td>
</tr>
</tbody>
</table>
### 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 Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- 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 concern 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 $\geq 38^\circ C$;
- 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.
Severe Acute Respiratory Infections (SARI)

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 positive SARI cases, reported separately.

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


References

- 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
### 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 $\geq 38$ °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 with the patient at days 7, 14, 28 and 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. |
<table>
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<tr>
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<tbody>
<tr>
<td>Results</td>
</tr>
</tbody>
</table>
| Reference | ▪ *WHO Guidelines for the Global Surveillance of SARS, Updated Recommendations, October 2004*  
▪ *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

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

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.

**Analyze 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)

<table>
<thead>
<tr>
<th>Laboratory confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
</tbody>
</table>
| 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  
* 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 vesicle. 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](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](https://www.who.int/trachoma/). (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.

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Detection of specific antigen. Nucleic acid tests and tissue culture techniques. Occasionally, in epithelial cells in Giemsa or iodine stained smears by direct microscopy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specimen</td>
<td>Collection of conjunctival scrapings</td>
</tr>
<tr>
<td>How to prepare, store, and transport the specimen</td>
<td>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 conjunctiva. 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.</td>
</tr>
<tr>
<td>Results</td>
<td>Outside of specialist laboratories, most ocular infection is diagnosed clinically (see annex 8 on the recommended case definition for the confirmed case) or immunologically.</td>
</tr>
</tbody>
</table>
Reference: Trachoma

- **WHO Trachoma Page**
  
  [http://www.who.int/topics/trachoma/en/](http://www.who.int/topics/trachoma/en/)

  
  [http://www.who.int/blindness/publications/tcm%20who_pbd_get_06_1.pdf](http://www.who.int/blindness/publications/tcm%20who_pbd_get_06_1.pdf)

  
  [http://www.who.int/blindness/achieving_en.pdf](http://www.who.int/blindness/achieving_en.pdf)

  
  [http://www.who.int/blindness/publications/trachoma_english.pdf](http://www.who.int/blindness/publications/trachoma_english.pdf)

  
  [http://www.who.int/blindness/prevalence_protocol_trachoma_english.pdf](http://www.who.int/blindness/prevalence_protocol_trachoma_english.pdf)

- **CDC Trachoma**
  

- **The Carter Center**
  
## Trypanosomiasis

### Background

- Trypanosomiasis is an infection of blood, lymphatics and central nervous system. In Africa it is caused by the protozoan *Trypanosoma brucei rhodesiense* and *T. b. gambiense*, which are transmitted by the bit of infected *Glossina* (tsetse) flies.

- Trypanosomiasis is endemic in over 30 African countries in West, Central and East Africa. It is highly epidemic in the Democratic Republic of Congo, Angola, and other areas of civil conflict, where 80% of some village populations may be infected. Cattle are the major reservoir of *Trypanosoma brucei rhodesiense*, and humans are the major reservoir for *T. b. gambiense*.

- Incubation period is usually days to weeks with *T. b. rhodesiense*, and months to years with *T. b. gambiense* infections. Without treatment, both forms are usually fatal.

- Trypanosomiasis control strategies include human and cattle population surveys to treat infected persons and diminish cattle reservoirs, and tsetse fly habitat control (for example, removal of bushes and tall grasses near villages, and use of residual insecticides).

### Surveillance goal

- Increase percentage of cases confirmed by laboratory methods.
- Use population-based surveys and serologic screening for active case finding in endemic areas.
- Conduct human and cattle screening in trypanosomiasis-free areas.

### Standard case definition

**Suspected case:**

*Early stage:* a painful chancre originating as a papule and then evolving into a nodule at the primary fly bite site. There may be fever, intense headache, insomnia, painless lymphadenopathy, anaemia, local oedema and rash.

*Late stage:* cachexia, somnolence, and central nervous system signs. **Confirmed case:**

A suspected case confirmed by card agglutination trypanosomal test (CATT) or by

### Respond to alert threshold
If you observe that the number of cases or deaths is increasing over a period of time:

Report the problem according to national guidelines.
Treat any individual suspected and confirmed cases with appropriate therapy in closely monitored setting.
Collect specimen for laboratory confirmation.
Investigate cause of increasing number of cases to identify problems with prevention activities.
Trypanosomiasis

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 prevention activities in the area around the cases and take action to improve them as indicated.
Conduct active case finding activities if it is an endemic area.
Conduct vector control activities specified by national guidelines.

Analyse and interpret data

Time: Graph quarterly cases.
Place: Plot the distribution of case households.

Laboratory confirmation

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Presumptive:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Serological: card agglutination trypanosomiasis test (CATT)</td>
</tr>
<tr>
<td></td>
<td>Confirmation:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Whole blood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lymph nodes aspirates</td>
</tr>
</tbody>
</table>

When to collect the specimen

<table>
<thead>
<tr>
<th></th>
<th>Suspects from endemic places with fever</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Any patient with fever and may have come into contact with tsetse flies.</td>
</tr>
</tbody>
</table>

How to prepare, store, and transport the specimen

For slides:
Put the slides in a slide box and close properly. Store at room temperature in a dust-free place. In case there is no slide box, the slides can be wrapped in soft tissue paper (filter papers, serviettes, toilet paper, etc.)

Results

Results should be available the same day.

Reference

- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
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 unpasteurized 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.
<table>
<thead>
<tr>
<th><strong>Laboratory confirmation: Tuberculosis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
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<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport the specimen</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Reference</strong></td>
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</table>
# 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. *(Provide updated data from more recent years)*

- 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

<table>
<thead>
<tr>
<th>Diagnostic test</th>
<th>Culture:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Isolation of <em>salmonella spp.</em> from stool or blood of a patient</td>
</tr>
<tr>
<td></td>
<td>The WIDAL Test should not be used for diagnostic purpose</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stool</td>
</tr>
</tbody>
</table>

| When to collect | Collected samples preferably before antibiotics are administrated |

<table>
<thead>
<tr>
<th>How to prepare, store, and transport</th>
<th>5-10 ml of blood distributed in a blood culture bottle. Stool in stool container</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Store specimens at 4-8 C or ambient temperature away from heat and direct sunlight.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results</th>
<th>Blood culture 4 days to 2 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stool 3-4 days.</td>
</tr>
</tbody>
</table>

### 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.

How reported information is handled:
- 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 for 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

#### Analyse 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. Analyse 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.
## Unexplained Cluster of Health Events or Deaths

### 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.
West Nile Fever

**Background**

- West Nile Fever is a febrile illness resulting from a mosquito-borne arbovirus in the *Flaviviridae* 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

<table>
<thead>
<tr>
<th>Time</th>
<th>Construct an epidemic curve during the outbreak.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place</td>
<td>Plot location of case residence and worksite.</td>
</tr>
<tr>
<td>Person</td>
<td>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.</td>
</tr>
<tr>
<td>Laboratory confirmation: West Nile Fever</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Diagnostic test</strong></td>
<td>Presence of IgM antibodies against West Nile Fever</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
<td></td>
</tr>
<tr>
<td><em>For ELISA:</em></td>
<td></td>
</tr>
<tr>
<td>Whole blood, serum or plasma</td>
<td></td>
</tr>
<tr>
<td><em>For PCR:</em></td>
<td></td>
</tr>
<tr>
<td>Whole blood or blood clot, serum/plasma or tissue</td>
<td></td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
<td></td>
</tr>
<tr>
<td>Collect specimen from the first suspected case.</td>
<td></td>
</tr>
<tr>
<td>If more than one suspected case, collect until specimens have been collected from 5 to 10 suspected cases.</td>
<td></td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport the specimen</strong></td>
<td></td>
</tr>
<tr>
<td>HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS.</td>
<td></td>
</tr>
<tr>
<td><em>For ELISA or PCR:</em></td>
<td></td>
</tr>
<tr>
<td>▪ Refrigerate serum or clot</td>
<td></td>
</tr>
<tr>
<td>▪ Freeze (-20°C or colder) tissue specimens for virus isolation</td>
<td></td>
</tr>
<tr>
<td><em>For Immunohistochemistry:</em></td>
<td></td>
</tr>
<tr>
<td>▪ 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</td>
<td></td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td></td>
</tr>
<tr>
<td>Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.</td>
<td></td>
</tr>
</tbody>
</table>
## Reference: West Nile Fever

- Infection Control for Viral Haemorrhagic Fevers in the African Health Care Setting WHO/EMC/ESR/98.2
### Yaws and endemic syphilis or bejel

#### Background

- Endemic trepanometoses in the WHO African Region include two Neglected Tropical Diseases caused by two different sub species of *Treponema pallidum* (*T.p.*): yaws, due to *T. p. pertenue* and bejel caused by *T. p. pallidum*

- Yaws initially presents as a papilloma teemed with bacteria (primary yaws). The papilloma is a typical presentation of yaws and clinical diagnosis is straightforward. Without treatment, the papilloma will ulcerate. Papilloma and ulcers are very infectious and in the absence of treatment can quickly spread to other persons. Other clinical forms of yaws exist but they are not very infectious. Apart of papilloma and ulcers, other lesions of yaws and bejel range from macules, papules, nodules, plaques to secondary yaws that occurs weeks to months after the primary infection and typically presents with multiple raised yellow lesions or pain and swelling of long bones and fingers (dactylitis).

- Yaws spreads in inter-tropical areas, in humid and warm zones such as equatorial rain forests and their surroundings, while bejel is found in most dry and arid regions such as the Sahel trip

- Children from 2 to 14 years old are the most affected age-group, especially in school-age children where outbreaks of yaws or bejel could be observed

- Yaws treatment which was based on single injection of long lasting penicillin (benzathine benzyl penicillin) has improved greatly by the confirmation of the efficacy of a single dose of Azithromycin for curing yaws lesion in 2010. Further to this confirmation, the WHO has designed a yaws eradication strategy, titled “The Morges Strategy” from the name of a city near Geneva, where the Strategy was drafted in 2012. This eradication strategy consists mainly in mass administration of azithromycin (MAA) to at-risk communities and achieving at least 90% coverage of targeted populations

- The mode of transmission is through direct contact with skin lesions or items already contaminated by primary lesions (papilloma and ulcers)

- Confirmation of diagnosis is done by dual treponemal and non-treponemal rapid tests, a syphilis test which is not specific for yaws followed by a dual path platform (DPP) test which is specific for *T. p; pertenue*. These rapid tests can be performed in the fields and are able to detect recent and past infections

#### Surveillance goal

- Yaws is targeted for eradication by 2020, eradication being defined as complete interruption of transmission (zero new case of yaws) globally. The surveillance goals are to 1) ensure detection of any new case of yaws in a given area for implementing the eradication strategy and 2) after stopping transmission, maintain active case search for at least three years to certify yaws eradication

#### Standard case definition

**Suspected case:** a person with a history of residence in an endemic area (past or present) who presents with clinically active (visible) yaws lesions

**Confirmed case:** a suspected case with a positive serological test (rapid treponemal test for syphilis confirmed by DPP test)

**Imported case:** a person who presents with clinically active yaws serologically confirmed in an area where yaws is not known to be endemic

