Technical Guidelines for Integrated Disease Surveillance and Response in Sierra Leone

JUNE 2008

GOVERNMENT OF SIERRA LEONE

MINISTRY OF HEALTH AND SANITATION

TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN SIERRA LEONE

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DIRECTORATE OF DISEASE PREVENTION AND CONTROL

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This document is a local adaptation of the one prepared by WHO Regional Office for Africa. It is the result of a series of consultations culminating in a three days intensive workshop facilitated by:

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Introduction

In September 1998, the 48th World Health Organisation Regional Committee for Africa met in Harare. Through resolution AFRO/RC48/R2, Member States adopted integrated disease surveillance as a regional strategy for early detection and efficacious response to priority communicable diseases for the African region.

On 23 May 2005, the Fifty-eighth World Health Assembly adopted the International Health Regulations in Geneva, Switzerland through Resolution WHA58.3. The International Health Regulations has entered into force on June 15, 2007.

Communicable diseases are the most common causes of death, disability and illness in the African region. While these diseases present a large threat to the well-being of African communities, there are well-known interventions that are available for controlling and preventing them. Surveillance data can guide health worker in the decision-making needed to implement the proper strategies for disease control and lead to activities for preventing future cases.

Surveillance is a watchful, vigilant approach to information gathering that serves to improve or maintain the health of the population. A functional disease surveillance system is essential for defining problems and taking action. Using epidemiological methods in the service of surveillance equips district and local health teams to set priorities, plan interventions, mobilize and allocate resources and predict or provide early detection of outbreaks.

An estimated 35 million people died from chronic non-communicable diseases world wide accounting 60% of all deaths in 2005. Heart disease, stroke, cancer, diabetes and other chronic non communicable diseases are often thought to be public health problems of significance only in high income countries. In reality, only 20% of chronic disease deaths occur in high income countries – while 80% occur in low and middle income countries, where most of the world's population lives. Moreover, as described in detail in the WHO publication "Preventing Chronic Diseases: a Vital Investment", the impact of chronic diseases in many low and middle income countries is steadily growing. In these settings, middle-aged adults are especially vulnerable to chronic disease. Thus, people tend to develop chronic diseases at younger ages, suffer longer, and die sooner than those in high income countries.

Without action, an estimated 28 million people will die from chronic non communicable diseases in the next 10 years in the WHO African Region. Many of these deaths will occur prematurely, affecting families, communities and countries both economically and socially because killing the very economically active people. But this prediction need not be fulfilled.

Concerted action now could result in the fulfilment of WHO global goal: an additional 2% reduction in chronic disease death rates annually over the next 10 years to 2015. This could be done through integrated approaches focusing on the reduction of common risk factors: unhealthy diet, physical inactivity, tobacco use, harmful alcohol consumption and biological risk Factors such as overweight and obesity, raised blood pressure, raised

blood glucose and abnormal blood lipids all combined with appropriate treatment programmes across different Non-Communicable Diseases. Integrating chronic non communicable diseases surveillance into the IDSR will provide much needed data for timely interventions, advocacy and better planning.

Surveillance is a watchful, vigilant approach to information gathering that serves to improve or maintain the health of the population. A functional disease surveillance system is essential for defining problems and taking action. Using epidemiological methods in the service of surveillance equips district and local health teams to set priorities, plan interventions, mobilize and allocate resources and predict or provide early detection of outbreaks.

Depending on the goal of the disease prevention programme, the surveillance activity objective guides programme managers towards selecting data that would be the most useful to collect and use for making evidenced-based decisions for public health actions.

A disease control program may want to know what progress is being made with its prevention activities. The program collects age and vaccination statues for cases of vaccine-preventable diseases. If the program's goal is to prevent outbreaks, the surveillance unit can monitor the epidemiology of a particular disease so that the program can more accurately identify where the next cases might occur or the populations at highest risk. In addition, improving laboratory support for disease surveillance is essential for confirming causes of illness and early detection of outbreaks. Case-based investigation and laboratory confirmation provide the most precise information about where action must be taken to achieve an elimination target. Monitoring populations at highest risk for a particular disease can help to predict future outbreaks and focus prevention activities in the areas where they are most needed.

Too often, however, surveillance data for communicable and non-communicable disease is neither reported nor analyzed. As a result, the opportunity to take action with an appropriate public health response and save lives is lost. Even in cases where adequate information is collected, it is often not available for use at the local level.

Surveillance System in Sierra Leone

Over the past years, there have been many vertical surveillance systems implemented by different health partners and organizations (Disease Control Programs NGOs, Agencies and the private sectors). All these programs and organizations have their own data collection and reporting instruments. Many of these forms have been introduced in the districts making it very difficult, as staff members have to deal with many forms.

Recording and reporting of data becomes very difficult as timely, complete and quality data cannot be obtained. As a result of this, the Ministry of Health and Sanitation has decided to adopt the Integrated Disease Surveillance and Response as a strategy to improve the data collection, reporting and analysis.

What is integrated disease surveillance and response?

Experiences with some disease eradication and elimination programs show that disease control and prevention objectives are successfully met when resources are dedicated to improving the ability of health officials to detect the targeted diseases, obtain laboratory confirmation of outbreaks, and use thresholds to initiate action at the district level. . Building on these successes, the World Health Organization (WHO) Regional Office for Africa (AFRO) proposes a comprehensive strategy for improving communicable disease surveillance and response through integrated disease surveillance (IDS) linking community, health facility, district and national levels in the African region.

The IDSR strategy provides for a rational use of resources for disease control and prevention. Currently, many intervention programs have their own disease surveillance systems. Each program has made efforts through the years to improve its ability to obtain data for developing timely and reliable information that can be used for action. They involve similar functions especially at district and health facility levels. They often use the same structures, processes and personnel.

In an integrated system:

- The district level is the focus for integrating surveillance functions. This is because the district is the first level in the health system with full-time staff dedicated to all aspects of public health such as monitoring health events in the community, mobilizing community action, encouraging national assistance and accessing national resources to protect the district's health.
- All surveillance activities are coordinated and streamlined. Rather than using scarce resources to maintain separate vertical activities, resources are combined to collect information from a single focal point at each level.
- Several activities are combined into one integrated activity and take advantage of similar surveillance functions, skills, resources and target populations. For example, surveillance activities for acute flaccid paralysis (AFP) can address surveillance needs for neonatal tetanus, measles and other diseases. Thus, health workers who routinely monitor AFP cases can also review district and health facility records for information about other priority diseases.
- Surveillance focal points at the district and national levels collaborate with epidemic response committees (e.g. Emergency Task Force, village development committee) at each level to plan relevant public health response actions and actively seek opportunities for combining resources.

Objective of integrated disease surveillance and response

The goal of IDSR is to improve the ability of districts to detect and respond to diseases and conditions that cause high levels of death, illness and disability in the district's catchment area. By strengthening skills and resources for integrated disease surveillance and response, improved health and well-being for the communities in the district can result.

The general overall objective of the IDSR strategy is to provide a rational basis for decision-making and implementing public health interventions that are efficacious in responding to priority communicable and non-communicable diseases. To implement IDSR, WHO/AFRO has proposed to countries a system of simplified tools and response actions. These tools should contribute to efficient and timely decision-making based on the use of timely information, selection of appropriate responses and effective use of available resources for preventing and controlling communicable and non-communicable diseases.

The specific objectives of integrated disease surveillance are to :

- Strengthen the capacity of Sierra Leone to conduct effective surveillance activities
- Integrate the multiple programme surveillance systems so that forms, personnel and resources can be used more efficiently and effectively
- Improve the use of information for decision making
- Improve the flow of surveillance information between and within levels of the health system
- Improve laboratory capacity in identification of pathogens and monitoring of drug sensitivity
- Increase the involvement of clinicians and other health workers in the surveillance system.
- Emphasize community participation in detection and response to public health problems
- Strengthen the involvement of laboratory personnel in epidemiologic surveillance.

International Health Regulations: New Obligations, New Opportunities

The International Health Regulations (2005), (also referred to as the IHR or the Regulations) entered into force on 15 June 2007. The Regulations are binding on all 46 WHO Member States in the African Region as all have agreed in 2005 to be bound by these Regulations.

The IHR have a broad scope and the Regulations apply to "any emergency with international repercussions for health, including outbreaks of emerging and re-emerging epidemic-prone diseases, outbreaks of food borne disease, natural disasters, and chemical or radio-nuclear events , whether accidental or caused deliberately''. The IHR take into account lessons learnt in past decades in detecting and responding to disease outbreaks. The International Health Regulations aim at protecting global health security while

avoiding unnecessary interference with international travel and trade.

Purpose and scope of IHR

The purpose and scope of the IHR is to "prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade''.

The successful implementation of the IHR requires the proper functioning of core surveillance, risk assessment and response capacities at country level.

In Sierra Leone, IHR will be implemented within the context of the Integrated Disease Surveillance and Response (IDSR) strategy. Through IDSR, Sierra Leone is developing capacities for surveillance, laboratory confirmation, notification and response to outbreak. This infrastructure could be applied for IHR implementation. On the other hand, the legal and policy backing of IHR and the additional resources that may be mobilized for supporting its implementation could be used to build national core capacities thus consolidating IDSR implementation.

How does information flow in an Integrated Disease Surveillance and Response (IDSR) System?

An ill person referred by a health worker or not. Information about the patient is recorded in a register. The register is updated d include information for both inpatients and outpatients. At a minimum, the following data is collected: the patient's ID number, da onset, date of presentation at the facility, date of discharge (inpatient only), village (location), age, gender, diagnosis, treatment, a outcome (inpatient only).

If the clinician suspects a disease or condition that is targeted for elimination or eradication, or if the disease has high epidemic po the disease is reported immediately to the designated health worker in the health facility and at the district level. The health facility begin a response to the suspected outbreak. At the same time, the district takes steps to investigate and confirm the outbreak. The investigation results are used to plan a response action with the health facility.

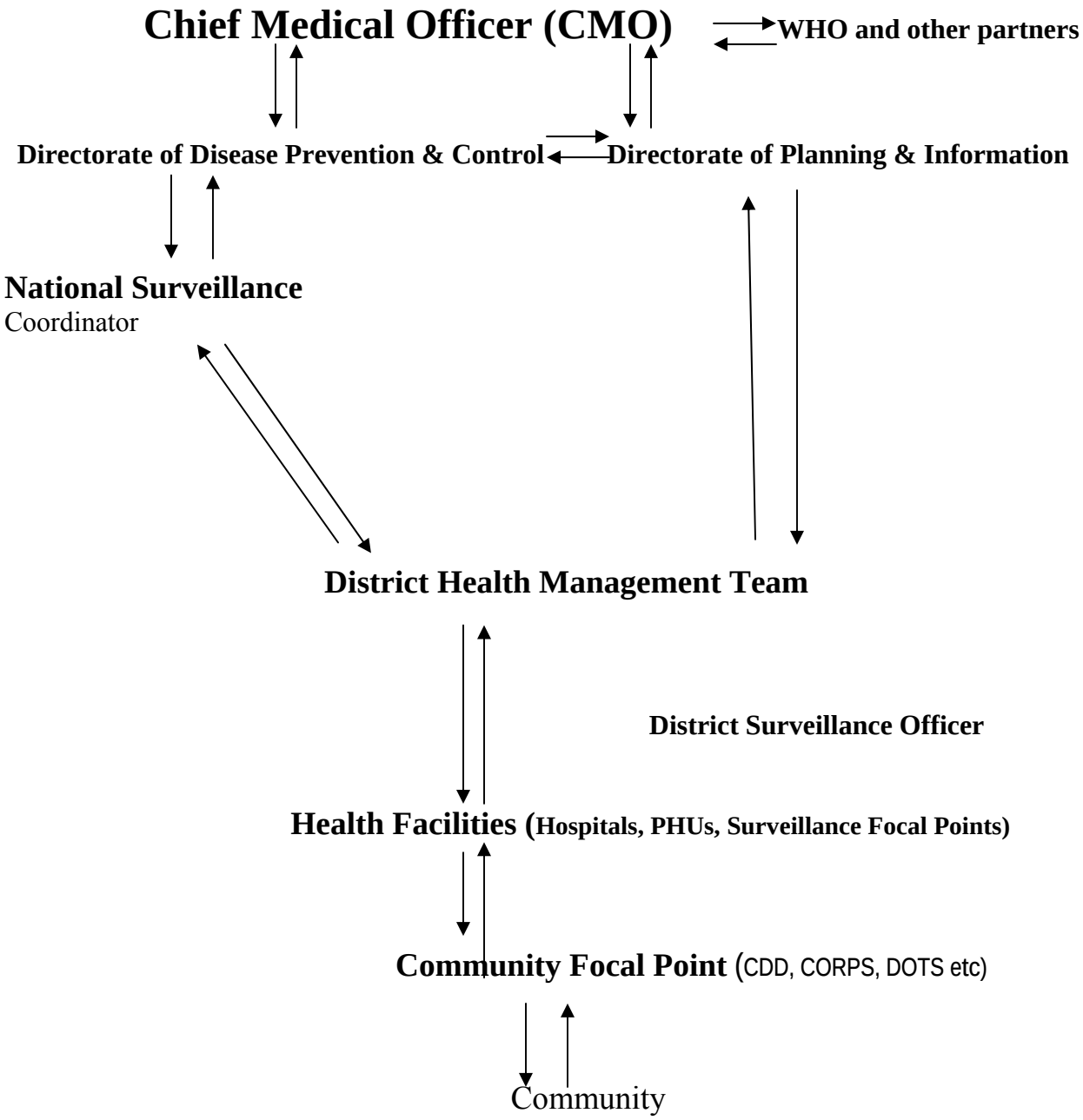
Periodically, once a month, weekly, quarterly or annually, the health facility summarizes the number of cases and deaths for each reported IDSR condition and reports the totals to the district. The health facility performs some analysis of the data such as keepin lines for selected priority diseases or conditions and observing whether certain thresholds are passed to alert staff to take action. action that is taken if an outbreak is suspected is to obtain laboratory confirmation. Laboratory specimens are obtained and the fo data is documented: type of specimen, date obtained, date sent to the lab, condition of specimen when received in the lab (good or poor), and lab results.

At the district level, data is compiled monthly for each of the IDSR conditions. The district prepares analyses of time, place and characteristics of the patients such as age and gender for both outpatients and inpatients. These results are sent to the national lev

The district uses the data to plot graphically the routine surveillance trends and epidemic curves for IDSR conditions. In addition, district maintains a log of suspected outbreaks reported by health facilities. This list documents the nature of the potential outbreak number of possible cases, the dates of investigations and actions taken by the district. It also includes any findings of investigation district, or national levels.

The district surveillance focal point provides disease-specific data and information to each prevention programme

Information Flow



How can IDSR contribute to epidemic preparedness?

When an outbreak of an infectious disease occurs or is detected, there is no time to conduct initial training or assemble supplies. All efforts must be focused on meeting the needs of patients and containing the outbreak in the community.

Being prepared for an emergency situation can ultimately save lives. In cases where epidemic preparedness plans have been in place, timely detection of outbreaks has been followed by prompt and appropriate response actions.

Because epidemiologic surveillance collects data for describing and analyzing health events, it provides skills and information for early detection of emergency outbreaks leading to enhanced preparedness for emergency situations. For example, a district's epidemic management committee can define each level's role in outbreak response in advance. Limited resources are maximized by combining resources for training, simulations and setting aside adequate supplies of equipment, vaccines, drugs and supplies.

How are surveillance functions describe in these guidelines?

These guidelines assume that all levels of the health system are involved in conducting surveillance activities for detecting and responding to priority diseases and conditions according to the following:

Step 1 - Identify cases and events. Using standard case definitions identify priority diseases and conditions. For events use the decision instrument (annex 4 of technical guidelines or annexe 2 of IHR) to identify Public Health Emergency with International Concern (PHEIC).

Step 2 - Report suspected cases or conditions to the next level. If this is an epidemic prone disease or a potential Public Health Emergency with International Concern (PHEIC), or a disease targeted for elimination or eradication, respond immediately by investigating the case or event and submit detailed report.

Step 3 - Analyze and interpret data. Compile the data, and analyze it for trends. Compare information with previous periods and summarize the results.

Step 4 - Investigate and confirm suspected cases and outbreaks. Take action to ensure that the case or outbreak is confirmed including laboratory confirmation wherever it is feasible. Gather evidence about what may have caused the outbreak and use it to select appropriate control and prevention strategies.

Step 5 - Respond. Mobilize resources and personnel to implement the appropriate public health response.

Step 6 - Provide feedback. Encourage future cooperation by communicating with levels that reported outbreaks, cases and events about the investigation outcome and success of response efforts.

Step 7 - Evaluate and improve the system. Assess the effectiveness of the surveillance and response systems, in terms of timeliness, quality of information, preparedness, thresholds, case management and overall performance. Take action to correct problems and make improvements.

There is a role for each surveillance functions at each level of the health system.[1] The levels are defined as follows:

Community: Represented by basic village-level services such as trained birth attendants, village leaders, school teachers, extension workers, and village health workers or similar care providers.

Health facility: Community Health Centre, Community Health Post, Maternal and Child Health Post, Non-Governmental Organization clinics, and Private clinics

District level: The District Health Management Team. .

National level: The Directorate of Disease Prevention and Control and the Directorate of Planning and Information . In Sierra Leone this is where policies are sent and resources are allocated.

Laboratory: National reference laboratory and district laboratory

How can districts strengthen surveillance and response?

Sierra Leone has completed the assessment of the surveillance system and the findings and recommendations have now been translated to a five years strategic plan of action. This plan prioritises the district as the level of implementation. District surveillance activities are now fully integrated into district action plans.

Districts have been provided with the surveillance matrix to guide them in the role within surveillance system. On pages 22 and 23 (the following two pages), there is a matrix that describes a complete system in which all the skills and activities are in place. Each level supports activities at other levels and reinforces the opportunity for successful decision-making at corresponding levels and functions. In a developing system, the matrix

[1]These guidelines focus on improving surveillance for public facilities. In districts or Provinces where reporting from public facilities is of good quality, integrate private and non-governmental organizations into the system.

provides a systematic framework for improving and strengthening the system.

Practical uses of the matrix include:

- Ensuring that all necessary functions and capacities have been identified
- Establishing accountability to provide a basis for assigning functions to appropriate levels and determining what capacities should be present
- Developing activities and training for human resource development
- Managing and monitoring programs
- Planning for surveillance and laboratory personnel, supplies and materials.

Moreover, the matrix illustrates several key assumptions about surveillance systems.

- If one or more of the elements at each level is not present or is being performed poorly, the risk of failure increases for achieving surveillance and control objectives.
- An effective system will be supported at each level from the levels above and below.
- A complete system minimizes any delay in taking public health actions.
- The functions of detection, analysis, investigation, response, feedback and evaluation are interdependent and should always be linked.

The matrix on the next two pages defines the surveillance functions and how they are achieved at each level of the health system.

DETECT AND RESPOND TO PRIORITY DISEASES

	1.0 Identify *Note: Laboratory steps apply to each level with access to laboratory services*	2.0 Report	3.0 Analyze and Interpret
Community	• Use simple case definitions to identify priority diseases or conditions in the community	• Know which health events to report to the health facility and when to report them	• Involve local leaders in observing and interpreting disease patterns and trends in the community
Health Facility	• Use standard case definitions to identify priority diseases or conditions that present in: -inpatient and outpatient services -community reports -private sector reports • Record information about suspected cases in clinic register and patient charts • *Use local laboratory capacity to diagnose suspected cases* • *Use standard protocols to process laboratory specimens* • *Collect and transport clinical specimens for laboratory evaluation*	• Report case-based information for immediately notifiable diseases • Report data gathered from inpatient and outpatient services and from community and private sector sources • Report summary data to next level • *Report laboratory results from screening sentinel populations at target sites (for example, STI clinic, MCH service, blood bank)*	• Prepare and periodically update graphs, tables and charts to describe time, person, and place for reported diseases and conditions • Identify and report immediately any disease or condition that: - exceeds an action threshold - occurs in locations where it was previously absent - occurs more often in a population group than previously - presents unusual trends or patterns • Interpret results. Discuss possible public health action with district team • *Observe changes in trends during routine analysis of laboratory results*
District, State, Province	• Maintain activities for collecting routine surveillance data in a timely way • Review records of suspected outbreaks • *Collect and transport clinical specimens for laboratory evaluation*	• Support health facilities in knowledge and use of standard case definitions for reporting priority diseases and conditions • Make sure health facility staff know when and how to report priority diseases and conditions • Promptly report immediately notifiable diseases to the next level • *Report laboratory results to national and local officials*	• Define denominators and obtain data for ensuring accurate denominators • Aggregate data from health facility reports • Analyze case-based data by person, place and time • Calculate rates and thresholds • Compare current data with previous periods • Prepare and periodically update graphs, tables and charts to describe time, person and place for reported diseases and conditions • Make conclusions about trends, thresholds, and analysis results • Describe risk factors for priority disease or conditions
National	• Establish steps for surveillance of sentinel populations • Conduct special surveys to gather information about reported cases, outbreaks or unusual events • Define and update surveillance needs and implement training for and other support to each level • Advocate for adequate resources to support the identification and reporting of cases • *Set policies and procedures with national reference laboratory* • *Use national reference laboratory for maintaining quality control and standards*	• Set policies and procedures for reporting priority diseases and conditions at each level • Include private sector laboratories in the reporting network • Support reporting activities throughout the system	• Set policies and procedures for analyzing and interpreting data • Aggregate data received from district reports • Make sure each level uses appropriate denominators for analysis • Interpret trends from national perspective • Adapt or define action thresholds • Provide training resources for analyzing and interpreting data • Analyze data for time, person and place • Analyze map and stratify by district and other factors • Make conclusions based on analysis results • Provide reports and share data with national authorities and WHO as required • Define public health analysis skills appropriate to each level of personnel in the system
National WHO Representative, WHO Regional Office	• Support policy setting at national and regional level for detecting priority diseases • Mobilize resources for training, logistics and supervision • Develop and distribute standard guidelines for surveillance "best practices" • Inform countries about problems that may cross borders or have impact on regional areas	• Receive reports of outbreaks and international notifiable diseases	• Establish and disseminate standard guidelines for analysis of data for each priority disease

WHO
Regional Office for Africa

Centers for Disease Control and Prevention (CDC)
EPO - Division of International Health
NCID - Division of Bacterial and Mycotic Diseases
Atlanta, Georgia

4.0 Investigate *Note: These steps assume appropriate laboratory capacity*	5.0 Respond	6.0 Provide Feedback	7.0 Evaluate and Improve the System
• Support case investigation activities such as informing the community of the problem, case finding, collecting of specimens and other activities	• Assist health authorities in selecting response activities • Participate in response activities • Mobilize community resources appropriate for response activity • Carry out community health education	• Give feedback to community members about reported cases and prevention activities	• Decide if public health action took place as planned • Evaluate the community response to the public health action
• Take part in investigation of reported outbreaks • Collect, package, store and transport specimens for laboratory testing • Use investigation and laboratory results to confirm the outbreak • *Process and record laboratory results* • *Provide the results to clinical staff and patients*	• Treat cases and contacts according to standard case management guidelines • Use appropriate infection control measures • Carry out public health response with the district level • Mobilize community involvement in the response • Advocate for resources	• Give feedback to community members about outcome of reported cases and prevention activities	• Monitor timeliness and completeness for reporting routine and case-based information to the district level • Evaluate routine detection and reporting of priority diseases and conditions • Evaluate preparedness for and timeliness of response activities • Evaluate appropriateness of case management • Take action to improve reporting practices • Take action to improve readiness for timely response to outbreaks • Maintain contact with community to maintain preparedness and prevention activities • *Monitor the interval between receipt of specimens and sending of results* • *Monitor quality of laboratory results*
• Arrange and lead investigation of reported cases or outbreaks • Assist health facility in safe collection, packaging, storage and transport of laboratory specimens for confirmatory testing • Receive and interpret laboratory results • Decide if the reported outbreak is confirmed • Report the confirmed outbreak to the next level • *Distribute specimen collection kits for special surveillance activities*	• Select and implement appropriate public health response (for example, depending on the disease, plan to strengthen case management, conduct immunization activity, improve control and prevention activities) • Convene epidemic response committee and plan response • Conduct training for emergency activities • Plan timely community information and education activities • Alert nearby areas and districts about the confirmed outbreak	• Alert nearby areas and districts about outbreaks • Give health facilities regular, periodic feedback about routine control and prevention activities	• Monitor and evaluate program targets and indicators for measuring quality of the surveillance system • Monitor and evaluate timeliness and completeness of reporting from health facilities in the district • Monitor and evaluate timeliness of response to outbreaks • Monitor routine prevention activities and modify them as needed
• Alert laboratory and support its confirmation activities: supplies, transport media, logistics, transport of specimens • Support activities for investigating reported outbreaks: supplies, logistics, equipment, budget • Collaborate with international authorities as needed during investigations • Notify regional, international networks about confirmed outbreak • *Process specimens from investigation and send timely results as required to each level* • *Request additional specimens as needed* • *Take part in epidemic response team*	• Set policies and procedures for responding to cases and outbreaks of priority diseases and conditions • Support epidemic response and preparedness activities • Report and disseminate results of outbreak response in bulletins, media, press releases and briefings	• Give feedback about response activities to each level • Give districts regular, periodic feedback about routine control and prevention activities • Develop and periodically distribute regional bulletin for epidemiology and public health	• Establish and disseminate policies and procedures for monitoring surveillance and outbreak response activities • Establish policies and practices for supervising surveillance and outbreak response activities • Evaluate detection and reporting activities, and make improvements as needed: - Monitor and evaluate program targets and indicators for measuring quality of the surveillance system - Monitor and evaluate timeliness and completeness of reporting from intermediate levels - Monitor and evaluate timeliness of national support for outbreak response - Monitor and evaluate effectiveness of district-level outbreak response activities • Monitor routine prevention activities and modify as needed • Monitor quality assurance for laboratories at lower levels
• Communicate recommendations for case investigation and laboratory confirmation • Mobilize resources for improving laboratory capacity and skills • Mobilize resources for investigation and confirmation as required, based on national level need and request • Provide laboratory training and equipment • Establish guidelines for preparedness and outbreak investigations • Participate in investigations as requested	• Support response activities (technical experts, guidelines) • Report to and inform international authorities about outbreak response • Calculate response indicators and report status to next level • Assist national level with epidemiological response and development of public health action	• Provide feedback for collaboration with national and regional levels • Inform countries about problems that may cross borders or have impact on regional levels • Report analysis results in regional and international bulletins for disease trends and patterns • Develop and distribute regional bulletin for epidemiology and public health	• Use reports from countries to measure their systems and advocate for improvements

July, 2000

Core capacity requirements for surveillance and response under IHR

According to IHR, member states shall use existing national structures and resources to meet their core capacity requirements. These requirements include capacity for surveillance, reporting, notification, verification, response and collaboration activities. Each part is expected to assess the ability of existing national structures and resource to meet the minimum requirements. Based on the results of the assessment, each member state should develop and implement action plan to ensure that these core capacities are present and functioning throughout the country.

Annex 1 Part A of the regulations defines the core capacity requirements for surveillance and response. The regulations recognise the following three levels of the health care system.

- Local community level
- District response levels
- National level

Local Community levels

At the local community level, the capacities are:

(a) To detect events involving disease or death above expected levels for the particular time and place in all areas within the country.

(b) To report all available essential information immediately to the appropriate level of healthcare response. At the community level, reporting shall be to local community health-care institutions or the appropriate health personnel.

For the purposes of these guidelines, essential information includes the following:

- clinical descriptions,
- laboratory results,
- sources and type of risk,
- numbers of human cases and deaths,
- conditions affecting the spread of the disease and the health measures employed

(c) To implement preliminary control measures immediately.

District response levels

The core capacity requirements at district levels are as follows:

(a) to confirm the status of reported events and to support or implement additional control measures; and

(b) to assess reported events immediately and, if found urgent, to report all essential information to the national level. For the purposes of this Annex, the criteria for urgent events include serious public health impact and/or unusual or unexpected nature with high potential for spread

National Level: Assessment and notification.

Assessment and notification:

The capacities require are:

(a) to assess all reports of urgent events within 48 hours; and

(b) to notify WHO immediately through the National IHR Focal Point when the assessment indicates the event is notifiable pursuant to paragraph 1 of Article 6 and Annex 2 and to inform WHO as required pursuant to Article 7 and paragraph 2 of Article 9.

National Level: Public health response.

The capacities:

(a) to determine rapidly the control measures required to prevent domestic and international spread;

(b) to provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres) and logistical assistance (e.g. equipment, supplies and transport);

(c) to provide on-site assistance as required to supplement local investigations;

(d) to provide a direct operational link with senior health and other officials to approve rapidly and implement containment and control measures;

(e) to provide direct liaison with other relevant government ministries;

(f) to provide, by the most efficient means of communication available, links with hospitals, clinics, airports, ports, ground crossings, laboratories and other key operational areas for the dissemination of information and recommendations received from WHO regarding events in the State Party's own territory and in the territories of other States Parties

(g) to establish, operate and maintain a national public health emergency response plan, including the creation of multidisciplinary/ multi-sectoral teams to respond to events that may constitute a public health emergency of international concern; and

(h) to provide the foregoing on a 24-hour basis.

What is contained in these guidelines?

This manual contains practical guidelines for use as:

- A general reference for surveillance activities across all levels
- A set of definitions for thresholds that trigger some action for responding to specific diseases
- A stand-alone reference for level-specific guidelines
- A resource for developing training, supervision and evaluation of surveillance activities
- A guide for improving early detection and preparedness activities for improved and timely response.

Who are these guidelines for?

The information and recommendations in this manual are intended for use by health worker in the surveillance coordination unit at district and referral units. Information in these guidelines applies also to:

- Surveillance officers
- IHR National Focal Points
- National epidemiology unit staff
- National programme managers and staff
- District health management teams
- Veterinary Health Officers
- Environmental Health Units of Local Governments
- Medical and nursing officers, Health Superintendent,
- Health facility in-charges
- Public health officers and administrators
- Medical and nursing educators
- Public health educators
- Laboratory personnel
- Community

Which diseases are to be included?

The Ministry of Health and Sanitation suggests 36 communicable and non-communicable diseases and conditions for integrated disease surveillance in Sierra Leone. The diseases are recommended because they fall into one or more of the following categories:

- Are top causes of high morbidity and mortality in Sierra Leone (for example, malaria, pneumonia, diarrhoeal diseases, tuberculosis, and HIV/AIDS);
- Have epidemic potential (for example, plague, yellow fever and cholera);
- Surveillance required internationally (for example, Small pox, Human influenza caused by a new Subtype, SARS);
- Have available effective control and prevention interventions for addressing the public health problem they pose (for example, schistosomiasis, onchocerciasis, trypanosomiasis);
- Can easily be identified using simple case definitions;
- Have intervention programs supported by WHO for prevention and control, eradication or elimination of the diseases [for example, the Expanded Program on Immunizations (EPI) and the Integrated Management of Childhood Illness [IMCI])

The list of priority diseases could vary from country to country depending on the local epidemiological situation. We encourage countries to keep the list to the minimum possible to ensure that it is manageable by the system. On the next page, there is a list of the WHO/AFRO recommended priority diseases for IDSR.

> ***Note:*** While prioritizing the national priority list of diseases for the integrated disease surveillance, the national MOH officials have ensured the diseases in the epidemic prone and eradication/elimination categories are included because of their international implications. It is also recommend that countries include as many of the diseases under the category of the other diseases of public health importance as possible, depending on the strength of the integrated system.

Revised List WHO/AFRO IDSR Priority Diseases, conditions and events	
Epidemic-Prone and IHR recommended Diseases, conditions and events	
1. Cholera 2. Diarrhoea with blood (Shigelloses) 3. Measles 4. Meningitis 5. Plague 6. Viral hemorrhagic fevers (Lassa Fever, Ebola, Marburg, Rift valley fever,) 7. Human influenza caused by a new Subtype	8. Yellow Fever 9. SARS 10. Smallpox 11. Dengue 12. Trachoma 13. Chikungunya 14. Anthrax 15. Typhoid fever 16. Hepatitis –B
Diseases Targeted for Eradication and Elimination	
1. Poliomyelitis 2. Dracunculiasis 3. Leprosy	4. Neonatal tetanus 5. Noma
Other Diseases of Public Health Importance	
1. Diarrhoea in children less than 5 years of age 2. Pneumonia in children less than 5 years of age 3. HIV/AIDS 4. Malaria 5. Onchocerciasis 6. Sexually transmitted infections (STIs) 7. Trypanosomiasis	8. Tuberculosis 9. Filariasis 10. Buruli ulcer 11. Asthma 12. Diabetes mellitus 13. Epilepsy 14. High blood pressure 15. Sickle cell disease 16. Malnutrition

How does WHO support efforts to strengthen disease surveillance and response?

The World Health Organization provides support for implementation of surveillance and response at every level of the health system, including:

- The development of comprehensive technical guidelines for each level
- A framework for adapting guidelines to each level within each country
- Training of human resources involved in surveillance and response system
- Advocacy for resources and resource mobilization
- Monitoring, detection and control of diseases across regions and the continent.