**Index case:** first case of yaws which is detected in a community
# Yaws and endemic syphilis or bejel

<table>
<thead>
<tr>
<th>Respond to alert threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a single case is suspected:</td>
</tr>
<tr>
<td>▪ Report the suspected case to the appropriate level of the health system (peripheral health facility or health district) for serological confirmation and exclusion of imported case.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respond to action threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a single case is confirmed and importation excluded:</td>
</tr>
<tr>
<td>▪ The area is confirmed endemic and eradication strategy is implemented</td>
</tr>
<tr>
<td>If a single case is confirmed and is an imported case:</td>
</tr>
<tr>
<td>▪ Treat the case and his contacts as identified by the case and re-start post-elimination of transmission surveillance for again a three-year period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analyse and interpret data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time:</strong> Graph of cases by year of diagnosis, graph of cumulative number of cases.</td>
</tr>
<tr>
<td><strong>Place:</strong> Plot cases by location of households and colour shade endemic districts</td>
</tr>
<tr>
<td><strong>Person:</strong> Count newly detected cases which were treated and number of contacts identified and treated</td>
</tr>
<tr>
<td>▪ Estimate the number of persons in endemic communities or districts and calculate treatment coverage of Mass Azithromycin Administration (at least 90%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laboratory Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic test</strong></td>
</tr>
<tr>
<td>▪ Positive rapid Syphilis test confirmed by positive dual path platform (DPP) test</td>
</tr>
<tr>
<td><strong>Specimen</strong></td>
</tr>
<tr>
<td>▪ Blood from finger stick for serological tests</td>
</tr>
<tr>
<td>▪ Swab samples from papilloma and ulcerated lesions for PCR</td>
</tr>
<tr>
<td><strong>When to collect the specimen</strong></td>
</tr>
<tr>
<td>▪ Specimens should be collected from suspected patient with clinical symptoms (papilloma and ulcers mainly)</td>
</tr>
<tr>
<td><strong>How to prepare, store, and transport the specimen</strong></td>
</tr>
<tr>
<td>▪ During collection of specimen for PCR test, it is important to avoid cross contamination between the collection of samples</td>
</tr>
<tr>
<td>▪ Materials: Dry swabs and recipients.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
</tr>
<tr>
<td>▪ Positive Rapid Syphilis test and positive DPP test</td>
</tr>
<tr>
<td>▪ Positive PCR for Treponema pallidum pertenue for yaws or Treponema pallium</td>
</tr>
</tbody>
</table>
Yaws and endemic syphilis or bejel

References


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:
  - 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. 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 fetus, 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, fetal 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 $\geq$20 and Zika virus PRNT$_{90}$ titre ratio $\geq$ 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 bloodborne 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

<table>
<thead>
<tr>
<th>Country Context</th>
<th>Engage communities communicate risks</th>
<th>Monitor for Zika virus transmission and disease</th>
<th>Control transmission and prevent exposure</th>
<th>Manage complications associated with Zika virus</th>
<th>Investigate associated risks</th>
</tr>
</thead>
</table>

235
<table>
<thead>
<tr>
<th>Aedes + Zika virus + associated complications</th>
<th>✓</th>
<th>✓</th>
<th>✓</th>
<th>✓</th>
<th>✓</th>
<th>✓</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aedes + Zika virus</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Aedes</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Other</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Results</th>
<th>Diagnostic services for Zika virus are not routinely available. Contact the appropriate National authority or WHO for the assigned reference laboratory within the EDPLN.</th>
</tr>
</thead>
</table>

**VII. References**

1. Information note to the WHO representatives on prevention and response to Zika virus in the WHO African region, 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
Annexes to Section 11

The following annexes are examples of program specific forms. Some forms are for documenting initial findings while others are designed for in-depth investigation. Refer to your country’s national surveillance program for the appropriate forms.

ANNEX 11A Adverse event following immunization investigation form
ANNEX 11B Acute Flaccid Paralysis case investigation form
ANNEX 11C Cholera case-based investigation form
ANNEX 11D Guinea worm disease case investigation form
ANNEX 11E Maternal and Perinatal death reporting forms
ANNEX 11F Measles case investigation form
ANNEX 11G Meningitis Case Investigation Form and Decisional Tree for Meningitis Vaccine Choice in a Reactive Vaccination Campaign
ANNEX 11H Neonatal Tetanus case investigation form
ANNEX 11I Respiratory diseases (including Influenza) case investigation form
ANNEX 11J Tuberculosis (MDR and XDR TB) case-based reporting form
ANNEX 11K Viral haemorrhagic fever case reporting form
ANNEX 11L Viral haemorrhagic fever case investigation form
ANNEX 11M Acute or Chronic Viral Hepatitis Case Investigation Form
ANNEX 11N IDSR Outbreak Line List
ANNEX 11O Contact Listing forms
ANNEX 11P Community alert reporting form
ANNEX 11Q Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet
**ANNEX 11A  Adverse event following immunization investigation form**

<table>
<thead>
<tr>
<th>AEFI Investigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

**Further resources:**


Global Manual on Surveillance of Adverse Events Following Immunization”
http://www.who.int/vaccine_safety/publications/Global_Manual_revised_12102015.pdf?ua=1

<table>
<thead>
<tr>
<th>1. Be prepared (Steps to take before an event occurs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Read the resource documents on reporting, management and investigation of AEFIs.</td>
</tr>
<tr>
<td>• Develop standards: case definitions for reportable AEFIs, use of reporting forms and investigation procedures.</td>
</tr>
<tr>
<td>• Designate and train staff to conduct an AEFI investigation using the investigation form.</td>
</tr>
<tr>
<td>• Train staff on how to collect specimens.</td>
</tr>
<tr>
<td>• Establish procedure, criteria and designated person for notifying WHO and UNICEF</td>
</tr>
<tr>
<td>• (if UN-supplied vaccine) or other relevant party depending on procurement mechanism</td>
</tr>
<tr>
<td>• Establish a National Technical Advisory Committee with representation from major medical organizations</td>
</tr>
<tr>
<td>• Identify a spokesperson for public communications.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Receiving a report</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ensure immediate reporting of most serious events and rapid attention to reports received</td>
</tr>
<tr>
<td>• Verify the information in the report and classify and assess the AEFI using established case definitions. Decide whether it needs further investigating.</td>
</tr>
<tr>
<td>• If investigation is warranted, travel to the location of the AEFI, or delegate responsibility to another trained person</td>
</tr>
</tbody>
</table>
| 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 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td><strong>Dispatch specimens</strong> to appropriate testing facility (laboratory, regulatory authority, etc.)</td>
</tr>
</tbody>
</table>
| 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 |
### Case Investigation Form - Acute Flaccid Paralysis

**Official Use Only:**

- **EPID Number:** ___________ - ___________ - ___________ - ___________
- **Country/Region/Prov./Districts/Years Onset/Cases Number**

**Received:**

#### Identification

- **District:** ______________
- **Region/Province:** ______________
- **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:

- **Date of Notification:** __________/________/________
- **Date of Investigation:** __________/________/________

**Hospitalization**

- **Hospitalized:**
  - 1 = Yes
  - 2 = No
- **Date of admission to hospital, if applicable:** __________/________/________
- **Hospital record #:** ______________
- **Name of hospital/address:** ______________

#### Clinical History

- **Fever at the onset of paralysis:** ______________
- **Progressive Paralysis:** ______________
- **LA:**
- **RA:**
- **Site of Paralysis:**
  - LL
  - RL
- **Paralyzed limb(s):**
  - Sensitive to pain:
  - Was there any injection just before onset of paralysis:
    - Yes
    - No
- **If yes mention the site of injection in the table below**

<table>
<thead>
<tr>
<th>Paralyzed Limb</th>
<th>Arm</th>
<th>Fore-arm</th>
<th>Buttocks</th>
<th>Thigh</th>
<th>Leg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Provisional Diagnosis

**AFTER INVESTIGATION, WAS THIS A TRUE AFP?**

- 1 = Yes
- 2 = No

**IMMUNIZATION HISTORY**

- **Total Number of Polio vaccine doses**
  - Exclude dose at birth
  - OPV dose at birth:
    - 1st __________/________/________
    - 2nd __________/________/________
    - 3rd __________/________/________
  - If > 4 4th __________/________/________

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

- **Total IPV doses received through RI and/or SIA:**
  - 99 = Unknown
- **Date of last IPV dose received through RI or SIA:** __________/________/________
**STOOL SPECIMEN COLLECTION:**

<table>
<thead>
<tr>
<th>Date 1st specimen</th>
<th>Date 2nd specimen</th>
<th>Date specimen sent to the national level</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date specimen received at inter-county/national Laboratory</th>
<th>Date specimen sent to the national level</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
</tr>
</tbody>
</table>

**STOOL SPECIMEN RESULTS:**

<table>
<thead>
<tr>
<th>Date specimen received at inter country (I-C)/national Lab</th>
<th>Status of specimen at Reception at the lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>1= Adequate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date combined Cell Culture Results available</th>
<th>Date Results sent to national EPI</th>
<th>Date Results received at national EPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
</tr>
</tbody>
</table>

**FINAL CLASSIFICATION**

<table>
<thead>
<tr>
<th>1=Confirmed Polio</th>
<th>2=Compatible</th>
<th>3=Discarded</th>
<th>6=Not an AFP case</th>
<th>7=cVDPV</th>
<th>8=aVDPV</th>
<th>9=iVDPV</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1=Residual Flaccid Paralysis</th>
<th>2=Residual paralysis</th>
<th>3=Lost follow-up</th>
<th>4=Died before follow-up</th>
<th>5=Residual Spastic Paralysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1= Residual Paralysis?</td>
<td>1=Residual Flaccid Paralysis</td>
<td>2=Residual paralysis</td>
<td>3=Lost follow-up</td>
<td>4=Died before follow-up</td>
</tr>
</tbody>
</table>

**FOLLOW-UP EXAMINATION**

<table>
<thead>
<tr>
<th>Date of Follow-up exam.</th>
<th>Residual LA Results of exam</th>
<th>1= Residual Flaccid Paralysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date isolate sent for sequencing</th>
<th>Date seq results sent to program</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
<td>_____<em><strong><strong>/</strong><strong><strong>/</strong></strong></strong></em></td>
</tr>
</tbody>
</table>

**Immunocompromised status suspected:**

<table>
<thead>
<tr>
<th>1=Y, 2=N, 9=Unknown</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1=Residual Flaccid Paralysis</th>
<th>2=Residual paralysis</th>
<th>3=Lost follow-up</th>
<th>4=Died before follow-up</th>
<th>5=Residual Spastic Paralysis</th>
</tr>
</thead>
</table>

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:_________________________
## ANNEX 11C  Cholera case-based investigation form

### Area A : Patient and clinical laboratory related information

<table>
<thead>
<tr>
<th>Variables/Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Detection day (dd/mm/yyyy)</td>
<td></td>
</tr>
<tr>
<td>2  Detection place (Health facility or Community)</td>
<td></td>
</tr>
<tr>
<td>3  Patient identification number (yyyy-week-CCC-PPP-DDD-Reporting site-nnn)</td>
<td></td>
</tr>
<tr>
<td>4  Patient surname or last name</td>
<td></td>
</tr>
<tr>
<td>5  Patient first name(s)</td>
<td></td>
</tr>
<tr>
<td>6  Age (years)</td>
<td></td>
</tr>
<tr>
<td>7  Sex (F/M)</td>
<td></td>
</tr>
<tr>
<td>8  Number of people in same household</td>
<td></td>
</tr>
<tr>
<td>9  Patient's residential Address</td>
<td></td>
</tr>
<tr>
<td>10 Village/Town</td>
<td></td>
</tr>
<tr>
<td>11 Neighbourhood</td>
<td></td>
</tr>
<tr>
<td>12 District</td>
<td></td>
</tr>
<tr>
<td>13 Region/Province</td>
<td></td>
</tr>
<tr>
<td>14 Country</td>
<td></td>
</tr>
<tr>
<td>15 Date of onset (first symptoms) (dd/mm/yyyy)</td>
<td></td>
</tr>
<tr>
<td>16 Clinical signs and Symptoms</td>
<td></td>
</tr>
<tr>
<td>17 Was patient exposed to any known risk factor for this disease? (Yes/No)</td>
<td></td>
</tr>
<tr>
<td>18 If yes, specify risk factor(s): Water used by the patient for drinking: (list by type, e.g. tap water, borehole, unprotected well, protected well, river, dam, lake, pond)</td>
<td></td>
</tr>
<tr>
<td>19 Number of doses of cholera Vaccine</td>
<td></td>
</tr>
<tr>
<td>20 Date last dose was administered</td>
<td></td>
</tr>
<tr>
<td>21 Laboratory related information: at least first and last cases</td>
<td></td>
</tr>
<tr>
<td>22 Vibrio cholerae identified in stools?</td>
<td></td>
</tr>
<tr>
<td>23 Drugs to which the vibrio strain is sensitive</td>
<td></td>
</tr>
<tr>
<td>24 Drugs to which the vibrio strain is resistant</td>
<td></td>
</tr>
<tr>
<td>25 Outcome (Died, Survived, Unknown)</td>
<td></td>
</tr>
<tr>
<td>26 Final Classification (Not a case, Suspect, Probable, Confirmed by Lab, confirmed by epidemiological link, Pending)</td>
<td></td>
</tr>
<tr>
<td>27 Other Notes and Observations</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Date latest update of this record (dd/mm/yyyy)</td>
</tr>
</tbody>
</table>
Area B: Risk factor search (Information to be obtained from water and sanitation group of the investigation)

Mapping Potential Hazards

<table>
<thead>
<tr>
<th>Variables/Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Potential vibrio vehicles: drinking water</td>
<td></td>
</tr>
<tr>
<td>2 Drinking water source 1</td>
<td></td>
</tr>
<tr>
<td>3 Drinking water source 2</td>
<td></td>
</tr>
<tr>
<td>4 Drinking water source 3</td>
<td></td>
</tr>
<tr>
<td>5 Drinking water source 4</td>
<td></td>
</tr>
<tr>
<td>Potential vibrio vehicles: non drinking water</td>
<td></td>
</tr>
<tr>
<td>6 Non drinking water source 1</td>
<td></td>
</tr>
<tr>
<td>7 Non drinking water source 2</td>
<td></td>
</tr>
<tr>
<td>8 Non drinking water source 3</td>
<td></td>
</tr>
<tr>
<td>9 Non drinking water source 4</td>
<td></td>
</tr>
<tr>
<td>10 Non drinking water source 4</td>
<td></td>
</tr>
<tr>
<td>Potential vibrio vehicles: Food items</td>
<td></td>
</tr>
<tr>
<td>11 Food items 1</td>
<td></td>
</tr>
<tr>
<td>12 Food items 2</td>
<td></td>
</tr>
<tr>
<td>13 Food items 3</td>
<td></td>
</tr>
<tr>
<td>14 Food items 4</td>
<td></td>
</tr>
<tr>
<td>15 Food items 5</td>
<td></td>
</tr>
<tr>
<td>16 Food items 6</td>
<td></td>
</tr>
<tr>
<td>17 Food items 7</td>
<td></td>
</tr>
<tr>
<td>18 Food items 8</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Bacteriology lab findings</td>
<td></td>
</tr>
<tr>
<td>20 Drinking water found infected by vibrio</td>
<td></td>
</tr>
<tr>
<td>21 Non drinking water found infected by vibrio</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>23 Food items found infected by vibrio</td>
<td></td>
</tr>
<tr>
<td>24 Looking out for Exposure to the identified hazards</td>
<td></td>
</tr>
<tr>
<td>25 Water used by the patient for drinking : (list by type, e.g. tap water, Borehole, unprotected well, protected well, River, dam, lake, pond):</td>
<td></td>
</tr>
<tr>
<td>26 Within 3 days prior to the onset of the disease did the patient drink from</td>
<td></td>
</tr>
<tr>
<td>27 Water source 2 (Yes/No)</td>
<td></td>
</tr>
<tr>
<td>28 Water source 3 (Yes/No)</td>
<td></td>
</tr>
<tr>
<td>29 Water source 4 (Yes/No)</td>
<td></td>
</tr>
<tr>
<td>30 Water source 5 (Yes/No)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Question</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>31</td>
<td>Within 3 days prior to the onset of the disease did the patient eat</td>
</tr>
<tr>
<td>32</td>
<td>Food item 1 (Yes/No)</td>
</tr>
<tr>
<td>33</td>
<td>Food item 2 (Yes/No)</td>
</tr>
<tr>
<td>34</td>
<td>Food item 3 (Yes/No)</td>
</tr>
<tr>
<td>35</td>
<td>Food item 4 (Yes/No)</td>
</tr>
<tr>
<td>36</td>
<td>Food item 5 (Yes/No)</td>
</tr>
<tr>
<td>37</td>
<td>Within 3 days prior to the onset of the disease did the patient attend any</td>
</tr>
<tr>
<td>38</td>
<td>funerals (Yes/No)</td>
</tr>
<tr>
<td>39</td>
<td>other social event (Yes/No)</td>
</tr>
</tbody>
</table>
# Guinea worm disease case investigation form

**COUNTRY NAME** GUINEA WORM ERADICATION PROGRAMME  
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

---

## 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:** ___________________________
- **Sex:** _______  
- **Age:** _______
- **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):** _______

## 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.**

---

*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: ________________________________

<table>
<thead>
<tr>
<th>Admission Date: <strong>/__<strong>/</strong></strong>__</th>
<th>Discharged Date: <strong>/__<strong>/</strong></strong>__</th>
</tr>
</thead>
</table>

SN.NO. Location of worm | Date worm detected | Date of guinea-worm | Date confirmed | Date of guinea-worm | Regular emergence | Extracted by supervisor: | Completely expelled | Bandaging |
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>__ ____________</td>
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<tr>
<td>__ ____________</td>
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<tr>
<td>__ ____________</td>
<td><strong>/__<strong>/</strong></strong>__</td>
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<td><strong>/__<strong>/</strong></strong>__</td>
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<td><strong>/__<strong>/</strong></strong>__</td>
<td><strong>/__<strong>/</strong></strong>__</td>
</tr>
</tbody>
</table>

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: ______________________

For National Secretariat Only:

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
### Maternal Death Reporting Form

*The form must be completed for all deaths, including abortions and ectopic gestation related deaths, in pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy*

<table>
<thead>
<tr>
<th>Questions / Variables</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Country</td>
<td></td>
</tr>
<tr>
<td>2 District</td>
<td></td>
</tr>
<tr>
<td>3 Reporting Site</td>
<td></td>
</tr>
<tr>
<td>4 How many of such maternal deaths occurred cumulatively this year at this site?</td>
<td></td>
</tr>
<tr>
<td>5 Date this maternal death occurred (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>6 Maternal death locality (Village or Town)</td>
<td></td>
</tr>
<tr>
<td>7 Record's unique identifier (year-Country code-District-site-maternal death rank)</td>
<td></td>
</tr>
<tr>
<td>8 Maternal death place (Community, health facility, district hospital, referral hospital or private hospital, on the way to health facility or hospital)</td>
<td></td>
</tr>
<tr>
<td>9 Age (in years) of the deceased</td>
<td></td>
</tr>
<tr>
<td>10 Gravida: how many times was the deceased pregnant?</td>
<td></td>
</tr>
<tr>
<td>11 Parity: how many times did the deceased deliver a baby of 22 weeks/500g or more?</td>
<td></td>
</tr>
<tr>
<td>12 Time of death (specify &quot;During pregnancy, At delivery, during delivery, during the immediate post-partum period, or long after delivery&quot;)</td>
<td></td>
</tr>
<tr>
<td>13 If abortion: was it spontaneous or induced?</td>
<td></td>
</tr>
</tbody>
</table>

#### Maternal death history and risk factors

<table>
<thead>
<tr>
<th>Questions / Variables</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Was the deceased receiving any antenatal care? (Yes/No)</td>
<td></td>
</tr>
<tr>
<td>Did she have Malaria? (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>15 Did she have Hypertension? (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>16 Did she have Anaemia? (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>17 Did she have Abnormal Lie? (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>18 Did she undergo any Previous Caesarean Section? (Yes or No)</td>
<td></td>
</tr>
<tr>
<td>19 What was her HIV Status? (choose &quot;HIV+; HIV-; or Unknown HIV status&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

#### Delivery, puerperium and neonatal information

<table>
<thead>
<tr>
<th>Questions / Variables</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 How long (hours) was the duration of labor</td>
<td></td>
</tr>
<tr>
<td>21 What type of delivery was it? (choose one from &quot;1=Vaginal non assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section&quot;)</td>
<td></td>
</tr>
<tr>
<td>22 What was the baby status at birth? (Alive or Stillborn)</td>
<td></td>
</tr>
<tr>
<td>Questions / Variables</td>
<td>Answers</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------</td>
</tr>
<tr>
<td>23 In case the baby was born alive, is he/she still alive or died within 28 days after his/her birth? (choose 1=Still alive, 2=neonatal death, 3=died beyond 28 days of age)</td>
<td></td>
</tr>
<tr>
<td>24 Was the deceased referred to any health facility or hospital? (Yes/No/Don't know)</td>
<td></td>
</tr>
<tr>
<td>25 If yes, how long did it take to get there? (hours)</td>
<td></td>
</tr>
<tr>
<td>26 Did the deceased receive any medical care or obstetrical/surgical interventions for what led to her death? (Yes/No/Don't know)</td>
<td></td>
</tr>
<tr>
<td>27 If yes, specify where and the treatment received*</td>
<td></td>
</tr>
<tr>
<td>28 Primary cause of the Maternal Death</td>
<td></td>
</tr>
<tr>
<td>29 Secondary cause of the Maternal Death</td>
<td></td>
</tr>
<tr>
<td>30 Analysis and Interpretation of the information collected so far (investigator's opinion on this death)</td>
<td></td>
</tr>
<tr>
<td>31 Remarks</td>
<td></td>
</tr>
<tr>
<td>32 Maternal death notification date (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>33 Investigator (Title, name and function)</td>
<td></td>
</tr>
</tbody>
</table>

* Treatment received

- I.V. Fluids; Plasma; Blood Transfusion; Antibiotics; Oxytocin; Anti-seizure drugs; Oxygen; Anti-malarial; Other medical treatment; Surgery; Manual removal of placenta; Manual intra uterine aspiration; Curettage, laparotomy, hysterectomy, instrumental delivery (Forceps; Vacuum), Caesarean section, anaesthesia (general, spinal, epidural, local)

Definitions

- Gravida: The number of times the woman was pregnant-
- Parity: Number of times the woman delivered a baby of 22 weeks/500g or more, whether alive or dead
**Perinatal death reporting form**

The form must be completed for selected perinatal deaths, comprising of stillbirths and neonatal deaths