ANNEXE 1 Using assessment results to improve surveillance and response at the district level

Sierra Leone has assessed its surveillance systems and identified where improvements are needed. This assessment uses a tool developed by WHO/AFRO. It provides results that can be used to solve problems with resources, the quality and timeliness of information, and how the information is used. The assessment tool includes an action planning and prioritization step.

IDSR is not proposing a new system, but is providing guidance in how surveillance and response activities can be improved. National assessment results have resulted in specific plans and activities being carried out. If districts want to update their district profiles, a checklist such as the one below can be used to help identify where districts can select priority activities to improve their surveillance and response capacity.

1. _____ Define the sources of information about health events in the district, including points of contact the community has with health services. For example, list the following sources on a list of district reporting sites such as that in Annex 7 of section 2:

- health facilities and hospitals
- community health workers
- traditional birth attendants
- rural community leaders who have knowledge of health events in the community (for example, the village elders, traditional healer, school teacher, leaders of faith-based communities, etc.)
- Environmental Health officers/public health officers
- private sector practitioners
- public safety officers such as fire, rescue or police departments
- others (please describe)_____

2. _____ Identify surveillance focal points for each source. Identify and specify the opportunities for community involvement in surveillance of health events.

3. _____ Describe how communication about surveillance and response takes place between the district and the surveillance focal points. Include methods such as monthly meetings, newsletters, Disease notification form, telephone calls and so on. Update the description periodically.

4. _____ Describe the laboratory referral network for confirming priority diseases and conditions in the district. For example, list the following:

- Public, private or NGO district facilities with reliable laboratory services for confirming priority diseases.
- Prevention, control or special surveillance activities in the district with laboratory access (for example, any HIV sentinel surveillance sites in the district).

5. _____ Update the policies of the district epidemic response team so that assessing preparedness is a routine agenda item of the team. Specify and disseminate schedules for:

- Meeting to routinely assess preparedness for response and discuss current problems or activities at least once a month and more frequently during outbreaks.
- Outbreak response meetings

6. _____ Describe the communication links between the community and health facilities with the epidemic response committee that can be activated during an outbreak and for routine activities.

7. _____ Specify the priority diseases and conditions for surveillance within the district and those directed by national policy. List diseases that are:

- Epidemic-prone diseases
- Diseases targeted for eradication and elimination
- Other diseases of public health importance

8. _____ For each priority disease or condition selected, state the available public health response activity.

9. _____ For each disease or condition that the district can respond to, specify the target, alert threshold or analysis results that would trigger an action.

10. _____ For each priority disease or condition, review the minimum data element that health facilities and other sources should report. State when it should be reported, to whom, and how. For example:

    - State the information that should be reported from in-patient sources and outpatient sources. For example, a minimum requirement would be to report all cases and deaths for the selected diseases and conditions.
    - State the diseases or conditions that require immediate reporting and communicate the list to health facilities in the district.
    - Define the means for reporting data to the district (by phone, by form, by voice). If there is electronic reporting, do all facilities have access to computers and modems?

- Define how often the required data should be reported.

11. _____ Define the data management tools available in the district and how they should be used in an integrated system

- Routine reporting forms
- Case-based surveillance reporting forms
- Line lists for use in outbreaks of more than 5 cases
- Tables for recording summary totals
- Graphs for time analysis of data
- Maps for place analysis of data
- Charts for person analysis of data

12. _____ Define the exact data management requirement for each reporting site. For example, develop and disseminate a policy and specify the procedures so that reporting sites know they must each month:

- Tally, compile and report summary totals
- Analyze monthly summaries in graphs, tables or maps
- Provide some interpretation to the district level and the community.

13. _____ Periodically update the availability of relevant supplies at each reporting site for conducting surveillance. (Note: If a reporting site has capacity for electronic reporting, is there an electronic format that is compatible with the methods used at the district, region and national levels? If electronic reporting is not available, do the focal points who are required to manage data have a reliable supply of paper, coloured pencils, graph paper, log books?)

14. _____ Decide if current forms address the priorities of integrated disease surveillance and response. For example, do current forms provide the information necessary for detecting problems and signalling a response to the priority diseases under surveillance?

15. _____ Decide if additional indicators will be evaluated and plan how to monitor and evaluate timeliness and completeness of reporting.

16. _____ Define methods for informing and supporting health workers in the implementation of integrated disease surveillance. For example:

- List the current opportunities for training health workers in surveillance, response or data management in the district.
- Coordinate training opportunities between disease programs that take advantage of overlapping skills between programs such as supervision, report writing, budgeting, data analysis, and using data to set priorities.

- Define the training needs for each category of health workers for either initial training in surveillance and response skills or refresher training on how to integrate surveillance activities.

17. _____ Review and update feedback procedures and methods between the district, health facilities and community as well as between the district and higher levels. For example, specify the feedback methods and update as necessary:

- Bulletins summarizing data reported by health facilities to the district
- Periodic meetings to discuss public health problems and recent activities
- Supervisory visits

18. _____ Gather and present relevant data about your district that can be used to advocate for additional resources for improving surveillance and response activities in your district. (Example: Health workers are able to document an increase in malaria cases; they know that an effective response is available with insecticide-treated mosquito nets. The district surveillance officer used data to show the expected reduction in malaria cases if some of the community's mosquito nets cost could be supported by local businesses.)

19. _____ State three objectives you would like to achieve for improving surveillance in your district over the next year.
Include them in your planned activities and cost them.

Section 1

Identify cases of priority diseases, conditions and events

This section describes how to:

- Use standard case definitions for reporting suspected priority diseases and conditions
- Use the Decision Instrument to evaluate and notify Public Health Events of International Concern (PHEICs)
- Improve district procedures for surveillance and response
- Use the laboratory network to confirm suspected outbreaks.
- Use of decision instrument

1.0 Identify cases of priority diseases, conditions and events

Cases and suspected outbreaks of priority diseases, conditions and events conditions may come to the attention of the health system in several ways. For example:

- A patient falls ill and seeks treatment from a health facility
- A member of the community reports a single suspected case, a cluster of deaths or unusual event to the health facility. For example, a pharmacy reports a sharp increase in the number of purchases of a particular medication or treatment. The school reports an increased number of absences due to similar signs and symptoms such as influenza like illness.
- During active searches to find additional cases for a particular disease, the surveillance officer or the health officer conducting the search identifies cases of other priority diseases that have not been reported. For example, during a review of the clinic register for cases of acute flaccid paralysis (AFP), the officer also look for suspected cases of other vaccine-preventable diseases or diseases with epidemic potential, such as measles, neonatal tetanus, meningitis, cholera or non communicable diseases such as High blood pressure and diabetes mellitus
- Radio, television or newspapers report rare or unexplained health events in the area or increase in the number of people getting sick from a known epidemic prone disease such as meningitis or diarrhoeal diseases.
- An individual health facility reports a cluster of deaths or an unusual increase in the number of cases which may not cross the health facility's action threshold. When the cases are added together and analyzed at the district with reports from other health facilities, an outbreak is detected. For example, an individual health facility reports that there has been an adult with bloody diarrhoea who dies, the problem appears to be only in that catchment area. If several health facilities report a similar event, a district problem is detected and action can be taken.
- Vital events records show an increase in neonatal deaths.

1.1 Use standard case definitions

A case definition is a standard set of criteria used to decide if a person has a particular disease, or if the case can be considered for reporting and investigation. Case definitions make use of both clinical and surveillance criteria. For example:

- ***Clinical case definition:*** Clinical staff (doctors, nurses, or a clinical assistant) sees a patient with signs and symptoms. A clinical case definition provides the criteria for identifying appropriate and potentially life-saving treatment to offer the patient. Resources permitting, the clinician will ask for a diagnostic laboratory test to support the diagnosis. Without the laboratory confirmation, the clinician may not be able to determine either the cause of or appropriate treatment for the patient's condition.

- ***Surveillance case definition:*** A case definition for surveillance is used to:
  -- Obtain an accurate detection of all cases of a disease or condition in a given population
  -- Exclude other similar conditions.

  Using the same case definition throughout a country's public health surveillance system ensures efficient tracking of particular diseases or conditions. Data can be compared more accurately from one area to another. When health facilities and districts use different case definitions, tracking the trend of a particular infectious disease will be impossible. Health workers who analyze the data and take action will not know if the trends are due to the disease under surveillance or to some other cause.

1.1.1 Review and distribute case definitions used by health facilities in the district.

Take action to ensure that health facility staff know how to use standard case definitions specified by national policy for reporting priority diseases and conditions to the district level.

Suggested case definitions for the priority diseases in an integrated disease surveillance system are in Annex 2 at the end of this section.

Also refer to information about case definitions in the disease specific recommendations in Section 8 of these guidelines.

1.1.2 Distribute simplified case definitions to the community

Involve the community in plans to improve surveillance and response procedures in the district. If the community does not know how to notify health authorities when priority diseases or unusual health events occur, suspected cases will not be seen at the health facility, and cases will not be reported.

Community health workers, traditional healers, birth attendants and community leaders should know how to recognize and report selected priority diseases to the health facility. They should also refer people with the suspected disease or condition to the health facility for treatment. Provide information to the community about priority diseases on posters, newsletters and announcements during community meetings.

Being prepared to respond effectively to the community reports will encourage the community to participate in the system.

A list of simplified case definitions for use in community surveillance are in Annex 3 of this section.

1.1.3 Use decision instrument of IHR to assess events that may constitute public health emergency of international concern

Does the event meet at least two of the following criteria?
If the answer is "YES" to any two of the questions I-IV, then the event may constitute a public health emergency of international concern

I Is the public health impact of the events serious?
If the answer is "YES" to any of the following questions, then the public health impact of the event is serious.
- *Is the number of cases and/or number of deaths for this type of event large for the given place, time or population?*
- *Has the event the potential to have a high public health impact?*
- *Is external assistance needed to detect, investigate, respond and control the current event, or prevent new cases?*

II Is the event unusual or unexpected?
If the answer is "YES" to any of the following questions, then the event is unusual or unexpected
- *Is the event unusual?*
- *. Is the event unexpected from a public health perspective?*

III Is there a significant risk of international spread?
If the answer is "YES" to any of the following questions, then there is a significant risk of international spread
- *Is there evidence of an epidemiological link to similar events in other States?*
- *Is there any factor that should alert us to the potential for cross border movement of the agent, vehicle or host?*

IV Is there a significant risk of international travel and trade
If the answer is "YES" to any of the following questions, then there is significant risk of international travel and trade
- *Have similar events in the past resulted in international restriction on trade and/ travel?*
- *Is the source suspected or known to be a food product, water or any other goods might be contaminated that has been exported/imported to/from other States*?
- *Has the event occurred in association with an international gathering or in an area intense international tourism?*
- *Has the event caused requests for more information by foreign officials or international media?*

1.2 Improve district procedures for surveillance and response

Use national assessment results to plan improved activities based on the prioritized list. Each year, evaluate the system and modify plans to address the next priority on the list.

1.2.1 Update the description of the catchment area

Periodically, update information about the catchment area. For example, make sure you have up-to-date information about:

- The size of important target populations in the district such as children less than 5 years of age, women of childbearing age, all children and adults from ages 1 through 30, people living in refugee settlements, youth out of school, and so on.

- Major public health activities in the area including public, private, and NGO immunization activities, clean water projects, family planning clinics, feeding centres for undernourished children, and so on.

- List five to ten current leading public health problems treated in the district or facility.

- Create a regular forum to discuss surveillance and response activities of the priority health events with district health stakeholders. This could be done through a monthly 1-2 hour meeting or a half a day quarterly meeting. The opportunity could be used to provide feedback that includes surveillance data reported from their institutions.

1.2.2 Update the list of reporting sites in the district

Identify all of the health facilities in the district required to report surveillance information to the district level. Record the health facility and names of staff who are responsible for surveillance activities. Annex 8 of section 2 is a worksheet that can be used to list the reporting sites and contact focal person at each site.

When reporting from public facilities is of good quality, add private and non-governmental sources of information to the routine reporting system.

1.3 Define laboratories for confirming suspected outbreaks

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

Laboratory testing is a useful tool for public health because it can support or confirm the diagnosis. Even well-trained, experienced health providers may be unable at times to make the correct diagnosis. Having laboratory support for the diagnosis increases the likelihood that the diagnosis is correct, and that public health action will be efficient and appropriate. Laboratory confirmation ensures that surveillance data (for example, the number of measles cases diagnosed according to clinical signs and symptoms) does not result in unnecessary public health actions (for example, conducting a mass immunization campaign for measles vaccine when the cause of the illness is not measles).

Annex 5 at the end of this section contains a rapid reference table for requesting, collecting, and shipping specimens for recommended laboratory tests to confirm priority diseases. General information about interpreting laboratory tests is in the introduction to Annex 5.

1.3.1 Establish communication with the designated laboratories

Establish or strengthen routine communication with identified laboratories that will receive specimens from your health facility or district and confirm suspected outbreaks. The purpose of this routine contact is to strengthen procedures between the health facilities in the district who will be sending specimens and the laboratory that will be receiving them. Ensure that the procedures for collection, transportation of Specimen and confirmation of the disease or condition and reporting the results are clear and can be reliably carried out.

1.3.2 Identify a district laboratory superintendent

A district laboratory superintendent should make sure that laboratory confirmation procedures are known and followed in the district. The designated staff should:

- Ensure specimen collection and transport materials are pre positioned at district laboratory level. Rapid laboratory diagnostic tests or serological tests are available for detection of priority diseases and hazards (e.g. chemicals) for the region and the country

- Support the health facility in determining when to take a specimen for confirming the suspected case

- Coordinate with the laboratory, as needed, to identify the correct specimen for collection and any special concerns or procedures
- Collect and package the specimen safely or assist the health facility in collecting the specimen.
- Ensure the safe and reliable transport of the specimen from the health facility to the district
- Receive the laboratory results from the laboratory and report them promptly to the health facility and national levels.
- Take action with the health facility based on the laboratory report.

Annexes to Section 1

- ANNEX 2 MoH recommended case definitions for reporting suspected priority diseases or conditions from the health facility to the district
- ANNEX 3 Simplified case definitions for use in community surveillance

ANNEX 4 Decision instrument for the assessment and notification of events that may constitute a public health emergency of international concern

- ANNEX 5 Recommended laboratory tests for confirming priority diseases and conditions
- ANNEX 6 List of laboratories for confirming priority diseases and conditions

Annex 2. Recommended case definitions for reporting suspected priority diseases or conditions from the health facility to the district

Sierra Leone adapts the WHO/AFRO recommendation that health facilities use the following surveillance case definitions for reporting suspected cases of priority diseases and conditions to the district level. Please refer to the disease-specific guidelines in Section 8 for additional information about specific case definitions.

Epidemic-prone diseases	
Cholera	Any person 5 years of age or more who develops severe dehydration or dies from acute watery diarrhoea (Report as watery diarrhoea until the Ministry of Health and Sanitation declares Cholera outbreak
Diarrhoea with blood *(Shigella)*	Any person with diarrhoea and visible blood in the stool.
Measles	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. A measles death is a death occurring within 30 days of onset of the rash.
Meningitis	Any person with sudden onset of fever (>38.5□C rectal or >38oC axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal signs.
Lassa Fever	Any person with onset of high fever, not responding to appropriate anti malarial and anti biotic treatment, with sore throat, vomitting, facial oedema.
Yellow fever	Any person with sudden onset of high fever (>39□C rectal or 38□C axillary), followed by jaundice within two weeks of onset of first symptoms.
Diseases targeted for eradication and elimination	
Acute flaccid paralysis (AFP)/polio	Any child less than 15 years of age with AFP or a person of any age in whom the clinician suspects polio.
Dracunculiasis	Any person with a history of skin lesion and emergence of Guinea worm within one year of the skin lesion.

Leprosy	Any person with clinical signs (as defined by the national program) of leprosy with or without bacteriological diagnostic confirmation and requiring chemotherapy (excluding patients released from treatment).
Neonatal tetanus	Any newborn with a normal ability to suck or cry during the first two days of life, and who, between 3 and 28 days of age, cannot suck normally and becomes still or has convulsions or both.
Other diseases of public health importance	
Diarrhoea in children less than 5 years of age	***Diarrhoea with some dehydration:*** Any child less than 5 years of age with diarrhoea and two or more of the following: – restless or irritable – sunken eyes – drinks eagerly, thirsty – skin pinch goes back slowly ***Diarrhoea with severe dehydration*** Any child less than 5 years of age with diarrhoea and two or more of the following: – lethargic or unconscious – sunken eyes – not able to drink or drinking poorly – skin pinch goes back very slowly
Pneumonia in children less than 5 years of age	**Pneumonia** Any child aged 2 months up to 5 years of age with cough or difficult breathing and – breathing 50 breaths or more per minute in an infant 2 months up to 1 year – breathing 40 breaths or more per minute for a child aged 1 to 5 years *(Infants less than 2 months with fast breathing 60 breaths or more per minute are referred for treatment for serious bacterial infection.)* ***Severe Pneumonia*** Any child age 2 months up to 5 years with cough or difficult breathing, and with any general danger sign, or chest indrawing, or stridor in a calm child. General danger signs are: unable to drink or breast-feed, vomits everything, convulsions, lethargy or unconsciousness.

New AIDS cases	Any person who meets the AIDS case definition adopted by the national policy.
Malaria	***Uncomplicated malaria*** Any person with fever or fever with headache, back pain, chills, sweats, myalgia, nausea and vomiting diagnosed clinically as malaria. ***Confirmed uncomplicated malaria*** Any person with fever or fever with headache, back pain, chills, sweats, myalgia, nausea and vomiting and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites. ***Malaria with severe anaemia*** Any child 2 months up to 5 years with malaria and, if an outpatient, with severe palmar pallor, or if an inpatient, with a laboratory test confirming severe anaemia. ***Severe malaria*** Any person hospitalized with a primary diagnosis of malaria and confirmed by a positive blood smear or other diagnostic test for malaria.
Onchocerciasis	In an endemic area, any person with fibrous nodules in subcutaneous tissues.
Sexually transmitted infections (STIs)	***Genital ulcer syndrome (non-vesicular)*** 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. ***Urethral discharge syndrome*** Any male with urethral discharge with or without dysuria

Yaws	Any person with painless papulla leison on the face and extremities and the papula may progress to ulcer.
Tuberculosis	***Smear-positive pulmonary tuberculosis*** Any patient with cough for 3 weeks or more and: – at least 2 sputum specimens positive for acid-fast bacilli by microscopy, or -- 1 sputum specimen smear positive for acid-fast bacilli and radiographic abnormalities consistent with active pulmonary tuberculosis as determined by the treating medical officer, or – one sputum specimen smear positive for acid-fast bacilli and one sputum specimen culture positive for acid-fast bacilli.
Typhoid fever	
Schistosomiasis	
Hepatitis B	

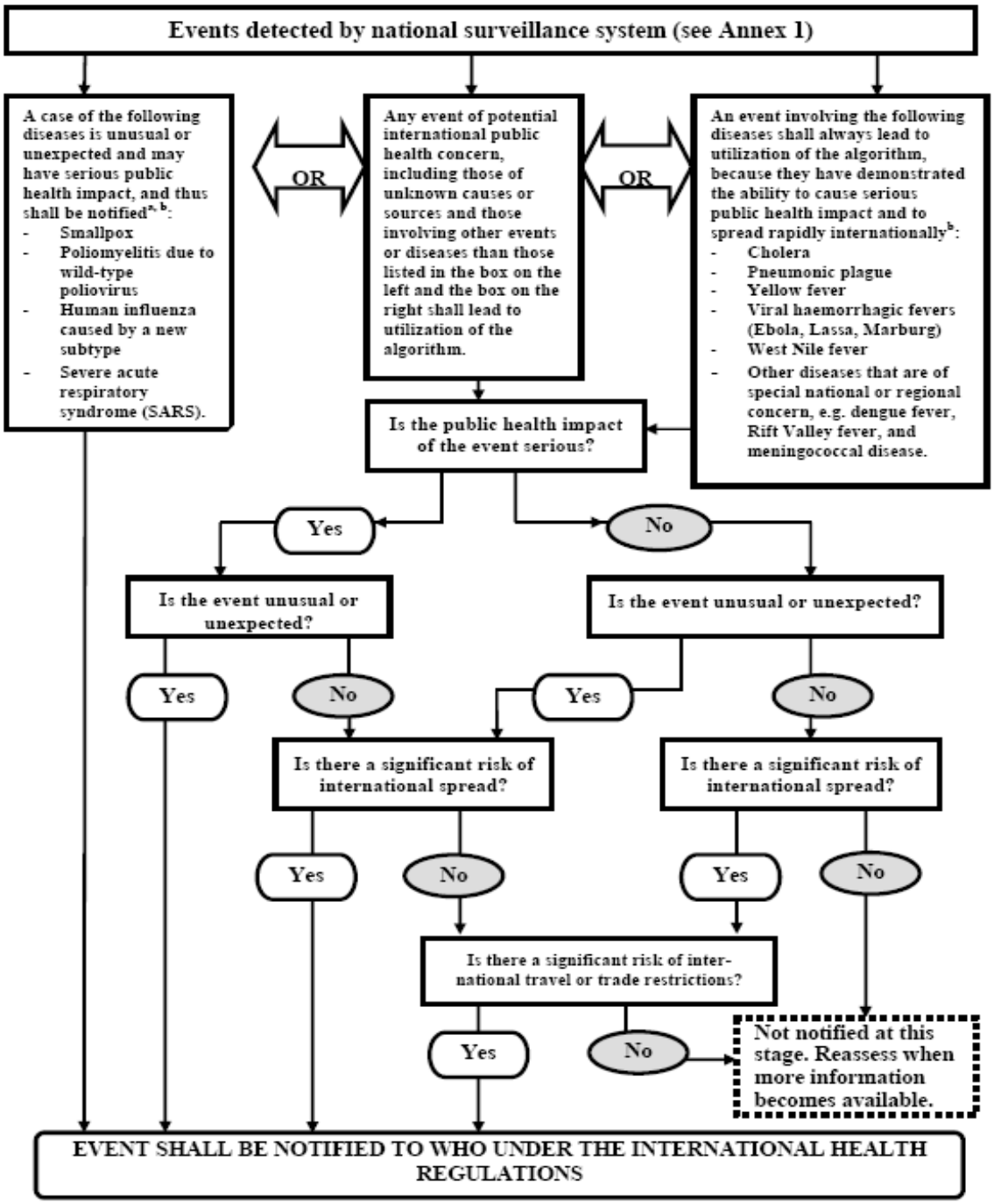
Annex 3. Simplified case definitions for use in community surveillance

Inform community health workers, traditional healers, birth attendants, health workers who conduct outreach activities in hard-to-reach areas, and community leaders about the priority diseases and conditions under surveillance in your area. Use simplified messages such as the following to help the community to recognize when a person with these signs should be referred to the health facility.

Simplified community messages	
Acute flaccid paralysis	Any sudden weakness or soft paralysis of the limbs or any other part of the body.
Acute watery diarrhoea	Any person with 3 or more loose stools within the last 24 hours and a danger sign or dehydration.
Cholera	Any person 5 years of age or more with lots of watery diarrhoea
Diarrhoea with blood	Any person with diarrhoea and visible blood in the stool
Malaria	Any person who has an illness with fever, headache, weakness and joint pains
Measles	Any person with fever and rash
Meningitis	Any person with fever and neck stiffness
Neonatal tetanus	Any newborn who is normal at birth, and then after 2 days, becomes unable to suck or feed.
Yaws	Person with painless sore on the face or hands or feet.
Pneumonia	Any child less than 5 years of age with cough and fast breathing or difficulty in breathing.
Tuberculosis	Any person with cough for 3 weeks or more
Lassa Fever	Any person with onset of high fever, not responding to appropriate anti malarial and anti biotic treatment, with sore throat, vomiting, facial oedema
Yellow fever	Any person with fever and yellowing in the white part of the eyes or yellowing of the skin

ANNEX 4

DECISION INSTRUMENT FOR THE ASSESSMENT AND NOTIFICATION OF EVENTS THAT MAY CONSTITUTE A PUBLIC HEALTH EMERGENCY OF INTERNATIONAL CONCERN
(Annex II of IHR)



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

EXAMPLES FOR THE APPLICATION OF THE DECISION INSTRUMENT FOR THE ASSESSMENT AND NOTIFICATION OF EVENTS THAT MAY CONSTITUTE A PUBLIC HEALTH EMERGENCY OF INTERNATIONAL CONCERN

The examples appearing in this Annex are not binding and are for indicative guidance purposes to assist in the interpretation of the decision instrument criteria.

DOES THE EVENT MEET AT LEAST TWO OF THE FOLLOWING CRITERIA?

Is the public health impact of the event serious?

I. Is the public health impact of the event serious?

1. *Is the number of cases and/or number of deaths for this type of event large for the given place, time or population?*
2. *Has the event the potential to have a high public health impact?*

THE FOLLOWING ARE EXAMPLES OF CIRCUMSTANCES THAT CONTRIBUTE TO HIGH PUBLIC HEALTH IMPACT:

- ✓ Event caused by a pathogen with high potential to cause epidemic (infectiousness of the agent, high case fatality, multiple transmission routes or healthy carrier).
- ✓ Indication of treatment failure (new or emerging antibiotic resistance, vaccine failure, antidote resistance or failure).
- ✓ Event represents a significant public health risk even if no or very few human cases have yet been identified.
- ✓ Cases reported among health worker.
- ✓ The population at risk is especially vulnerable (refugees, low level of immunization, children, elderly, low immunity, undernourished, etc.).
- ✓ Concomitant factors that may hinder or delay the public health response (natural catastrophes, armed conflicts, unfavourable weather conditions, multiple foci in the State Party).
- ✓ Event in an area with high population density.
- ✓ Spread of toxic, infectious or otherwise hazardous materials that may be occurring naturally or otherwise that has contaminated or has the potential to contaminate a population and/or a large geographical area.

3. *Is external assistance needed to detect, investigate, respond and control the current event, or prevent new cases?*

THE FOLLOWING ARE EXAMPLES OF WHEN ASSISTANCE MAY BE REQUIRED:

- ✓ Inadequate human, financial, material or technical resources – in particular:
  - Insufficient laboratory or epidemiological capacity to investigate the event (equipment, personnel, financial resources)
  - Insufficient antidotes, drugs and/or vaccine and/or protective equipment, decontamination equipment, or supportive equipment to cover estimated needs
  - Existing surveillance system is inadequate to detect new cases in a timely manner.

IS THE PUBLIC HEALTH IMPACT OF THE EVENT SERIOUS?
Answer "yes" if you have answered "yes" to questions 1, 2 or 3 above.

Is the event unusual or unexpected?

II. Is the event unusual or unexpected?

4. *Is the event unusual?*

THE FOLLOWING ARE EXAMPLES OF UNUSUAL EVENTS:

- ✓ The event is caused by an unknown agent or the source, vehicle, route of transmission is unusual or unknown.
- ✓ Evolution of cases more severe than expected (including morbidity or case-fatality) or with unusual symptoms.
- ✓ Occurrence of the event itself unusual for the area, season or population.

5. *Is the event unexpected from a public health perspective?*

THE FOLLOWING ARE EXAMPLES OF UNEXPECTED EVENTS:

- ✓ Event caused by a disease/agent that had already been eliminated or eradicated from the State Party or not previously reported.

IS THE EVENT UNUSUAL OR UNEXPECTED?
Answer "yes" if you have answered "yes" to questions 4 or 5 above.

Is there a significant risk of international spread?

III. Is there a significant risk of international spread?

6. *Is there evidence of an epidemiological link to similar events in other States?*

7. *Is there any factor that should alert us to the potential for cross border movement of the agent, vehicle or host?*

THE FOLLOWING ARE EXAMPLES OF CIRCUMSTANCES THAT MAY PREDISPOSE TO INTERNATIONAL SPREAD:

- ✓ Where there is evidence of local spread, an index case (or other linked cases) with a history within the previous month of:
  - international travel (or time equivalent to the incubation period if the pathogen is known)
  - participation in an international gathering (pilgrimage, sports event, conference, etc.)
  - close contact with an international traveller or a highly mobile population.
- ✓ Event caused by an environmental contamination that has the potential to spread across international borders.
- ✓ Event in an area of intense international traffic with limited capacity for sanitary control or environmental detection or decontamination.

IS THERE A SIGNIFICANT RISK OF INTERNATIONAL SPREAD?
Answer "yes" if you have answered "yes" to questions 6 or 7 above.

Risk of international restrictions?

IV. Is there a significant risk of international travel or trade restrictions?

8. *Have similar events in the past resulted in international restriction on trade and/ travel?*

9. *Is the source suspected or known to be a food product, water or any other goods might be contaminated that has been exported/imported to/from other States*?

10. *Has the event occurred in association with an international gathering or in an area intense international tourism?*

11. *Has the event caused requests for more information by foreign officials or international media?*

IS THERE A SIGNIFICANT RISK OF INTERNATIONAL TRADE OR TRAVEL RESTRICTIONS?
Answer "yes" if you have answered "yes" to questions 8, 9, 10 or 11 above.

States Parties that answer "yes" to the question whether the event meets any two of the four criteria (I-IV) above, shall notify WHO under Article 6 of the International Health Regulations.

Annex 5. Recommended laboratory tests for confirming priority diseases and conditions

Confirming diagnoses of infectious diseases is essential. The laboratory results are used to:

- Accurately diagnose illness in an individual patient, and
- Verify the cause (or etiology) of a suspected outbreak.

Laboratory specimens should arrive in the laboratory in good condition. This is to ensure that processing provides reliable results. Specimens should be collected safely, stored in appropriate media, and kept within a specific temperature range. Minimize delays between collection of the specimen and processing it at the laboratory.

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

- A blood specimen has been collected inappropriately and becomes haemolysed.
- There has been a delay in transportation or refrigeration resulting in bacterial overgrowth in the collected specimen.
- Inadequate sample maintenance media and improper storage temperature may cause or reduce viability of the suspected bacteria and/or antigen and antibody.
- The specimens are not plated on the appropriate media or reagents are out-of-date.

A positive result for serum IgM or viral isolation taken from any site (blood, serum, urine, cerebro spinal fluid (CSF) or tissue) usually confirms a suspected condition. In situations when a negative result is received for testing of serum IgM or viral isolation, repeating the laboratory test may be indicated. Implementing public health measures even before the laboratory confirmation is complete may be necessary.

The reference chart on the following pages lists recommended laboratory tests for confirming priority diseases and conditions. The table contains information about:

- the diagnostic test for confirming the disease or condition
- the specimen to be collected
- when to collect the specimen
- how to prepare, store and transport specimen
- when to expect the results
- sources for additional information.

The chart is intended for use as a rapid reference chart. Use the information when suspected priority diseases or conditions are reported from the health facility or when a suspected outbreak is reported. Refer to the disease specific guidelines in Section 8 for additional information about confirming outbreaks of priority diseases and conditions.