<table>
<thead>
<tr>
<th>Questions / Variables</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identification</strong></td>
<td></td>
</tr>
<tr>
<td>1 Country</td>
<td></td>
</tr>
<tr>
<td>2 District</td>
<td></td>
</tr>
<tr>
<td>3 Reporting site/facility</td>
<td></td>
</tr>
<tr>
<td>4 Perinatal death locality (village or town)</td>
<td></td>
</tr>
<tr>
<td>5 Place of death (community, health facility, district hospital, referral hospital or private hospital, on the way to health facility or hospital)</td>
<td></td>
</tr>
<tr>
<td>6 Date this perinatal death occurred (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>7 Record's unique identifier (year-country code-district-site) for the mother.</td>
<td></td>
</tr>
<tr>
<td>8 Record's unique identifier (year-country code-district-site) for the baby (diseased).</td>
<td></td>
</tr>
<tr>
<td><strong>Pregnancy progress and care (Perinatal death history and risk factors)</strong></td>
<td></td>
</tr>
<tr>
<td>9 Mother’s age (in years)</td>
<td></td>
</tr>
<tr>
<td>10 Type of pregnancy (singleton/twin/higher multiples)</td>
<td></td>
</tr>
<tr>
<td>11 Did the mother of the deceased receive any antenatal care? (Yes/No/Unknown).</td>
<td></td>
</tr>
<tr>
<td>12 If yes to 11, how many visits? _______</td>
<td></td>
</tr>
<tr>
<td>13 Did the mother of the deceased have malaria? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>14 If yes to 13, did the mother receive treatment _ (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>15 Did the mother of the deceased have pre-eclampsia disease ? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>16 If yes to 15, did the mother receive any treatment? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>17 Did the mother of the deceased have severe anaemia (HB,7g/dl)? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>18 If yes to 17, did the mother receive any treatment? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>19 Did the mother of the deceased have recommended maternal immunizations (e.g. tetanus toxoid) (Yes/ No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>20 Did the mother of the deceased have Rhesus factor (Rh) or ABO incompatibility? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>21 If Rhesus positive, did the mother of the deceased receive Anti-D injection during this baby’s pregnancy? (Yes/ No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>22 Did the deceased present in an abnormal Lie (including breech presentation)? (Yes/No/Unknown)</td>
<td></td>
</tr>
<tr>
<td>23 What was the HIV status of the mother? (choose &quot;HIV+; HIV-; or Unknown HIV status&quot;)</td>
<td></td>
</tr>
<tr>
<td>24 What was the status of the syphilis test of mother? (Positive (+) or negative (-))</td>
<td></td>
</tr>
<tr>
<td><strong>Labour, birth, puerperium</strong></td>
<td></td>
</tr>
<tr>
<td>25 Date of birth (day/month/year)</td>
<td></td>
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<td></td>
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<td>---</td>
<td>---</td>
</tr>
<tr>
<td>26</td>
<td>Attendance at delivery (Nurse/midwife/doctor/other-specify).</td>
</tr>
<tr>
<td>27</td>
<td>Was fetal heart rate assessed on admission? (Yes, No)</td>
</tr>
<tr>
<td></td>
<td>What type of delivery was it? (choose one from 1=Vaginal non assisted delivery, 2=vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section)</td>
</tr>
<tr>
<td>28</td>
<td>Sex of the baby (1=male; 2=female, 3=ambiguous)</td>
</tr>
<tr>
<td>29</td>
<td>Birth weight in grams(&gt;=2500; 1500-2499 (LBW); 1000-1499g (VLBW); &lt;1000 (ELBW))</td>
</tr>
<tr>
<td>30</td>
<td>Did the mother of the deceased have premature rupture of membranes (PROM) (Yes/No/Unknown)</td>
</tr>
<tr>
<td>31</td>
<td>Did the mother of the deceased have foul smelling liquor?</td>
</tr>
<tr>
<td>32</td>
<td>Gestational age (in weeks)</td>
</tr>
<tr>
<td></td>
<td>Method of estimation: Ultrasound/LMP (DD/MM/YY)</td>
</tr>
<tr>
<td>33</td>
<td>How long (hours) was the duration of labor</td>
</tr>
<tr>
<td></td>
<td>Information on the death and actions taken before and after the death</td>
</tr>
<tr>
<td>30</td>
<td>If stillbirth – gestational age (in weeks) of the deceased</td>
</tr>
<tr>
<td>31</td>
<td>If neonatal death – age (in days) of the deceased</td>
</tr>
<tr>
<td>32</td>
<td>If the deceased baby was born alive what was the APGAR Score?</td>
</tr>
<tr>
<td>33</td>
<td>If the deceased baby was born alive, was resuscitation with bag and mask conducted?</td>
</tr>
<tr>
<td>34</td>
<td>If the deceased baby was born alive was he/she referred to any health facility or hospital? (Yes/No/Unknown)</td>
</tr>
<tr>
<td>35</td>
<td>If the deceased baby was born alive did he/she receive any other medical care beyond resuscitation? (Yes/No/Unknown)</td>
</tr>
<tr>
<td></td>
<td>If yes, specify where and the treatment received: * I.V. Fluids; Blood/Plasma transfusion; Antibiotics; Oxygen; Other medical treatment;</td>
</tr>
<tr>
<td></td>
<td>Primary cause of death:</td>
</tr>
<tr>
<td></td>
<td>Secondary cause of death:</td>
</tr>
<tr>
<td></td>
<td>Maternal condition (if applicable)</td>
</tr>
<tr>
<td>34</td>
<td>Timing of death (1-fresh stillbirth; 2-macerated stillbirth)</td>
</tr>
<tr>
<td>35</td>
<td>Any physical malformation noted on the deceased? (Yes/No)</td>
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<td></td>
<td>If yes, type of birth defect (with full description):</td>
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<tr>
<td></td>
<td>Investigator’s report</td>
</tr>
<tr>
<td>36</td>
<td>Analysis and interpretation of the information collected so far (investigator's opinion on this death)</td>
</tr>
<tr>
<td>37</td>
<td>Perinatal death notification date (day/month/year)</td>
</tr>
<tr>
<td>38</td>
<td>Investigator (Title, name and function)</td>
</tr>
</tbody>
</table>
## Still Births and Neonatal deaths weekly summary reporting form

The form must be completed for stillbirths and neonatal deaths

<table>
<thead>
<tr>
<th>Questions / Variables</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td></td>
</tr>
<tr>
<td>1 Data for the month of</td>
<td></td>
</tr>
<tr>
<td>2 Country</td>
<td></td>
</tr>
<tr>
<td>3 District</td>
<td></td>
</tr>
<tr>
<td>4 Reporting site/facility</td>
<td></td>
</tr>
<tr>
<td>5 Births</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Births</th>
<th>Total Births</th>
<th>Stillbirths</th>
<th>Neonatal deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Antepartum</td>
<td>Intrapartum</td>
<td>Unknown</td>
</tr>
<tr>
<td></td>
<td>Early</td>
<td>Late</td>
<td></td>
</tr>
<tr>
<td>&lt;1000 g (ELBW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000-1499 g (VLBW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500 – 1999 g (LBW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000 – 2499 g (MLBW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500 + g</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pregnancy progress and care (Perinatal death history and risk factors)**

| 6 Multiple pregnancies |         |
| 7 Born before arrival  |         |
| 8 Mode of delivery     | Normal vaginal | Vacuum | Forceps | Caesarean | Unknown |
|                        | Post-term Ext preterm (<1000g) Very preterm (1000-1499) Mod preterm (1500-2499) Unknown |
| 9 Gestational age       | Term     | Post-term Ext preterm (<1000g) Very preterm (1000-1499) Mod preterm (1500-2499) Unknown |
| 10 HIV status           | Negative | Positive | Unknown |
| 11 Syphilis serology    | Negative | Positive | Unknown |
| 12 Maternal age         | >34 years 20-34 years 18-19 years <18 years Unknown |
MEASLES CASE INVESTIGATION FORM

<table>
<thead>
<tr>
<th>Variable/Description</th>
<th>Value/Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td></td>
</tr>
<tr>
<td>ID number</td>
<td></td>
</tr>
<tr>
<td>Reporting district</td>
<td></td>
</tr>
<tr>
<td>Province of report</td>
<td></td>
</tr>
<tr>
<td>Reporting health facility</td>
<td></td>
</tr>
<tr>
<td>Disease/Condition</td>
<td>Measles</td>
</tr>
<tr>
<td>Date received form at national level (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Name(s) of patient</td>
<td></td>
</tr>
<tr>
<td>Date of birth (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Age in years</td>
<td></td>
</tr>
<tr>
<td>Age in months</td>
<td></td>
</tr>
<tr>
<td>Patient’s residence: village/neighbourhood</td>
<td></td>
</tr>
<tr>
<td>Town/City</td>
<td></td>
</tr>
<tr>
<td>Urban/Rural</td>
<td></td>
</tr>
<tr>
<td>District of Residence</td>
<td></td>
</tr>
<tr>
<td>Province</td>
<td></td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td></td>
</tr>
<tr>
<td>Date seen at health facility (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Date health facility notified district (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Date of onset (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Number of vaccine doses</td>
<td></td>
</tr>
<tr>
<td>Date of last vaccination (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Blank variable #1</td>
<td></td>
</tr>
<tr>
<td>Blank variable #2</td>
<td></td>
</tr>
<tr>
<td>In-patient or Out-patient?</td>
<td></td>
</tr>
<tr>
<td>Outcome (1=Alive; 2=Dead; 3=Unknown)</td>
<td></td>
</tr>
<tr>
<td>Final classification (1=Lab Confirmed; 2=Confirmed by Epidemiological linkage; 3=Compatible; 4=Discarded (IgM negative); 5= Pending (Suspected with specimen lab results pending))</td>
<td></td>
</tr>
<tr>
<td>Date sent form to district (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Date received form at district (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Date specimen collection (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Date specimen sent to Lab (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Specimen source</td>
<td></td>
</tr>
<tr>
<td>Variable/Description</td>
<td>Value/Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Specify</td>
<td></td>
</tr>
<tr>
<td>Date lab received specimen (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Specimen condition [1=adequate (good); 2=not adequate (not good)]</td>
<td></td>
</tr>
<tr>
<td>Measles IgM (1=positive; 2=negative; 3=indeterminate; 4=pending)</td>
<td></td>
</tr>
<tr>
<td>Rubella IgM (1=positive; 2=negative; 3=indeterminate; 4=pending)</td>
<td></td>
</tr>
<tr>
<td>Other lab results</td>
<td></td>
</tr>
<tr>
<td>Date lab sent results to district (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Date district received lab results (day/month/year)</td>
<td></td>
</tr>
<tr>
<td>Name, title and function of reporting officer</td>
<td></td>
</tr>
</tbody>
</table>
Bacterial Meningitis case investigation form

<table>
<thead>
<tr>
<th>MINISTRY OF HEALTH</th>
<th>1 GENERIC CASE-BASED REPORTING FORM</th>
<th>Name of country</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH FACILITY:</td>
<td>District: Region:</td>
<td></td>
</tr>
</tbody>
</table>

- □ Cholera □ Disease 2 ...... □ Meningitis □ Other (specify): ______________

EPID NUMBER: /_/_/_ / _/_/_ / _/_/_ / _/_/_ / _/_/_ / _/_/_ / _/_/_ /
(To be completed at the district level)

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>District</th>
<th>Year</th>
<th>Disease</th>
<th>Case</th>
</tr>
</thead>
</table>

PATIENT IDENTIFICATION

Patient's name: __________________________
Patient's first name (s): __________________________

Date of Birth: ____/____/____
or Age in years: ____  or  Age in months (if <12 months) ____  or  Age in months (if<1 month) ____

Sex: □ Female □ Male
Occupation (enter child if <5 years old): __________________________

Patient's residence

District of residence: __________ Town/Village: __________ Neighbourhood/Area: ________ □ Urban / □ Rural
Name of father/mother/guardian: __________________________
Patient's or guardian's phone number ___________

Date seen: ____/____/_____ Date of onset: ____/____/____
□ In-patient/Under observation □ Out-patient

Outcome: □ Healed □ Deceased □ Under treatment □ Unknown

PATIENT VACCINATED: □ YES □ NO □ UNKNOWN

If not a meningitis case:

Type of vaccine: _______________ Number of doses: _____ □ Unknown Date of last vaccination: ___/___/____

If suspected case of meningitis vaccines received:

<table>
<thead>
<tr>
<th>MenAC</th>
<th>□ Yes, Date: <strong><strong>/</strong></strong>/____ □ No □ Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>MenACW</td>
<td>□ Yes, Date: <strong><strong>/</strong></strong>/____ □ No □ Unknown</td>
</tr>
<tr>
<td>MenACWY</td>
<td>□ Yes, Date: <strong><strong>/</strong></strong>/____ □ No □ Unknown</td>
</tr>
</tbody>
</table>

Source of vaccine information:

□ card □ vaccination register □ verbal □ Unknown
| Conjugate A | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |
| PCV13-1 | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |
| PCV13-2 | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |
| PCV13-3 | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |
| Hib 1 | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |
| Hib 2 | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |
| Hib 3 | □ Yes, Date: ____/___/____ | □ No □ Unknown | □ card □ vaccination register □ verbal □ Unknown |

**SPECIMEN COLLECTED:** □ YES □ NO *(Note: IF NO, Please fill in the form and send it to the district CISSE)*

**IF NO:** Why: □ Lack of kit □ Lack of kit □ Patient's condition □ Other: ________________________

**IF YES:**

Date of specimen collection: ____/____/_____ Time of specimen collection: /__/__/HH__/__/ Min

Specimen source: □ Stool □ Blood □ CSF □ Other: ________________________________

Appearance of specimen: CSF: □ Clear □ Turbid □ Hematic □ Xanthochromic □ Citrin □ Cloudy □ Purulent

Stool: □ Aqueous □ Mucoid □ Bloody mucoid □ Bloody

Date and time of inoculation in the transport medium: ___/___/____ and /__/__/HH__/__/ Min

Specimen(s) sent to lab: □ Yes □ No If not why? ________________________________

Packaging: □ Dry tube □ Trans-Isolate □ Cryotube □ Cary blair □ Other: ________________________________

RDT carried out: □ Cholera □ Meningitis □ Other (Specify): _______________________ Results: ___________________

Date specimen sent to lab: ____/____/_____ Name of laboratory: ______________________

Date of reporting to the higher level: /__/__/ Person completing form: ___________________ Tel: _______

Date form sent to District: ____/____/____ Date District received the form: /__/__/ Min

Date form sent to Region: ____/____/____ Date Region received form: /__/__/ Min

Date form sent to the central level: ____/____/____

**DISTRICT LABORATORY OF:**

Date of receipt: ____/____/____ Time: /__/__/ Min  No. in laboratory register: __________________

Specimen(s) received: □ Dry tube □ Trans-Isolate □ Cryotube □ Cary blair □ Other (specify): __________________

Conditions of transport of Specimen(s): □ Adequate □ Not Adequate
Appearance of specimen: CSF: □ Clear □ Turbid □ Hematic □ Xanthochromic □ Citrin □ Cloudy □ Purulent
Stool: □ Aqueous □ Mucoid □ Bloody mucoid □ Bloody

Type of tests performed: □ Cytology □ Fresh state □ Gram □ Latex □ RDT □ Other (specify): ____________

| Cytology: Leucocytes / ___/ ___/ ___/ ___/ mm3 PN / ___/ ___/___% LYMPH / ___/ ___/_% |
| Gram : □ GPD □ GND □ GPB □ GNB □ Other pathogens □ Negative |
| RDT carried out: Cholera □ Meningitis □ Other (Specify): __________ Results: ___________________ |
| Latex: □ NmA □ NmC □ NmW/Y □ NmB □ S. pneumoniae □ Hib □ Negative |
| Other test (specify type and results): ________________________________ |

Date specimens sent to reference laboratory: ____/ ____/ ______

REGIONAL LABORATORY OF: ________________________________________________________________

Date received: ____/ ____/ ____ Time: ____ / H ____/ Min  No. in laboratory register: __________________
Specimen(s) received: □ Dry tube □ Trans-Isolate □ Cryotube □ Cary blair □ Other (specify): __________

Conditions of transport of Specimen(s): □ Adequate □ Not Adequate

Appearance of specimen: CSF: □ Clear □ Turbid □ Hematic □ Xanthochromic □ Citrin □ Cloudy □ Purulent
Stool: □ Aqueous □ Mucoid □ Bloody mucoid □ Bloody

Type of tests performed: □ Cytology □ Fresh state □ Gram □ Latex □ RDT □ Other (specify): ____________

| Cytology: Leucocytes / ___/ ___/ ___/ ___/ mm3 PN / ___/ ___/___% LYMPH / ___/ ___/_% |
| Gram : □ GPD □ GND □ GPB □ GNB □ Other pathogens □ Negative |
| RDT carried out: Cholera □ Meningitis □ Other (Specify): __________ Results: ___________________ |
| Latex: □ NmA □ NmC □ NmW/Y □ NmB □ S. pneumoniae □ Hib □ Negative |
| Culture: □ NmA □ NmC □ NmW □ NmB □ NmX □ Nm Indeterminate □ {ut11 } S. Pneumoniae |
| □ Hib □ H. influenzae Indeterminate □ StrepB □ Other pathogens (specify): ___________________ |
| □ Contaminated □ Negative |
| Other test (specify type and results): ________________________________ |

Antibiogram: Ceftriaxone: □ Sensitive □ Resistant □ Intermediate □ Not done
Penicillin G: □ Sensitive □ Resistant □ Intermediate □ Not done
Oxacillin: □ Sensitive □ Resistant □ Intermediate □ Not done
Other __________: □ Sensitive □ Resistant □ Intermediate □ Not done

Date specimens sent to reference laboratory: ____/ ____/ ______
**REFERENCE LABORATORY:**

Date received: 

Specimen(s) received: 

Conditions of transport of Specimen(s): 

Appearance of specimen: 

Type of tests performed: 

Cytology: 

Gram: 

Rapid Diagnostic Test Results (RDT/Dipstick): 

Latex: 

Culture: 

PCR: 

date of PCR: 

Type of PCR: 

Serotype: 

Final Laboratory Result: 

Antibiogram: 

Comments: 

Date results sent to the Surveillance Department of the Ministry of Health:
Decisional tree for Meningitis Vaccine Choice in a Reactive Vaccination Campaign

- **Alert threshold reached**
  - > 10 confirmed* bacterial meningitis cases available
    - yes
      - Main pathogen = Men A
        - ≥ 30% of Men positive are C or W
          - yes
            - ACW containing vaccine
          - no
            - Men A conjugate
      - no
        - Main pathogen = Men C or W
          - Main pathogen = Men X
            - Main pathogen = Spn / Hib
              - no
                - Conduct active field investigation and obtain specimens
              - yes
                - Case management no vaccination
    - no
      - Main pathogen = Men X
        - Main pathogen = Spn / Hib
          - no
            - Conduct active field investigation and obtain specimens
          - yes
            - Case management no vaccination
      - yes
        - ACW containing vaccine
      - no
        - Men A conjugate

If epidemic threshold is crossed:

- ACW containing vaccine
- Men A conjugate
- ACW containing vaccine
- Option: monovalent C conjugate
ANNEX 11H  Neonatal Tetanus case investigation form

Official Use  Epid Number: ______-____-____-____ Received
Only (completed by district team) Province District Year Onset Case Number at National _____/____/____

IDENTIFICATION
District: _____________________________ Province: _____
Nearest Health Village/ Town/
Facility to Village: ___________ Neighbourhood: ___________ City:

Address:

Name(s) of patient: ____________________________ Mother:
Sex:  1 = Male, 2 = Female  Father:

NOTIFICATION/INVESTIGATION
Notified Date Date Case
by: ___________________________ Notified: _____/_____/______ Investigated: _____/_____/______

MOTHER’S VACCINATION HISTORY (Please use the following if applicable where, key, 1=Y, 2=N, 9=U),

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
<th>1st <em><strong><strong>/</strong></strong></em>/______ 4th <em><strong><strong>/</strong></strong></em>/______ 2nd <em><strong><strong>/</strong></strong></em> 5th <em><strong><strong>/</strong></strong></em>/______ 3rd <em><strong><strong>/</strong></strong></em>/______ If &gt;5, last dose <em><strong><strong>/</strong></strong></em>/______</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother vaccinated with TT?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have card?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of doses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaccination status of mother prior to delivery? **</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BIRTH OF INFANT
Date of birth: _____/_____/______ Please use the following key, 1=Y, 2=N, 9=U, where applicable.

Questions
- 1=Hospital, 2=Health centre, 3=Home, trained attendant, 4=Home, untrained attendant, 5=Home, no attendant, 9=Unknown

| Question                                                        | Location of birth: *** | If birth in institution, name of institution: |
|                                                               |                        |                                             |
|                                                               |                        | Cut cord with a sterile blade?               |
|                                                               |                        | Cord treated with anything?                 |
|                                                               |                        | Describe treatment of cord                  |

Questions
- 1=Hospital, 2=Health centre, 3=Home, trained attendant, 4=Home, untrained attendant, 5=Home, no attendant, 9=Unknown

INITIAL CLINICAL HISTORY Please use the following key, 1=Y, 2=N, 9=U, where applicable.

Was baby normal at birth?  Spasms or
Normal cry and suck during first 2 days?  Convulsions?
Stopped sucking after 2 days?  Complications
Arched back?  Did the baby die?
Stiffness?  Age at death:
Onset of symptoms: _____/_____/______  Age of onset in days:

Days
Days (9=Unknown)
### TREATMENT

Date of admission _____/_____/_____

Medical record number: __________

Facility Address: __________________________

### COMMENTS/RESPONSE

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answer</th>
<th>Date of response: <em><strong><strong>/</strong></strong></em>/_____</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother given protective dose of TT within 3 months of report?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplemental immunization within same locality as the case?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FINAL CLASSIFICATION OF THE CASE:

**Neonatal Tetanus:** 1=Yes, 2=No, 9=Unknown

### INVESTIGATOR

Name: ____________________________

Title: ____________________________

Unit: ____________________________

Address: ____________________________

Phone: ____________________________
### ANNEX 11 I Respiratory diseases (including Influenza) case investigation form

#### Section 1: Essential basic information

**A. Data collector information**

1. Name of data collector
2. Data collector telephone number
3. Data collector institution
4. Form completion date (dd/mm/yyyy) _/__/___

**B. Interview respondent information (if not patient)**

5. Name of respondent
6. Respondent telephone number
7. Respondent address
8. Relationship to patient

**C. Patient identifier information**

9. Unique case ID/cluster number (if applicable)
10. Case status (confirmed, probable, suspect, other)
11. Family name
12. Given name(s)
13. Country of residence
14. Sex □ Male □ Female □ Unknown
15. Date of birth (dd/mm/yyyy) _/__/___ □ Unknown
16. Age (years, months) __________ □ Unknown
17. Address (village/town, district, province/region)
18. Patient telephone number

#### Section 2: Clinical information

**D. Patient clinical course**

19. Date of symptom onset (dd/mm/yyyy) _/__/___ □ Unknown □ Asymptomatic
20. Date of first health facility visit (including traditional care) _/__/___ □ NA □ Unknown
21. Total health facilities visited till outcome __________ □ NA □ Unknown
22. Date of first hospitalization _/__/___ □ NA □ Unknown
23. Date of intensive care unit admission Start: _/__/___ Stop: _/__/___ □ NA □ Unknown
24. Date of mechanical ventilation Start: _/__/___ Stop: _/__/___ □ NA □ Unknown
25. Antiviral treatment Start: _/__/___ Stop: _/__/___ □ NA □ Unknown
26. Outcome □ Died □ Alive □ NA □ Unknown
27. Outcome date _/__/___ □ NA □ Unknown
### Section 2: Clinical Information (continued)

#### E. Patient symptoms (from disease onset) and complications

<table>
<thead>
<tr>
<th>No.</th>
<th>Symptom Description</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Fever (≥38 °C) or history of fever</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Chills</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Sore throat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Runny nose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Vomiting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Diarrhoea</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Neurological signs</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Specify</td>
</tr>
<tr>
<td>37</td>
<td>Rash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Conjunctivitis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Shortness of breath</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Muscle aches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Pneumonia by chest X-ray</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Date started __ / __ / ___</td>
</tr>
<tr>
<td>42</td>
<td>Acute respiratory distress syndrome</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Date started __ / __ / ___</td>
</tr>
<tr>
<td>43</td>
<td>Acute renal failure</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Date started __ / __ / ___</td>
</tr>
<tr>
<td>44</td>
<td>Cardiac failure</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Date started __ / __ / ___</td>
</tr>
<tr>
<td>45</td>
<td>Consumptive coagulopathy</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Date started __ / __ / ___</td>
</tr>
<tr>
<td>46</td>
<td>Other symptoms (if yes, specify)</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Specify</td>
</tr>
</tbody>
</table>

#### F. Patient pre-existing condition

<table>
<thead>
<tr>
<th>No.</th>
<th>Condition Description</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>HIV/other immune deficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Heart disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Asthma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Chronic lung disease (non-asthma)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Chronic liver disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Chronic haematological disorder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Pregnancy</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>If yes, specify trimester: ___</td>
</tr>
<tr>
<td>56</td>
<td>Chronic kidney disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Chronic neurological impairment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Obesity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Other (if yes, specify)</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Specify</td>
</tr>
<tr>
<td>60</td>
<td>Patient was vaccinated for influenza in the past 12 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Section 3: Exposure information and travel history

#### G. Patient occupational exposures

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>61  Occupation (specify location/facility)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>62  Health-care worker (if yes, specify type/location)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63  Laboratory worker (if yes, specify type/location)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>64  Veterinary worker (if yes, specify animal types handled in the 10 days before illness)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65  Wildlife worker (if yes, specify animal types handled in the 10 days before illness)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>66  Live animal market worker (if yes, specify animal types handled in the 10 days before illness)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>67  Farm worker (if yes, specify animal types handled in the 10 days before illness)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### H. Patient human exposures in the 14 days before illness onset

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>68  Patient visited outpatient treatment facility (if yes, specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>69  Patient visited traditional healer (if yes, specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70  Patient visited or was admitted to inpatient health facility (if yes, specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>71  Patient attended festival or mass gathering (if yes, specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72  Patient exposed to person with similar illness</td>
<td></td>
<td></td>
<td>Unknown</td>
<td>Specify</td>
</tr>
<tr>
<td>73  Type of contact (tick as needed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>74  Location of exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75  Unique case ID of sick person (if available)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76  Relationship to current patient (specify, e.g. family, friend, health-care worker, colleague)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>77  Blood linked (if yes, specify link)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78  Sick person confirmed or deemed a probable case in current event</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Section 3: Exposure information and travel history [continued]