Specimens for laboratory confirmation for priority diseases at the district level

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Acute flaccid paralysis (Suspected polio) **REFERENCE:** WHO global action plan for laboratory containment of wild polio viruses. WHO/V&B/99.32, Geneva, 1999 Manual for the virological investigation of polio WHO/EPI/GEN/97.01 Geneva, 1997	Isolation of polio virus from stool Isolation of polio is not possible now in Sierra Leone due to lack of appropriate laboratory	Stool **Note:** If no specimen is collected, re-evaluate patient after 60 days to confirm clinical diagnosis of polio (AFP).	Collect a sample from every suspected AFP case. Collect the first specimen when the case is investigated. Collect a second specimen on the same patient 24 to 48 hours later.	X Place stool in clean, leak-proof container and label clearly. X Immediately place in refrigerator or cold box not used for storing vaccines or other medicines. X Ship specimens so they will arrive at designated polio laboratory within 72 hours of collection X When there is a delay, and specimen will not be shipped within 72 hours, freeze specimen at -20°C or colder. Then ship frozen specimen with dry ice or cold packs also frozen at -20°C or colder.	Preliminary test results are usually available 14-28 days after receipt of specimen by the laboratory. If wild polio virus is detected, the national programme will plan appropriate actions
Cholera **REFERENCE:** "Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera". CDC/WHO, 1999 CDC, Atlanta, GA, USA	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).	Liquid stool or rectal swab	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: X onset within last 5 days, and X before antibiotics treatment has started **Do not delay treatment of dehydrated patients.** Specimens may be collected after rehydration (ORS or IV therapy) has begun.	X Place specimen (stool or rectal swab) in a clean, leakproof container and transport to lab within 2 hours. X 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: X Store at 4°C to 8° C X Do not allow specimen to dry. Add small amount of 0.85% NaCl if necessary. X Totransport in well marked, leakproof container to avoid contamination and infection X Transport container in cold box at 4°C to 8°C	Cholera tests may not be routinely performed in all laboratories. Culture results usually take 3 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 color 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. Serological determination of Ogawa or Inaba is not clinically required but is often necessary for epidemiological purpose

Yellow fever	Any person with fever and yellowing in the white past of the eyes or yellowing of the skin

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and trasport	Results
Diarrhoea with blood ***(Shigella dysenteriae type 1)*** and other shigellae **Note:** SD1 infections are epidemic-prone and associated with high levels of antibiotic resistance. SD1 is the most significant of the shigellae due to the high levels of mortality in the young and elderly and due to its association with hemolytic uremic syndrome (HUS). **REFERENCE:** "Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera". CDC/WHO, 1999 CDC, Atlanta, GA, USA	Isolate *Shigella dysenteriae* type 1 (SD1) and others in culture to confirm shigella outbreak. If SD1 and others are confirmed, perform antibiotic sensitivity tests with appropriate drugs.	Stool or rectal swab.	Collect sample when an outbreak is suspected. Collect stool from 5-10 patients who have bloody diarrhoea and: • Onset within last 4 days, and • Before antibiotic treatment has started. Preferably, collect stool in a clean, dry container. Do not contaminate with urine. Sample stool with a swab, selecting portions of the specimen with blood or mucus. If stool can not be collected, obtain a rectal swab sample with a clean, cotton swab.	• Place stool swab or rectal swab in Cary-Blair transport medium. Ship to laboratory refrigerated. • If Cary-Blair is not available, send sample to lab within 2 hours in a clean, dry container with a tightly-fitting cap. • Either in 0.85% saline or in no transport medium with a tightly fitting cap, in a cool box but to take • Specimens not preserved in Cary-Blair will have significant reduction of shigellae after 24 hours. • If storage is required, hold specimens at 4°C to 8°C, do not freeze.	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 an initial 5-10 cases in an outbreak, sample only a small number of cases until the outbreak ends. Refer to disease specific guidelines in Section 8 for additional information about the epidemic potential of *Shigella dysenteriae* 1
Dracunculiasis	**Routine laboratory confirmation for surveillance is not required.**				

HIV **REFERENCE**: Guidelines for Second Generation HIV Surveillance, WHO and UNAIDS, 2000 WHO/CDC/CSR/EDC/2000.5	ELISA for HIV or Refer to national HIV/AIDS program guidelines for recommended diagnostic test in your area.	Serum	Obtain specimens according to national HIV/AIDS program strategy for clinical or epidemiological sampling.	**Use universal precautions to minimize exposure to sharps and any body fluid.** *For 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 pipette serum into sterile, screw capped tubes. • Store serum at 4°C. • Ship serum samples using appropriate packaging to prevent breakage or leakage.	HIV testing is highly regulated with strict controls on release of information. Results are usually available within one week from arrival in the laboratory.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Leprosy	**Routine laboratory confirmation for surveillance is not required.**				
Malaria **REFERENCE:** "Basic Laboratory Methods in Medical Parasitology" WHO, Geneva, 1991	X Presence of malarial parasites in blood films for suspected cases admitted to in-patient facility X Hematocrit or hemoglobin for suspected malaria in children 2 months to 5 years of age.	Blood Usually finger-prick sample. Finger prick or other accepted method for collecting blood from young children	*For blood smear:* prepare blood film for all suspected cases admitted to inpatient facility, or according to national malaria case management guidelines *For hematocrit or hemoglobin*: In the inpatient setting, perform a laboratory test confirming severe anaemia	*For blood smear:* Collect blood directly on to cleaned. Dried and labeled microscope slides and prepare thick and thin smears. X Allow smears to dry thoroughly. X Stain using the appropriate stain and technique. X Store stained and thoroughly dried slides at room temperature out of direct sunlight. *For hematocrit or hemoglobin:* Collect specimen according to instructions in national guidelines.	Thick and thin smear results may be available the same day as preparation. Microscopic examination of malaria slides may also reveal the presence of other blood-borne parasites.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and transport	Results
Measles **REFERENCE:** WHO Guidelines for Epidemic Preparedness and Response to Measles Outbreaks WHO/CDS/CSR/ISR/99.1	Presence of IgM antibodies to measles virus in serum.	Serum. But whole blood can be used in rapid diagnostic kits	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:* X Collect specimen from every suspected case of measles X Collect serum for antibody testing at first opportunity or first visit to the health facility.	X For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer. X 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 piptte serum into a clean glass tube. – If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pipette 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. X Store serum at 4°C. X Ship serum samples using appropriate packaging to prevent breaking or leaks during shipment.	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 contamination, ensure that the serum is pipette in a clean dry sterile glass test tube. The test tube does not need to be sterile, just clean. Transport the serum in an EPI hand vaccine carrier at 4oC to 8oC to prevent bacterial contamination (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.

Meningitis **REFERENCE:** "Laboratory Methods for the Diagnosis of Meningitis Caused by *Neisseria meningitidis, Streptococcus pneumoniae and Haemophilus influenzae*". WHO document WHO/CDS/EDC/99.7 WHO, Geneva	Microscopic examination of CSF for Gram negative diplococci Culture and isolation of *N. meningitidis* from CSF	Cerebro spinal fluid (CSF) **Note:** CSF is the specimen of choice for culture and microscopic exam. If CSF is not available, collect blood (10 ml adults, 1-5 ml for children) for culture.	Collect specimens from 5 to 10 cases once the alert or action threshold (see "Meningitis" in Section 8) has been reached.	Prepare the patient and aseptically collect CSF into sterile test tubes with tops. • Immediately place 1 ml of CSF into a pre-warmed bottle of trans-isolate medium. • Incubate at body temperature (36EC to 37EC). • Never refrigerate specimens that will be cultured. • Keep CSF for microscopic exam and chemistry in the original syringe (replace cap). Refrigerate the capped syringe and send it to the laboratory as soon as possible.	Isolation of *N. meningitidis*, 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. meningitidis* should be serotyped and an antibiogram performed to ensure appropriate treatment. Trans Isolate medium (TI) is stable. If properly stored at refrigerator 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 color change (yellowing or clouding of the liquid medium) or obvious drying or shrinkage of the agar slant, the medium should not be used.
Neonatal tetanus	***Laboratory confirmation is not required.***				
Onchocerciasis	***Routine laboratory confirmation for surveillance is not required.***				

Suspected disease or condition	Diagnostic test	Specimen	*When to collect*	How to prepare, store and ship	Results
			X	X	
Sexually transmitted infections (STIs)	***Routine laboratory confirmation for surveillance is not required.***				
Tuberculosis (Smear positive pulmonary tuberculosis) REFERENCE: Laboratory Services in Tuberculosis Control, Parts I, II and III. WHO publications WHO/TB/98.258	Presence of acid fast bacillus (AFB) in Ziehl Nelsen (ZN) stained smears	Deep-chest sputum	Collect sputum (not saliva) for direct smear microscopy and examine at least three stained specimens taken on different days.	Smear should be examined at health facility where the specimen is taken or transported in a sputum container to the nearest diagnostic center as soon as possible.	TB microscopy is read daily. Quantification of observed mycobacteria are reported using various reporting methods. Refer to the criteria used by the examining laboratory.
Suspected disease or condition	**Diagnostic test**	**Specimen**	**When to collect**	**How to prepare, store and ship**	**Results**
Viral hemorrhagic fevers **REFERENCES:** Infection Control for Viral Hemorrhagic Fevers in the African Health Care Setting WHO/EMC/ESR/98.2 Viral Infections of Humans; Epidemiology and Control. 1989. Evans, A.S. (ed). Plenum Medical Book Company, New York	Presence of IgM antibodies against , , Lassa or Dengue fevers	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.	Handle and transport specimens from suspected vhf patients with extreme caution. Wear protective clothing and use barrier precautions. *For ELISA or PCR:* • Refrigerate serum or clot • Freeze (-20C or colder) tissue specimens for virus isolation	Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Results will depend on standards established by the lassa lab in Kenema. Contact DPC

Yellow fever **REFERENCES:** District guidelines for Yellow Fever Surveillance, WHO/GPVI/EPI/98.09 Yellow Fever. 1998. WHO/EPI/Gen/98.11	ELISA for the presence of yellow fever IgM antibodies	Serum	Collect specimen from the first suspected case of yellow fever. If more than 1 suspected case, collect until specimens have been collected from 5 to 10 suspected cases.	• Collect 10 ml of venous blood from adults, 1-5 ml from children. In a standard glass test tube, capillary tube or vacationers. • 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 pipette serum into a clean glass tube. – If no centrifuge, allow sample in vertical position for 4 –6 hours until clot retracts, or in a refrigerator overnight. Pipette 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 clean tube. • Store serum at 4°C. • Ship serum samples using appropriate packaging (e.g. dry ice) to prevent breaking or leaks during shipment.	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 contamination, ensure that the serum is pipetted into a clean dry 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.

Annex 6. List of laboratories for confirming priority diseases and conditions

Periodically update the list of laboratories or those specified by the national level for confirming priority diseases in your district. Also record whom to contact for assistance.

Name of disease	Available laboratory tests	Name, address, and phone number for laboratory
HIV/AIDS	Rapid Test ELISA	Connaught Hospital Laboratory Ramsey Laboratory Choithram Memorial Hospital Blue shield Laboratory All district hospital laboratories
Meningitis	Gram stain Rapid Diagnostic Test	Connaught Hospital Laboratory Ramsey Laboratory Choithram Memorial Hospital Blue shield Laboratory All District Hospitals Laboratories
Cholera	Isolation of the vibrio	Connaught Hospital Laboratory, Freetown
Shigellosis	Isolation of the bacteria	Connaught Hospital laboratory
Malaria	Giemsa Stain Rapid Diagnostic Test	Connaught Hospital Laboratory Ramsy Laboratory Choithram Memorial Hospital Blue shield Laboratory All district hospital laboratories
TB	AFB microscopy	Connaught Hospital Laboratory Ramsey Laboratory Choithram Memorial Hospital Blue shield Laboratory All district hospital laboratories
Salmonollosis	Blood investigation	Connaught Hospital Laboratory Ramsy Laboratory Choithram Memorial Hospital Blue shield Laboratory All districts hospital laboratories

Session 2
Report Priority Diseases, Conditions and Events

This section describes how to:

- Report priority diseases, conditions and events in a timely way
- Record information in clinic registers or patient charts
- Use standard methods for reporting diseases
- Improve routine reporting practices

2.0 Report Priority diseases, conditions and events

Ensuring reliable reporting of surveillance data throughout the system is important so that DHMT, program managers, national IHR focal point and other health care staff can use the information to:

- Identify problems and plan appropriate responses
- Take appropriate action in a timely way
- Monitor disease trends and spread in the area
- Evaluate the effectiveness of the response

2.1 Know how often to report priority disease, conditions and events

The National Disease Surveillance system determines that data from the districts and health facilities are reported immediately, weekly, monthly, or quarterly. The recommendations about when to report will depend on specific disease control activities.

These guidelines recommend two kinds of reporting:

- ***Immediate reporting***: Report information about an individual case when an epidemic-prone disease, conditions and other events with potential public health emergencies of international concern is suspected and requires immediate notification. Also report case-based information for diseases targeted for elimination or eradication or when an action threshold is crossed.

  Note: Some epidemic-prone diseases for example,
  Leprosy is reported quarterly, Meningitis cases and deaths should be reported weekly in Sierra Leone.

- ***Routine summary reporting:*** Routinely report the total number of cases and deaths seen in a given period (for example, monthly or weekly). These totals are analyzed and the results used to monitor progress toward disease reduction targets, measure achievements of disease prevention activities in the district, and identify hidden outbreaks or problems so that early action can be taken.

The following list suggests when to report a suspected outbreak and monthly summary reporting:

Name of disease	*When to report a suspected outbreak*
For these diseases, including those targeted for elimination and eradication, a single suspected case is a suspected outbreak: Acute Flaccid Paralysis (AFP)/ Polio Cholera Dracunculiasis Measles *(elimination)* Neonatal tetanus Lassa fever Yellow fever Other viral haemorrhagic fevers Human influenza caused by a new Subtype * Dengue Fever SARS * Anthrax* Potential PHEIC	• Report case-based information immediately to the district as soon as an outbreak is suspected -- Make the initial report by fastest means possible (telephone, fax E-mail, VH radio) -- Follow up with a written report of the case-based information recorded on a form • Report summary information monthly. Enter "zero" when no cases were suspected or confirmed during the reporting period. • Immediate notification to the National IHR NFP using the fastest means of communication
For these diseases, report a suspected outbreak when the threshold is exceeded: Measles *(non-elimination)* Meningitis Diarrhoea with blood	• Report suspected measles outbreak when 5 or more cases are suspected in one month. • Report suspected meningitis outbreak when the alert threshold is exceeded. (See Section 8 for specific guidance on alert and action thresholds for meningitis.) •
For these diseases, report monthly summaries of cases and deaths to the next level Diarrhoea with severe dehydration in children < 5 years of age Diarrhoea with some dehydration in children < 5 years of age Bloody Diarrhoea Leprosy (report quarterly) Malaria New AIDS cases Pneumonia in children <5 years of age Severe pneumonia in children <5 years Sexually transmitted infections (STIs) TB (report quarterly)	• Health facilities report summary totals to the district. District reports summary totals to the central level. • Observe alert and action thresholds for specific diseases during analysis of monthly summary reports.

2.2 Record information in clinic registers or patient charts

Each district or health facility should have the standardized procedures for recording the patient's diagnosis.

For immediately notifiable diseases, contact the district immediately and provide information about the patient. As a follow-up, complete a case-based reporting form and send it to the district.

To collect daily summaries, a clinician, nurse, or clinical assistant records the diagnosis in the ward register. Other staff such as a nurse or records clerk visits the ward daily to tally the cases and deaths for each diagnosis. Each month, the daily totals are summarized and reported to the district level as required. Another method is when the clinician records the patient's diagnosis in a patient record. Other health worker reviews the charts and tally cases and deaths which are then used to compile weekly or monthly summaries.

To ensure that cases of priority diseases and conditions are recorded correctly:

- Take steps to ensure that all Health Workers know the standard case definitions recommended by national policy. Establish or modify existing procedures so that all Health Workers will be able to apply the standard case definitions in detecting or suspecting cases or outbreaks.

- Highlight with staff those diseases or conditions that require immediate reporting for case-based surveillance. For example, all the Health Workers should be aware of the epidemic-prone disease for which one case is a suspected outbreak requiring immediate action.
- Depending on the recommendations for a specific priority disease or condition, as soon as an epidemic-prone disease is suspected, ask the patient about additional cases in the home, work place or community.

- Identify the focal person at the health facility who will be responsible for tracking priority diseases and reporting them as required. If the disease is one that requires immediate reporting, specify how the information should be reported to the district level through the fastest means possible. For the district, specify how the district should notify national level. Use facsimile, telephone, electronic mail, telegrams, personal messages, or other rapid communication methods.

Identify sources in the community who will be able to report suspected cases of priority diseases to the health facility. Examples of community sources include:

-- Pharmacists
-- School teachers
-- Private clinics
-- Village leaders
-- Religious leaders

-- Traditional healers
-- Trained birth attendants or other community health workers -- Extension workers
-- Drug Peddlers (Quacks)

Provide the community sources with information about the priority diseases you are interested in monitoring through surveillance. Give enough information about the disease so that the community source can refer cases to the health facility, or notify the health facility when unusual or unexplained health events occur in the community.

Please refer to the list of simplified messages for community surveillance in the Annex 3 of Section 1.

2.3 Use standard methods for reporting priority diseases, conditions and events

In an integrated system, streamlining reporting allows for data to be reported efficiently by using a minimum number of forms and reporting contacts. Rather than requiring health facilities to provide reports using several forms for different disease control and prevention programs, data about the priority diseases can be reported on a single form. Case-based information can be reported first verbally. Then written information is provided on a case reporting form. Summary data is reported on monthly summary reporting forms.

2.3.1 Report immediately reportable diseases or unusual events promptly

When an immediately reportable disease or outbreak of any priority disease is suspected, report the patient's locating information, (ie present and previous address) immunization history, date of onset of symptoms, and other relevant risk factors to the next level. The verbal or written notification should reach the district within 24 hours from when the case was first seen by the health facility.

Also report immediately any unusual health event reported by the community such as a large number of deaths with fever that did not respond to usual treatment for causes of fever in the area. Report information about the health event verbally by telephone or radiophone. Or, use an electronic method such as E-mail or facsimile. Prompt reporting is required for certain diseases (Measles, AFP, Meningitis, Cholera, Shigellosis, Yellow Fever, Lassa Fever.) because action can be taken to control the wider transmission of the disease and prevent additional cases from occurring.

2.3.2 Report case base information using recommended form

After the initial verbal report is made, complete a case-based surveillance form. If a verbal report cannot be made, the case reporting form may be the first contact that the district receives about the case. An example of the form and instructions for completing it are in Annex 9 at the end of this section.

Include the following information:

- The patient's name. If neonatal tetanus is reported, also record the name of the mother
- Patient's date of birth, if known, or the age of the patient
- Patient's locating information (address, village, and neighbourhood). Include the following information
- How to contact the patient or the parents of the patient if more information is needed
- Patient's gender
- The date the patient was seen at the health facility and the date the case was reported to the district
- Date of onset of the disease (refer to disease specific guidelines for signs and symptoms that define onset of the disease)
- If you are reporting a suspected case of a vaccine preventable disease, describe the patient's immunization history (and also for the mother if neonatal tetanus is suspected)
- Patient's status at the time of the report (if an inpatient, report final outcome as living or deceased)
- Provide the date of the report.

The Health worker who completes the form should record his or her name and the date the form was sent to the district. Make two additional copies of the form by photocopy, carbon copy or by hand. Submit the original to the district. Keep one copy at the health facility. Use the second copy as a laboratory transmittal slip if a laboratory specimen is taken. Send the copy of the case-based form with the specimen to the laboratory.

Refer to Annex 5 or the disease specific guidelines in Section 8 for information about which laboratory tests to request.

2.3.3 Report summary data routinely

Each month, the health facility calculates the total number of cases and deaths due to priority diseases and conditions seen in the health facility. Separate totals are calculated for outpatient cases and inpatient cases. The summary totals are recorded on a form and sent to the district level.

The district aggregates the totals from all the health facilities that reported and reports district summary totals to national level.

2.4 Improve routine reporting practices

In some health facilities, more than one person may be responsible for recording information about patients seen in the facility. For example, the clinician records the patient's name and diagnosis in a clinic register. Later in the day, a nurse tallies the number of cases and deaths seen in an outpatient service. The ward nurse tallies the number of hospitalised cases. Each month, a records clerk or statistician calculates summaries for all the diseases and records them in a standard form.

2.4.1 Review the flow of information in the health facility

Make sure that:

- Clinicians record information in the clinic register using the recommended case definition so that health workers who tally the cases at the end of the day can reliably record the required diagnoses on the tally sheet.
- Clinicians, ward nurses or other responsible staff should complete the case form while the patient is still present.
- Records clerks or statisticians have summary forms that contain spaces for recording cases and deaths due to the priority diseases according to the standard case definitions. (See section 8)
- Records clerks know how to complete the summary forms.
- Health workers review the monthly totals and provide comments on the forms about results seen in monthly analysis. (See Section 3.0).
- Health workers record the totals on a recommended monthly summary reporting form.

Note: In the sample monthly summary reporting forms at the end of this section, there is space for recording observations about the data that Health Workers at the health facility and district observe either during routine analysis or when they complete the form each month.

2.4.2 Submit zero reporting when no cases of immediately reportable diseases are diagnosed

If no cases of an immediately reportable disease have been diagnosed during the month, record a zero (0) on the reporting form for that disease. If the space is left blank, the staff that receives the report will not know why there is a blank space.

Submit a zero for each immediately reportable disease even if no cases were detected during the month. This will tell the staff at the next level that a complete report has been submitted by the health facility or district.

2.4.3 Use line list and summary reporting during outbreaks

When a limited number of cases of a single disease occur during a specified period of time, report the information about each case on an individual case reporting form.

If more than 5 to 10 cases occur in a specified time, use a line list instead of individual case reporting forms to record and report the cases weekly (see annex 10).

When a large number of cases occur in a single suspected outbreak, report summary totals of cases and deaths each week.

How to conduct routine analysis of surveillance data is described in Section 3.0.

Indicators for monitoring timeliness of immediately reportable diseases are in Section 7.0.

Monitoring timeliness of reporting suspected outbreaks is in Section 7.0.

Annexes to Section 2

- ANNEX 7 List of district reporting sites
-
- ANNEX 8 Maintaining clinic registers for recording priority diseases and conditions
- ANNEX 9 Case-based surveillance reporting form (sample)
- ANNEX 10 **L**ine list – Reporting from health facility to district and for use during outbreaks
- ANNEX 11 Summary Weekly Report under weekly surveillance for out-patient
- Cases and in-patient cases and deaths (health facility to district level)
- ANNEX 12 Summary Weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (district level to national level)
- ANNEX 13 Monthly summary reporting form for in-patient cases and deaths: health facility to district to national
- ANNEX 14 Tuberculosis quarterly report form
- ANNEX 15 Leprosy quarterly report form
- ANNEX 16 Managing public health surveillance

Annex 7. List of district reporting sites

Record information for contacting the health worker who provides information to the district related to surveillance and outbreak detection. For example, include community health workers, MCH Aides trained birth attendants, village leaders and public safety officials, trained Public Health Overseers.

District……..

Name of health facility or point of patient contact with health service	**Address or location of facility or point of contact**	**District Surveillance Officer**	***Contact Information***

Annex 8. Maintaining clinical registers for recording priority diseases, conditions and events

Each health facility should maintain registers for recording cases of priority diseases and conditions seen in the health facility. As a minimum, the clinic register should have spaces for recording the following information:

- The patient's name, age and address (present and previous)
- Date of onset of the disease

- The patient's diagnosis. This is mainly important for reporting summary information. Use IMCI diagnosis for diarrhoea with dehydration and for pneumonia in children less than 5 years of age.
- The patient's status if an in-patient or if under observation
- The date the patient was seen.

Some registers include spaces also for recording:

- The patient's gender
- Treatments
- Laboratory results, if case was confirmed with laboratory specimen
- Other notes relevant to patient's disease, treatment or outcome.

Example of clinic register in use.

- Gneral clinic register GC01
- Under five clinic register UF01
- Epidemic Prone Diseases Register
- Mothers and neonates clinic register
- EPI register
- Hospital out-patient register
- Hospital in-patient register

Annex 9. Case based surveillance reporting form

WHO/AFRO recommends a generic case-based reporting form that can be used to report written information about individual cases of priority diseases recommended for case-based surveillance. These include:

- Epidemic-prone diseases (cholera, diarrhoea with blood*, measles, meningitis, Lassa fever and yellow fever)

> * Not every case of bloody diarrhoea is reported. Report diarrhoea with blood when an outbreak is suspected either because there has been an adult death in a patient who had diarrhoea with blood, or when a threshold has been reached that prompts reporting. Please see disease specific guidelines in Section 8 for guidance on when to report a suspected outbreak of *Shigella*.

- Diseases targeted for eradication (Polio, Dracunculiasis,)
- Diseases targeted for elimination (Leprosy and neonatal tetanus.) Leprosy is reported quarterly.

- Other diseases recommended by national policy for case-based surveillance (Measles, Lassa fever, Yellow fever, Meningitis.

If the health facility suspects a disease or condition in one of the above categories, health facility staff should contact the district immediately by telephone, facsimile, e-mail or other prompt communication. Send the form as a follow-up to the verbal report.

The sample form on the next page has two sections. The first forms where information is recorded about the individual case. It provides information that can be used to plan a more detailed case investigation. The second form is a laboratory transmittal slip. It contains spaces where laboratory results and information about the timeliness of the laboratory testing should be recorded. After the health facility or district staff complete the first form, a copy of it can be made and included with the specimen, if a specimen has been collected, when it is sent to the laboratory.

REPORTING FORM FOR HEALTH FACILITY

_____ _____ _____ _____
Health facilityReporting Location Chiefdom District
Epidemiological number

Reporting Form – from Health Facility/Health Worker to District Health Team

☐ AFP ☐ Cholera ☐ Diarrhea with Blood/Shigella ☐ Dracunculiasis ☐ Neonatal Tetanus ☐ Measles ☐ Meningitis ☐ Lassa fever ☐ Yellow Fever _____ Other

_____/_____/_____
Date form received at National Level

Name(s) of Patient: _____ **Date of Birth:** _____/_____/_____ **Age:** _____ _____ _____
(If DOB unknown) **years** **months** (If <12 months) **days** (NNT only)

Patient's address: Village/Neighbourhood _____ **Sex:** ☐ M=Male F=Female

Town/City: _____ **District of residence:** _____ ☐ U=Urban R=Rural **Urban/Rural**

Locating Information: _____
If applicable, Name of mother and father if neonate or child

Date Seen at Health Facility: _____/_____/_____
Date Health Facility Notified District: _____/_____/_____

For cases of Measles, NT (TT in mother), Yellow Fever, and Meningitis:
Number of vaccine doses received ☐ 9=unknown
For Measles, TT, YF- documented by card. For Meningitis, by history.

Dates of Onset: _____/_____/_____

Date of last vaccination: _____/_____/_____
(Measles, Neonatal Tetanus (TT in mother), Yellow Fever, and Meningitis only)

Blank variable #1_____

Blank variable #2_____

In/Out patient : ☐ 1=In-patient 2=Out-patient

Outcome ☐ 1=Alive 2=Dead 9=unknown

Final Classification: ☐ 1=Confirmed 2=Probable/Compatible 3=Discarded 4=Suspected

Person Completing Form **Name:** _____
Signature: _____

Date Form submitted to District:_____/_____/_____

Designation ----------

Laboratory form

For Health Facility: If lab specimen is collected, complete the following information. And send a copy of this form to the lab with the specimen.

Date of specimen collection: _____/_____/_____ Specimen source: Stool Blood CSF _____
Date Specimen sent to lab: _____/_____/_____ **EPID NO** ------- --------- ------ ---------- --------
Country Province District Year onset Case No.

For the Lab: Complete this section and return the form to district team and clinician

Date lab specimen: Received _____/_____/_____ Specimen Condition: Adequate Not adequate

Name of patient.

Disease/ Condition	Type of test	Results (P=pending)		Disease / Condition	Type of test	Results	
Cholera	Culture	+ - P		Yellow Fever	IgM	+ - P	
	Direct Exam	+ - P	_____ Method used for Direct Exam	Measles	IgM	+ - P	
				Rubella	IgM	+ - P	**Virus Detection**
Meningitis							
N. meningitidis	Culture	+ - P		RVF	IgM	+ - P	+ - P
S. pneumonia	Culture	+ - P		CCHF	IgM	+ - P	+ - P
H. influenza	Culture	+ - P		Lassa	IgM	+ - P	+ - P
N. meningitidis	Latex	+ - P					
S. pneumonia	Latex	+ - P					
H. influenza	Latex	+ - P					
Shigella Dysenteriae	Culture	SD type 1	Other shig No shig				
Dengue	culture	+ - P					
Haman influenza, SRAS	IFA>1: 64	+ - P					

Other lab results: _____
_____

Date lab sent results to district: _____/_____/_____ _____

Name of lab sending results:_____ Other pending tests: _____

Date district received lab results: _____/_____/_____ Date lab results sent to clinician by district: _____/_____/_____

NOTE: District is responsible for ensuring lab results get to clinicians. and the clinician should ensure that the results gets to the family. Failure to do so will undermine cooperation with clinicians an community on reporting of cases in the future

Instructions for completing the Case Reporting Form

For the health facility:

1. Complete the name of the health facility submitting the case-based reporting form.

2. Record the name of the district that is receiving the report.

3. Tick the box at the top of the form to indicate which disease is being reported. If the disease or condition is not stated, or its cause is unknown, write the name of the disease or condition (or "unknown") in the blank marked "Other".

For the district:

4. If unique identification numbers are used to record cases reported to the district, record the identification number (EPID number) in the blank for "EPID number".

5. When the report is received at the district, record the date it was received. If a verbal report was made, report the date of the verbal report.

For the health facility:

6. Record the name of the patient. For a neonatal tetanus case, record the name of the mother.

7. Record the patient's age, if it is known, or the patient's date of birth.

8. Record information about the patient's residence. Include the name of the village or neighborhood that the patient lives in. Include the name of the district that the patient lives in also.

9. Record information about how to contact the patient or the patient's parents for use at a later time when additional information about the patient's illness may be needed.

10. Record "M" for Male, and "F" for Female.

11. Record the date the patient was seen at the health facility and the date the health facility reported the disease or condition to the district. (The form should be a follow-up to prompt verbal reporting.)

12. Record the date of onset of the disease, if known.

13. For vaccine preventable diseases, such as AFP, neonatal tetanus, measles, meningitis and yellow fever, obtain an immunization history for the patient. Record the date of the last immunization dose for the reported illness. Decide if the dose was more than 15 days ago. If the immunization was received within the last 15 days, there may not have been an immunization response. Do not count doses that were received within the last 15 days.

    - For meningitis, record if there is a history of vaccination during a mass campaign.

- For neonatal tetanus, record the number of lifetime doses of tetanus toxoid the mother received up to 15 days before the delivery.

14. Report whether the patient was an outpatient or inpatient at the time the case was reported.

15. Record whether the patient was living or deceased at the time the report was made. If the patient's illness is reported, and the patient later dies, inform the district. The district can change the status on the form.

16. When the investigation of the case is complete, record "confirmed" or "discarded" in the item "Final Classification". When the case is first suspected, record "suspected" as the Final Classification.

17. The health facility staff member who completes the form should sign his or her name and also the date the form was sent to the district.

If there is no laboratory specimen collected, the form is complete. If a laboratory specimen is taken, send a copy of the form to the laboratory with each specimen.

18. Record the date the specimen was collected in the box labelled "If lab specimen collected". Also record the date the specimen was sent to the laboratory.

19. Circle what type of specimen was collected (blood, CSF, stool).

When the specimen arrives at the laboratory:

20. Record the date the laboratory received the specimen. Also record the condition of the specimen. See Annex 3 in Section 1 for information about ensuring the quality of specimens. If the specimen arrives in poor condition, inform the health facility promptly to let them know a useful laboratory result is not going to be possible. They may decide to send another specimen. Give guidance in ensuring the specimen arrives in adequate condition.

21. Record the results of the laboratory testing according to the prompts on the bottom part of the form.

22. Record the date the results were given (verbally or in writing) to the health facility and/or the district. If it is national policy that results are given to the district, the district will inform the health facility.

At the district:

23. Send a complete case reporting form to the national level for data entry and analysis. Also send the laboratory results.

Annex 10. Line list – Reporting from health facility to district and for use during outbreaks

Health Facility: _____ Date received at district:_____
District: _____ Disease or condition:_____

CASE Id Nbr	O=out-patient I=in-patient	Name	Village, Town, and Neighborhood	Sex	Age[1]	Date seen at health facility	Date onset of disease	Number of doses of vaccine[2] received	Record date laboratory specimen taken	Record results of laboratory testing	Outcome A=alive D=dead	Co

- If district sends specimen to the lab, use EPID number as well (PPP-DDD-YY-oox format) to identity lab specimen
- If health facility sends lab specimen to lab without passing through the district, then the name (only) will be the lab specimen identifier

NOTE: -If more than 100 cases occur in a week (e.g. for measles, cholera, etc.) at a health facility, line listing of cases is not required, record jus the total number of cases

- If previously reported cases die, update the status by completing a new row with "died" in the status column and "update record" in the Comments column.

**Age in years if more than 12 months, otherwise write age in months (e.g. 9m) or age in days if less than one month

Annex 11. Summary Weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (health facility to district level

Health Facility: _____ **Catchment Population: _____**

District: _____ **Province: _____** **Country: _____**

Year	Week	Disease*	Village and/or Neighborhood	Cases	Deaths	Lab Confirmed Cases	Lab findings	Remarks

***NB*: * = Priority Epidemic Prone Disease or Public Health Event of Local, National or International Concern**

Analysis, Interpretation and Response

Comments on trends:	
Comments on Lab:	
Comments on Mortality:	
Conclusion:	
Action taken:	
Recommendations:	

Deadline for this Report:

Date of Report: ____/____/_____/ **____/____/_____/**

How to qualify this Report? ____ (T = timely, L = late)

Officer in charge: _____

Annex 12. Summary weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (district or national level)

District: _____ **Population: _____ inhabitan**

Region / Province: _____ **Country: _____**

Number of Sites (Health facility) which are expected to Report: _____

Number of Sites (Health facility) that reported ontime: _____ **Timeliness of reporting: _____ %**

Number of Sites (Health facility) that reported late: _____ **Completeness of reporting: _____ %**

Year	Week	Disease*	Cases	Deaths	Lab Confirmed Cases	Lab findings	Remarks

***Nota bene*: * = Priority Epidemic Prone Disease or Public Health Event of Local, National or International Concern**

Analysis, Interpretation and Response

Comments on trends:	
Comments on Lab:	
Comments on Mortality:	
Comments on completeness and timeliness of reporting:	
Conclusions:	
Action taken:	
Recommendations:	

Date of Report: ____/____/_____/ **Deadline for this Report: ____/____/_____/**

How to qualify this Report? ____ (T = timely, L = late)

Officer in charge: _____

Annex 13. Monthly surveillance report form for out-patient and in-patient cases and deaths (from health facility to district to national)

Health Facility _____ Chiefdom _____District _____

Year _____ Month _____ Record below the total number of cases and total number of deaths for each disease/condition.

Report these totals to the district. Complete the column for the current month for all disease/conditions.

		Out-Patient		In-Patient	
		Cases	**Deaths**	**Cases**	**Deaths**
Malaria <5 years	Uncomplicated				
	Severe				
Malaria ≥5 years	Uncomplicated				
	Severe				
In-Patient Malaria with severe anemia (<5 years)					
Malaria in pregnancy					
Uncomplicated Malaria < 5 years, lab-confirmed					
Uncomplicated Malaria 5+ years lab-confirmed					
Pneumonia (<5 years)					
Severe Pneumonia (< 5 years)					
Diarrhoea with some dehydration (<5 years)					
Diarrhoea with severe dehydration (<5 years)					
New AIDS cases					
Male Urethral Discharge					
Male Non-vesicular Genital Ulcer					
Female Non-vesicular Genital Ulcer					
Diarrhoea with blood					

Number of sites that reported on time _____

Number of Out-patient sites that are supposed to report _____ Number of sites that reported late _____

Zero reporting for immediately-reported, case-based disease/conditions:
Total cases previously reported this month on case forms or line lists

AFP		Measles		Lassa fever	
Cholera		Meningitis		Yellow Fever	
Dracunculiasis		Neonatal Tetanus		Other Viral Hemorrhagic Fever	

NOTE: Official counts of immediately notified cases come only from case forms or line lists. The counts from the zero-reporting boxes are not official counts.

Analysis, interpretations, comments, and recommendations on both out-patient and in-patient data

Other information:

Look at the trends in the District Analysis Book. Comments on observed trends? Abnormal increase in cases, deaths, or case fatality ratios? Lack of decrease of previous increasing trends? Improving trends?

Conclusions, actions taken, and recommendations:

Sent Report Date: _____ Person: _____ Received Report Date: _____ Person: _____

- Some dehydration, severe dehydration, pneumonia, and severe pneumonia are defined according to WHO Integrated Management of Childhood Infections (IMCI) definitions. TB and Leprosy data reported quarterly on separate forms.

Annex 14. Tuberculosis quarterly reporting form

Year _____ Quarter _____

Health Facility _____ Chiefdom _____ District_____

Case Notifications	Number
Pulmonary- Smear + New case	
Pulmonary- Smear + Relapse	
Pulmonary- Smear Negative	
Pulmonary- Smear not done/unknown	
Extra-pulmonary	
Total	

Category of Re-treatment cases	Number
Relapses	
Failures	
Re-treatment after interruption	
Total	

Age of new pulmonary smear+ cases			
	M	F	Total
0-14			
15-24			
25-34			
35-44			
45-54			
55-64			
65+			
Total			

Cohort Analysis done on patients registered in same quarter in the previous year

Smear conversion	New pulm smear+ (at 2 months)	Re-treatment smear+ (at 3 months)
New sputum + converted by 2-3 months		
New sputum + evaluated with sputum by end of 3rd month		

Treatment results	New pulm smear+	Re-treatment -smear+
Total registered		
Total evaluated		
Smear negative at end of treatment (cured)		
Completed treatment, but smear not done at end of treatment		
Died		
Failure		
Interrupted treatment		
Transferred out		

Analysis, interpretations, comments, and recommendations

Other information:

Comments on observed trends? Abnormal increase in cases ? lack of decrease of previous increasing trends? Improving trends?

Conclusions, actions taken, and recommendations:

Sent Report Date: _____ Person: _____

Received Report Date: _____ Person: _____

Annex 15. Leprosy quarterly report form

Year _____ Quarter _____

Health Facility _____Chiefdom _____ District_____

Category	Indicators	Clinical form of leprosy		Total
		Multibacillary	Paucibacillary	
Total cases under treatment during the quarter	Total cases being treated (or about to immediately start treatment) during the quarter			
In-coming cases seen during the quarter	Total new cases never treated (=detection)			
	0-14 years			
	15+ years			
	New cases with < 2nd degree Disability			
	Relapse, defaulter, or transferred			
Cases that left program during this quarter	Died			
	Treatment finished			
	Transferred			
	Lost to follow-up (at least 1 year without treatment			
	Total			
Cases in program at the last day of the quarter	Total (=cases at the beginning plus new cases during the quarter minus cases that left the program)			

Analysis, interpretations, comments, and recommendations

Other information:

Comments on observed trends? Abnormal increase in cases? lack of decrease of previous increasing trends? Improving trends?

Conclusions, actions taken, and recommendations:

Sent Report Date: _____ Person: _____

Received Report Date: _____ Person: _____

Annex 16. Managing public health surveillance data

Effective public health activities, including public health surveillance, depend on a trusting relationship between the public health workers and the public they are trying to assist.

The following are obligations of public health workers including epidemiologists:

- **Protect the confidentiality and privacy of the community**

  Privacy is the right of patients to choose what information they will release about themselves and to whom.

  Confidentiality is the obligation of public health workers to keep information about individuals restricted only to those persons who absolutely need it for the health of the community. Patients have the right to know why they are providing information, to refuse to provide information, and to expect that information will be handled as confidential.

  Information, even when it does not include names, can still be used to identify persons and lead to discrimination or other consequences against individuals and, therefore, must be protected. In many countries and districts, even a few pieces of information that may seem to be unimportant can be used unintentionally to identify the patient. Additionally, consideration will be given to how to protect patients from identification while still allowing the public health system to trace contacts or outbreaks when required. A good information system will have thought carefully about what information is essential for public health action.

- **Informed Consent**

  Make sure that information is used only for the purposes for which it was intended. Information for surveillance is not expected by the community to be used for research purposes. There may be national or institutional laws that specify what the uses should be and when additional consent from the patient is needed. The public health worker respects these laws.

- **Maintaining professionalism and the public trust**

  To perform public health functions, including surveillance, it is essential that there is public support. Trust is an expression of confidence that public health workers will be fair, reliable, ethical, and competent.

Section 3

Analyse Data

This section describes how to:

- Receive, handle and store data reported from other levels
- Analyse data by time, place and person
- Draw conclusions based on the analysis results
- Compare analysis results with thresholds for public health action.
- Mapping of priority diseases and syndromes is recommended.
- Laboratory data are also analysed at this level

3.0 Analyze Data

Data should be analysed at the point where the data was collected. Analysing trends of disease cases, other conditions, events and deaths over time has many benefits. The analysis provides key information for:

- Identifying trends and taking prompt public health action
- Identifying causes of problems and their most appropriate solutions
- Evaluating the quality of public health programs in the district over the medium- and long-term.

Analysis of surveillance data emphasizes two important outcomes:

- During an acute outbreak of a disease or condition, the information that results from data analysis leads to the identification of the most appropriate and timely control actions. The actions are taken immediately to limit the outbreak and prevent further cases from occurring.
- Disease rates change over time. Some of these changes occur regularly and can be predicted such as an increase of malaria cases during the rainy season. Analysis and use of the trends in summary data over time provides information for improving district public health activities that target diseases such as malaria, tuberculosis, HIV/AIDS and vaccine preventable diseases. These are diseases that can account for up to 80% of the deaths due to the priority diseases and conditions. Many of the deaths are in children less than 5 years of age.
- These are diseases that can account for up to 80% of the deaths due to the priority diseases and conditions. Many of the deaths are in children less than 5 years of age.
- Laboratory data are also analysed at this level where available

This section focuses on the analysis of data at the district level.
However, the steps can be applied to data at the health facility level.

Ideally, do some data analysis at each level where data are collected.

3.1 Receive data from health facilities

The district team receives two types of surveillance data from reporting sites, such as health facilities, in the district:

- Case-based or other information from suspected cases of immediately reportable diseases
- Monthly summary totals of cases and deaths for the priority diseases.

WHO/AFRO recommends that:

- Reports of suspected cases for immediately reportable diseases be received by the district within 48 hours of the case being seen at the health facility.
- Monthly reports of summary data should be received on time.

> **Note:** When an outbreak is suspected, cases and deaths should be reported and graphed weekly. In Sierra Leone, weekly reporting of immediately reportable meningitis cases should be done.

When written reports are received, review case-based reporting forms to see if any essential information is missing.

If reports are not being received at all, or if they are consistently late, contact or visit the health facility to find out what has caused the problem. Work with the staff at the reporting health facility to help find a solution that could be implemented for improving reporting.

> **Note:** Make sure that Health Workers who record, report or store data understand the need for privacy and confidentiality. Please see Annex 15 for guidance in managing public health surveillance data.

3.2 Prepare to analyze data time, place and person

In order to detect outbreaks, events and other conditions, follow their course, and monitor public health activities, health workers need to know:

- How many cases occurred
- Where the cases occurred
- When the cases occurred
- The population most affected
- Risk factors that contributed to transmission of the disease

This information comes from patient registers and line lists. But it is easier to identify problems and detect outbreaks if the data from the patient record or clinic register are summarized and displayed in a table, graph or map. When data are displayed, the information can be understood quickly, and it is easier to see patterns and trends.

One method for ensuring that at least routine summary data for priority diseases is analysed every month is to maintain an "analysis book" at the health facility and district levels. Recommended graphs, tables and maps for analysing data about the selected priority diseases can be kept together in a notebook or placed on the wall. Each month the graphs and tables are updated and conclusions drawn about what is shown.

The analysis book can be easily observed during a supervisory visit or when the health facility staff or district health management team (DHMT) want to have information about how to respond to health events in the area. How to set up and maintain an analysis book is in Annex 17 at the end of this section.

The chart on the following page lists recommended methods and tools for analysing surveillance data so that Health Workers will have the information they need to take a public health action.

Objectives, tools and methods of descriptive analysis for communicable diseases

Type of analysis	Objective	Tools	Method
Time for immediately reportable diseases and monthly summary totals of cases and deaths for priority diseases	Detect abrupt or long-term changes in disease occurrence, how many occurred, and the period of time from exposure to onset of symptoms.	Record summary totals in a **table** or on a **line graph** or **histogram.**	Compare the number of case reports received for the current period with the number received in a previous period (months, seasons or years)
Place usually for immediately reportable diseases only	Determine where cases are occurring (for example, to identify high risk area or locations of populations at risk for the disease)	Plot cases on a **spot map** of the district, chiefdom or area affected during an outbreak.	Plot cases on a map and look for clusters or relationship of the location of the cases to the health event being investigated.
Person usually for immediately reportable diseases only	Describe reasons for changes in disease occurrence, how it occurred, who is at greatest risk for the disease, and potential risk factors	Extract specific data about the population affected on a **table.**	Depending on the disease, characterize cases according to the data reported for case-based surveillance such as age, gender, place of work, immunization status, school attendance, and other known risk factors for the diseases.

3.3 Analyze data by time

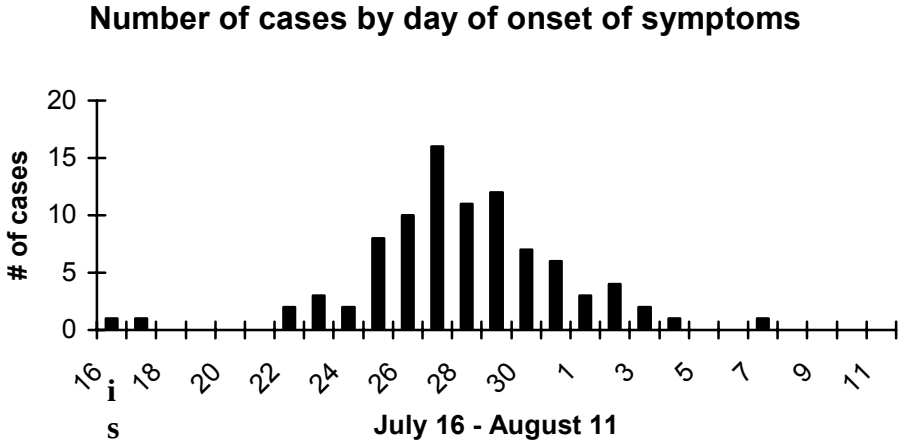
Analysing data to detect changes in the numbers of cases and deaths over time is the purpose of "time" analysis. Observing disease trends over time helps to show when regular changes occur and can be predicted. Other disease rates make unpredictable changes. By examining events that occur before a disease rate increases or decreases, it may be possible to identify causes and appropriate public health actions for controlling or preventing further occurrence of the disease.

Data about time is usually shown on a graph. The number or rate of cases or deaths is placed on the vertical or y-axis. The time period being evaluated is placed along the horizontal or x-axis. Events that occurred that might affect the particular disease being analysed can also be noted on the graph. For example, the graph may indicate the date that refresher training was conducted for health workers in IMCI case management for childhood diseases.

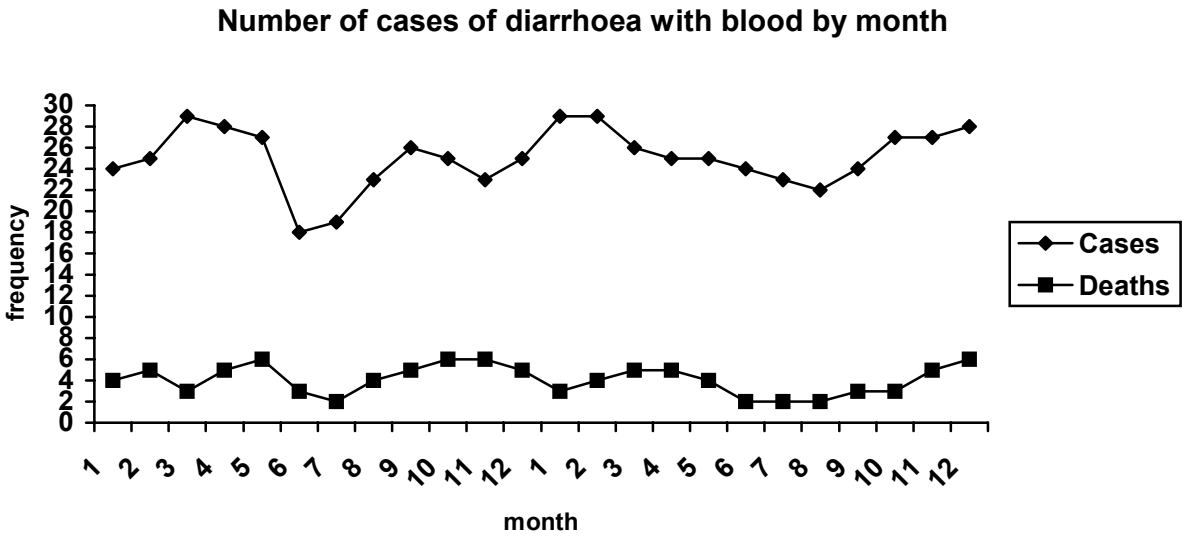
Graphs can show how many cases and deaths have occurred in a given time. It is easier to see changes in the number of cases and deaths by using a graph, especially for large numbers of cases or showing cases over a period of time.

Graphs are made with bars (a bar graph) or lines (a line graph) to measure the number of cases over time.

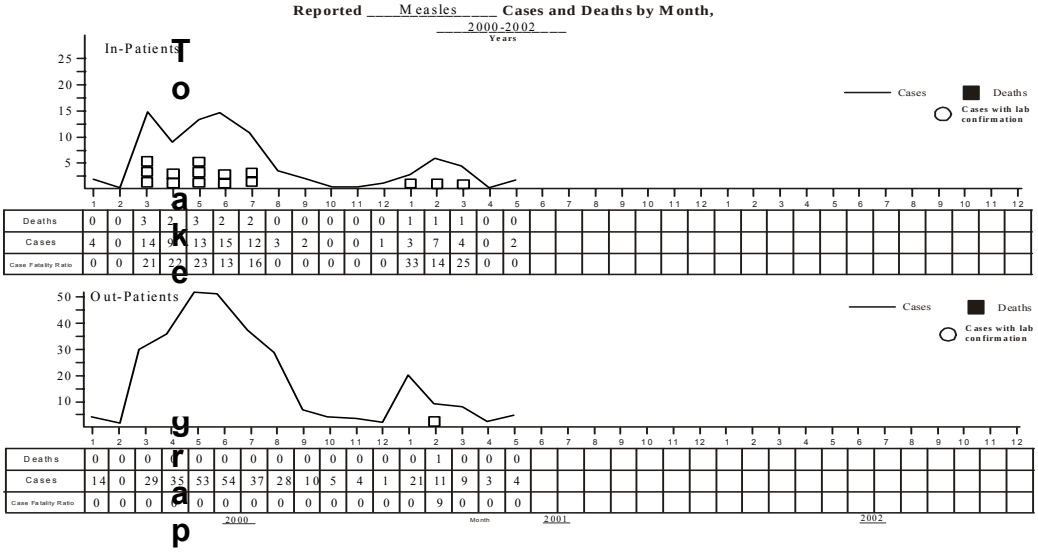
This is an example of a bar graph.



an example of a line graph.



A histogram is like a line graph except that it uses squares to represent cases rather than a line to connect plotted points. Use histograms to analyse outbreak data and to show an epidemic curve (an "Epi" curve). For acute outbreak diseases, time may be shown in 1-day, 2-day, 3-day or 1-week or longer intervals. In a histogram, the cases are stacked on the graph in adjoining columns so that the number of cases and deaths can be observed during the period under observation.



Take to group

To make a graph:

1. Decide what information you want to show on the graph.

2. Write a title that describes what the graph will contain (for example, *Monthly totals for inpatient cases and deaths due to malaria with severe anaemia*

3. Decide on the range of numbers to show on the vertical axis.

   - Start with 0 as the lowest number
   - Write numbers, going up until you reach a number higher than the number of cases
   - Chose an interval if the numbers you will show on the vertical axis are large.

4. Label the vertical axis, explaining what the numbers represent.

5. Label the horizontal axis and mark the time units on it. The horizontal axis is divided into equal units of time. Usually you will begin with the beginning of an outbreak, or the beginning of a calendar period, such as a month or year.

6. Make each bar on the graph the same width.

7. Mark the number of cases on the graph or histogram. For each unit of time on the horizontal axis, find the number of cases on the vertical axis. Fill in one square for each case, or for some number of cases in the column for the day on which the patient was seen. Show deaths by using a different pattern of lines, or a different colour. If you are making a line graph, instead of making a bar or filling in squares, draw a cross or make a point where the horizontal and vertical lines cross. Connect the points on the graph to show the trend going up or down over time.

3.4 Analyze data by place

Analysing data according to place gives information about where a disease is occurring. Establishing and regularly updating a spot map of cases for selected diseases can give ideas as to where, how, and why the disease is spreading. An analysis of place provides information that is used to:

- Identify the physical features of the land
- Understand the population distribution and density of the area
- Describe the variety of populations in an area. (farming area, high density urban area, refugee, internally displaced persons, settlement, and so on.)
- Describe environmental factors (major water sources in a community, such as rivers, lakes, pumps, and so on.)
- Identify clinics, meeting houses, schools, community buildings, and large shelters that can be used during emergency situations
- Show distances between health units and villages (by travel time or distance in kilometres)
- Plan routes for supervisory or case investigation activities
- Spot locations of disease cases and identify populations at highest risk for transmission of specific diseases.

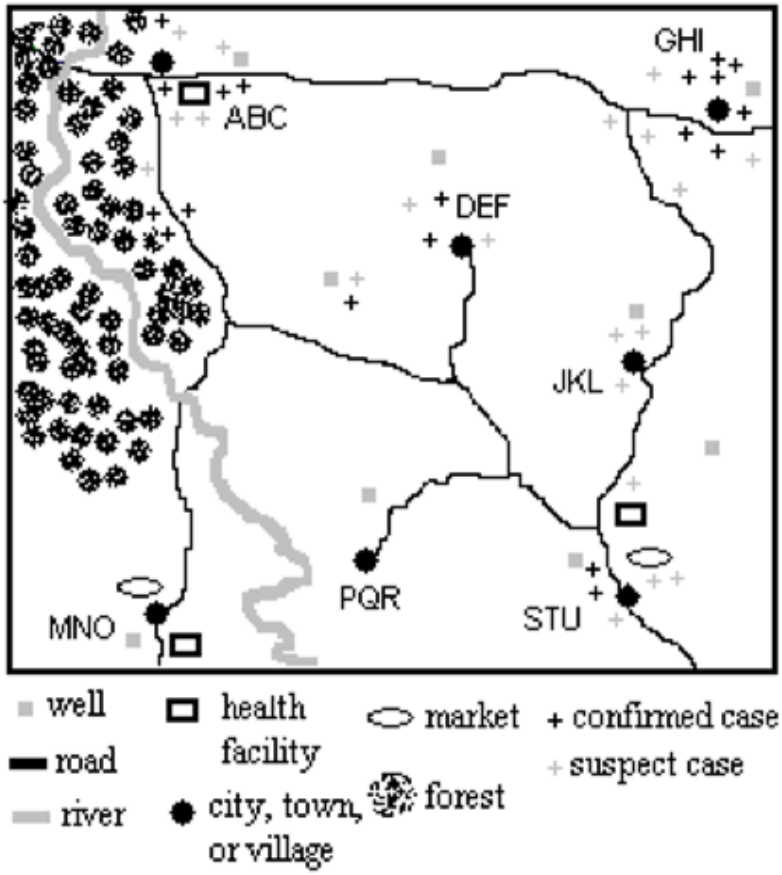
Create a map to use as part of routine surveillance of disease.

- Obtain a local map from the local government office or land department. Trace the main features needed for health work onto transparent paper and then to a large card that can be hung on a wall for easy use. If no official map is available, sketch the whole district area.

- Prepare a code of signs to use on the map, to represent each of the following features that will be shown on the map:

  - Location of health facilities in the district and the areas each serves
  - Geographic areas such as forests, savannah areas, villages, roads, rivers and cities
  - Socio-economic areas of relevance to priority diseases
  - Significant occupation sites such as mines or construction sites
  - Location of suspected and confirmed cases of priority diseases
  - Location of previous confirmed outbreaks

Figure 5: Spot Map of District X



3.5 Analyze data by person

Analysis by person is recommended for describing the population at risk for epidemic-prone diseases and diseases targeted for eradication or elimination. These are diseases that are reported with case-based surveillance so data about personal characteristics is likely to be available. Analysis by person is not routinely recommended for summary data.

A simple count of cases does not provide all of the information needed to understand the impact of a disease on the community, health facility or district. Simple percentages and rates are useful for comparing information reported to the district.

The first step in analysing person data is to identify the numerator and denominator for calculating percentages and rates.

- The ***numerator*** is the number of specific events being measured (such as the actual number of cases or deaths of a given disease, for example the number of cases of Guinea worm that occurred during the year in children less than 5 years of age.)

- The ***denominator*** is the number of all events being measured (such as the size of the population in which the cases or deaths of a given disease occurred, or the population at risk.)

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

Table **: Measles cases in children under 5 years of age

Health facility	Number of measles cases this year in children less than 5 years of age
Kamakwie community health	42
Binkolo Community Health	30

By looking only at the number of reported cases, it appears that a higher occurrence of Guinea worm cases occurred in health facility A.

But when the number of reported cases at each health facility is compared to the total number of school-aged children living in each catchment area, then the situation becomes clearer.

Table **: School-aged children living in the catchment area

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

By calculating the percentage of the number of cases of Guinea worm during the last 12 months in school aged children, the district medical officer can compare the impact of the illness on each facility. The numerator is the number of cases that occurred over one year. The denominator is the number of school aged children at risk in each catchment area. In this example, the incidence rate is higher in health facility B than in health facility A.

Table **: Measles cases in school-aged children in past 12 months

Health facility	Percentage of cases of measles in school-aged children during last 12 months
A	0.4%
B	0.5%

3.5.1 Make a table for person analysis

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

To make a table:

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

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

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

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

Age group	Number of reported cases	Number of deaths
0 - 4 years	40	4
5-14 years	9	1
15 years and older	1	0
Age unknown	28	0
Total	78	5

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

When the summary totals for each age group are entered, one analysis that can be done is to find out what percent of the cases occurred in any given age group. Use the information on the table to:

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

2. Calculate the total number of cases for the time or characteristic being measured. (In this example, there are 50 cases whose age is known.)

3. Divide the total number of cases within each age group by the total number of reported cases. (For example, for children age 0 up through 4 years, divide 40 by 50. The answer is 0.8.)

4. Multiply the answer by 100 to calculate the percent. (Multiply 0.8 X 100. The answer is 80%.)

Table **: Measles cases by age group

Age group	Number of reported cases	% of reported cases in each age group
0-4 years	40	51.3%
5-14 years	9	11.5%
15 years and older	1	1.3%
Age unknown	28	35.9%
Total	78	100%

3.5.3 Calculate a case fatality rate

A case fatality rate helps to:

- Indicate whether a case is identified promptly
- Indicate any problems with case-management once the disease has been diagnosed
- Identify a more virulent, new or drug-resistant pathogen.
- Indicate poor quality of care or no medical care.
- Compare the quality of case management between different catchment areas, cities, and districts.

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

To calculate a case fatality rate:

1. Calculate the total number of deaths. (In the example of the measles data, there are 5 deaths.)

2. Divide the total number of deaths by the total number of reported cases. (For example, the total number of reported cases is 78. The number of deaths is 5. So divide 5 by 78. 5 ÷ 78 is 0.06.)

3. Multiply the answer by 100. (0.06 X 100 equals 6%.)

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

3.6 Draw conclusion from the analysis

Depending on how often data is reported to the next level (for example, monthly):

3.6.1 Review the updated charts, tables, graphs and maps

Review the analysis tools to make sure that:

- The total number of cases and deaths under surveillance is up-to-date.
- The case fatality rates are calculated and up-to-date
- The geographical distribution of the cases and deaths are described and include case fatality rates as appropriate.

3.6.2 Compare the situation with previous months, seasons and years

1. Observe the trends on the line graphs and look to see whether the number of cases and deaths for the given disease is stable, decreasing or increasing.

2. If case fatality rates have been calculated, is the rate the same, higher, or lower as it was in the previous months?

3.6.3 Determine if thresholds for action have been reached

Thresholds are markers that indicate when something should happen or change. They help surveillance and program managers answer the question, "When will you take action, and what will that action be?"

Thresholds are based on information from two different sources:

- A situation analysis describing who is at risk for the disease, what are the risks, when is action needed to prevent an wider outbreak, and where do the diseases usually occur?

- International recommendations from technical and disease control program experts.

Districts may decide to observe thresholds for the most critical diseases in their area. It is not useful to have a threshold or trigger occurring for multiple diseases constantly. Health Workers will lose their willingness to

truly watch for trends and respond to problems if they become overextended.

These guidelines recommend two types of thresholds: an alert threshold and an action threshold. Not every disease has both types of thresholds, although each disease certainly has a point where a problem needs to be reported and some action taken. The thresholds as described in these guidelines represent the continuum of recommended practices and are used to describe where action is recommended. Detailed thresholds for specific diseases are in Section 8 of these guidelines. Definitions of the thresholds are included in this section.

An ***alert threshold*** suggests to Health Workers that further investigation is needed. Depending on the disease, an alert threshold is reached when there is one suspected case (as for an epidemic-prone disease or for a disease targeted for elimination or eradication) or when there is an unexplained increase seen over a period of time in monthly summary reporting. Health Workers respond to an alert threshold by:

- Reporting the suspected problem to the next level
- Reviewing data from the past
- Requesting laboratory confirmation to see if the problem is one that fits a case definition
- Being more alert to new data and the resulting trends in the disease or condition
- Investigate the case or condition
- Alert the appropriate disease-specific program manager and district epidemic response team to a potential problem.

An **epidemic threshold** triggers a definite response. It marks the specific data or investigation finding that signals an action beyond confirming or clarifying the problem. Possible actions include communicating laboratory confirmation to affected health s, implementing an emergency response such as an immunization activity, community awareness campaign, or improved infection control practices in the health care setting.

Suggested thresholds that alert Health Workers to a possible outbreak are in the Annex to Section 4. Also refer to the disease-specific guidelines in Section 8.

3.6.4 Summarize the analysis results

Consider the analysis results with the following factors in mind:

- Trends for inpatient cases describe increases and decreases for the most severe cases. Deaths are most likely to be detected for cases that are hospitalized. The reporting of the case according to the definition is likely to be more accurate than those reported for outpatient cases.

- Increases and decreases may be due to factors other than a true increase or decrease in the number of cases and deaths being observed. The program objectives for the disease reduction activities in your area should be to decrease the number of cases and deaths over time.

- If this decrease is not occurring, and the number of cases is remaining the same or increasing, consider whether any of the following factors are affecting reporting:

  - Has there been a change in the number of health facilities reporting information?
  - Has there been any change in the case definition that is being used to report the disease or condition?
  - Is the increase or decrease a seasonal variation?
  - Has there been a change in screening or treatment programs? In community outreach or health education activities that would result in more people seeking care?
  - Has there been a recent immigration or emigration to the area or increase in refugee populations?
  - Has there been any change in the quality of services being offered at the facility? For example, lines are shorter, Health Workers are more helpful, drugs are available, clinic fees are charged.

3.6.5 Compare this month's achievement towards disease reduction targets

Many public health programs have set disease reduction targets. There may be targets for individual health facilities, for communities and for the district as a whole. Collaborate with the managers of the public health activity programs to discuss progress towards the targets based on the analysis results.

If analysis results indicate that the program strategy is not leading to a change or an increase in the number of cases being detected and treated, then discuss ways to improve the situation. For example, any increases or lack of decline in the number of cases should prompt further inquiry and action to improve the quality of the public health program. Consider improvements such as:

- Improve drug availability for pneumonia case management in children under 5 years of age
- Improve drug availability at least for pregnant women and children during the malaria season
- Work with community Health Workers to improve community awareness about when to bring children to the health facility for treatment for diarrhoea with dehydration, pneumonia, and malaria.
- Expand HIV/AIDS prevention education to reach youth not in school.
- Improve immunization coverage in areas of highest risk for a given vaccine-preventable disease (measles, meningitis, neonatal and maternal tetanus, yellow fever)

3.7 Summarize and use the analysis results to improve public health action

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

- Conduct an investigation to find out where there is an increase in the number of cases.
- Collaborate with specific disease reduction programs to intensify surveillance if an alert threshold has been crossed,
- Advocate with political leaders and the community for more resources, if a lack of resources is identified as a cause for the increased number of cases.

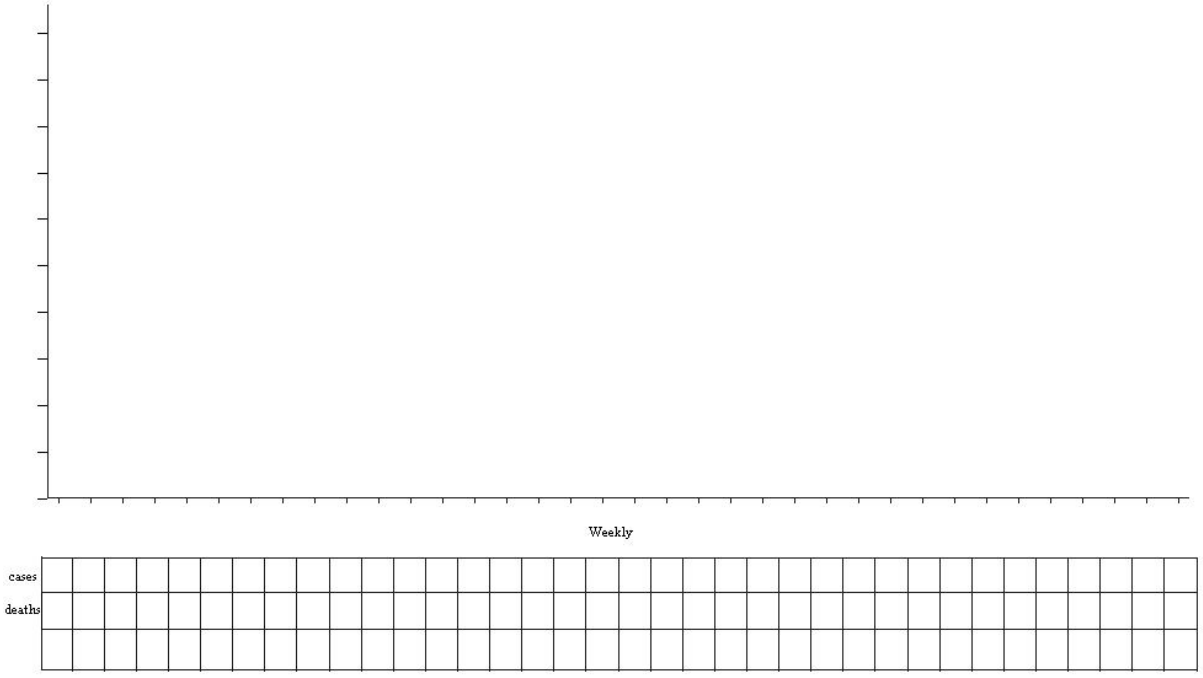
How to investigate public health problems is in Section 4.0.

Providing feedback to other levels of the health system and the community is in Section 6.0.

Annexe to section 3

- ANNEX 17 Sample graph for time analysis
- ANNEX 18 Sample tables for person analysis

Annex 17. Sample Graph for Time Analysis



Annex 18. Sample tables for person analysis

These are examples of person analyses that may be done for outbreak data or at the end of the year to analyze summary data for case-based surveillance reports.