#### I. Patient travel history in the 14 days before illness onset (add sheets if multiple locations visited)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
<th>(Skip to)</th>
</tr>
</thead>
<tbody>
<tr>
<td>79  Patient travelled out of first administrative region</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Destination: ____________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode of travel: _________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrival: <strong>/</strong>/__ ______________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departure: <strong>/</strong>/__ ____________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80  If yes, specify location 1 (city or region, country)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destination: ____________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode of travel: _________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrival: <strong>/</strong>/__ ______________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departure: <strong>/</strong>/__ ____________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81  If yes, specify location 2 (city or region, country)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Destination: ____________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mode of travel: _________________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrival: <strong>/</strong>/__ ______________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departure: <strong>/</strong>/__ ____________________________________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>82  Patient travelled with companions (if yes, specify)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Specify</td>
</tr>
<tr>
<td>83  Patient handled animals</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>84  Types of animals handled (e.g. pigs, chicken, ducks or others)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85  Nature of contact (e.g. feed, groom or slaughter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>86  Location of animal contact</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Workplace</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Tour Group</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Specify</td>
</tr>
<tr>
<td>87  Within 2 weeks before or after contact, any animals sick or dead? (if yes, specify type and number, and proportion from flock or herd)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>88  Patient exposed to animals in environment but did not handle them (e.g. in neighbourhood, farm, zoo, at home, agricultural fair or work)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>89  Types of animals in that environment (e.g. pigs, chicken, ducks or others)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>90  Location of exposure</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Neighbourhood</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Market</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Agricultural fair/zoo</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Farm</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>Specify</td>
</tr>
<tr>
<td>91  Within 2 weeks before or after exposure to animals in the environment, any animals sick or dead? (if yes, specify type and number, and proportion from flock or herd)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>92  Patient exposed to animal by-products (e.g. bird feathers) or animal excreta (if yes, specify product)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>93  Patient visited live animal market (if yes, specify market)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>
### Section 3: Exposure information and travel history [continued]

#### K. Patient food exposures in the 14 days before illness onset

<table>
<thead>
<tr>
<th>94</th>
<th>Patient consumed raw or unpasteurized animal products (if yes, specify products)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Yes □ No □ Unknown Specify __________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>95</th>
<th>Patient consumed health or traditional remedies with raw or unpasteurized animal products (if yes, specify products)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Yes □ No □ Unknown Specify __________</td>
</tr>
</tbody>
</table>

#### L. Patient perceived exposure

96 From the point of view of the patient or family, what is the likely source of infection and geographic location of exposure?

________________________________________________________________________

________________________________________________________________________

### Section 4: Laboratory information

#### M. Laboratory specimens and results

<table>
<thead>
<tr>
<th>97</th>
<th>Specimens collected from patient (tick as needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Nasal swab Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Throat swab Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Nasopharyngeal swab Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Nasal wash Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Sputum Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Nasopharyngeal aspirate Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Tracheal aspirate Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Bronchoalveolar lavage Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Tissue biopsy Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Serum (first sample) Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Serum (second sample) Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Whole blood Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Urine Date collected: __ / __ / ____</td>
</tr>
<tr>
<td></td>
<td>□ Other: __________ Date collected: __ / __ / ____</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>98</th>
<th>Pathogen testing done (tick as needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Influenza A/B Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Influenza subtyping Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ MERS-CoV Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ SARS Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ RSV Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Human metapneumovirus Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Parainfluenza (1,2,3) Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Adenovirus Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Rhinovirus Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Enterovirus Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Coronavirus Test used: __________</td>
</tr>
<tr>
<td></td>
<td>□ Chlamydia pneumonia Test used: __________</td>
</tr>
</tbody>
</table>
### M. Laboratory specimens and results

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>Pathogen testing done (tick as needed) [continued]</td>
<td>□ Mycoplasma pneumonia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Legionella</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Streptococcus pneumonia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Other: ____________</td>
</tr>
</tbody>
</table>
| 99 | Specimens shipped to international reference laboratories | □ Yes □ No | If yes, specify recipient laboratory and shipment date: ____________
| 100| Specify specimen(s) positive | | |
| 101| Specify pathogen(s) positive | | |
| 102| Specify targets positive (e.g. for MERS-CoV) | | |
| 103| Specify subtype positive (e.g. for influenza) | | |
| 104| Specify titres (e.g. paired serum for influenza) | | |

ID: Identification; MERS-CoV, Middle East respiratory syndrome coronavirus; RSV, respiratory syncytial virus; SARS, severe acute respiratory syndrome; NA, not-applicable.
## ANNEX 11J  Tuberculosis (MDR and XDR TB) case-based reporting form

<table>
<thead>
<tr>
<th>Country:</th>
<th>Year:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Quarter:</th>
<th>Month:</th>
<th>Drug Susceptibility Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case unique Identifier (Detection year-Country code-Number in Tb Register)</td>
<td>Case based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sex (F/M)</th>
<th>Age (Yrs)</th>
<th>Date of Diagnosis (dd/mm/yyyy)</th>
<th>Type of Notification (MDR-TB* or XDR-TB**)</th>
<th>TB Site (Pulmonary or extra Pulmonary)</th>
<th>Type of TB Case (New /Relapse /After default /After failure of first treatment /After failure of re-treatment)</th>
<th>Patient Treatment Status (On treatment /Not on treatment /Don't Know)</th>
<th>HIV Status (positive /negative /Unknown)</th>
</tr>
</thead>
</table>

| Other (Specify) | H | R | E | Z | S | T | h | A | m | K | m | C | m | C | f | O | f | L | f | M | f | G | f | G | f | P | t | E | t | C | s | PA | S |
* **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 = Prothionamide
- Eto = Ethionamide
- Cs = Cycloserine
- PAS = P-aminosalicylic acid
<table>
<thead>
<tr>
<th>Variables / Questions</th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Detection day (dd/mm/yyyy)</td>
<td></td>
</tr>
<tr>
<td>2  Detection place (Health facility or Community)</td>
<td></td>
</tr>
<tr>
<td>3  Patient identification number (yyyy-week-CCC-PPP-DDD-</td>
<td>Reporting site-nnn)</td>
</tr>
<tr>
<td>4  Patient surname or last name</td>
<td></td>
</tr>
<tr>
<td>5  Patient first name(s)</td>
<td></td>
</tr>
<tr>
<td>6  Age (years)</td>
<td></td>
</tr>
<tr>
<td>7  Sex (F/M)</td>
<td></td>
</tr>
<tr>
<td>8  Number of people in same household</td>
<td></td>
</tr>
<tr>
<td>9  Number of other contacts</td>
<td></td>
</tr>
<tr>
<td>10 Patient's residential address</td>
<td></td>
</tr>
<tr>
<td>11 Village/Town</td>
<td></td>
</tr>
<tr>
<td>12 Neighborhood</td>
<td></td>
</tr>
<tr>
<td>13 District</td>
<td></td>
</tr>
<tr>
<td>14 Province</td>
<td></td>
</tr>
<tr>
<td>15 Country</td>
<td></td>
</tr>
<tr>
<td>16 Date of first symptoms onset (dd/mm/yyyy)</td>
<td></td>
</tr>
<tr>
<td>17 Observed Symptoms and Clinical signs</td>
<td></td>
</tr>
<tr>
<td>18 Was patient exposed to any known risk factor for this</td>
<td>Disease? (Yes/No)</td>
</tr>
<tr>
<td>19 If yes, specify risk factor(s)</td>
<td></td>
</tr>
<tr>
<td>20 Lab results</td>
<td></td>
</tr>
<tr>
<td>21 Final Classification (Not a case, Suspect, Probable,</td>
<td>Confirmed by Lab, Confirmed by epidemiological link, Pending)</td>
</tr>
<tr>
<td>22 Outcome (Died, Survived, Unknown)</td>
<td></td>
</tr>
<tr>
<td>23 End of latest contact followed-up (dd/mm/yyyy)</td>
<td></td>
</tr>
<tr>
<td>24 Other Notes and Observations</td>
<td></td>
</tr>
<tr>
<td>25 Date latest update of this record (dd/mm/yyyy)</td>
<td></td>
</tr>
</tbody>
</table>
ANNEX 11L Viral haemorrhagic fever case investigation form

<table>
<thead>
<tr>
<th>Date of detection of the case /<strong>/</strong>/__</th>
<th>ID Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Case was notified by (tick off the right answer and specified)</td>
<td></td>
</tr>
<tr>
<td>E Mobile team, # ______________________ E Health Centre</td>
<td></td>
</tr>
<tr>
<td>E Hospital E</td>
<td></td>
</tr>
<tr>
<td>Others:</td>
<td></td>
</tr>
<tr>
<td>Form filled by (first name and surname)</td>
<td></td>
</tr>
<tr>
<td>Information given by (first name and surname)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Identity of the patient**

First name: ___________________ Surname ___________________ Nickname ___________________

For the babies, son/daughter of (name of father) ____________________________

Birth date: __/__/__ Age (years) ___ Sex EM EF

Permanent address: Head of Household (first name and surname) ____________________________

Village/Suburb _____________ Country _____________ GPS lat _____________ long

Nationality: ___________________ Ethnic group ___________________

Profession of the patient (tick off the right answer)

E Health staff, details:

Name of health care facility ___ ___ Service ______________ qualification

E Miner E House wife E Hunter/trading game meat E Children

E Pupil/ Student E Farmers E Others________________________

**Status of the patient**

Status of the patient at detection E Alive E Death If dead, please specify date of death:__/__/__

Place of death: E Community, name village __________________________

E Hospital, name and service __________________________ Country

Place of the funerals, name village: __________________________ Country

**History of the disease**

Date of onset of symptoms:__/__/__

Name of the village where the patient got ill _____________ Country _____________

Did the patient travel during illness: E Yes E No E DNK

If Yes, indicate the places and the country:

Village ___________________ Health Centers ___________________ Country ______ _____________

Health Centers ______ Country ______
Did the patient have fever? E Yes E No E DNK. If yes, date of onset for the fever: ___/___/___

**Does or did the patient have the following symptoms (tick off when apply)**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>E Yes</th>
<th>E No</th>
<th>DNK</th>
<th>E Yes</th>
<th>E No</th>
<th>DNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vomiting/Nausea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anorexia/Loss of Appetite</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrhoea</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intense Fatigue</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdominal Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle or Joint Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty swallowing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty breathing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Exposition Risks**

- Was the patient hospitalized or did he visit anyone in the hospital anytime in the three weeks before becoming ill? 
  - Yes ☐ No ☐ DNK; If Yes, where ___________ between (dates) ___/___/___ and ___/___/___
- Did the patient have visit/consult a traditional healer during the three weeks before becoming ill or during illness?
  - Yes ☐ No ☐ DNK; If Yes, name of the traditional healer __________ Village ______ Country _____;
  - When and where did the contact take place? Place __________ date: ___/___/___
- Did the patient receive traditional medicine? ☐ Yes ☐ No ☐ DNK; If Yes, explain which kind:
- Did the patient attend funeral ceremonies during anytime in the three weeks before becoming ill? ☐ Yes ☐ No
- Did the patient travel anytime in the three weeks before becoming ill? ☐ Yes ☐ No ☐ DNK
  - If Yes, where _______________ between (dates) ___/___/___ and ___/___/___
- Did the patient have a contact with a known suspect case anytime in the three weeks before becoming ill?
  - Yes ☐ No ☐ DNK; If Yes, Surname ___________ First Name ___________ ID Case
  - During the contact, the suspect case was ☐ Alive ☐ Dead date of death ___/___/___
  - Date of last contact with the suspect case ___/___/___
- Did the patient have contact with a wild animal (non-human primate or others), that was found dead or sick in the bush, or animal behaving abnormally anytime in the three weeks before the illness?
  - ☐ Yes ☐ No ☐ DNK; If Yes, kind of animal __________ Location __________ date ___/___/___
- Has a sample been collected? ☐ Yes ☐ No ☐ DNK; If yes, date ___/___/___
  - Blood sampling ☐ Urine ☐ Saliva ☐ Skin Biopsy
- Was the patient sent to a hospital? ☐ Yes ☐ No
- Was the patient admitted in the isolation ward? ☐ Yes ☐ No
  - If Yes, name of Hospital __________ No. de hospital __________ Hospitalization date ___/___/___
**Update on the Hospital information**

<table>
<thead>
<tr>
<th>ID Case: __________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reception date: <em><strong>/</strong></em>/___</td>
</tr>
<tr>
<td>Country: __________</td>
</tr>
<tr>
<td>Member of family helping the patient: __________</td>
</tr>
<tr>
<td>Name and Surname: ____________________ Date of discharge <em><strong>/</strong></em>/___ OR Date of death <em><strong>/</strong></em>/___</td>
</tr>
</tbody>
</table>