Age distribution

Age Group	Number of reported cases	% of reported cases
0 - 4 years		
5 - 14 years		
15 years and above		
Sub-total		
Number with missing data		
Total		

Location: Urban versus rural

Location	Number of reported cases living in this area	% of reported cases
Urban		
Rural		
Sub-total		
Number with missing data		
Total		

Gender distribution

Gender	Number of reported cases	% of reported cases
Female		
Male		
Sub-total		
Number with missing data		
Total		

Comparing Inpatient and Outpatient Status

Source of report	Number of reported cases	% of reported cases
In-patient		
Out-patient		
Sub-total		
Number with missing data		
Total		

Comparing immunization status and outcome

Number of doses	Number survived	Number deceased
Zero doses		
1 dose		
2+ doses		
Sub total		
Number (%) with missing data		
Total		

Section 4

Investigate reported outbreaks and other public health problems, conditions and events

This section describes how to:

- Decide to investigate a reported outbreak or other public health problems and events
- Plan and carry out an outbreak case investigation
- Analyze the investigation results to determine what caused the problem.

4.0 Investigate suspected outbreaks and other public health problems, conditions and events

An investigation is a method for identifying and evaluating people who have been exposed to an infectious disease or affected by an unusual health event. The investigation provides relevant information to be used in taking immediate action and improving longer term disease prevention activities. The steps for conducting an investigation of a suspected outbreak due to an infectious disease can also be used to investigate other public health problems in the district. The purpose of an investigation is to:

- Verify the outbreak or the public health problem.
- Identify and treat additional cases that have not been reported or recognized.
- Collect information and laboratory specimens for confirming the diagnosis.
- Identify the source of infection or cause of the outbreak.
- Describe how the disease is transmitted and the populations at risk.
- Select appropriate response activities to control the outbreak.
- Strengthen prevention activities to avoid future recurrence of the outbreak.

In Sierra Leone, districts have the overall responsibility for investigating outbreaks. In other countries, health facilities (at least large health facilities with adequate numbers of staff and a public health officer or team) will undertake some or all aspects of investigating outbreaks for some diseases or conditions. These guidelines assume that the district level has responsibility for leading the investigation.

4.1 Decide to investigate a reported outbreak and public health problems, conditions and events

For some communicable diseases, a single suspected case is the trigger for taking action, reporting the case to a higher level, and conducting an investigation. These are dangerous diseases with the potential for

explosive outbreaks or with high case fatality rates if cases are not treated promptly.

For other diseases, the trigger is when a certain threshold is reached. Health worker should promptly investigate the problem and respond to the

immediate cases. Preparations for taking a wider public health response should be made. Alert and epidemic thresholds are described in Section 3.6.3.

> ***NOTE:*** *The threshold for some diseases will not change between districts or health facilities because they are thresholds for immediately notifiable diseases and are set by national policy.*

Some health events require investigations to be started immediately. Districts should investigate suspected outbreaks within 48 hours of notification.

Conduct an investigation when:

- The district receives a report of a suspected outbreak of an immediately notifiable disease
- An unusual increase is seen in the number of deaths during routine analysis of data
- Alert or epidemic thresholds have been reached for specific priority diseases.
- Communities report rumours of deaths or about a large number of cases that are not being seen in the health facility
- A cluster of deaths occurs for which the cause is not explained or is unusual (for example, an adult death due to bloody diarrhoea).

To establish health facility thresholds for notifying the district about other diseases such as shigellosis, measles, diarrhoea with some or severe dehydration in children less than 5 years, and meningitis, meet with the health facility staff to discuss the following steps:

1. If data from previous years are available, review trends in cases and deaths due to these diseases over the last 5 years. Determine a baseline number to describe the current extent of the disease in the catchment area.

2. As appropriate, take into account factors for diseases such as cholera with seasonal increases.

3. State the threshold clearly as a number of cases per month or week, so that health worker responsible for surveillance activities can readily recognize when the threshold is reached.

4. Periodically, revise the epidemic threshold and adjust it accordingly depending on past and current trends for the disease. If the extent of the disease's burden is changing

(for example, cases are increasing), then adjust the threshold.

Examples of thresholds or triggers for taking action to implement interventions or investigations of a case or outbreak are in Section 8 of these guidelines.

These thresholds are recommended by WHO/AFRO and have been adapted by the Ministry of Health and Sanitation to meet national policies, priorities, and capacity to respond.

4.2 Record reported outbreaks and rumours, conditions or events

Prepare a method for tracking the reporting of and response to outbreaks and rumours reported to the health facilities and the district. A sample form for tracking reports of outbreaks is in Annex 19 of this section. If the district is using a district analysis workbook, include this form in the workbook.

The purpose of tracking reported outbreaks is to ensure that the report of each suspected outbreak or rumour, conditions or events is followed by some action and resolution. Keeping this record will help to gather information for evaluating the timeliness and completeness of the outbreak investigation and response process.

4.3 Verify reported outbreak and rumours, conditions or events

Promptly verify reported outbreaks from health facilities or community rumours. This is important for making sure that timely decisions are made to prevent expending resources on investigating events that are not true outbreaks of priority diseases.

Consider the following factors:

- Source of information (For example, is the source of the rumour reliable? Is the report from a health facility?)
- Severity of illness
- Number of reported cases and deaths
- Transmission mode and risk for wider transmission
- Political or geographic considerations
- Maintaining good public relations
- Available resources.

The outbreak situation, when compared to the above factors, may cause the district to treat the investigation with more urgency. For example, reports of a suspected Viral Haemorrhagic Fever (VHF) (Lassa Fever) case are treated with more urgency than a report of a neonatal tetanus case

because the risk for wider transmission of the VHF is greater. Regardless of the factors, suspected outbreaks (including immediately notifiable cases) from health facilities need to be reported within 48 hours.

4.4 Prepare to conduct an investigation

Coordinate the investigation objectives with the DHMT responsible for control of that disease or condition. Make sure that the objectives of the investigation will provide the essential information for implementing the most appropriate and relevant response. Plan to use appropriate methods that are relevant to the disease or condition being investigated. If epidemic response and preparedness activities have taken place in the district or health facility, staff who might be able to take part in the investigation should already be identified and trained.

4.4.1 Specify the tasks the health worker is expected to do

Inform health worker about the tasks they will be expected to do and the functions they will support. Contribute to the positive motivation for doing the investigation. For example, make sure that the investigation team understands the link between the investigation and the selection of response activities for preventing additional cases and saving lives.

4.4.2 Define supervision and communication line

Make a communication plan. Prepare a diagram showing who will report to whom and how information will move both within the investigation team and between the district and other levels, including the most local level. District Medical Officer will communicate with the Directorate of Disease Prevention and Control, (National Disease Surveillance coordinator) the media and the community. State the methods for communicating and how often it should be done during an outbreak to keep officials informed. Methods may include daily updates by radiophone, facsimile, electronic mail or conference calls.

Show on the diagram the lines of authority and the roles of each staff on the team. Define the role of non-health workers and how they should be supervised.

4.4.3 Decide where the investigation will take place

1. Review information already known about the suspected illness, including its transmission method and risk factors. Use this information to define the geographic boundaries and target population for conducting the investigation**.** Begin the investigation in the most affected place.

2. Contact nearby health facilities to see if they have seen similar cases or an increase in cases with the same diagnosis.

3. Involve the community and local health facility staff in planning and conducting the investigation. Information about local customs, culture, taboos and routines could affect the success of the outbreak investigation.

4.4.4 Obtain the required authorizations

Observe the appropriate authorizations, clearances, ethical norms, and permissions that are required to do the investigation. (Local social norms should be kept in view during the investigation).

4.4.5 Finalize procedures, forms and methods for collecting information and specimens

Review with the investigation team how to collect the required information and record it. For example, at a minimum, staff should know how to gather and record information on a line list.

Select the variables to identify, record and analyze for the disease being investigated. Depending on staff responsibilities, review how to identify and record information for preparing the following:

- Line list for summarizing time, place and person analysis
- Epidemic/Epidemiologic curve
- Spot map
- Analysis tables for risk factors, age group, gender, immunization status and so on.

Refer to the steps in Section 3.0.

4.4.6 Arrange transport

Make travel arrangements for getting to and from the site of the investigation and for travelling during the investigation. Make sure transportation for moving specimens to the appropriate laboratories have been arranged.

4.4.7 Gather supplies for collecting lab specimens and case management of initial cases

In each district, there should be a rapid response kit pre-positioned that contains supplies and equipment for carrying out the investigation.

If a kit is not available in the district, look at the disease specific program guidelines and talk to laboratory specialists to find out the requirements for laboratory supplies for proper collection, storage, and transport of relevant specimens. Use of Personal Protective equipment (PPE) and disinfection materials is strongly recommended.

Refer to the laboratory chart in Section 1.0 and to the disease specific guidelines in Section 8.0

4.5 Confirm the diagnosis

4.5.1 Review clinical history

Examine the patient(s) to confirm that their signs and symptoms meet the case definition. Ask the patient or a family member who can speak for the patient:

- Where do you live?
- When did the symptoms begin?
- Who else is sick in your home (or workplace, village, neighbourhood)
- Where have you travelled recently?
- Where did you live within the 2 weeks prior to the onset of symptoms (residence at time of infection)?
- Were you visited by anyone within the last 2 weeks?

4.5.2 Collect laboratory specimens and obtain laboratory

results

If the disease is confirmable by laboratory testing, refer to the laboratory chart in Section 1.0 to determine the diagnostic test and the specimen that is required. The chart also describes how to collect, store and transport the specimen, and how many specimens to collect to confirm an outbreak for a particular disease.

Review laboratory results with the investigation team, clinicians, and laboratory staff at the health facility. Are the laboratory results consistent with the clinical findings? Seek additional assistance from national level program managers or technical experts if you have any questions about the laboratory results.

4.5.3 Isolate and Manage the cases

Strengthen infection control (isolate if indicated) and case management where the patients are being treated. Provide the health facility with advice, support, and supplies as indicated by the case management guidelines. For example:

- Monitor the patients' signs and symptoms
- Treat the patient with available recommended drugs and therapies
- Support the health facility in enhancing infection control as needed depending on the specific disease. Use standard precaution with all patients in the health facility, especially during an outbreak of a disease transmitted by contact with contaminated supplies and body fluids.

4.6 Search of additional cases

Once the initial cases have been confirmed and treatment has begun, actively search for additional cases.

4.6.1 Search for suspected cases and deaths in the health facility records

In the health facilities where cases have been reported, search for additional cases and deaths in the registers. Look for other patients who may have presented with the same or similar signs and symptoms as the disease or condition being investigated. Request health workers to search for similar cases in the registers of neighbouring health facilities.

See Annex 20 at the end of this section for instructions on conducting a register review. Make sure to follow up any cases that have been allowed to go home.

4.6.2 Search for contact persons, suspected cases and deaths in the community

Identify areas of likely risk where the patients have lived, worked, or travelled. Also talk to other informants in the community such as community leaders, traditional healers, extension workers, blue flag volunteers, traditional birth attendants, pharmacists or school teachers.

The areas for the search may be influenced by the disease, its mode of transmission, and risk factors related to time, place and person analysis. Visit those places and talk to people who had or were likely to have had contact with the patient. Ask if they or anyone they know has had an illness or condition like the one being investigated. Find out if anyone else in the area around the case has been ill with signs or symptoms that meet the case definition. Collect information that will help to describe the magnitude and geographic extent of the outbreak.

Refer newly identified cases to the health facility for treatment.

4.7 Record information about the additional cases **(see 4.6)**

For each new case either in the health facility register or in searches of the community that fits the surveillance case definition, record the collected information on either a case-based reporting form, line list or other recommended form.

4.7.1 Record information on a case reporting form

Record information on a case reporting form for at least the first five patients. Also record information on a case form for all those from which laboratory specimens will be taken. For each case, record at least:

- The patient's name, address, and village or neighbourhood and locating information. If a specific address is not available, record information that can be used to contact patients if additional information is needed or to notify the patient about laboratory and investigation results.
- The patient's age gender and occupation. This information is used to describe the characteristics of the population affected by the disease.

- The date of onset of symptoms and date the patient was first seen at the health facility
- Relevant risk factor information such as vaccination status if the disease being investigated is a vaccine-preventable disease.
- The name and designation of the person reporting the information

NOTE: *To streamline data collection methods, WHO/AFRO recommends using the case reporting form as a laboratory transmittal slip. (See the sample form in Annex 9).*

Some diseases have their own more detailed case investigation forms. A copy of the more detailed forms for neonatal tetanus and AFP case investigation are in Annexes 24 and 25 of this section.

According to national guidelines, the more detailed neonatal tetanus and AFP case forms should be completed by the health facility or by a member of the district team when the district is notified about the case.

4.7.2 Record information about additional cases on line list

When more than five to ten cases have been identified, and the required number of laboratory specimens have been collected, record any additional cases on a line list. Use the line list as a laboratory transmittal form if 10 or more cases need laboratory specimens collected on the same day and specimens will be transported to the lab in a batch.

4.8 Analyze data about the outbreak **(see4.7)**

The methods for analyzing outbreak data are similar to how the analysis of summary data is described in Section 3. Data about the outbreak is analyzed and reanalyzed many times during the course of an outbreak.

During the initial analysis, summarize the outbreak or event and look for clues about where the outbreak or event is occurring, where it is moving, the source of the outbreak (from a single source, for example, a well or a funeral), and the persons at risk of becoming ill (for example, young children, refugees, persons living in rural areas, and so on). Present the data in the following way:

- Draw a histogram representing the course of the disease (an "epi" curve).
- Plot the cases on a spot map.
- Make tables of the most relevant characteristics for cases (for example, comparing age group with vaccination status).

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

4.8.1 Analyze data by time

Prepare a histogram using data from the case reporting forms and line lists. Plot each case on the histogram according to the date of onset. Use symbols to represent each case.

As the histogram develops, it will demonstrate an epidemic curve. Define the geographic area the curve will represent. For example, decide if the curve should describe the entire district or the health facility catchment area where the cases occurred.

The results of the time analysis allows program managers and surveillance officers to look back at the outbreak and answer questions such as when patients were exposed to the illness and the length of the incubation period. Highlight significant events on the histogram with arrows. For example, review the log of reported outbreaks and rumours to highlight the dates when:

- Onset of the first (or index) case
- The health facility notified the district
- The first case was seen at the health facility
- The district began the case investigation
- A concrete response began
- The district notified the national level

NOTE: *The purpose for using arrows to highlight these events is to evaluate the timeliness of detection, investigation and response to the outbreak. For example, monitoring the interval between the onset of the first known case and when the first case was seen in the health facility is an indicator of the community's awareness of the disease's signs and symptoms and the need to refer cases to the health facility. These intervals are discussed further in Section 7.0 Evaluate and Make Improvements to the System.*

Section 3.0 describes in more detail how to prepare and plot cases on a histogram.

Section 7.0 describes how to use information on the histogram to monitor and evaluate timeliness of the case detection, investigation and response actions.

4.8.2 Analyze data by place

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

- Whether clusters of cases are occurring in a particular area
- Travel patterns that relate to the method of transmission for this disease
- Common sources of infection for these cases.

Please see Section 3 for detailed steps describing how to prepare a map for marking the location of suspected and confirmed cases.

Mark the following on a map the area where the suspected and confirmed cases occurred:

- Roads, water sources, location of specific communities and other factors related to the transmission risk for the disease under investigation. For example, a map for neonatal tetanus includes locations of traditional birth attendants and health facilities where mothers deliver infants.

- Location of the patients' residences or most relevant geographic characteristic for this disease or condition (for example, by village, neighbourhood, work camp, or refugee settlement. Another example is when mapping patients during a meningitis outbreak, locate the school where the patients attend.)

- Other locations that are appropriate to the disease being investigated. Please see the disease specific guidelines for specific recommendations for analyzing data by place.

4.8.3 Analyze data by person

Review the case investigation forms and line lists and compare the variables for each person suspected or confirmed to have this disease or condition. For example, depending on the factors that must be considered in planning a specific response, compare the total number and proportion of suspected and confirmed cases according to:

- Age or date of birth
- Gender
- Urban and rural residences
- Vaccination status

- Inpatient and outpatient status
- Risk factors, for example,, occupation
- Outcome of the episode, for example, whether the patient survived, died or the status is not known.
- Laboratory results
- Final classification of the case
- Other variables relevant to this disease (death by age group, for example).

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

Please see the disease specific guidelines for recommendations about the essential variables to compare for each disease. Please refer to Section 3.0 for detailed steps about preparing tables for analyzing data by person.

4.9 Interpret results of analysis (see 4.8)

Review the analysed results and make conclusions about the outbreak. For example:

- What was the causal agent of the outbreak?
- What was the source of infection?
- What was the transmission pattern?
- What control measures were implemented and to what effect?

4.9.1 Interpret time analysis results

Look at the histogram and observe the shape of the epidemic curve. Draw conclusions about when exposure to the agent that caused the illness occurred, the source of infection and related incubation period.

- If the shape of the curve suddenly increases to develop a steep up-slope, and then descends just as rapidly, exposure to the causal agent was probably over a brief period of time. There may be a common source of infection.
- If exposure to the common source was over a long period of time, the shape of the epidemic curve is more likely to be a plateau rather than a sharp peak.
- If the illness resulted from person-to-person transmission, the curve will present as a series of progressively taller peaks separated by incubation periods

4.9.2 Interpret place analysis results

Use the map to:

- Describe the geographic extent of the problem.
- Identify and describe any clusters or patterns of transmission or exposure.
- Depending on the organism that has contributed to this outbreak, specify the proximity of the cases to likely sources of infection.

4.9.3 Interpret person analysis results

Information developed from the person analysis is essential for planning the outbreak response because it describes more precisely the population at risk for transmission of this disease or condition. For example, if yellow fever cases occurred in patients less than 15 years of age, then the immunization response action would need to target children less than 15 years of age.

4.9.4 Calculate case fatality rates

Refer to the steps in Section 3 that describe how to calculate case fatality rates.

4.9.5 Conclusion and recommendations of the investigation

After reviewing the analysis results, formulate conclusions and recommendations about the outbreak:

- Confirmation of the outbreak/public health problem (is this situation an outbreak/public health problem?)
- Population affected and at risk
- Possible causes of the outbreak/ public health problem, laboratory results, source of infection, mode of transmission, attack rate, case fatality rate and possible risk factors.
- Measures already initiated to contain the outbreak
- Recommendations
    - For controlling the situation
    - Investigation/studies

4.10 Report of outbreak investigation

District rapid investigation team should prepare immediately an outbreak investigation report. A detailed report on the outbreak investigation should be prepared and disseminated immediately to all concerned including the health facility where the outbreak occurred.

A suggested outline for writing an investigation report is in Annex 39 section 6.

4.11 Conduct a risk assessment and identify the determinants to explain the outbreak, condition and event

- Signals (based on events or indicators) will be assessed to determine to what extent they are urgent (e.g. an event with serious public health impact and/or unusual or unexpected nature with high potential spread).
- Assessment is initiated within 24 hours after the verification of the event, takes into account the reports of the rapid response teams and the investigation of the events, and is based on Annex II of IHR.
- A designated authority is responsible for risk assessment and should be reachable on a 24/7 basis by all means of communications.
- Once a signal is considered as a PHEIC, notify immediately concerned authorities. Regular testing is carried out and reports are produced and shared.

Annexes to Section 4

- ANNEX 19 Log of suspected outbreaks and rumours
- ANNEX 20 How to conduct a register review
- ANNEX 21 Checklist of laboratory supplies for use in an outbreak investigation
-
- ANNEX 22 Recommended list of Personal Protective equipment

  ANNEX 23 Event Risk Assessment
- ANNEX 24 Neonatal tetanus case investigation form
- ANNEX 25 AFP case investigation form
- ANNEX 26 Measles case investigation form
- ANNEX 27 VHF case investigation form
- ANNEX 28 Contact record form
- ANNEX 29 Contact tracing form

Annex 19. District Log of suspected outbreaks, conditions and events or rumours

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

District:……..Health facility: *Name of reporting officer:* *Date:*

Condition or Disease (1)	Number of cases initially reported (2)	Location (Health Centre, village, etc) (3)	Date of notification of suspected outbreaks (4)	Date suspected outbreak was investigated (5)	Result of investigation (Confirmed, Ruled Out, or Unknown) (6)

Annex 19. District Log of suspected outbreaks, conditions and events or rumours (continued)

Date Outbreak Began (Date onset of index case/date crossed threshold or first cluster) (7)	Date a case was first seen at a health facility (8)	Date Concrete intervention began (9)	Type of Concrete Intervention that was begun (10)	Date District Notified National Level of the Outbreak (11)	Date District received national response (12)	Comments (13)

Annex 20. How to conduct register review

The purpose of a register review is to collect information on cases admitted to the health facility during a specific period. Explain that the information will be used to determine what caused the outbreak or increase in number of cases.

1. ***Select the facilities for review***. Depending on the local conditions and the priority disease or condition being investigated, select:

- Any inpatient facility with more than 10 hospital beds or inpatients at any given time. Give priority to government health facilities.

- Large reference or teaching hospitals with paediatric wards because they receive referrals from other health facilities.

- Small hospitals or health facilities that serve remote areas and high risk populations. For example, nomadic groups, refugees, or areas without regularly scheduled health services.

2. ***Meet with the health facility staff and explain the purpose of the review.***

Explain to the health facility's senior staff the purpose of the review. The information will assist the district and health facility in determining the most appropriate action for limiting the outbreak and preventing future cases from occurring. Emphasize that the activity is an information-gathering exercise, and is not a review of health worker performance.

3. ***Arrange to conduct the review.***

Arrange a time to conduct the review when staff who will assist with the review are present and available to help or to answer questions.

4. ***Identify sources of information***.

During the visit, depending on the priority disease or condition being investigated, check inpatient registers for the paediatric and infectious disease wards. The inpatient register for the paediatric ward is a good source because it lists all children admitted to the ward. Annual summary reports are not always accurate, and outpatient registers often include only a provisional diagnosis.

Review the system and procedures health workers use to record information in the registers about diagnoses. Make sure that the information needed for investigating any suspected case is available. At a minimum, the register should include:

-- the patient’s name and where he /she was born
-- the signs and symptoms
-- date of onset of symptoms and outcome (for example, date of death, if relevant)
-- vaccination status, if appropriate to this disease

If the health facility does not keep at least the minimum information, talk with senior staff about how to strengthen the record keeping so that the minimum information is collected.

5. ***Do the record review at the scheduled day and time***.

Go to the selected wards as scheduled. During the visit, look in the health facility registers for cases and deaths that may be suspected cases. These should be cases or deaths that meet the standard case definition for suspected cases. Find out whether the suspected case was investigated and reported according to national guidelines.

6. Line lists the suspected cases that are found.

Record information about the suspected cases. This information will be used during case investigation activities.

7. Provide feedback to the health facility staff.

Meet with the health facility supervisor and discuss the findings of the activity. Use the opportunity to review any features of case management for the illness that may help health workers in the facility. Reinforce the importance of immediate reporting and case investigation as tools for prevention of priority diseases and conditions.

8. Report any suspected cases to the next level.

Report the suspected cases according to local procedures. Investigate the case further to determine the factors that placed the patient at risk for the disease or condition. Develop an appropriate case response.

Annex 21. Checklist of laboratory supplies for use in an outbreak investigation

- For using standard safety precautions when collecting and handling all specimens:

- _____ Pieces of bicycle soap and bleach for setting up handwashing stations (cholrine based soap for VHF)
- _____ Supply of gloves
- _____ Safety boxes for collecting and disposing of contaminated supplies and equipment
- Gowns and masks, goggles and other barrier nursing equipment and materials

---

- For collecting laboratory specimens:

Blood
_____ Sterile needles, different sizes
_____ Sterile syringes
_____ Vacutainers
_____ Test tube for serum
_____ Antiseptic skin disinfectant
_____ Tourniquette
_____ Transport tubes with screw-on tops
_____ Transport media - Cary-Blair, Trans-Isolate
_____ Sterile and needles and syringes

Cerebral spinal fluid (CSF)
_____ Local anaesthetic
_____ Needle and syringe for anaesthetic
_____ Antiseptic skin disinfectant
_____ Screw-top tubes and tube rack
_____ Microscopic slides in a box
_____ Trans-Isolate media

Blood films (malaria)
_____ Sterile or disposable lancet
_____ Glass slides
_____ Slide box
_____ Alcohol and cotton wool

Stool
_____ Rectal swabs
_____ Cary-Blair transport media
_____ Plastic spoon: 0.85% saline and specimen container

- If health facility has a centrifuge:

_____ Sterile pipette and bulb
_____ Sterile glass or plastic tube, or bottle with a screw-on top

---

- For packaging and shipping samples:

_____ Cold box with frozen ice packs or vacuum flask
_____ Cotton wool for cushioning sample to avoid breakage
_____ Shipping labels for addressing shipment to lab
_____ Labels for marking “store in a refrigerator” on outside of the shipment box
_____ Case forms and line lists to act as specimen transmittal form
_____ Marking pen to mark tubes with name of patient and ID number (if assigned by the district)

Annex 22. Recommended List of Personal Protective Equipment

Composition of one set of PPE	**WHO Deployment Kit**
1 surgical gown	100 surgical gowns
1 coverall	100 coveralls
1 head cover	100 head cover
2 pairs of goggles	50 pair of goggles
1 pair of rubber gloves	100 pairs
1 mask N95	200 pieces
1 boot cover*	0
1 box 50 pairs of examination gloves	800 pairs of examination gloves
1 plastic apron re-usable	20 pieces
1 pair of rain boots	20 ? rain boots
1 hand sprayer	2 of 1.5 litres each
1 Back sprayer	1 back sprayer of 10-12 litres
specimen containers	
Scotch of tapes	3 rolls
Anti fog for goggles	3 bottles
Chlorine	
N.B: 1:- To be purchased locally: Chlorine (international restrictions), gum boots (few is included in the kit) * Not a must	

Annex 23. Events Risk assessment

Definition

Risk assessment is an iterative process that continues from the time the event is first detected by WHO, to the time the event is “closed”.

IHR Core requirements

- Nominate a district level authority responsible of risk assessment
- Set up a risk assessment committee composed of a medical clinician, a public health microbiologist, an environment al health officer
- Ensure that the committee is reachable on a 24/7 basis by all means of communications
- Initiate assessment within 24 hours after the verification of the event , the short brief by the RRT and then the investigation report
- Notify immediately concerned authorities once a signal is considered as a PHEIC,

Tools for risk assessment

The main tool for risk assessment is the **Decision Instrument (**Annex 2 of the IHR (2005) and Annex 4 of the TG).The following list of risk questions does not intend to be exhaustive but rather enable rapid event assessment. These questions supplement (Annex 2 of the IHR (2005) and Annex 4 of the TG). In addition, once the aetiology of the event is known, further refinement of the risk assessment may be required.

- Does the event fulfil the minimum criteria for notification in accordance with Annex 2 of the IHR (2005) and Annex 4 of the TG?
- Has sufficient information been provided to adequately assess the event? What additional information is required to predict disease/hazard spread and event impact?
- Is there evidence that international spread of the hazard and/or disease has already occurred?
- Do other States need to know about this event in order to prevent or prepare for similar occurrences?
- What is the reported incidence, prevalence, morbidity and mortality, if available?
- In what context is this event occurring (vulnerability assessment - population at risk, technical [e.g. diagnostic capacity], response and support infrastructure, socio-political, ecological/environmental, etc)?
- Do WHO guidelines indicate the need for international contact tracing or food/product recall? Has there been a request for WHO’s assistance in international contact tracing?
- Have similar events in the past resulted in the international spread of disease?
- Are evidence-based prevention and control measures available, and can they be implemented in the affected State without assistance?
- Does the event pose a threat to the routine safety and sanitary environments for travellers, or constitute a public health emergency at designated ports of entry?
- What is the public perception of risk, level of community reaction and level of media interest?
- What will happen if WHO does nothing?
- Should WHO make recommendations for the international control of this event? (consequence - Senior Management will be notified and briefed, options will be presented)

- What might be the unintended consequences of WHO involvement (legal, political, economic etc)?
- Is the response to the event by other State Parties commensurate to the risk?

Outcome of Risk Assessment

Although the risk assessment is ongoing and iterative, at any point in time an event can be at one the following risk levels, with the noted consequent actions:

- **Discard**: No international risk and no international risk expected, close the event, document the assessment in EMS
- **Monitor:** the event is currently of no international public health importance but requires continuous assessment;
- **Disseminate:** event information to the international community to prepare or prevent similar events:
- **Escalate:** to senior management as Event Management Group (EMG) and/or other WHO units cannot reconcile their differences in the technical assessment of an event or for information dissemination;
- **Recommend:** to senior management to invoke PHEIC procedure.

ANNEX 24. CASE INVESTIGATION FORM – NEONATAL TETANUS

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

IDENTIFICATION

District: _____ **Province: _____**

Nearest Health Facility to Village: _____ **Village/ Neighbourhood: _____** **Town/ City: _____**

Address: _____

Name(s) of patient: _____ Mother: _____

Sex: ☐ 1 = Male, 2 = Female Father: _____

NOTIFICATION/INVESTIGATION

Notified by: _____ **Date Notified: _____/_____/_____** **Date Case Investigated: _____/_____/__**

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

Question	Answer
Mother vaccinated with TT?	
Have card?	
Number of doses:	
Vaccination status of mother prior to delivery? **	

**1=up-to-date, 2= not up-to-date, 9= unknown

1st _____/_____/_____ **4th** _____/_____/_____
2nd _____/_____/_____ **5th** _____/_____/_____
3rd _____/_____/_____ **If >5, last dose**_____/_____/

BIRTH OF INFANT (0-2 months)

Date of birth: _____/_____/_____ Please use the following key, 1=Yes, 2=N0, 9=Unknown, where applicable.

Questions		Questions	
Mother received antenatal care?		Location of birth: ***	
How many prenatal visits?		If birth in institution, name of institution:	
Attended by a trained TBA/midwife?		Cut cord with a sterile blade?	
If attended by a trained TBA/midwife, give name		Cord treated with anything?	
Attended by doctor/nurse? Give name		Describe treatment of cord: Where?	

*** 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 Convulsions?	
Normal cry and suck during first 2 days?		Complications? If yes list	
Stopped sucking after 2 days?		Did the baby die?	
Arched back?		Age at death:	Days
Stiffness?		Age of onset in days:	Days (99=Unknown)

Onset of symptoms: _____/_____/_____

TREATMENT

Date of admission _____/_____/_____

Medical record number: _____

Facility Address:

Questions	Answer 1=Y, 2=N, 9=U
Seen in OPD?	
Admitted?	

COMMENTS:

RESPONSE Please use the following key, 1=Yes, 2=No, 9=Unknown, where applicable.

Questions	Answer
Mother given protective dose of TT within 3 months of report?	
Supplemental immunization within same locality as the case?	

Date of response: _____/_____/_____

Details of response: _____

_____

FINAL CLASSIFICATION OF THE CASE: Neonatal Tetanus: ☐ 1=Yes, 2=No, 9=Unknown

INVESTIGATOR

Name: _____ Title: _____

Unit: _____ Address: _____ Phone: ____

ANNEX 25. CASE INVESTIGATION FORM – ACUTE FLACCID PARALYSIS

Official Use Only **Epid Number**: _____/_____/_____/_____/_____
(completed by district team) Province District Year Onset Case Number Received : _____/_____/_____

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

Address: _____

Name(s) of patient: _____ Mother/Father: _____
Sex: ☐ 1 = Male, 2 = Female **Date of birth:** _____/_____/_____ or **Age: years** _____ **months** _____ (If DOB is unknown)

NOTIFICATION/INVESTIGATION
Notified by: _____ **Date Notified:** _____/_____/_____ **Date Investigated:** _____/_____/_____

HOSPITALIZATION

Admitted to health facility ? ☐ 1= Yes, 2= No Date of admission _____/_____/_____ Medical record number: _____
Facility Address:

CLINICAL HISTORY Please use the following key, 1=Yes, 2=No, 9=Unknown.

Question	Answer
Fever at Onset of paralysis	
Paralysis progresses <= 3 days	
Flaccid & sudden paralysis	
Asymmetrical	

Site of paralysis

LA			RA
LL			RL

Onset of paralysis: ____/_____/____

AFTER INVESTIGATION, WAS IT TRUE AFP? ☐ 1= Yes, 2= No If "No," then the rest of the form does not need to be completed. Mark "6" for Final Classification.

VACCINATION HISTORY
Total Doses of Polio: ☐ 99=Unknown

Birth _____/_____/_____
1st _____/_____/_____
2nd _____/_____/_____
3rd _____/_____/_____
4th _____/_____/_____
If >4, last dose _____/_____/_____

SPECIMEN COLLECT
Date 1st Stool: _____/_____/_____ Date 2nd Stool: _____/_____/_____ Date Sent to National lab: ____/_____/_____

STOOL SPECIMEN RESULTS: Condition of Stool: ☐ 1=Adequate, 2= Not Adequate

_____/_____/_____ Date received by national Lab
_____/_____/_____ Date results sent by lab to district
_____/_____/_____ Date results receive by district
_____/_____/_____ Date isolate sent by national Lab to district lab
_____/_____/_____ Date differentiation result sent by district lab
_____/_____/_____ Date differentiation result received by district

Primary Isolation Results:

P1	P2	P3	NP-Ent	W1	W2	W3	V1	V2	V3	NP-Ent

FOLLOW UP EXAMINATION
Date of follow up examination: _____/_____/_____

Residual Paralysis?