**Laboratory**

<table>
<thead>
<tr>
<th>A specimen was collected</th>
<th>☐ before the death</th>
<th>☐ After the death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date sample <em><strong>/</strong></em>/___</td>
<td>Date results <em><strong>/</strong></em>/___ ID Lab ____</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample</th>
<th>☐ blood</th>
<th>☐ blood with anti-coagulants</th>
<th>☐ skin biopsy</th>
<th>☐ cardiac function</th>
<th>☐ other: _________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Results</th>
<th>PCR</th>
<th>☐ pos</th>
<th>☐ neg</th>
<th>☐ NA</th>
<th>date <em><strong>/</strong></em>/___</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigen detection</td>
<td>☐ pos</td>
<td>☐ neg</td>
<td>☐ NA</td>
<td>date <em><strong>/</strong></em>/___</td>
<td></td>
</tr>
<tr>
<td>Antibodies IgM</td>
<td>☐ pos</td>
<td>☐ neg</td>
<td>☐ NA</td>
<td>date <em><strong>/</strong></em>/___</td>
<td></td>
</tr>
<tr>
<td>Antibodies IgG</td>
<td>☐ pos</td>
<td>☐ neg</td>
<td>☐ NA</td>
<td>date <em><strong>/</strong></em>/___</td>
<td></td>
</tr>
<tr>
<td>ImmunoHistochemistry</td>
<td>☐ pos</td>
<td>☐ neg</td>
<td>☐ NA</td>
<td>date <em><strong>/</strong></em>/___</td>
<td></td>
</tr>
</tbody>
</table>

**Outcome (verified 4 weeks after the onset of symptoms)**

<table>
<thead>
<tr>
<th>☐ Alive</th>
<th>☐ Dead; If dead, date of death <em><strong>/</strong></em>/___</th>
</tr>
</thead>
</table>

**Case Classification**

<table>
<thead>
<tr>
<th>☐ Alert Case</th>
<th>☐ Suspect</th>
<th>☐ Probable</th>
<th>☐ Confirmed</th>
<th>☐ Not a case</th>
</tr>
</thead>
</table>
## ANNEX 11M  Acute or Chronic Viral Hepatitis case investigation form

### Acute or Chronic Viral Hepatitis case investigation form

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable/Description</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>General characteristics – identification</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Epid. Number (e.g. Country code-RRR-DDD-YY-NNN)</td>
<td>Country code- _ _ _ · _ _ _ · _ _ _</td>
</tr>
<tr>
<td>2</td>
<td>GPS coordinates: Latitude; Longitude</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reporting Region /Province</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Reporting District</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Reporting health facility</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Patient Health Facility Identification Number</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Date seen at health facility (dd/mm/yyyy)</td>
<td>/ _ _ / _ _ _ / _ _ _ _ /</td>
</tr>
<tr>
<td>8</td>
<td>Date health facility notified district (dd/mm/yyyy)</td>
<td>/ _ _ / _ _ _ / _ _ _ _ /</td>
</tr>
<tr>
<td>9</td>
<td>Patient Surname</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Patient Other Names</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Name of mother/father/ Care taker if child ≤12 years</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Date of birth (dd/mm/yyyy)</td>
<td>/ _ _ / _ _ _ / _ _ _ _ /</td>
</tr>
<tr>
<td>13</td>
<td>Country of Birth</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Age (Completed Years, Months, Days)</td>
<td>_ _ _ Years _ _ _ Months _ _ _ Days</td>
</tr>
<tr>
<td>15</td>
<td>Sex: M=Male  F=Female</td>
<td></td>
</tr>
<tr>
<td>16a</td>
<td>Patient's residential Address: (House Number, Location, Community of residence)</td>
<td></td>
</tr>
<tr>
<td>16b</td>
<td>Telephone number</td>
<td></td>
</tr>
<tr>
<td>16c</td>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>16d</td>
<td>Place of work</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Urban/Rural</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Sub-district of Residence</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>District of Residence</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Region of Residence</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Country of Residence</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Clinical characteristics and testing circumstances</strong></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Clinical diagnosis</td>
<td>Acute [ ] Chronic [ ]</td>
</tr>
<tr>
<td>23</td>
<td>Acute Onset</td>
<td>Yes [ ] No [ ]</td>
</tr>
<tr>
<td>24</td>
<td>If Acute, Onset Date (first symptoms) (dd/mm/yyyy)</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>If Chronic, answer 25a and 25b below.</td>
<td></td>
</tr>
<tr>
<td>25a</td>
<td>Systematic testing (Screening)</td>
<td>Yes [ ] No [ ]</td>
</tr>
<tr>
<td>25b</td>
<td>Chronic liver disease screening (eg liver cirrhosis and/or tumour)</td>
<td>Yes [ ] No [ ]</td>
</tr>
<tr>
<td>27</td>
<td>In-patient or Out-patient?</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>If In-patient, date of admission (dd/mm/yyyy)</td>
<td></td>
</tr>
</tbody>
</table>
### Acute or Chronic Viral Hepatitis case investigation form

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable/Description</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>Clinical Signs and Symptoms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jaundice: Yes [ ] No [ ]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others: [ ]</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Diagnosis and Treatment History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30a</td>
<td>Previously identified with chronic HBV infection</td>
<td></td>
</tr>
<tr>
<td>30b</td>
<td>Previously identified with chronic HCV infection</td>
<td></td>
</tr>
<tr>
<td>31a</td>
<td>Patient on specific anti-viral therapy for HBV</td>
<td></td>
</tr>
<tr>
<td>31b</td>
<td>Patient on specific anti-viral therapy for HCV</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis Vaccination History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Has the person ever received at least one dose of hepatitis A vaccine?</td>
<td></td>
</tr>
<tr>
<td>33a</td>
<td>Has the person ever received Hepatitis B Birth dose</td>
<td></td>
</tr>
<tr>
<td>33b</td>
<td>Has the person ever received at least one dose of hepatitis B vaccine?</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Has the person ever received at least one dose of hepatitis E vaccine?</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Date of last vaccination (dd/mm/yyyy)</td>
<td>/ _ _ / _ _ / / / / /</td>
</tr>
<tr>
<td>General Exposures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Is the person health-care worker exposed to blood through patient care?</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Is the person a man who has sex with other men?</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Does the person undergo chronic haemodialysis?</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Does the person inject recreational drugs?</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Is the person involved in a reported, identified outbreak?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible exposures in the 2–6 weeks before onset (acute hepatitis only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Was there contact with patient(s) with the same symptoms?</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Did the person drink water from a well or other unsafe water source?</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Did the person eat unwholesome food e.g. raw, uncooked shellfish?</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Is the person a child or a staff member in a day-care centre?</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Did the person travel to an area highly endemic for hepatitis A?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible exposures in the 1–6 months before onset (acute hepatitis only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Did the person receive injections in a health-care setting?</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Was the person hospitalized?</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Did the person undergo surgery?</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Did the person receive a blood transfusion?</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Did the person go to the dentist?</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Was there sexual contact with someone with hepatitis B?</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Was there household contact with someone with hepatitis B?</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Was there unprotected sex with non-regular partner(s)?</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td>Skin piecing and tattooing</td>
<td></td>
</tr>
</tbody>
</table>

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### Acute or Chronic Viral Hepatitis case investigation form

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable/Description</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>55a</td>
<td>Outcome (1=Alive; 2=Dead; 3=Unknown)</td>
<td></td>
</tr>
<tr>
<td>55b</td>
<td>If dead, Date of death (dd/mm/yyyy)</td>
<td>/__ ____/ __ __ ___</td>
</tr>
<tr>
<td>56</td>
<td>Final classification (1=Lab Confirmed; 2=Confirmed by Epidemiological linkage; 3=Discarded (lab negative))</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Date form sent to district (dd/mm/yyyy)</td>
<td>/__ ____/ __ __ ___</td>
</tr>
<tr>
<td>58</td>
<td>Date received form at district (dd/mm/yyyy)</td>
<td>/__ ____/ __ __ ___</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Date sample collected (dd/mm/yyyy)</td>
<td>/__ ____/ __ __ ___</td>
</tr>
<tr>
<td>2 Date sample sent to Laboratory (dd/mm/yyyy)</td>
<td>/__ ____/ __ __ ___</td>
</tr>
<tr>
<td>3 Type of sample (specify)</td>
<td></td>
</tr>
<tr>
<td>4 Date laboratory received sample (dd/mm/yyyy)</td>
<td>/__ ____/ __ __ ___</td>
</tr>
<tr>
<td>5 Epid Number (e.g. GHA-GAR-DDD-YY-NNN) **</td>
<td>GHA- <strong>-</strong>-<strong>-</strong>-<strong>-</strong>-__</td>
</tr>
<tr>
<td>6 Patient name(s)</td>
<td></td>
</tr>
<tr>
<td>7 Sex: (M= Male F= Female)</td>
<td></td>
</tr>
<tr>
<td>8 Age (Completed Years, Months, Days)</td>
<td>[ ] Years [ ] Months [ ] Days</td>
</tr>
<tr>
<td>9 Person sending sample: Name, Designation,</td>
<td></td>
</tr>
<tr>
<td>Tel No., E-mail</td>
<td></td>
</tr>
</tbody>
</table>

**Part II. Laboratory Officer to complete this section and return the form to district and clinician**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Sample condition 1=adequate (good); 2=not adequate (not good)</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Variable/Description</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11</td>
<td>Lab Results:</td>
</tr>
<tr>
<td></td>
<td>Hepatitis A:  Anti-HAV IgM</td>
</tr>
<tr>
<td></td>
<td>Hepatitis B:  HBsAg or IgM anti-HBc</td>
</tr>
<tr>
<td></td>
<td>Hepatitis C:  Anti-HCV</td>
</tr>
<tr>
<td></td>
<td>Hepatitis D:  HBsAg or IgM anti-HBc plus anti-HDV</td>
</tr>
<tr>
<td></td>
<td>Hepatitis E:  IgM anti-HEV and/or IgG anti-HEV</td>
</tr>
<tr>
<td>12</td>
<td>Other lab results</td>
</tr>
<tr>
<td>13</td>
<td>Date laboratory sent results to Clinician (dd/mm/yyyy)</td>
</tr>
<tr>
<td>14</td>
<td>Date laboratory sent results to District (dd/mm/yyyy)</td>
</tr>
<tr>
<td>15</td>
<td>Date district received laboratory results (dd/mm/yyyy)</td>
</tr>
<tr>
<td>16</td>
<td>Name of Lab Personnel completing form</td>
</tr>
<tr>
<td></td>
<td>Phone number</td>
</tr>
<tr>
<td></td>
<td>Signature</td>
</tr>
<tr>
<td></td>
<td>E-mail address</td>
</tr>
</tbody>
</table>
**Annex 11N  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:**

<table>
<thead>
<tr>
<th>S no</th>
<th>Name of Patient</th>
<th>District or Council</th>
<th>Ward</th>
<th>Locality</th>
<th>Mta/Kijiji</th>
<th>Age Type</th>
<th>Age Group</th>
<th>Sex</th>
<th>Occupation</th>
<th>Date of Onset</th>
<th>Date of Seizure</th>
<th>HF</th>
<th>Vomiting</th>
<th>Dehydration</th>
<th>Specimen</th>
<th>Result</th>
<th>Hospitalized</th>
<th>Treatment Given</th>
<th>Outcome</th>
<th>Date of Discharge or Death</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
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<td>3</td>
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<td>4</td>
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<tr>
<td>5</td>
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</tbody>
</table>
### ANNEX 11 O  Contact listing forms

<table>
<thead>
<tr>
<th>No.</th>
<th>Surname</th>
<th>First name</th>
<th>Sex (M/F)</th>
<th>Age (yrs)</th>
<th>Phone Number</th>
<th>Head of Household</th>
<th>Village</th>
<th>District</th>
<th>Relationship to Case</th>
<th>Date of Last Contact (When symptom)?</th>
<th>Type of contact (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

*Contacts*  
1. Slept, ate or spent time in the same household or room as case  
2. Direct physical contact with the case (dead or alive)  
3. Has touched or shared linen, clothes or dishwashing utensils of the case body fluids (blood, urine, saliva, feces)  
4. Has touched his/her body fluids (blood, urine, saliva, feces, semen)  
5. Needs to be followed for other reasons, specify (e.g. contact with affected animal)  

Completed by (Print Name): [Name]  
Title: [Title]  
Date: [Date]

**Reporting Instructions**  
Return this completed form to the outbreak investigation team.
## Community alert reporting form

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

<table>
<thead>
<tr>
<th>1. Name of CBS focal person reporting: ____________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Telephone number: __________________ Community ___________ District ___________</td>
</tr>
<tr>
<td>3. Date reporting (day, month, year) __ / __ / __</td>
</tr>
<tr>
<td>4. Type of illness/Condition/Event/Signal (please describe): ____________________________</td>
</tr>
<tr>
<td>5. When did this happen (Date: Day/Month/Year); Time __ / __ / __</td>
</tr>
<tr>
<td>6. Date/time this was detected (Date: Day/Month/Year); Time __ / __ / __</td>
</tr>
<tr>
<td>7. Where did this happen? (Location: community, ward/sub-district, district)</td>
</tr>
<tr>
<td>8. How many people have been affected?</td>
</tr>
<tr>
<td>9. Has anyone died? If yes, how many</td>
</tr>
<tr>
<td>10. Are there sick or dead animals involved?</td>
</tr>
<tr>
<td>11. Is the event ongoing as at the time of this report?</td>
</tr>
<tr>
<td>12. What action has been taken?</td>
</tr>
</tbody>
</table>

### 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:** Countries should adopt this form such that it is used to capture and notify/report the country’s priority diseases (Indicator-based surveillance) and events/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 11Q  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.