LA			RA
LL			RL

Findings at Follow-up: ☐
1= Residual paralysis 3= Lost to follow-up
2= No residual paralysis 4= Death before follow-up

FINAL CLASSIFICATION OF THE CASE: ☐ 1=Confirmed, 2=Compatible, 3= Discarded 6=Pas PFA

INVESTIGATOR

Name: _____ Title: _____ Signature:_____

Unit: _____ Address: _____ Phone: _____

ANNEX 26. MEASLES CASE BASED INVESTIGATION FORM

REPORTING FORM FOR Health Facility

_____ _____ _____ _____

Health facility Reporting Epidemiological number | Location | Chiefdom | District

Reporting Form – from Health Facility/Health Worker to District Health Team

☐ AFP ☐ Cholera ☐ Diarrhoea with Blood/Shigella ☐ Dracunculiasis ☐ Neonatal Tetanus ☐ Measles ☐ Meningitis ☐ Lassa fever ☐ Yellow Fever _____ Other

_____/_____/_____
Date form received at National Level

Name(s) of Patient: _____ **Date of Birth:** _____/_____/_____ **Age:** _____ _____ _____
(If DOB unknown) **years** **months** (If <12 months) **days** (NNT only)

Patient's address: Village/Neighbourhood _____ **Sex:** ☐ M=Male F=Female

Town/City: _____ **District of residence:** _____ ☐ U=Urban R=Rural **Urban/Rural**

Locating Information: _____
If applicable, Name of mother and father if neonate or child

Date Seen at Health Facility: _____/_____/_____
Date Health Facility Notified District: _____/_____/_____

Dates of Onset: _____/_____/_____

For cases of Measles, NT (TT in mother), Yellow Fever, and Meningitis:
Number of vaccine doses received ☐ 9=unknown
For Measles, TT, YF- documented by card. For Meningitis, by history.

Date of last vaccination: _____/_____/_____
(Measles, Neonatal Tetanus (TT in mother), Yellow Fever, and Meningitis only)

Blank variable #1_____

Blank variable #2_____

In/Out patient : ☐ 1=In-patient 2=Out-patient

Outcome ☐ 1=Alive 2=Dead 9=unknown

Final Classification: ☐ 1=Confirmed 2=Probable/Compatible 3=Discarded 4=Suspected

Person Completing Form **Name:** _____ **Signature:** _____

Date Form submitted to District:_____/_____/_____

Designation ----------

Laboratory form

For Health Facility: If lab specimen is collected, complete the following information. And send a copy of this form to the lab with the specimen.

Date of specimen collection: _____/_____/_____ Specimen source: Stool Blood CSF _____

Date Specimen sent to lab: _____/_____/_____ **EPID NO** ------- --------- ------ ---------- --------

Country Province District Year onset Case No.

For the Lab: Complete this section and return the form to district team and clinician

Date lab specimen: Received _____/_____/_____ Specimen Condition: Adequate Not adequate

Name of patient.

Disease/ Condition	Type of test	Results (P=pending)	Disease / Condition	Type of test	Results	
Cholera	Culture	+ - P	Yellow Fever	IgM	+ - P	
	Direct Exam	+ - P _____ Method used for Direct Exam	Measles	IgM	+ - P	
			Rubella	IgM	+ - P	**Virus Detection**
Meningitis						
N. meningitidis	Culture	+ - P				
S. pneumonia	Culture	+ - P				
H. influenza	Culture	+ - P	CCHF	IgM	+ - P	+ - P
N. meningitidis	Latex	+ - P	Lassa	IgM	+ - P	+ - P
S. pneumonia	Latex	+ - P				
H. influenza	Latex	+ - P				
Shigella Dysenteriae	Culture	SD type 1 Other shig No shig				
	IFA>1: 64	+ - P				

Other lab results: _____

_____

Date lab sent results to district: _____/_____/_____ _____

Name of lab sending results:_____ Other pending tests: _____

Date district received lab results: _____/_____/_____ Date lab results sent to clinician by district: _____/_____/_____

NOTE: District is responsible for ensuring lab results get to clinicians. and the clinician should ensure that the results gets to the family. Failure to do so will undermine cooperation with clinicians an community on reporting of cases in the future

ANNEX 27. VIRAL HAEMORRAHGIC FEVER – CASE INVESTIGATION FORM

Date of detection of the case ___/___/___
This Case was notified by *(tick off the right answer and specified)*
□ Mobile team, # _____ □ Health Centre _____
□ Hospital _____ □ Others: _____
Form filled by (first name and surname) _____
Information given by (first name and surname) _____
Family link with the patient _____

dentity of the patient Nickname _____
First name:_____ Surname _____
For the babies, son/daughter of (name of father) _____
Birth date: ___/___/___ Age (years)_____ Sex □ M □ F
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)*
□ Miner □ House wife □ Hunter/trading game meat □ Children
□ Pupil/ Student □ Farmers □ Health worker, details: Name of health care facility_____
Service _____ qualification _____
□ Others _____

Status of the patient

Status of the patient at detection □ Alive □ Death
If dead, please specify date of death: ___/___/___
Place of death: □ Community, name village _____ Country_____
□ 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 : □ Yes □ No □ DNK
If Yes, indicate the places and the country:
Village _____ Health Centers _____ Country_____
_____ Health Centers _____ Country_____
Did the patient have fever**?** □ Yes □ No □ DNK. If yes, date of onset for the fever: ___/___/___

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

Headache:	□ Yes	□ No	□ DNK	Skin Rash	□ Yes	□ No	□ DNK
Vomiting/Nausea	□ Yes	□ No	□ DNK	Bleeding from injection sites	□ Yes	□ No	□ DNK
Anorexia/Loss of Appetite	□ Yes	□ No	□ DNK	Bleeding gums	□ Yes	□ No	□ DNK
Diarrhoea	□ Yes	□ No	□ DNK	Bleeding into eyes (red eyes)	□ Yes	□ No	□ DNK
Intense Fatigue	□ Yes	□ No	□ DNK	Black or bloody stool	□ Yes	□ No	□ DNK
Abdominal Pain	□ Yes	□ No	□ DNK	Blood in vomitus	□ Yes	□ No	□ DNK
Muscle or Joint Pain	□ Yes	□ No	□ DNK	Bleeding from nose	□ Yes	□ No	□ DNK
Difficulty swallowing	□ Yes	□ No	□ DNK	Bleeding from vagina	□ Yes	□ No	□ DNK
Difficulty breathing	□ Yes	□ No	□ DNK	Hiccoughs	□ Yes	□ No	□ DNK

ID Cas
Date o

Exposition Risks

- Was the patient hospitalized or did he visit anyone in the **hospital** anytime in the three weeks before becoming ill? □ □Yes □ No □ DN
- 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 □ DNK;
- 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 _____ IDCas
  ____
- 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 ID Case: _____
Reception date: ___/___/___ Country: _____ Member of family helping the patient: _____ Name and Surname _____ Date of discharge___/___/___OR Date of death___/___/___

Laboratory

A specimen was collected □ before the death □ After the death
Date sample ___/___/___ Date results ___/___/___ ID Lab _____
Sample □ blood □ blood with anti-coagulants □ skin biopsy □ cardiac function □ other: _____

Results	PCR		□ pos	□ neg	□ NA	date	___/___/___
Antigen detection	□ pos	□ neg	□ NA		date	___/___/___	
Antibodies IgM	□ pos	□ neg	□ NA		date	___/___/___	
	Antibodies IgG		□ pos	□ neg	□ NA	date	___/___/___
	ImmunoHistochemistry		□ pos	□ neg	□ NA	date	___/___/___

Outcome *(verified 4 weeks after the onset of symptoms)*
□ Alive □ Dead; If dead, date of death ___/___/___

Case Classification

□ Alert Case □ Suspect □ Probable □ Confirmed □ Not a case

ANNEX 28. CONTACT RECORDING SHEET

Contacts[1] Recording Sheet filled in by …….

Case name ……..…….. Case number (if assigned) ……..….

Case's Village …… DC Chairman ……..……..….

District ……..….. Chiefdom ……..……Section……

Hospitalised …. / Found in the community …. If Hospitalised, Hospital ……. Date of Admission:…… ……..

Surname	Other Name	Relationship with the case	Age (yrs)	Sex (M/F)	Head of Household	Village	DC chairman	Chiefdom	Type of Contact (1, 2 or 3, list all)	Date of last contact	Last date for follow-up	1st Visit	Out come

[2] Contacts = 1 - sleeping in the same household with a suspected or a case within 3 weeks
2 - direct physical contacts with the case (dead or alive)
3 - has touched his / her linens or body fluids
4 – has eaten or touched a dead animal (monkeys)

[1] Doxycycline is WHO's antibiotic of choice for adults (except pregnant women) because only one dose is required.

ANNEX 29. CONTACT TRACING FORM (FOLLOW-UP)

Contact Tracing Form – by Village Team ……. Volunteer's name ……

Village ……..… DC Chairman ……

District …….. Chiefdom …….……

CN	Family Name	First Name	Age	Sex	Date of last contact	**Day of Follow-up**																			
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Tick " 0 " if the contact has not developed fever or bleeding
Tick " X " if the contact has died or developed fever and/or bleeding (complete Case Investigation Form and, if alive, refer to the hospital)

Section 5
Prepare for and Respond to outbreaks and other public health problems and events

This section describes how to:

- Work with the District Epidemic Management team to improve preparedness for responding to epidemics and other public health problems
- Obtain in advance the necessary resources for responding to epidemics and other public health problems

- Select and carry out appropriate public health responses based on investigation and results of analysis and disease-specific recommendations for:

  -- Strengthening case management of priority diseases and conditions
  -- Updating skills of Health Workers
  -- Conducting an emergency immunization campaign
  -- Enhancing surveillance during an outbreak response activity
  -- Informing and educating the community
  -- Improving access to clean water
  -- Ensuring safe disposal of human waste
  -- Improving food handling practices
  -- Reducing exposure to mosquitoes
  -- Controlling animal vectors

Put in place standard infection control measures

5.0 Prepare for and respond to outbreaks and other public health problems and events

Preparing to respond to epidemics and other public health problems is an important part of the district health care delivery services. When an outbreak of a priority disease occurs, the response is immediate. All efforts and resources are aimed at controlling the outbreak. If preparations have been done in advance of the outbreak, the health system will be able to function effectively and efficiently to prevent unnecessary deaths or disabilities that may result from the epidemic.

This section describes steps for responding to:

- Obtaining the necessary resources in advance for responding to epidemics and other public health problems
- A confirmed outbreak of a priority disease (for example, a confirmed outbreak of cholera)

- Trends seen in routine analysis (for example, a persistent increase in the number of deaths in children under 5 years due to severe pneumonia.) that indicate no change or an increase in the number of cases or deaths targeted by a disease prevention program.

When a problem is identified through analysis of routine data, select an appropriate response and take action. For example, improve the assessment and treatment of pneumonia cases in children less than 5 years of age.

In either case, coordinate information and planning of responses with the appropriate district staff. For responding to epidemic-prone diseases, the response is planned by an epidemic response committee. For situations where disease reduction targets are not being achieved as planned, the district surveillance focal persons works with the district staff responsible for prevention and control of the specific disease to take action.

District staff who respond to outbreaks or public health problems should routinely:

1. Review surveillance data for trends that cause a concern for public health.

2. Make sure that the medical supervisors in all the health facilities in the district know and use protocols for recommended case management of priority diseases and conditions.

3. Review and update supplies and resources for epidemic response of priority diseases, including:

    - Presence of trained staff
        - Appropriate equipment and supplies

- Resources for transportation and communication.
- Supplies for collecting and shipping specimens for confirmation
- Supplies for giving vaccinations
- Procedures for procuring stocks of vaccine in an emergency and conducting a prompt vaccine response to an emergency.

4. Check emergency stock of supplies periodically (every 4 months, for example), to make sure they are dry, clean and ready for use.

5. Make sure steps for obtaining laboratory confirmation are known by the appropriate staff.

5.1 Prepare to respond to outbreaks/epidemics

5.1.1 Establish a District Epidemic Management Committee

The district epidemic management committee should pattern the national epidemic management committee. This should be part of the district emergency management committee. Emphasize a multi-sectoral approach. Include the following:

From the public sector:

- Representative from the Local Council
- The District Medical Officer
- The DHMT
    - The District Surveillance Officers
    - District Public Health Superintendent
    - Clinicians including senior nursing officers
    - District Laboratory Superintendent /Technicians
- Entomologist
- Traditional leaders and rulers
- Extension workers of sectoral ministries

From non-governmental organizations with health care activities in the area:

- Community health programmes
- Sierra Leone Red Cross Society
- Other NGOs

From the private sector:

- Principal clinical or nursing officer from private hospital , clinic or laboratory

- Pharmacist/ Pharmacy Technician

Roles and responsibilities of the epidemic management committee:

- Review and approve the district epidemic preparedness and response plan
- Mobilise resources for epidemic prevention and control
- Coordinate and monitor control activities during outbreaks including information dissemination to the public and media
- Monitor resource utilisation (drugs, vaccines, supplies, disinfectants, logistics and financial resources)
- Coordinate post epidemic evaluation

Functions of the District Epidemic Management Committee

District epidemic management committee should periodically meet to assess and review the epidemic situation whether or not there is an outbreak.

During an outbreak/epidemic the epidemic management committee should:

- Meet as soon as the epidemic is recognized.
- Hold daily meetings at the beginning of an outbreak/epidemic and weekly depending on the evolution of the epidemic.
- Assess and request support if the situation is beyond the district's capacity
- Review and improve the epidemic response to ensure the success of epidemic control actions.
- Prepare minutes after each meeting and forward to higher level.

During non epidemic period the epidemic management committee should:

- Hold quarterly meetings to assess the trends of epidemics and monitor the implementation of the IDSR plan
- Organize special preparatory meeting at the beginning of each epidemic season to review their level of preparedness.
- *Share conclusion and recommendations of these meetings with the high level*

5.1.2 Roles of the District Health Management Team

District health management team/staff should routinely:

6. Hold regular meeting with the district epidemic management committee
7. Review surveillance data for trends that cause a concern for public health.
8. Make sure that the health supervisors in all the health facilities in the district know and use protocols for recommended case management of priority diseases and conditions.

9. Review and update supplies and resources for epidemic response of priority diseases, including:
    - Presence of trained staff
    - Treatment equipment and supplies
    - Resources for transportation and communication.
    - Supplies for collecting and transporting specimens for confirmation
    - Supplies for giving vaccinations
    - Procedures for procuring stocks of vaccine in an emergency and conducting a prompt vaccine response to an emergency.
    - Creation of a budget line for epidemic response
10. Check emergency stock of drugs and supplies monthly, to check the drugs expiry dates and make sure that all supplies are in good conditions (dry, clean and ready for use).
11. Make sure steps for obtaining laboratory confirmation are known by the appropriate staff.
12. Ensure health education and social mobilization in the risk areas just before the epidemic season

5.1.3 Establish a district Epidemic Rapid Response Team

In order to respond to epidemics promptly, establish a district rapid response team. The rapid response team provides technical support to the district health management team. The members of the team should:

- Be oriented on epidemic preparedness and response.
- Be provided with adequate logistics (vehicle, kit of drugs, reagents, supplies, etc.)

The district health management team should update regularly the list of the members of the rapid response team.

During the non-epidemic season, the rapid response team may have orientation/refresher trainings to strengthen their capacities. Also they should support the training on epidemic preparedness and response of health workers at all health facilities.

Composition of the district epidemic rapid response team

Members of the district epidemic rapid response team (DRRT) should include:

- An epidemiologist or public health officer (the disease control officer, for example)
- Laboratory technologist or technician
- Clinician
- Environmental health officer
- Others based on availability of technical staff and specificity of the outbreak.

Responsibilities of the DRRT

The district rapid response team will be responsible for:

- Investigation of rumours/outbreaks and other public health problems
- Proposing appropriate strategies and measures for the rapid containment of the epidemics
- Carrying out initial disease control measures to contain the outbreak
- Preparing detailed investigation report
- Contributing to the post mortem evaluation of the outbreak response.

5.1.4 Prepare Epidemic Response Plan

The purpose of the plan is to strengthen the capacity of the district in the preparedness and control of epidemic-prone diseases.

This plan should:

- Be based on the assessment of epidemiological situation, needs and resources available for epidemic preparedness and response.
- Take into account diseases with epidemic potential in the district and in neighbouring districts.
- Provide estimates of the population at risk for epidemic-prone diseases.
- Clearly indicate for each suspected outbreak which reference laboratory will be used for confirmation.
- Provide estimates of quantities of drugs, vaccines and supplies for each epidemic-prone disease likely to occur in the district.

The proposed outline of the plan is in the annex 30

5.1.5 Setting up contingency stocks of drugs, vaccines, reagents and other supplies

Districts at risk of outbreaks should:

- Set-up a contingency stock of drugs, vaccines, reagents and supplies allowing them to manage the first cases without delay before receiving support from higher levels.
- Regularly and carefully monitor the contingency stock in order to avoid shortages and expiry of drugs, vaccines, reagents and supplies.

The content of the contingency stock varies with the nature of epidemic-prone diseases and the risk of outbreak in the district. A list of drugs and supplies to be kept in the contingency stock are suggested at annex 31

5.2 Respond to outbreaks/epidemics

5.2.1 Prepare to respond to an epidemic

Once the epidemic is confirmed, the DHMT calls a meeting of the Epidemic management committee as part of the preparation of the response. When preparing to respond, the committee should:

1. Review existing resources and determine what additional resources are required. For example, consider:
   - Human resources that could be mobilized to manage the epidemic
   - Funds to support response activities
   - Emergency stocks or required drugs and other medical supplies according to the recommendation of the country's health system
   - Laboratory support for confirmation of pathogens responsible for the epidemics (if the district does not have the facility, identification of the reference laboratory and mechanism for collection and transportation of specimen to the reference laboratory)
   - Logistics support (travel of rapid response team, accommodation arrangement, communication, other essential equipment)
2. Request for the epidemic response funds
3. Identify areas or populations at high risk for the current epidemic.
4. Alert nearby districts about the outbreak. If they are having a similar outbreak, coordinate response efforts.
5. If supplies are not available locally:
   - Contact the national levels to find out where they might be obtained quickly
   - Borrow from other services, activities, or non-governmental organizations in your area
   - Identify practical low-cost substitutes.
6. Assign clear responsibilities to individuals or units for specific response activities.
7. Provide orientation/training and supplies to the district response team and health facility staff to be able to:
   - Keep detailed records on the response activities.
   - Review data on cases and treatment throughout the response activity.
   - Identify problems in implementing the activities and modify activities, as necessary.

5.2.2 Implement Response Activities

Review investigation results and conclusions of data analysis interpretation to select appropriate response activities to contain the confirmed outbreak or public health problem.

Refer to section 8 and other disease specific guidelines to select response activities, which involve:

- Proven measures to prevent unnecessary deaths or disabilities due to the specific cause of the problem.
- A mix of activities for immediately controlling the problem in the short-term, and reducing the risk of ongoing transmission in the long-term through preventive activities.
- Participation from the community, health care facilities and the district personnel.

The selected response activities common for outbreaks/public health problems include the following:

- Enhancing surveillance during the response activity
- Strengthening case management
- Updating health workers' skills
- Informing and educating the community
- Disseminating the technical recommendations appropriate for the outbreak.
- Monitoring the course of the epidemic throughout the duration.
- Evaluating and documenting the epidemic response

5.2.2.1 Response activities for selected outbreaks/public health problems or events

- Conduct emergency vaccination campaigns, when recommended
- Improve access to clean water
- Improve safe disposal of human waste
- Improve food handling practices
- Reduce exposure to mosquitoes and other vectors
- Control vectors

(A) Enhance surveillance during the response activities

During a response to an outbreak, encourage health workers at all health facilities to be vigilant in surveillance of the disease or condition.

Make sure that health workers:

- Search for additional persons who have the specific disease and refer them to the health facility or treatment s (cholera, for example), or quarantine the household (Lassa Fever, for example) and manage the patient.
- Update line list, make data analysis by time (epi-curve), person (age and sex) and place (draw map).

- Monitor the effectiveness of the outbreak or response activity.
- Report daily at the beginning of the epidemic.
- Active follow up of the contacts (Viral haemorrhagic fever for example)

(B) Strengthen case management

Take steps to support improved clinical practices. Review the recommendations in Annex 32 for treating cases during an outbreak. Prepare health workers to take these and other responses.

- Review with each health facility whether the clinical staff know and use recommended protocols for case management of outbreak diseases.
- Make sure that clinicians get laboratory confirmation of the outbreak disease, if the disease is laboratory confirmable.
- In a large epidemic, ask the medical officer at each health facility to identify an area that can be used for a large number of patients.
- Establish an isolation ward for highly infectious diseases (Human Influenza, SARS, etc.)
- Ensure safety and protective measures for health workers for highly infectious diseases (e.g. Human Influenza, SARS etc.)
- Make the necessary drugs and treatment supplies available.

(C) Update health workers' skills

1. **Give clear and concise directions** to health workers taking part in the response.
2. **Select topics for orientation/ training.** Emphasize case management for the specific disease according to disease specific recommendations. Select other training topics depending on the risk of transmission for the specific disease, for example:
    - Intensifying standard precautions (use of safe water, hand-washing and safe sharps disposal)
    - Barrier nursing and use of protective clothing
    - Isolation precautions
    - Treatment protocols such as delivering oral re-hydration salts (ORS) and using intravenous fluids
    - Disinfecting surfaces, clothing and equipment
    - Disposing of bodies safely.

3. **Implement orientation/training**
    - Orient or re-orient the district epidemic management committee, RRT and other health and non-health personnel on epidemic management based on the current epidemic. This will ensure continuous support to the response during an epidemic.

- In an urgent situation, there is often no time for formal training. Provide on-the-job training as needed. Make sure there is an opportunity for the training physician or nursing staff to observe the trainees using the updated or new skill.

(D) Inform and educate the community

Keep the public informed to calm their fears and encourage cooperation with the outbreak response. Develop community education messages with information about recognizing the illness, how to prevent transmission and when to seek treatment. Begin communication activities with the community as soon as an epidemic or public health problem is identified.

1. Decide what to communicate by referring to disease specific recommendations in Section 8.0. Make sure to include:
    - Signs and symptoms of the disease
    - How to treat the disease at home, if home treatment is recommended.
    - Prevention behaviours that are feasible and that have a high likelihood of preventing disease transmission
    - When to come to the health facility for evaluation and treatment
    - Vaccination recommendations, if any.
2. Decide how to state the message. Make sure that the messages:
    - Use local terminology
    - Are culturally sensitive and acceptable
    - Are clear and concise
    - Work with local traditions
    - Address beliefs about the disease.

    Sample community education messages are in Annex 37 at the end of this section.

3. Select appropriate communication methods that are present in your district. For example,
    - mass media, (Radio, Television, Newspapers)
    - Meetings (health personnel, community, religious, opinion and political leaders)
    - IEC materials (posters, fliers)
    - Multi media presentations (e.g. films) at the markets, health s, schools, women's & other community groups, service organizations, religious s.

4. Give health education messages to community groups and service organizations and ask that they disseminate them during their meetings.

5. Give health education messages to trusted and respected community leaders and ask them to spread them to the community.

6. Select and use a community liaison officer or health workers to serve as spokesperson to the media. As soon as the outbreak has been recognized:
    - Tell the media the name of the spokesperson, and that all information about the outbreak will be provided by the spokesperson
    - Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information.
7. On a regular basis, meet with the community spokesperson to give:
    - Frequent, up-to-date information on the outbreak and response
    - Clear and simple health messages that the media should use without editing
    - Clear instructions to communicate to the media only the information and health education messages from the Epidemic Response Committee.

(E) Conduct a mass vaccination campaign

Collaborate with the national EPI and disease control program manager to conduct a mass vaccination campaign, if indicated. Begin planning the mass vaccination campaign as soon as possible. Speed is essential in an emergency vaccination because time is needed to obtain and distribute vaccine.

Determine the target population for the activity based on the case and outbreak investigation results (Refer to the EPI program guidelines for specific recommendations about delivery of the indicated vaccines).

A worksheet called “Planning a mass vaccination campaign” is in Annex 34 at the end of this section.

A worksheet called “Estimating vaccine supplies for vaccination activities in Annex 35 is provided at the end of this section. Annex 36 describes recommended vaccination practices for use during the vaccination campaign.

(F) Improve access to safe water

Containers that hold drinking water can be the vehicle for disease outbreaks including cholera, typhoid, shigella and hepatitis. Make sure the community has an adequate supply of safe water for drinking and other uses. The daily water needs per person during non-outbreak situations are shown below. Water needs are much higher during an outbreak situation, especially outbreaks of diarrhoeal diseases.

Daily water needs per person*		
	Non-outbreak situation	***During outbreak of diarrhoeal disease***
Home use	20 litres per day	50 litres
Health care setting	40 to 60 litres per day	50 litres in wards 100 litres in surgery 10 litres in kitchen

**Refugee Health: an Approach to Emergency Situations, Medecins sans Frontieres, 1997 MacMillan

Safe sources of drinking water include:

- Piped chlorinated water
- Chlorination at point-of-use to ensure safe drinking water
- Protected water sources (for example, closed wells with a cover, rain water collected in a clean container)
- Boiled water from any source.

If no local safe water sources are available, during an emergency, water supply may need to be brought in by truck. However, transporting water is expensive and difficult to sustain.

To make sure that families have ***safe drinking water at home*** (even if the source is safe) provide:

- Community education on how to keep home drinking water safe. Refer to Annex 37 or sample community messages and references to specific prevention guidelines for preparing safe water at home.
- Containers that prevent contamination of water. For example, provide containers with narrow mouths so that people cannot contaminate the water by putting their hands into the container.
- Location site for defecation at least 30 metres or more away from sources of water.

(G) Ensure safe disposal of human waste

To make sure that human excreta are disposed safely to avoid viral haemorrhagic Fever and other communicable diseases:

- Assign teams to inspect local areas for human waste disposal. Safe practices include disposing of faeces in a latrine or burying them in the ground more than 10 metres from water supply.
- If unsafe practices are found, provide information to the community. Construct latrines appropriate for local conditions with the cooperation of the community

- Conduct community education on sanitation practices.

(H) Improve food handling practices

Make sure that people in the home, in restaurants, at food vending settings, and in factories handle food safely. Refer to the nationally established standards and controls for the handling and processing of food.
To ensure food hygiene:

- Conduct community education on food hygiene practices for the general public and those in the food industry.
- Visit restaurants, food vendors, food packaging factories, and so on to inspect food-handling practices. Look for safe practices such as proper hand-washing, cleanliness and adherence to national standards.
- Close restaurants, vending areas or factories if inspection results show unsafe food handling practices.
- Strengthen national controls as necessary.

(I) Reduce exposures to mosquitoes and other vectors

Encourage prevention of mosquito-borne diseases by helping people in your district reduce their exposure to mosquitoes during the day and at night.

Work with the malaria control program in your district to:

- Implement an insecticide treated nets (LLIN's) program.
- Conduct community education on the proper use of bed nets and how to avoid dusk-to-dawn mosquito bites.
- Promote the use of locally available LLINs and other ITMs (blankets, clothes, sheets, curtains, etc.)

(J) Control vectors

Encourage prevention of diseases carried by rodents by helping people in your districts reduce their exposure to these animals. For example, rodents can carry Lassa fever and they may be infested with fleas that carry plague. Work with the vector control officer in your district to encourage the community to:

- Avoid contact with the blood and saliva of dead rodents
- Keep food and water in the home covered to prevent making food available to rodents
- Keep your home and cooking area clean and uncluttered to remove places where rodents could nest in your home.
- Use chemicals (insecticides, rodenticides, larvicides etc.) as appropriate for the disease control based on environmental and entomological assessment.

(K) Monitor the course of the epidemic throughout the duration.

Monitoring of the epidemic is key for outbreak control. Following are some of the elements to be monitored:

- Disease trends in order to assess the effectiveness of the response measures, the extension of the epidemic and risk factors
- Resources assessment of the rational utilization, adequacy and sufficiency and determination of additional needs
- Effectiveness of the response: case fatality rate, incidence
- Implementation of the response: program coverage, meetings of the epidemic management committee etc.

5.2.3 Report on the outbreak

A detailed report on the outbreak can be helpful in planning for the next outbreak. As soon as the epidemic has been controlled, write a report and include:

- Details on the response activities. Include dates, places, and individuals involved in each activity. Also include the "epidemic" curve, spot map, table of person analyses, and the line list of cases.

- Any changes that were made to the initial response activities
- Recommended changes to improve epidemic response in the future. For example, you may recommend changes in the immunization strategy and programme to make the immunization activity more effective. You may recommend changes in the transporting procedure for laboratory specimens to allow specimens to reach the reference laboratory in good condition or more quickly.

- Disseminate a report on the outbreak.

The format of the report is in Annex 39 section 6.

5.2.4 Evaluate and Document the Epidemic Response

Evaluate the readiness to respond to an epidemic

Following are the key elements for the evaluation:

- The presence of an epidemic preparedness and response plan
- Availability of emergency stocks of drugs, vaccines and supplies during the last 12 months
- Availability of funds for outbreak response
- Presence of a well equipped trained district rapid response team to conduct an outbreak investigation
- Presence of a functional Epidemic Management Committee
- Availability of trained/oriented health worker for the response

These elements should be followed up during integrated supervisory visits.

Evaluate epidemic control activities

At the end of the outbreak/epidemic the national team in collaboration with the district epidemic management committee should evaluate control activities. This evaluation should focus on the appropriateness of control actions as well as their timeliness and effectiveness.

The evaluation exercise should help to answer the following questions:

Evaluation of outbreak/epidemic control activities

Appropriateness

Were the control activities appropriate as recommended by specific guidelines?

Timeliness

How long was the lag time between the onset of the outbreak/epidemic and the implementation of control actions?

Effectiveness

How long was the duration of the outbreak?
Were the attack rate and case-fatality ratio "acceptable"

Level of resources mobilised

Were enough resources mobilised in terms of: personnel? Drugs, vaccines, reagents, supplies, materials etc? Money?

Fill Annex 39 to answer the above questions.

Answers to the above questions will provide valuable lessons for a successful management of future outbreaks/epidemics.

Document the outbreak/epidemic

At the end of the outbreak/epidemic, the district health management team should:

- Collect all the documents including minutes of the meeting, activity, process, epidemic report, evaluation report and other relevant documents.
- Prepare a coversheet listing of all the above documents.

Annexes to Section 5

ANNEX 30 Outline of the epidemic preparedness and response plan

ANNEX 31 List of contingency stock of drugs and supplies for selected epidemic diseases

ANNEX 32 Treat cases during an outbreak

ANNEX 33 Prepare disinfectant solutions by using other chlorine products

ANNEX 34 Planning an emergency immunization campaign

ANNEX 35 Estimating vaccine supplies for immunization activities

ANNEX 36 Recommended immunization practices

ANNEX 37 Sample messages for community education

- Hand-washing
- Safe handling of food
- Safe disposal of human waste
- Clean drinking water and storage
- Safe burial of bodies
- Reducing exposure to mosquitoes

ANNEX 38 Communication under IHR requirements

Annex 30. Outline the Epidemic preparedness and response plan

OUTLINE OF EPIDEMIC PREPAREDNESS AND RESPONSE PLAN

Introduction
- Relevant background information of the district
- Epidemic-prone diseases
- Population at risk

Problems
Objectives
Strategies
Targets
Expected results
Activities
Responsible Persons/ Teams
Resources(human, financial and material)
Source of funding
Time frame
Critical factors
Monitoring and evaluation (indicators)

Annex 31. List of Contingency stock of drugs, vaccines, reagents,and supplies for selected epidemic diseases

Districts at risk of Anthrax outbreaks
Drugs : Choose one antibiotic from the following list : Penicillin V, Benzyl penicillin Tetracyclin Erythromycin *Disinfectant:* «Formaldehyde 10 % *Supplies:* «disposable gloves «Body bags N.B. District Health Management Team should collaborate with veterinary services
Districts at risk of Meningitis outbreaks due to N. meningitidis
Drugs :Oily Chloramphenicol Vaccines: AC, ACW135 *Supplies*: Autodestruct syringes Sterile tubes for CS fluid Transport media: trans-isolate Latex kit Gram strain kit May Grunwald Giemsa Kit

Districts at risk of Cholera outbreaks

Rehydration fluids:

- Oral rehydration salts
- Ringer's lactate

Drugs (drug resistance should be taken into account):

- Doxycycline
- Trimetroprim-sulfamethoxasole

Supplies:

- Nasogastric tubes 5.3 mm OD, 50 cm
- Nasogastric tubes 2.7 mm OD, 38 cm
- Scalp-vein sets

Materials:

- Cups
- Teaspoons
- Buckets

Disinfectants:

- Cresol
- Sodium hypochlorite or calcium hypochlorite

Laboratory supplies:

- Transport media (Cary-Blair)
- Rectal swab
- Stool containers

Districts at risk of bacillary dysentery outbreaks

Rehydration fluids

- Oral rehydration salts
- Ringer lactate

Drugs (drug resistance should be taken into account)

- Nalidixic acid
- Ciprofloxacin

Disinfectants

- 2 % chlorine

Laboratory supplies

- Transport media (Cary-Blair)
- Stool containers
  - Rectal swab

Districts at risk of yellow fever outbreaks

Re-hydration fluids

- Oral re-hydration salts
- Ringer lactate

Drugs

- Paracetamol
- Diazepam

Vaccines:

- Yellow fever vaccines

Supplies

- ITNs
- Larvicides
- Laboratory supplies
  - Needles (different sizes)
  - Tubes (vacutainers) for serum collection
  - Syringes (different sizes)

Annex 32. Treatment during an outbreak

Use appropriate drugs and other treatment for managing cases during an outbreak. These are treatment recommendations for use in an outbreak situation for cholera, dysentery, measles and bacterial meningitis.

1. Treat cholera in an outbreak situation

Source: *WHO guidelines for management of the patient with cholera, WHO/CDD/SER/91.15*

1. Assess the patient's level of dehydration. See assessment guide below.
2. Give fluids according to the appropriate treatment plan (see next page).
3. Collect a stool specimen from the first 5 suspected cholera patients that are seen in the health facility.
4. Give an oral antibiotic to patients with severe dehydration.

Assess the patient for signs of dehydration		
• Look at patient's general condition: Is the patient:		lethargic or unconscious? Restless and irritable?
• Look for sunken eyes.		
• Offer the patient fluid. Is the patient:		not able to drink, or drinking poorly? Drinking eagerly, thirsty?
• Pinch the skin of the abdomen. Does it go back:		very slowly (longer than 2 seconds?) slowly?
Decide if the patient has severe, some or no signs of dehydration and give extra fluid according to the treatment plan		
If two of the following signs are present: • lethargic or unconscious • sunken eyes • not able to drink or drinking poorly • skin pinch goes back very slowly	÷	**SEVERE DEHYDRATION*** Give fluid for severe dehydration (Plan C)
*In adults and children older than 5 years, other signs for severe dehydration are "absent radial pulse" and "low blood pressure".		
If two of the following signs are present: • restless, irritable • sunken eyes • drinks eagerly, thirsty • skin pinch goes back slowly	÷	**SOME DEHYDRATION** Give fluid according to for some dehydration (Plan B)
If there are not enough signs to classify as some or severe dehydration	÷	**NO DEHYDRATION** Give fluid and food to treat diarrhoea at home. (Plan A)

< Give antibiotics recommended for treatment of severely dehydrated cholera Patients		
Antibiotic	**Children**	**Adults**
Doxycycline *one single dose*	–	300 mg[1]
Tetracycline *4 times per day for 3 days*	-	500 mg
Trimethoprim-sulfamethoxazole (TMP-SMX) *2 times a day for 3 days*	TMP 5 mg per kg and SMX 25 mg per kg[2]	TMP 160 mg and SMX 800 mg
Furazolidone *4 times per day for 3 days*	1.25 mg per kg	100 mg[3]
Erythromycin[4] *adults: 4 times per day for 3 days* *children: 3 times per day for 3 days*	10 mg per kg	250 mg

- If the patient vomits while taking fluid, wait 10 minutes. Then allow the patient to resume feeding, but more slowly.
- Continue monitoring the patient and replacing fluid until the diarrhoea stops.
- When the patient is ready to leave the facility, counsel the patient on treating diarrhoea at home.
- Refer to IMCI guidelines for treating children under 5 years of age and to national guidelines for further information on treating acute watery diarrhoea and confirmed cholera.

Plan A: Treat diarrhoea at home

If patients showed no signs of dehydration when they were first assessed, they may be treated at home. Give a 2-day supply of ORS and explain how to take the ORS solution according to the following schedule: Advice the mother to give extra fluid; give zinc supplements and continue feeding.

[1] Doxycycline is WHO's antibiotic of choice for adults (except pregnant women) because only one dose is required.
[2] TMP-SMX is WHO's antibiotic of choice for children. Tetracycline is equally effective. However, in some countries, it is not available for paediatric use.
[3] Furazolidone is WHO's antibiotic of choice for pregnant women.
[4] Erythromycin or chloramphenicol may be used when the other recommended antibiotics are not available, or where *V. cholerae* is resistant to them.

AGE	Amount of solution after each loose stool	Provide enough ORS packets for preparing:
Up to 2 years	50 to 100 ml after each loose stool	500 ml per day
2 years up to 10 years	100 to 200 ml after each loose stool	1000 ml per day
10 years or more	As much as the patient wants	2000 ml per day

< Plan B: Treat some dehydration with ORS

In the clinic, give the recommended amount of ORS over a 4-hour period. Determine the amount according to the patient's weight. Use the patient's age only when the weight is not known.

< Determine the amount of ORS to give during the first 4 hours						
AGE or WEIGHT	**Up to 4 months**	**4 months up to12 months**	**12 months up to 2 years**	**2 years up to 5 years**	**5 years up to 14 years**	**15 years and more**
Weight in kg	< 6 kg	6 - < 10 kg	10 - < 12 kg	12 - < 19 kg	19 - 30 kg	30 kg and more
Give this amount of ORS	200 – 400 ml	400 - 700 ml	700- 900 ml	900 -400 ml	1400-2200 ml	2200-4000 ml

- If the patient wants more ORS than shown, give more.
- For infants under 6 months who are not breast-fed, also give 100-200 ml of safe water during this period.
- Give frequent small sips from a cup.
- If the patient vomits, wait 10 minutes. Then continue giving fluids, but more slowly.
- For infants who are breast-feeding, continue breast-feeding whenever the infant wants.
- Assess patients every 1-2 hours to make sure they are taking ORS adequately and to monitor fluid loss. Completely reassess the patient's dehydration status after 4 hours, and follow the appropriate treatment plan for the patient's dehydration classification.

Plan C: Treat severe dehydration quickly

1. Start intravenous fluids immediately. If the patient is a child and can drink, give ORS by mouth while the drip is set up. Give 100 ml per kg of Ringer's Lactate Solution divided as follows:

For giving IV fluids:		
	First:	***Then:***
For **adults** (and patients 1 year and older), give 100 ml per kg IV within 3 hours as follows:	First, give 30 ml/kg as rapidly as possible within 30 minutes	Then, give 70 ml per kg during the next 2 ½ hours
For **patients less than 1 year**, give 100 ml per kg IV in 6 hours as follows:	First, give 30 ml per kg in the first hour*	Then, give 70 ml per kg in the next 5 hours

** Repeat once if radial pulse is still very weak or not detectable after the first 30 ml per kg is given.*

2. Reassess the patient after the first 30 ml per kg, and then every 1 to 2 hours. If hydration status is not improving, give the IV drip more rapidly.
3. Also give ORS (about 5 ml per kg per hour) as soon as the patient can drink. This is usually after 3 to 4 hours for infants and after 1 to 2 hours for patients older than one year.
4. Reassess the patient after 6 hours (for infants) or 3 hours (for one year and older). Classify dehydration. Then choose the appropriate plan (Plan A, Plan B, Plan C) to continue treatment.
5. Give antibiotics recommended for treatment of severely dehydrated cholera patients. See the schedule on the next page.
6. Give patients information about home care before they leave the health facility.
   - If the patient vomits while taking ORS, wait 10 minutes and then continue giving fluids more slowly.
   - Continue breast-feeding of infants and young children.
   - Return for treatment if the patient develops any of the following:
     - increased number of watery stools
     - eating or drinking poorly
     - marked thirst
     - repeated vomiting
     - fever
     - blood in the stool

2. Give an appropriate oral antibiotic for outbreaks of bloody diarrhoea due to *Shigella dysentariae* type 1.

Source: *WHO Guidelines for the control of epidemics due to S. dysentariae type 1. WHO Geneva. 1995*

	NALIDIXIC ACID < Give four times daily for 5 days	**CIPROFLOXACIN** < Give two times daily for 5 days	**COTRIMOXAZOLE** (trimethoprim + sulphamethoxazole) Give two times daily for 5 days		
WEIGHT	**TABLET** 250 mg	**TABLET** 250 mg	**ADULT TABLET** 80 mg trimethoprim + 400 mg sulphametho-xazole	**PEDIATRIC TABLET** 20 mg trimethoprim + 100 mg sulphametho-xazole	**SYRUP** 40 mg trimethoprim + 200 mg sulphametho-xazole per 5 ml
Children's dose					
3 - 5 kg	¼	¼	1/4	2	5.0 ml
6 - 9 kg	½	½	1/2	2	5.0 ml
10 - 14 kg	1	1	1	3	7.5 ml
15 - 19 kg	1	1	1	3	7.5 ml
20-29 kg	2	2	1	6	15 ml
Adult dose	**TABLET** 250 mg	**TABLET** 250 mg	**TABLET** 160 mg TMP +800 mg SMX		
	4 tablets	4 tablets	2 tablets		

3. Give vitamin A to children with measles

- Give the first dose in the health facility or clinic.
- Give the mother one dose to give at home the next day.

Source: *WHO guidelines for epidemic preparedness and response to measles outbreaks, WHO/CDS/CSR/ISR/99.1*

AGE	***Vitamin A Capsules***		
	200 000 IU	100 000 IU	50 000 IU
Up to 6 months		½ capsule	1 capsule
6 months up to 12 months	½ capsule	1 capsule	2 capsules
12 months up to 5 years	1 capsule	2 capsules	4 capsules

4. Give appropriate antibiotic for bacterial meningitis cases during an outbreak

Source: Control of epidemic-prone meningococcal disease, WHO practical guidelines, 2nd edition 1998, WHO/EMC/BAC/98.3

1. Admit patient to a health facility for diagnosis and treatment.
2. Start an antibiotic immediately. Intra-muscular injectable oily chloramphenicol is best choice during an epidemic. It is very effective and a single dose is usually effective. treat with an antimicrobial recommended by national treatment guidelines for meningitis.
3. Patient isolation is not necessary. Provide good supportive care and simplify case management.

►Give a single dose of oily chloramphenicol

AGE	INTRAMUSCULAR OILY CHLORAMPHENICOL 100 mg per kg in a single dose, If the patient has not improved, give a second dose 24 to 48 hours later.	
	Dose in grams	Dose in millilitres
Adult: age 15 years and older	3.0 g	12 ml
Child: 10 to 14 years	2.5 g	10 ml
6 to 9 years	2.0 g	8 ml
3 to 5 years	1.5 g	6 ml
1 to 2 years	1.0 g	4 ml
2 to 11 months	0.5 g	2 ml
1 to 8 weeks	0.25 g	1 ml

►Other recommended antibiotics to treat meningitis

Agent	Route	Dose for adults	Dose for children	Duration of treatment
Penicillin G	IV	3-4 MU daily, every 4-6 hours	400 000 Units/ kg	4 days
Chloramphenicol	IV	1 g every 8-12 hours	100 mg per kg	4 days
Cefotaxime	IV	2 g every 6 hours	250 mg per kg	4 days
Ceftriaxone	IV	1-2 g over 12-24 hours	50-80 mg per kg	4 days
Ceftriaxone	IM	1-2 g single dose	50-80 mg per kg	1-2 days

Annex 33. Preparing disinfectant solutions by using other chlorine products

During a response to an outbreak of any disease transmitted through direct contact with infectious body fluids (blood, urine, stool, semen, and sputum for example), an inexpensive system can be set up using ordinary household bleach.

The following table describes how to make 1:10 and 1:100 chlorine solutions from household bleach and other chlorine products.

Use this chlorine product	**To make a 1:10 solution for disinfecting**: -- *Excreta* -- *Cadavers* -- *Spills of infectious body fluids*	**To make a 1:100 solution for disinfecting:** -- *Gloved hands* -- *Bare hands and skin* -- *Floors* -- *Clothing* -- *Equipment* -- *Bedding*
Household bleach 5% active chlorine	1 litre bleach per 10litres of water	100 ml per 10 litres of water, or 1 litre of 1:10 bleach solution per 9 litres of water
Calcium hypochlorite powder or granules 70% (HTH)	7 grams or ½ tablespoon per 1 litre of water	7 grams or ½ tablespoon per10 litres of water
Household bleach 30% active chlorine	16 grams or 1 tablespoon per 1 litre of water	16 grams or 1 tablespoon per10 litres of water

To disinfect clothing:

- Promptly and thoroughly disinfect patient's personal articles and immediate environment using one of the following disinfectants:
  - -- Chlorinated lime powder
  - -- 1% chlorine solution
  - -- 1% to 2% phenol solution

- Promptly and thoroughly disinfect patient's clothing:
  - -- Wash clothes with soap and water
  - -- Boil or soak in disinfectant solution
  - -- Sun dry
  - -- Wash utensils with boiling water or disinfectant solution
  - -- Do not wash contaminated articles in rivers or ponds that might be sources of drinking water, or near wells.

Annex 34. Planning an emergency immunization activity

1. Specify the target population for the immunization activity
2. Estimate the necessary amounts of vaccine, diluent, and immunization supplies such as sterile syringes and sterile needles, and safety boxes (see the worksheet in Annex 3)
3. Choose the immunization sites and inform the community.
   - Coordinate with the EPI or disease control program in your district to identify sites for conducting the immunization activity.
   - Identify the facilities that can participate in the activity
   - Identify a mobile vaccination team, if needed.
   - Determine if there are any hard-to-reach areas, e.g. a transient workers' camp. Identify a mobile vaccination team to reach these areas.
   - Contact the facilities and schedule the immunization sites.
   - Contact the national level for vaccine. If a national reserve stock is not available, the national EPI program manager will request an emergency supply from WHO.
   - Make sure there is enough capacity to store extra amounts of the vaccine during storage and transportation to the immunization site.
4. Select vaccinator teams. For every 100 to 150 people expected at the immunization site, the following staff is required:
   - 1 to 2 vaccinators to give immunizations
   - 1 recorder to record on immunization cards
   - volunteers to verify age and vaccination status.
5. Work with your EPI representative to conduct refresher training for vaccinators on recommended immunization practices. See Annex 26 for recommended immunization practices.
6. Mobilize the community. Inform the public about the emergency immunization activity.
7. Arrange transportation to the immunization site.
   - Plan their transportation to and from the site
   - Schedule vehicles and plan for fuel and other costs
   - Estimate per diem costs and make necessary arrangements for lodging if the site is away from the health worker's usual station.
8. Monitor the number of immunizations given.

Annexe 35 Estimating vaccine supplies for immunization activities

Outbreak: _____ ***Date confirmed***: _____

Target population: ___ children age 0 up to 5 years
___ children age 9 months up to 14 years
___ women of childbearing age - 15 years up to 45 years
___ all adults and children in the general population

1. Calculate the size of the target population. If the activity only targets a proportion of the general population, estimate the size of the target population. Multiply the general population times the percentage of children or adults in the target population. Use recommended age distribution for Sierra Leone such as the following:
   - children age 0 up to 59 months 17.7%
   - children age 9 months up to 14 years 45%
   - women of childbearing age 15-49 years 22.2%
2. Find out how many doses each person should receive. Record the number below as "number of doses recommended".
3. Allow for wastage. Use a wastage factor of 20%. Multiply the size of the target population (see step 1) times the number of doses times 1.20.

   _____ x _____ x 1.20 = _____
   Size of target population | *Number of recommended doses* | *wastage* | *Number of doses to order including wastage*
4. Allow for a reserve stock. Use a reserve factor of 25%. Multiply the estimated number of doses including wastage times 1.25 to obtain the total estimated number of doses.

   _____ x 1.25 = _____
   Number of doses including wastage | *Reserve factor* | *Total number of estimated doses*
5. To obtain the total number of vials of vaccine to order, divide the total number of estimated doses by the number of doses that are contained in the vial. (This is usually printed on the label.)

   _____ ÷ _____ = _____
   Total number of estimated doses | *Doses per vial* | *Total number of vials required*
6. If the vaccine requires a diluent, multiply the number of millilitres of diluent per vial times the total number of vials required.

   _____ x _____ = _____
   Diluent required per vial | *Total number of vial* | *Total diluent to order*
7. Estimate the number of sterile needles and syringes that will be needed to carry out the activity. If single-use needle and syringes are used, order the same amount as for the estimated number of doses in Step 4.
8. Estimate the number of dilution syringes necessary for preparing the vaccine.

Source: *Field Guide for Supplementary Activities Aimed At Achieving Polio Eradication*, World Health Organization, Geneva 1997*District guidelines for yellow fever surveillance*, Division of Emerging and other communicable disease surveillance and control, World Health Organization, Geneva 1998.

Annex 36. Recommended Immunization Practices

Work with your EPI representative to give refresher training to the vaccinator teams that will conduct the emergency immunization activity. At a minimum, make sure vaccinator teams know how to:

1. Reconstitute the vaccine correctly:
   -- Determine the appropriate quantity of diluents to reconstitute the freeze-dried vaccine.
   -- Use a sterile syringe and sterile needle.
   -- Draw up and expel the diluents several times in the vial that contains the vaccine.

2. Wrap the vial in silver foil or cover it with a dark cloth. This will protect the vial from sunlight.

3. In a field situation, protect the vaccine and diluents from contamination. Cover the open top of the vial with foil to keep out dirt and flies.

4. Place the vaccine immediately into a cup of ice, or stand it on an ice pack. Keep the ice and vaccines in the shade.

5. Do not discard the reconstituted vaccine at the end of the session. Follow national policy for reusing opened vials.

6. Record the dose on an immunization card for each person immunized.

7. Collect data for monitoring the activity. For example, record the number of doses given on a tally sheet so that coverage from the campaign can be calculated.

8. Remind health workers about the risk of getting blood-borne diseases from an accidental needle stick. Review safe practices for handling and disposing of sharp instruments and needles.

9. Arrange for safe disposal of used injection materials at the end of the activity. They can be burned or buried in a pit.

10. Give instructions for use of injection techniques. Review with health workers the need to plan vaccination campaigns.

11. Follow national policy for use of opened vials.

Annex 37. Sample messages for community education

Improve hand-washing:

Hand-washing with soap may be the most effective way to prevent transmission of some organisms causing infectious diseases. For that reason, promote hand-washing in every family. Hand-washing is particularly important after defecation, after cleaning a child who has defecated, after disposing of a child's stool, before preparing or handling food and before eating.

Hand-washing is practiced more frequently where water is plentiful and within easy reach. If possible, water for washing should be stored separately from drinking-water. During an epidemic, soap should be provided to those without it. If soap is not available, ash or earth can be used to scrub the hands. Do not dry washed hands with dirty cloths. Air-dry wet hands.

Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?
Washing your hands protects yourself and others from disease.

Always wash:

- after defecation
- after cleaning a child who has defecated
- after disposing of a child's stool
- before and after eating
- before preparing or handling food.

Message:

ARE YOU READY FOR HAND-WASHING?
Do you have

- Clean water with soap (or if you do not have soap, use ash or earth to scrub your hands)
- Clean cloth for drying.

Safe handling of food

Encourage the following food safety practices:

- Do not eat raw food, except undamaged fruits and vegetables that are peeled and eaten immediately.
- Cook food until it is hot throughout
- Eat food while it is still hot, or reheat it thoroughly before eating
- Wash and thoroughly dry all cooking and serving utensils after use
- Keep cooked food and clean utensils separate from uncooked foods and potentially contaminated utensils
- Wash hands thoroughly with soap before preparing food
- Protect food from flies by means of fly screens.

Message:

DO YOU PREPARE FOOD SAFELY?

Cooking kills germs

- Thoroughly cook all meats, fish and vegetables
- Eat cooked meats, fish and vegetables while they are hot.

Washing protects from disease

- Wash your hands before preparing or serving food
- Wash your dishes and utensils with soap and water
- Wash your *cutting board* especially well with soap.

Peeling protects from disease

- Only eat fruits that have been freshly peeled (such as bananas and oranges)

KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT.

Safe disposal of human waste

High priority should be given to ensuring the safe disposal of human waste at all time, and especially during epidemics of diarrhoea. Sanitary systems appropriate for local conditions should be constructed with the cooperation of the community.

Community messages should emphasize:

- Everyone should use latrines properly, including children
- Transfer children's excreta with a scoop or shovel to the latrine or bury in a hole.
- Avoid defecating on the ground, or in or near the water supply.

When large groups of people congregate—as for fairs, funerals, or religious festivals—, ensure the safe disposal of human waste. If there is no latrine, designate areas for defecation and provide a shovel to bury the excreta.

Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?
DO YOU USE A TOILET OR LATRINE?

Germs that cause dysentery live in faeces. Even a person who is healthy might have dysentery germs.

- *Always use* a toilet or latrine. It you don't have one – build one!
- Keep the toilet or latrine *clean*
- *Wash your hands* with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

- **Community drinking water supply and storage**

1. *Piped water*. To maintain safety, properly chlorinate piped water. To prevent entry of contaminated groundwater into pipes, repair leaking joints and maintain constant pressure in the system.

2. *Closed wells*. Equip with a well-head drainage apron, and with a pulley, windlass, or pump.

3. *Trucked in*. If locally available water is likely to be contaminated, drinking water should be supplied by tankers or transported in drums, if it is adequately chlorinated and a regular supply can be ensured. The trucking of water, however, is expensive and difficult to sustain; it is usually considered a short-term measure until a local supply can be established.

- **Home drinking water storage and treatment**

  When the safety of the drinking water is uncertain, it should be chlorinated in the home or boiled.

  To prevent contamination of drinking water, families should store drinking water using one of the following types of containers:

  1. *Covered containers* that are cleaned daily and kept away from children and animals. Water should be removed from the containers using a long-handled dipper, kept especially for this purpose.

  2. *Narrow-mouthed containers* with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or by a spigot.

  Water used for bathing, washing and other purposes other than drinking need not be treated and should be stored separately from drinking water.

Safe disposal of bodies

The body fluids of persons who die due to diarrhoea or a viral hemorrhagic fever are still infectious. Use extreme caution when preparing the bodies of suspected cholera or viral hemorrhagic fever patients.

- Hold funerals of persons quickly close to the place of death
- Discourage washing of dead bodies
- Discourage distribution of food during funerals.

Message:

PERSONAL PROTECTION TO REDUCE EXPOSURE TO MOSQUITOES:

- Use insect repellents
- Use LLINs
- Tuck the lower edge of the LLIN under the bedding

Annex 38. Communication under IHR Requirements

Introduction

- Following confirmation and verification of the event, the primary health and the district level authorities should liaise with the national level authorities to communicate and receive guidance on common positions to be delivered to the media.

- From first announcement throughout the outbreak, communication from the district level should follow the directions and the key messages developed at national level in consultation with the field team, in order to ensure consistency and speaking with one voice.

- Even though communication should be centrally coordinated by the national level, media would approach local and district public health response level to obtain first hand information from direct sources.

- In addition, the director of the district level hospital should support the communication and provide scientific expertise as evidence for intervention.

Actions at the district level

- Identify spokesperson(s) at district level (political and technical);
- Liaise regularly with national authorities to provide them with first hand information (received at the community local level, the media, local stakeholders);
- Be in contact regularly with national authorities to receive common messages including guide and answers for frequently asked questions to feed the local media;
- Be available for interviews by local media upon request to provide accurate, transparent and updated information following directions from national level in simple clear key messages;
- Organize press briefings to provide regular information to local media, following directions from national level;
- Develop good relationships with local media to partnership for delivery of accurate, transparent, timely messages to the population;
- Use information materials developed at the national level with clear consistent messages to provide guidance to the population;
- Identify local powerful channels for the delivery of information to the population;
- Meet regularly with local stakeholders to disseminate correct message of prevention and surveillance to the population;
- Organize capillary preventive door-to-door campaigns to reach the remote rural areas and promote prevention and surveillance, following directions from national level.

Section 6

Provide feedback

This section describes how to:

- Write an outbreak and events response report
- Develop information sheets summarizing data and its interpretation
- Develop and distribute a public health bulletin including Non Communicable Diseases (NCD)
- Develop district newsletters, fact sheets and reports

6.0 Provide feedback

Often, health facilities or districts reliably report surveillance data to the next level as required. If the facility does not receive information back about how the data were used or what the data meant, health workers may think that their reporting is not important. As a result, future reporting may not be as reliable because health workers will not know if the information they sent to other levels was useful or necessary. They will have a good understanding of the health situation at their own level, but they will not know or understand the situation at a district or national level.

When the district or national managers receive data, they should respond to the health facilities that reported it. The purpose of the feedback is to reinforce health workers efforts to participate in the surveillance system. Another purpose is to raise awareness about certain diseases and any achievements of disease prevention and control activities in the area.

Feedback may be written, such as a monthly newsletter, or it may be given orally, for example, during a monthly staff meeting. This section focuses on district level feedback. But the information can also be applied in health facility and national levels.

6.1 Write an outbreak report

After an outbreak response has taken place, district staff who led the investigation need to prepare a report. An example of a recommended report is in the Annex 39to this section. Use a copy of the report as feedback to the health levels that reported the cases in the first place.

6.2 Develop information summary sheets

An information summary sheet is a report that presents data and its interpretation in a table or other graphic format. For example:

- At a staff meeting, or during a supervisory visit, give a verbal report or comment about the data that were reported by the health facility during a given period of time. Display the data in a simple table. Sit with the health workers and show them the data. Discuss the likely conclusions that can be drawn from the data they have seen. Consider conclusions not only for the health facility, but for the district as a whole.

- Prepare a single sheet with a simple table that shows how the data reported for this period are different from the data reported for some other period or target population. For example, show the number of cases of diarrhoea with dehydration in children less than 5 years of age from the same period last year. Compare them

with a corresponding period this year, after a water vessel project was implemented in a high risk area, for example.

- Use the summary sheets to support requests made to higher levels for additional funds, supplies and resources.

6.3 Develop and distribute a Disease Surveillance Newsletter

In Sierra Leone, the national level publishes a national disease surveillance newsletter on a monthly basis via emails. The purpose of a disease surveillance newsletter is to present facts in a limited format and time frame. This newsletter has a wider audience than just the health workers in a particular district or health facility. The newsletter is about 1 to 2 pages.

A quarterly epidemiological bulletin should be developed and distributed to the districts, partners and line Government ministries. The purpose is to do in-depth analysis and interpretation of communicable and non-communicable diseases.

The newsletter contain at least:

- Summary of national or district data for a given priority disease
- Report of progress towards a specific public health target
- Report of a specific achievement towards public health by an individual heath worker or a group of health workers
- Description of special events or activities (for example, a change in market day).

Disease surveillance newsletter is sent to the district office, and this should be displayed where others can see it. Make copies to distribute to health facility staff. Take a copy of the newsletter with you on your next supervisory visit to show health workers how the data they report contributes to disease surveillance.

6.4 Develop fact sheets

Fact sheets are brief summaries of 1 to 2 pages. They are prepared by health workers for the general public. They usually deal with a single topic or message. For example, the district would like to give the community information about a cholera outbreak. The fact sheet states the steps for hand-washing and clean food preparation in addition to a table with the number of cases and deaths. These are sheets that could be hung on a bulletin board or distributed to community groups that are planning health education campaigns.

Other methods for providing feedback include:

- Talking to staff or reaching them electronically (e-mail, for example)
- Guidelines and technical manuals briefing reports
- Health education materials
- Verbal reports.

ANNEXES TO SECTION 6

ANNEX 39 District outbreak reports
ANNEX 40 Sample feedback bulletin

ANNEX 39. DISTRICT OUTBREAK REPORT

Title/Description (include disease/condition investigated)

_____ _____

Period | Place (Villages, Neighborhoods, District, Province)

Executive summary: _____

_____

Introduction:

Background:

Reasons for investigation (public health significance, threshold met, etc.)

Investigation and outbreak preparedness:

Methods:

Dates of investigation:

Site(s) of investigation (health care facilities, villages, other):

Case finding (indicate what was done regarding case finding, e.g., register review, contact investigation, alerting other health facilities, other)

Lab specimens collected:

Describe response and intervention (include dates):

Results:

Date and location of first known (index) case:

Date and health facility of first case seen by the health care system

Results of additional case finding:

Lab analysis and results:

With text, describe key features of results of time, place, and person analysis
For detailed results by time (epi curve), place (map), and person characteristics (table) and line lists, see attached.

Results of response and evidence of impact.

Self-evaluation of the timeliness and quality of preparedness, outbreak detection, investigation, and response

Epidemic Preparedness

- Adequate drugs and medical supplies available at the onset of the outbreak _____ _____ _____
  Date 1 Date 2
  Interval
- Treatment protocols available to health workers? _____ _____ _____
  Date 1 Date 2
  Interval
- District epidemic management committee regularly meet as part of epidemic preparedness _____ _____ _____
  Date 1 Date 2
  Interval

Outbreak detection:

- Interval between onset of index case (or occurrence of an usual cluster at the community level) [date 1] to arrival of first outbreak case at the health facility [date 2] (Target: <3 days): _____ _____ _____
  Date 1 Date 2
  Interval

- Interval between initial outbreak case seen at the health facility (or date of outbreak threshold crossing at the health facility) [date 1] and reporting to the district health team [date 2] (Target: within 24 hours): _____ _____ _____
  Date 1 Date 2
  Interval

- Cumulative interval between onset of index case (or occurrence of an usual cluster at the community or health facility) [date 1] to notification to the district [date 2] (Target: <7 days): _____ _____ _____
  Date 1 Date 2
  Interval

Outbreak investigation:

- Case forms/line listed completed? ____Yes _____No - Laboratory specimens taken (if required)? ____Yes ____No

- Interval between notification of district [date 1] and district field investigation conducted [date 2] (Target: within 48 hours) _____ _____ _____
  Date 1 Date 2
  Interval

- Interval between sending specimens to the lab [date 1] and receipt of results by the district [date 2] (Target: 3-7 days, depending on type of test) _____ _____ _____
  Date 1 Date 2
  Interval

Outbreak response:

- Interval between notification of outbreak to district [date 1] and concrete response by the district [date 2] (Target: within 48 hours of notification) _____ _____ _____
  Date 1 Date 2
  Interval

Evaluation and Feedback:

- Interval between end of the outbreak [date 1] and finalization of outbreak report with case forms/line list sent to national level [date 2] (Target: 2 weeks) _____ _____ _____
  Date 1 Date 2
  Interval

- Outbreak management committee met? ____Yes ____No

- Feedback given to health facilities and community? ____Yes ____No

_____

Method of feedback used

Other aspects, evaluation:

Interpretations, discussion, and conclusions:

Recommended public health actions: Comment on following levels: community, health facility, district, partners, provincial, and national

District Epidemic Committee Chairperson: _____ _____

Name Signature

District Medical Officer: _____ _____

Name Signature

Date reported completed: _____

ANNEX 40. SAMPLE FEEDBACK BULLETIN

Section 7

Evaluate and Improve Integrated Disease Surveillance and Response

- Monitor the quality of surveillance activities at the district level
- Report timeliness and completeness to other levels
- Identify targets and indicators
- Supervise Integrated Disease Surveillance and Response activities
- Take action to improve surveillance in next year's plan.

7.0 Evaluate and Improve Integrated Disease Surveillance and Response

Section 3 of these guidelines describes how each month, the health worker responsible for surveillance at the health facility and at the district level review and analyze the data reported during the month. They make conclusions each month about the:

- Timeliness and completeness of reporting, and
- How well routine prevention and control activities are taking place so that when problems are detected, districts respond with appropriate action.

The same information can also be used to monitor and evaluate the quality of:

- The reporting of immediately notifiable diseases, conditions and events, outbreak investigations and outbreak responses.
- Reporting of summary data on a routine basis.

Note: Evaluating outbreak investigations and response are described in Section 5.5.

When improvements have been made to the disease or events surveillance system in your district, and the new activities have become routine, evaluate the system every year. During the evaluation, determine whether:

- The surveillance objectives are being met
- Surveillance data are used for action
- The improved surveillance has had an impact on health events in the district.

The information in this section will describe how to routinely monitor and annually evaluate the performance of the surveillance system and specific disease or public health condition, control and prevention programmes.

7.1 Monitor the quality of the surveillance system

An important indicator of a quality reporting system is to measure its timeliness and completeness. When reports are sent and received on time, the possibility of a prompt and effective response is greater. Completeness of reporting describes whether all the reporting units have reported as expected. If reports are late, or are not submitted, the aggregated information for the district (or other administrative area) will not be accurate. Outbreaks can go undetected, and other opportunities to respond to identified problems will be missed.

7.1.1 Monitor and evaluate detection of immediately notifiable diseases, conditions or events

Monitor and evaluate the interval between the onset of the first known case and when the first case was seen in the health facility. The delay in the use of health services is one of the factors in the evolution of the diseases, and, therefore, its prognosis.

Other intervals to monitor for detection of immediately notifiable diseases include monitoring reporting from the community to the health facility (within 48 hours of onset of disease), from the health facility to the district (within 24 hours) and from the time the threshold is reached to a concrete response. (Within 48 hours)

7.1.2 Monitor timeliness and completeness of monthly reporting

Routinely monitor the receipt of reports to evaluate the timeliness of reporting and the completeness of the information. Use a monitoring tool such as a record of reports received to monitor timeliness and completeness of reporting in your district. A sample form for recording timeliness of reporting is in Annex 41 at the end of this section.

If you routinely record and review the dates on which reports are received, the effectiveness of the system can be assessed easily each month during the analysis of routine and case-based data. For example, use the record of reports received to:

- Measure how many reporting units submitted reports for a given month
- Identify which reporting units have reported
- Measure how many reports were submitted on time.