<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Type of illness/Condition/Event/Alert</th>
<th>When did this happen (DD/MM/YYYY)</th>
<th>Where did this happen (Community, District)</th>
<th>How many have been affected</th>
<th>How many died</th>
<th>what action was taken</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Cases/Conditions/Events/Signals to be reported</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Any person with headache and stiff neck</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Any person with fever and rash</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Two or more persons presenting with similar signs/symptoms from the same community, school, or workplace within one week</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>A cluster of unexplained deaths of animals within one week</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Any person presenting with new or rare signs/symptoms</td>
<td></td>
</tr>
</tbody>
</table>

*Insert pictures/images describing the Case/Conditions/Events/Signals to assist in detection at the community level*
ANNEX 11R: Reporting forms for adverse events following immunization (AEFI)

**AEFI reporting ID number:**

**REPORTING FORM FOR ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI)**

<table>
<thead>
<tr>
<th><em>Patient Name:</em></th>
<th><em>Reporter’s Name:</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Patient’s full Address:</em></td>
<td>Institution:</td>
</tr>
<tr>
<td>Telephone:</td>
<td>Designation &amp; Department:</td>
</tr>
<tr>
<td>Sex: □ M □ F</td>
<td>Address:</td>
</tr>
</tbody>
</table>

*Date of birth: _ _ / _ _ / _ _ |
OR Age at onset: □ 0 Years □ 0 Months □ 0 Days
OR Age Group at onset: □ < 1 Year □ 1 to 5 Years □ > 5 Years

<table>
<thead>
<tr>
<th>Telephone &amp; E-mail:</th>
<th>Date patient notified event to health system: _ _ / _ _ / _ _</th>
</tr>
</thead>
<tbody>
<tr>
<td>Today’s date: _ _ / _ _ / _ _</td>
<td></td>
</tr>
</tbody>
</table>

**Health facility (place or vaccination centre) name & address:**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Diluent (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Name of vaccine</em></td>
<td><em>Date of vaccination</em></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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

<table>
<thead>
<tr>
<th>Province/State</th>
<th>District</th>
<th>Case ID</th>
</tr>
</thead>
</table>

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: ________

Sex: □ M □ F

Patient Name: ________________________________________

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

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Diluent</th>
<th>Dose (e.g. 1st, 2nd, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine</td>
<td>Diluent</td>
<td>Vaccine</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Diluent</td>
<td>Vaccine</td>
</tr>
<tr>
<td>Vaccine</td>
<td>Diluent</td>
<td>Vaccine</td>
</tr>
</tbody>
</table>

Type of site (✓) □ Fixed □ Mobile □ Outreach □ Other ____________

Date of first key symptom (DD/MM/YYYY): ___ / ___ / ___

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

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Finding</th>
<th>Remarks (If yes provide details)</th>
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</thead>
<tbody>
<tr>
<td>Past history of similar event</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
<tr>
<td>Adverse event after previous vaccination(s)</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
<tr>
<td>History of allergy to vaccine, drug or food</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
<tr>
<td>Pre-existing illness (30 days) / congenital disorder</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
<tr>
<td>History of hospitalization in last 30 days, with cause</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
<tr>
<td>Patient currently on concomitant medication?</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
<tr>
<td>(If yes, name the drug, indication, doses &amp; treatment dates)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family history of any disease (relevant to AEFI) or allergy</td>
<td>Yes / No / Unkn</td>
<td></td>
</tr>
</tbody>
</table>

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

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:

<table>
<thead>
<tr>
<th>Name and contact information of person completing these clinical details</th>
<th>Designation</th>
<th>Date/time</th>
</tr>
</thead>
</table>

**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

<table>
<thead>
<tr>
<th>Number immunized for each antigen at session site. Attach record if available.</th>
<th>Vaccine name</th>
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</thead>
<tbody>
<tr>
<td>Number of doses</td>
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</tbody>
</table>

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?

- ☐ Did all the cases in the cluster receive vaccine from the same vial? [Yes] / [No] / [Unkn]

- ☐ 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)

- Reconstitution procedure (✓)
  - Same reconstitution syringe used for multiple vials of same vaccine?
  - Same reconstitution syringe used for reconstituting different vaccines?
  - Separate reconstitution syringe for each vaccine vial?
  - Separate reconstitution syringe for each vaccination?

Specific key findings/additional observations and comments:
Section F  Cold chain and transport  
(Complete this section by asking and/or observing practice)

<table>
<thead>
<tr>
<th>Last vaccine storage point:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the temperature of the vaccine storage refrigerator monitored?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>○ If “yes”, was there any deviation outside of 2–8 °C after the vaccine was placed inside?</td>
<td>Yes / No</td>
</tr>
<tr>
<td>○ If “yes”, provide details of monitoring separately.</td>
<td></td>
</tr>
<tr>
<td>Was the correct procedure for storing vaccines, diluents and syringes followed?</td>
<td>Yes / No / Unkn</td>
</tr>
<tr>
<td>Was any other item (other than EPI vaccines and diluents) in the refrigerator or freezer?</td>
<td>Yes / No / Unkn</td>
</tr>
<tr>
<td>Were any partially used reconstituted vaccines in the refrigerator?</td>
<td>Yes / No / Unkn</td>
</tr>
<tr>
<td>Were any unusable vaccines (expired, no label, VVM at stages 3 or 4, frozen) in the refrigerator?</td>
<td>Yes / No / Unkn</td>
</tr>
<tr>
<td>Were any unusable diluents (expired, manufacturer not matched, cracked, dirty ampoule) in the store?</td>
<td>Yes / No / Unkn</td>
</tr>
</tbody>
</table>

Specific key findings/additional observations and comments:

Vaccine transportation:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of vaccine carrier used</td>
<td></td>
</tr>
<tr>
<td>Was the vaccine carrier sent to the site on the same day as vaccination?</td>
<td>Yes / No / Unkn</td>
</tr>
<tr>
<td>Was the vaccine carrier returned from the site on the same day as vaccination?</td>
<td>Yes / No / Unkn</td>
</tr>
<tr>
<td>Was a conditioned ice-pack used?</td>
<td>Yes / No / Unkn</td>
</tr>
</tbody>
</table>

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 11S: Aide-Memoire on adverse event following immunization investigation

WHEN TO INVESTIGATE AEFI?

If a detailed investigation is warranted, it should be initiated as soon as possible, ideally within 24 to 48 hours of the case being first reported.

CHECKLIST FOR AEFI INVESTIGATION

1. PRELIMINARY STEPS

☐ Develop national guidelines with case definitions for reportable AEFI, reporting forms, investigation procedures, roles and responsibilities
☐ Develop resource documents and training material on reporting, management and investigation of AEFI
☐ Designate and train staff to conduct an AEFI investigation using the investigation form and guidelines
☐ Train staff on how to collect and store specimens
☐ Have a functioning National AEFI Review Committee with suitable representation
☐ Establish procedure, criteria and designate focal persons for notifying and communicating with WHO and UNICEF (if UN-supplied vaccine) or other relevant party depending on procurement mechanism
☐ Identify a spokesperson for public communications

2. RECEIVING A REPORT

☐ Provide rapid attention to all reports received and immediate response to serious events
☐ Verify the information in the report, confirm the diagnosis, classify and assess the AEFI using established case definitions. Decide whether it needs further detailed investigation.
☐ If investigation is warranted, travel to the location of the AEFI, or delegate responsibility to another trained person

3. INVESTIGATE AND COLLECT DATA

☐ Obtain information from patient or relatives directly/ use available records
☐ Obtain information from immunization service providers and medical care service providers (hospital staff) use available records
☐ Ask about the vaccine(s) administered and other drugs potentially received
☐ Establish a more specific case definition if needed
☐ Ask about other vaccines who may have received the same or other vaccines
☐ Observe the service in action
☐ Ask about cases in unvaccinated persons
☐ Formulate a hypothesis as to what may have caused the AEFI (see table below)
☐ Collect specimens (if indicated by investigation, but not as a routine):
  ✓ from the patient
  ✓ the vaccine and diluent if applicable
  ✓ the syringes and needles

DETECTION AND REPORTING

Vaccine recipients themselves and/or parents of vaccine recipients who identify AEFI should notify the same to the health care provider. All notified AEFI cases should be documented and reported in a simple standard reporting form by the health care provider.

WHICH OF THE REPORTED AEFI SHOULD BE INVESTIGATED IN MORE DETAIL?

A detailed AEFI investigation to assess causality is necessary if:

☐ it is serious
☐ it is part of a cluster
☐ it is part of a suspected signal
☐ it is a suspected immunization error
☐ it appears on the list of events defined for AEFI investigation
☐ it causes significant parental or public concern

WHO SHOULD INVESTIGATE AEFI?

Detailed AEFI field investigation can be done based on the program's operational structure and the expertise available. A basic preliminary investigation by local programme managers may be sufficient if the cause of the reported AEFI is very clear; otherwise, investigation should be done by next higher administrative level, by a trained/skilled person/team, depending on the nature of event, its seriousness and impact to the programme.
ADVERSE EVENT FOLLOWING IMUNIZATION

4. ANALYSE THE DATA
- Review epidemiological, clinical, and laboratory findings
- Share findings with national AEfi committee for expert advice
- Summarize and report findings

5. TAKE ACTION
The local response after an AEfi investigation should be based on findings (data/information) and local practices. The highest priority is to treat patient. Suspending vaccincation or the locality of the event temporarily pending investigation outcome may be necessary but is uncommon. Broader suspension of vaccination is only rarely necessary. When taking action, it is important to:
- Provide feedback to health staff
- Communicate findings and action to the parents and public – during all stages of the investigation
- Correct problem (based on the cause) by improving training, supervision and/or distribution of vaccines/injection equipment
- Replace vaccines if indicated

INVESTIGATING DEATHS AFTER IMMUNIZATION
After informing higher authorities, field investigation should be conducted by a team of clinical, laboratory and forensic experts supported by programme managers. A decision on autopsy should be taken within the local sociocultural, religious, political context. Autopsies should be done with adequate information of the circumstances of the event using standard autopsy protocols. Appropriate specimens should be collected for testing.

OUTCOME OF AEfi INVESTIGATION
On concluding the investigation, the documents and evidence collected should be compiled, a report prepared and submitted to a group of experts to determine/evaluate causality.

INVESTIGATING AEfi CLUSTERS
Suggested steps for identifying the most likely cause of a cluster of AEfi

- Cluster of AEfi
  - All cases from only one facility
  - Same vaccine lot over time?
  - Knows vaccine reaction?
  - Similar illness in others who did not get vaccine?
  - Rate of reported within the expected rate?

- Coincidental event
- Immunization error
- Manufacturer error, batch problem or transport/dosage error

- Immunization error, coincidence or unknown (SignX)
- Coincidental event
- Vaccine product reaction