7.1.3 Identify problems and take actions

If the monitoring information shows that a health facility or other reporting unit has not provided a report, or if the report is not on time, contact the surveillance focal point at the facility. Work with the designated staff to identify what has caused the problem and develop solutions together. For example, find out if health worker have a reliable supply of forms for reporting the required information. Another example is if a new staff person has started at the facility and does not know the procedure for reporting. Or, health worker are not motivated to send the reports because they do not think it is important and do not have resources to take action.

Make plans with the reporting unit to find solutions for improving the situation. Explain that when information is complete, the district can assist health worker more efficiently with planning responses and carrying them out. For example, if lack of supplies is a problem, the district can use the reporting information to advocate with higher levels in the system.

7.1.4 Report timeliness and completeness of other levels

When routine reports of the number of cases are sent to the district and national level, also send the data for timeliness and completeness. This will help the other levels understand the situation more clearly and evaluate the quality of the data that is being sent. For example, if the report to the national level states that two cases of measles were detected during the month, it should also include information about the number of health facilities that reported. It will make a difference to the other levels when they evaluate the information if the 2 cases occurred with only 20% rather than 100% of the units reporting.

7.1.5 Identify targets and indicators

Measuring indicators is a method for measuring the extent of achievement for a particular program or activity. The achievement is compared to overall recommended standard quality practices. It can also measure progress towards implementing an overall program target. For example, a district may have as its goal the achievement of 100% completeness of reporting by a certain period. An indicator can be developed to measure the proportion or percentage of facilities that are reporting. This proportion is then compared with the desired goal or target, and can be used to evaluate progress and, therefore, the quality of the service or activity.

List possible district level indicators that should be measured and related to national goals and indicators, or to specific plans for improving integrated disease surveillance and response activities in a district. Select the indicators that are most relevant to the district's plan for improving surveillance this year, and that will provide information that the district can use. Sample district level indicators are on the next page.

District level indicators for monitoring quality of IDSR at health facility

Function of surveillance	***Indicator: Regularly monitor the number of health facilities that:***
Identify and record suspected cases	• Have a clinical register • Correctly record information in the register
Confirm suspected cases	• Safely and appropriately collect and properly package specimens for transport to a designated laboratory • Submit specimens of priority diseases for confirmation in a timely way • Have access to a designated laboratory that can reliably process specimens (sputum, stool, blood, serum, cerebral spinal fluid, for example) for confirmation of priority diseases.
Analysis and interpretation of data	▪ Keep up-to-date trend lines for each selected priority diseases ▪ Have detected a new epidemic/event within 48 hours of onset ▪ Have an epidemic threshold for each priority disease ▪ Have a monitoring board for indicators on priority diseases
Review and analyze data	▪ Have an epidemic threshold for each priority disease
Report data	• Report case-based information for immediately notifiable diseases • Have a reliable supply of reporting forms • Accurately record case register data on summary report forms • Submitted reports on time to the district during last 3 months • Submitted required number of reports during last 3 months
Respond to outbreak thresholds and analysis results	• Used local information to conduct a community disease prevention and control activity during the last 12 months. • Implemented prevention and control measures based on local data for at least one epidemic-prone disease
Provide feedback	• Received a bulletin or report from district and national about data health facility reported during the year • Met with community members to discuss investigation results during last 3 months.
Maintain readiness for epidemic response	• Use standard case management protocols for priority diseases • Use a minimum level of standard precautions with all febrile patients regardless of infection status • Maintain an emergency stock of urgent drugs and treatment supplies for responding to epidemic-prone diseases seen previously in the area.

Supervision	• Use a supervisory checklist for surveillance during supervisory visit at least once in last 3 months
Training	• Conducted training for health worker on one or more of following topics in last 12 months: using case definitions, handling specimens safely, collecting and reporting data, analysing and interpreting trends, using thresholds for action, supervisory skills.
Resources	• Have reliable transportation methods, with fuel source as needed (bicycles, motorcycle, vehicle, fuel) • Have access to reliable communication methods (telephone, facsimile, radiophone, electronic mail, others) • Have supplies for carrying out outbreak investigations • Have funds for implementing response actions

7.1.6 Select data for measuring the indicators

After you have selected relevant indicators, specify the numerator and the denominator. For example, a district has as its objective to have all health facilities keep trend lines in an analysis workbook for the selected priority diseases. The analysis workbooks are monitored during supervisory visits.

Indicator: The proportion of health facilities in the district that keep trend lines for priority diseases.

Numerator: The number of health facilities that keep trend lines for priority diseases.

Denominator: The number of health facilities in the district.

$$\textit{Indicator} = \frac{\textit{Numerator}}{\textit{Denominator}}$$

7.2 Conduct Supportive Supervision

Supportive supervision is a process of helping health workers to improve their work performance. Supportive supervision is not an inspection, but aims to sustain quality services and improve service delivery.

In a good system, supervisors and health professionals work together to review progress, identify problems, decide what has caused the problem and develop feasible solutions.

7.2.1 Improve job description to improve surveillance tasks relevant to each category of health worker

Job descriptions are the basis for conducting supervision and assessing performance. Review the job descriptions of health worker who have a role in the surveillance and response system. Make sure that the job description states:

- The surveillance tasks the specific category of health worker should perform
- To whom the health worker reports
- Other health worker that are supervised by the specific category or person.

7.2.2 Prepare a supervisory plan

Include surveillance and response targets in the overall plan for supervision in your district. For example:

Decide how often to monitor health worker performance. For example, a district may decide to conduct a supervisory visit at least once a month for each health facility and national level may conduct supervisory visit once every three month.

- Ask health facility supervisors to make a schedule of the supervision they will conduct over the next year in their own facilities and to any community sites that report to the facility.

- Make sure that transport is available for supervision and for surveillance activities that require transportation. For example, coordinate travel or logistics for surveillance supervisory visits with visits made by other programs or activities.

- Include other reporting sites in supervision of district surveillance activities such as health facilities (hospitals and PHUs) and community reporting sites in the overall plan. Include private clinics if feasible.

- Identify and obtain necessary resources for supervision.

7.2.3 Conduct supervisory visits

Begin regularly scheduled supervision in the district to ensure that:

- Health workers know how to identify and use standard case definitions to record suspected cases of priority diseases seen in their health facility.

- Priority diseases are recorded in the case register according to the case definition.

- Some data is analyzed in the health facility to identify thresholds to take action both for routinely reported priority diseases (disease of public health importance) and case-based diseases (epidemic prone diseases, and diseases targeted for eradication or elimination).

- Reported cases of diseases for which a single case is a suspected outbreak are investigated promptly (e.g. yellow fever).

- Response takes place when outbreaks are confirmed, or when problems are identified in routine reporting.

- Response actions are monitored and action is taken by the health facility to improve surveillance actions and readiness for outbreak response.

Make sure during the visit:

1. Provide feedback to health worker during each visit. Let the health worker know what is working well and what is not working. Also give feedback on how the data reported previously was used to detect outbreaks and take action to reduce disease, mortality and disability in the district. If improvements are needed, discuss solutions with the staff.

2. Provide on-the-job training as needed if a problem is identified. For example, during a review of the analysis workbook, the supervisor noted that case fatality rates were not calculated correctly. The supervisor met with the health worker who do the calculation and reviewed the steps for calculating the rate with the staff.

3. Follow up on any request for assistance such as for emergency response equipment or supplies.

4. If a solution to a pre-existing problem was identified in a previous visit, check to see how well the solution has been implemented. Find out if problems are still occurring and modify the solution if necessary.

7.2.4 Use an integrated supervisory checklist

Each health facility has unique problems and priorities that require specific problem solving and corrections. To maintain the positive motivation of the health facility staff for making the improvements, consider developing an integrated checklist to guide the supervisory visit. The items listed in an integrated checklist are selected based on what has been achieved so far at the health facility. For example, when the facility has achieved one objective (using standard case definitions consistently, for example), work with health facility staff to include the next indicator or item for monitoring performance (using thresholds for action, for example). Revise the supervisory checklist accordingly. Use it during future visits to help health worker monitor their activities and progress towards an improved system.

During the visit, use a checklist to monitor how well health worker are carrying out the recommended surveillance functions. For example, a district surveillance officer visiting a health facility for a supervisory visit should verify the following:

Identify and Register cases	Check in the clinic register to see if the diagnoses correspond to the recommended case definition. Check the register to see if all the columns in the registry are filled out correctly.
Confirm cases	Compare the laboratory records for priority diseases with the number of cases seen in the clinic for the same period of time. For example, compare the number of positive vibro cholerae in stool samples as compared with the reported number of suspected cholera cases.
Reporting	Ask to see copies of the most recent reports or for the most recent reporting period. Compare the number of cases of priority diseases that were reported with the number recorded in the register.

	Check the date on which the case report was sent against the date recommended for sending the report. Check the reports to make sure they are complete and accurate.
Review and analyze data	Verify that trend lines are prepared and kept up-to-date for priority diseases Ask to see the "Health Facility Analysis Book", if these are in use in your district. Look to see if the trend lines for selected diseases are up-to-date.
Preparedness	Look at the stocks of emergency drugs, supplies and protective clothing to be sure there is an adequate supply.

Note: A sample supervisory checklist is in Annex 43 at the end of this section. The questions to be answered during the supervisory visit can be adapted or modified to meet the specific concerns and extent of progress towards an integrated surveillance system within the health facility.

7.2.5 Write a report of the supervisory visits

Provide in the report achievements that were recognized during the visit. Also state the actions that were planned with the health worker and any requests for additional resources, funds or special problems.

7.3 Use supervisory visits to improve surveillance activities in the district

Visits of surveillance supervisors and National Disease Control Programmes are good opportunities to discuss and improve disease control in your district. For example, if National TB/Leprosy control programme person visits the district, you can discuss why the inpatient of TB deaths has not been declining. You can ask about additional ideas or resources that the National TB/Leprosy control programme can provide.

7.4 Annually evaluate quality of IDSR

7.4.1 Determine indicators and programme targets to evaluate

Depending on the development status of surveillance in a district, select indicators for evaluation that will provide information that relates to the district's priorities and objectives for the year. Selected indicators are likely to be the following:

- Indicators for measuring quality of surveillance in general. For example, to evaluate timeliness and completeness of reporting, select as an indicator the percentage of health facilities that reported routine information completely and on time.

- Indicators for measuring quality of surveillance for specific diseases (for example, to monitor response to surveillance data about AFP, select as an indicator the percentage of health facilities where AFP cases were detected -- that is, the rate was more than 2 suspected cases per 100, 000 population -- and which were laboratory confirmed.)

7.4.2 Compile and organize monitoring and other results

Gather data from several sources. For example:

- Review the objectives for the year listed in the district's annual plan for improving surveillance and response.
- Gather the monthly summaries of cases and deaths reported to the district, spot maps, and other analysis results performed by the district.
- Collect as well any results from special surveys or studies that were done in the district over the last year.
- Include case investigation forms and reports of outbreak response activities that took place in the district.
- Gather summary information from the community and also from health worker.

7.4.3 Analyze results

As you evaluate the summary data for the year, decide:

- Were the reports complete, on time and accurate?
- What were significant changes in disease/conditions trends during the year?
- If an increase occurred, was the problem identified?
- If additional cases are still occurring, why are they occurring? Where are they occurring?
- Were appropriate and timely actions taken in response to the surveillance data?
- Were supervisory visits conducted as planned and follow up tasks carried out as planned?
- Did the community feel that response activities were successful?
- Were any actions taken to address health worker requests or suggestions about services or surveillance?
- Were appropriate measures taken to prevent similar events?

7.4.4 Identify problems and their causes

If problems occurred, and the district did not meet an expected target, or reach a desired level of performance with any indicator, look to see what caused the difference between what was planned and what actually occurred. If a problem is identified, talk with the district team and health facility staff to find out the possible causes of the problem.

7.4.5 Prioritized plans to improve IDSR in next year's plan

Include in the district plan for the next year successful activities that should continue. Also include feasible solutions selected as a result of analysis of this year's annual evaluation.

Plan to implement the solution. For example:

1. State the new activity and its objectives
2. Specify the health worker who will carry out the activity.
3. Estimate the cost of the activity
4. Develop a chronogram of activities.
5. Specify the logistics for the new activity (equipment, personnel, transportation, resource allocation)

7.4.6 Provide feedback to health facilities about the evaluation

Provide a report and give feedback to health facilities and others in the district about the results of the evaluation activity. Mention in the feedback report:

- What the objectives were for the year
- What was actually achieved
- What were likely reasons for any differences between what was planned and what was achieved
- Recommended solutions and prioritized activities for improving surveillance and response in the district.

Annexes to section 7

- ANNEX 41 Sample form for recording timeliness and completeness of monthly reporting from the health facility to the district level
- ANNEX 42 Sample indicators for monitoring by the national level of district-level surveillance activities
- ANNEX 43 Sample supervisory checklist for surveillance and response activities at the health facility level

Annex 41. Sample form for recording timeliness and completeness of monthly reporting from the health facility to district

District _____ Chiefdom _____ Year _____

Name of health Facility	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total number of reports expected (N)												
Total reports sent on time (T)												
Total reports sent late (L)												
Total number of reports not received (NR)												
Timeliness of the reports = 100 * T / N												
Completeness of reporting = 100 * (N-NR) / N												

Please note that timeliness and completeness are expressed as percents (%). When the surveillance system is good, the rates for timeliness and completeness should approach 100%. This table allows for monitoring the progress of these two indicators in the district so that action can be taken to improve timeliness and completeness for each health facility in the district.

Legend

T = arrived on time
L = arrived late
NR = report not received

Annex 42. Indicators for monitoring the quality of district level surveillance activities

To evaluate the quality of surveillance functions listed in column 1 below, regularly monitor and observe the progress for the following indicators listed in column 2. When comparing several health facilities at the same level of the health system, use proportions or rates.

For these surveillance functions:	***Regularly monitor the number of districts that :***
Maintain readiness for epidemic response	• Have a plan for outbreak response • Have access to emergency stocks of drugs and supplies at all times during the last 12 months • Have access to funds for outbreak response • Have a team trained to conduct an outbreak investigation
Identify suspected cases	• Have a surveillance coordinating focal point at the district level • Review case registers and logs
Investigate and confirm reported outbreaks	• Investigated at least one reported outbreak during the last 12 months • Have laboratory capacity within the district that can confirm suspected cases of priority diseases • Confirm priority diseases in a timely way • Are able to demonstrate safe handling, packaging, storing, and transport of specimens to higher level laboratory
Report data	• Have a reliable supply of recommended forms at all times over the last 3 (6) months • Submitted all required reports to the next highest level on time during the last 3 (6) months
Analyze data	• Describe outbreak data by time, place and person • Perform trend analysis by health facility • Have an epidemic threshold for each priority disease and appropriate denominators and a defined response action • Compare quarterly data
Response	• Responded within 48 hours of reaching the threshold for action. • Meet with community about a health problem at least once every 3 (6) months • Achieved acceptable case fatality rates during the most recent outbreak (for example, not more than 10% for meningitis, not more than 1% for cholera) • Have management committees that evaluated their preparedness and response activities during the last 12 months
Provide feedback	• Prepare and disseminate a written report of surveillance information at least quarterly during the last year • Received a written report or bulletin containing information district reported from a national level during the last year • Provide feedback to the community

Supervision	• Number of health facilities that received a supervisory visit from the district surveillance focal point during the last 3 (6) months
Training	• Number of health personnel in the district that received training for a surveillance function or topic such as investigation during the last 12 months.
Resources and personnel	Number of districts with: • Transportation or logistical supports (vehicles and, motor cycles with fuel and lubricants) • Supplies for carrying out data management (computers, statistical program package) • Communication methods (reliable telephone service, facsimile, radiophone, electronic mail) • Information and education materials (VCR and monitor, portable generator, screen, projector (slides or film) • Human resources (trained epidemiologist, laboratory technologists, data managers

Annex 43. Checklist for supervising IDSR activities at the health facility level

District---------- Chiefdom----------Health Facility: _____Date of Supervisory Visit:____-------

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
Identify Suspected Cases	1. How often do you collect information from the community about reports of suspected cases or deaths due to a priority disease or condition?	_____ (weekly or monthly)	
Register cases	1. Are diagnoses of cases of priority diseases recorded in the clinic register according to the standard case definition?	Yes No	
Report	1. Do health worker use a standard case definition to report the suspected cases and outbreaks? 2. Do you record information about immediately notifiable diseases on a case investigation form or line list?	Yes No Yes No	
Analyze and Interpret	1. Do you plot the numbers of cases and deaths for each priority disease on a graph? (Ask to see the health facility's analysis book. Look to see if the trend lines are up-to date.) 2. Do you plot the distribution of cases on a map?	Yes No Yes No	

Investigate and Confirm Reported Cases and Outbreaks	1. If an epidemic-prone disease was suspected, was it reported immediately to the district office? 2. For the cases of priority diseases needing laboratory tests seen since the last supervisory visit, how many had laboratory results? 3. Are appropriate supplies available or set aside for collecting laboratory specimens during an urgent situation? show me the supply.	Yes No Number of results obtained:_____ Number of expected cases seen:_____ Yes No	

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
Respond	1. Are appropriate supplies available for responding to a confirmed case or outbreak *(for example, immunization supplies, ORS, antibiotics, and so on*)? (Please show me the supplies for carrying out a recommended response.) 2. Who is the surveillance focal point for this facility? 3. How often do you provide information and training on outbreak response to the staff of this facility?	Yes No Name:_____ Designation:_____ Monthly/ Quaterly/Bi-annually/annually	
Provide Feedback	1. How often do you report information to the community? 2. Do you receive the latest newsletter/bulletin from the *(nationall, district l*) level?	Weekly/Monthly/ Quaterly/Bi-annually/annually Yes No	
Evaluate and Improve the surveillance System	1. Were the last 3 routine reports sent to the district office? 2. Were the last 3 routine reports sent on time?	Yes No Yes No	
Epidemic Preparedness	1. What precautions do health worker (including laboratory staff) take routinely with all patients regardless of the patients' infection status? 2. How do you estimate the number of supplies to set aside for use during an emergency situation?	Minimum level of standard precautions: _____ How supplies are estimated: _____	

Section 8

Summary guidelines for specific priority diseases and conditions

- Take action to respond to alert, and epidemic thresholds for specific diseases
- Identify surveillance goals and objectives for each priority disease
- Identify data to analyze and interpret for each priority disease
- Prepare to use the district analysis workbook.

The pages in this section provide summary guidelines for each of the priority diseases targeted for integrated disease surveillance by WHO/AFRO. Look at the table below to see what information is available in the summary guidelines. Detailed guidelines for each disease or condition are available from WHO Country Office or national programmes or the Disease Prevention and Control Directorate.

Name of priority disease for integrated disease surveillance and response

Background	In this section, you will find general information about: ▪ The disease, the agent that causes the disease or infection, geographic range affected, and other epidemiologic information. ▪ Transmission routes such as person-to-person, unprotected contact with infectious body fluids or contaminated materials, vector-borne, and so on. ▪ Why the disease is a priority disease for surveillance. For example, the disease is responsible for a high number of deaths, disability and illness, especially in African countries. ▪ General risk factors and specific risk factors in African countries. ▪ Any additional background information that might serve the district surveillance team.
Surveillance goal	This section states the purpose for surveillance of this disease. Generally, the purpose for surveillance of these priority diseases is for early detection and effective appropriate response to the leading causes of death, illness and disability.
Recommended case definition	***Suspected case***: A definition is provided for suspecting a case or outbreak of this disease. ***Confirmed case***: A definition is provided for classifying a case as confirmed through laboratory diagnostic testing.
Respond to alert threshold for epidemic-prone diseases and diseases targeted for elimination and eradication	Some diseases have specified thresholds for alerting the health facility or district to a problem. *For epidemic-prone diseases, and for disease targeted for elimination or eradication*, a single case is a suspected outbreak and requires immediate reporting. Prompt responses should follow such as reporting the case, treating the case, collecting specimens for confirming the case, and investigating the case to determine if it is an outbreak, and, if so, determine the risk factors associated with the case. *For other priority diseases of public health importance*, an outbreak is suspected when there is any unusual increase in the number of cases when compared with previous time periods. This should prompt a response such as reporting the increase and investigating what might have caused the unusual increase. If laboratory confirmation is indicated, specimens should be collected for laboratory confirmation.
Respond to epidemic or outbreak thresholds	*For epidemic-prone diseases, and for disease targeted for elimination or eradication*, a confirmed case should trigger a response action 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 for IMCI diseases, providing information, education and communication about preventing and controlling the disease, and so on.
Analyze and interpret data	This section contains generic information about the data to collect, analyze and interpret. The data may be from outbreak response or for more long-term analysis. The key points to consider for interpreting the data and specific elements for analysis are stated (time, place, person).
Reference	Appropriate references for further information are available from WHO. The most relevant to the district level is stated for each disease.

Anthrax (human)

Background	▪ Anthrax is a widespread zoonosis caused by a Spore-forming Bacillus anthracis, a Gram) positive rod-shaped bacterium. A. It is transmitted from domestic animals (cattle, sheep, goats, buffaloes, pigs and others) to humans by direct contact or indirect contact through animal products. ▪ The incubation period ranges from 1 to 7 days. Persons exposed to occupational hazards include those handling infected carcasses and those employed in the processing of bones, hides, wool and other animal products. ▪ Human anthrax is a serious problem in several countries and has potential for explosive outbreaks (especially the gastrointestinal form); 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 occupationally exposed and successful vaccines for livestock, particularly for herds with ongoing exposure to contaminated soil. ▪ In most countries anthrax is a notifiable disease. Notification to WHO is universally required by IHR using the decision Instrument (Annex 2 : IHR)
Surveillance goal	▪ to detect outbreaks. ▪ to monitor the control programmes
Recommended case definition	***Suspected case*** Any person with acute onset characterized by several clinical forms which are: (a) localized form: • *cutaneous:* skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by oedema that may be mild to extensive (b) systemic forms: • *gastro-intestinal: abdominal distress characterized by nausea, vomiting, anorexia and followed by fever* • *pulmonary (inhalation): brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnoea and hightemperature, with X-ray evidence of media*stinal widening • *meningeal: acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections* **And** has an epidemiological link to confirmed or suspected animal cases or contaminated animal products. ***Probable case*** A suspected case that has a positive reaction to allergic skin test (in non-vaccinated individuals). ***Confirmed case*** A suspected case that is laboratory-confirmed.

Anthrax (human)	
Respond to alert threshold for epidemic-prone diseases	**If a single case is suspected:** ▪ Report case-based information immediately to the appropriate levels (public health sector and animal health sector) ▪ Begin infection control isolation precautions immediately and enhance standard precautions throughout the health care setting. Use protective clothing and face masks if there is a risk of aerosols, disinfection and dressing any cuts and abrasion before putting on protective clothing. Avoid blood-spilling operations on infected/suspected animals /carcasses ▪ Treat and manage the patient with supportive care 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
Respond to epidemic threshold for diseases targeted for eradication	**If a single case is confirmed:** ▪ Maintain strict infection control 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 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. ▪ Establish isolated ward to handle additional cases that may come to the health .
Analyze and interpret data	**Time::** Graphs of number of suspected / probable / confirmed cases by date. **Place:** Map of suspected and confirmed human and animal cases by geographical area (district) **Person:** Table showing the number of suspected / probable / confirmed cases by date, age and sex,
Reference	*WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2* *WHO recommended Strategies for the Prevention and Control of Communicable Diseases, WHO/CDS/CPE/SMT/2001.13*

Cholera

Background	▪ Acute illness with profuse watery diarrhoea caused by *Vibrio cholerae* serogroups O1 or O139. The disease is transmitted mainly through eating or drinking contaminated food or water; that is, cholera is spread through the faecal-oral route. ▪ 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 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, with the majority of cases occurring from January through April. ▪ Cholera may cause severe dehydration in only a few hours. The case fatality rate (CFR) may exceed 50% in untreated patients with severe dehydration. 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 of 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 promptly. To confirm an outbreak, collect stool specimens transported in Cary-Blair medium. ▪ Immediate case-based reporting of cases and deaths when an outbreak is suspected.
Recommended case definition	***Suspected case***: In a patient age 5 years or more, severe dehydration or death from acute watery diarrhoea. If there is a cholera epidemic, a suspected case is any person age 5 years or more with acute watery diarrhoea, with or without vomiting. ***Confirmed case***: A suspected case in which *Vibrio cholerae* O1 or O139 has been isolated in the stool.
Respond to alert threshold for epidemic-prone diseases	**If a single case is suspected:** ▪ Report case-based information immediately. ▪ Manage and treat the case according to national guidelines. ▪ Enhance strict handwashing and isolation procedures. ▪ Conduct case-based investigation to identify similar cases not previous reported and confirm the outbreak. ▪ 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 ship the specimens.

Respond to action threshold for epidemic-prone diseases	**If a suspected case is confirmed:** ▪ Establish treatment centre in locality where cases occur. Treat cases onsite rather than asking patients to go to standing treatment centres elsewhere. ▪ Strengthen management and treatment of cases. ▪ 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. ▪ 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. ▪ Promote the effective use of chlorine based disinfectsnt.
Analyze and interpret data	**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. Analyze age distribution, distribution according to sources of drinking water; assess risk factors to improve control of sporadic cases and outbreaks.
Reference	*Management of the patient with cholera*, World Health Organization, 1992. WHO/CDD/SER/91.15 Rev1 (1992) *Epidemic diarrhoeal disease preparedness and response--Training and practice.* Facilitator and participant manuals. World Health Organization, 1997. WHO/EMC/DIS/97.3 and WHO/EMC/DIS/97.4

Dengue Fever

including Dengue haemorrhagic fever (DHF) & Dengue shock syndrome (DSS)

Background	▪ Dengue fever, including Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS), is the most significant arthropod-borne viral disease worldwide. It occurs in over 100 countries and territories and threatens the health of over 2 500 million people in tropical and subtropical regions. ▪ Dengue viruses are transmitted to humans through the bites of infective female *Aedes aegypti* and a few other *Aedes* mosquito species. These generally acquire the virus while feeding on the blood of viraemic person. Once infective-after 7 to 12 days- a mosquito can transmit the virus to susceptible individuals for the rest of life; transovarial transmission to the next generation of mosquitoes has been demonstrated, albeit rarely. The virus circulates in the blood of infected humans for 2-7days and the period from infective bite to the appearance of symptoms ranges from 3 to 14 days (usually about 1 week) ▪ Dengue fever is a severe disease with high epidemic potential. An estimated 500 000 patients, 90% of them below the age of 15, are hospitalized with DHF / DSS every year. WHO aims to accelerate the final development of an attenuated dengue vaccine. ▪ Immediate Notification to WHO is formally required by IHR using the Decision Instrument :(Annex 2,IHR)
Surveillance goal	▪ Monitor trend to predict and detect outbreaks of plague promptly. ▪ Investigate cluster of suspected cases ▪ Target high risk areas for intervention ▪ Monitor changes in serotype circulation and rate of DHF / DSS ▪ Monitor larval and adult populations of *Ae. aegypti* and *Ae. albopictu* ▪ Monitor control measures
Recommended case definition	***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. ***Probable case*** ▪ Any case compatible with the clinical description and **one or more** of the following: - supportive serology (reciprocal haemagglutination-inhibition antibody titre - 1280, comparable IgG EIA titre or positive IgM antibody test in late acute or convalescent-phase serum specimen). - occurrence at same location and time as other confirmed case ***Confirmed:*** Any case compatible with the clinical description and is laboratory confirmed. ***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 - 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, hypoproteinaemia) **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.

Dengue Fever

including Dengue haemorrhagic fever (DHF) & Dengue shock syndrome (DSS)

Respond to alert threshold for epidemic-prone diseases	**If a single case is suspected:** ▪ Report case-based information immediately, weekly/monthly to the appropriate levels. ▪ Begin VHF isolation precautions immediately and enhance standard precautions throughout the health care setting. Use protective clothing, disinfection of surfaces and spills, safe disposal of materials used for patient care and safe disposal of patient waste. Treat and manage the patient with supportive care. Collect specimen safely to confirm the case.
Respond to epidemic threshold for diseases targeted for eradication	**If a single case is confirmed:** ▪ Rapid referral to more advanced facilities. Maintain strict VHF infection control 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 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. ▪ Proper disposal of solid waste. Improved water storage. Application of insecticides to larval habitats in water storage containers and animal drinking bowls, mosquitoes eating fish, repellents settings . Intensify sources reduction measures , including community mobilization. Assess risk factors immediately and consider request for assistance to improve outbreak control.
Analyze and interpret 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. Analyze age and sex distribution. Percentage of DHF / DSS cases and of hospitalizations.
Reference	WHO Recommended Surveillance Standards *WHO/CDS/CSR/ISR/99.2*

Diarrhoea with blood (dysentery)

Background	▪ *Shigella dysenteriae* 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 Shigella dysentariae type 1 (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 type 1 (SD1). ▪ Determine antibiotic sensitivity pattern of the agents isolated (especially SD1) both for routine surveillance and during outbreaks.
Recommended case definition	***Suspected case***: A person with diarrhoea with visible blood in stool. ***Confirmed case***: Suspected case with stool culture positive for *Shigella dysentariae 1.*
Respond to alert threshold for epidemic-prone diseases	**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 outbreak. ▪ Investigate the case to determine risk factors contributing to transmission.
Respond to action threshold for epidemic-prone diseases	**If a suspected case is confirmed:** ▪ Search for additional cases in locality of confirmed cases. ▪ Strengthen case management and treatment. ▪ 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, strengthening access to safe water supply and storage, and use of latrines and safe disposal of human waste. ▪ Promote the effective use of chlorine based disinfectant
Analyze and interpret 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 analyze age distribution. Assess risk factors to improve control and prevention of sporadic diseases and outbreaks.

Reference	*Guidelines for the control of epidemics due to Shigella dysenteriae type 1*. WHO/CDR/95.4 *Safe Water Systems for the Developing World: A Handbook for Implementing Household-based Water Treatment and Safe Storage Projects*. Department of Health & Human Services. Centres for Disease Control and Prevention. Atlanta. 2000

Diarrhoea with dehydration in children less than 5 years of age

Background	▪ Diarrhoea with dehydration in children less than 5 years of age is due to infections of the gastrointestinal tract caused by viruses (especially Rotavirus), bacteria *(E. Coli, Salmonellae, shigellae, Campylobacter, Yersinia*, and others), and parasites (*Giardia, Entamoeba*, cryptosporidia, cyclospora). These diseases are transmitted through eating contaminated food or water, or through faecal -oral spread. ▪ Diarrhoea diseases represent the second leading cause of death among children less than 5 years of age in many African countries, with more than 3 million deaths per year. ▪ Different epidemiological patterns (for example, seasonality) are observed for different pathogens. ▪ The WHO and UNICEF advocate that each district team use the Integrated Management of Childhood Illnesses (IMCI) strategy to reduce morbidity and mortality of childhood diarrhoea.
Surveillance goal	▪ Detect diarrhoea outbreaks promptly. Laboratory confirmation can confirm specific pathogenic agent outbreak, but laboratory confirmation is not necessary for routine surveillance of diarrhoea with dehydration. ▪ Monitor antimicrobial resistance during outbreaks of bacterial origin.
Recommended case definition	***Suspected case***: Passage of 3 or more loose or watery stools in the past 24 hours with or without dehydration and: *Some dehydration* -- two or more of the following signs: restlessness, irritability; sunken eyes; thirsty; skin pinch goes back slowly, or *Severe dehydration* -- two or more of the following signs: lethargy or unconsciousness; sunken eyes; not able to drink or drinking poorly; skin pinch goes back very slowly. ***Confirmed case***: Suspected case confirmed with stool culture for a known enteric pathogen. *Note:* Laboratory confirmation of specific agent causing outbreak is not routinely recommended for surveillance purposes.
Respond to a suspected outbreak for other diseases of public health importance	**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 a confirmed outbreak for other diseases of public health importance	**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. ▪ Promote the effective use of chlorine based disinfectant.

Analyze and interpret data	**Time:**	Graph cases and deaths to compare with same period in previous years. Prepare graphs for outpatient diarrhoea with some dehydration and for diarrhoea with severe dehydration. Construct an epidemic curve when outbreaks are detected.
	Place:	Plot location of case households.
	Person:	Report monthly totals due to diarrhoea with some dehydration and also for diarrhoea with severe dehydration from outpatient services. Also report monthly inpatient total cases and deaths due to diarrhoea with severe dehydration.
Reference	*Management of childhood illness: Clinical skills training course for first level health facilities*. World Health Organization. WHO/CDR/95.14 *Integrated Management of Childhood Illness: A WHO/UNICEF Initiative Bulletin of the World Health Organization.* Vol. 75, 1997, Supplement 1, 1997. ISBN 92 4 068750 5	

Dracunculiasis

Background	▪ Dracunculiasis is commonly known as Guinea worm. It is caused by a large nematode, a disabling parasite that emerge through the skin of the infected person. ▪ This is an old disease, known since antiquity, leaving many patients with unfortunate socio-economic consequences. It is transmitted through ingestion of a crustacean (cyclops) eaten by an immature form of the nematode (larvae). The cyclops lives found in stagnant water sources (lakes, swamps and rivers) in rural areas in African countries. The female nematode discharges from the host's skin when there is contact with water. The incubation period is for a period of 9 to 12 months. There is no treatment or vaccine against the illness. ▪ Successful disease control strategies conducted by an international coalition and their partners has pushed Dracunculiasis towards eradication. In the first quarter of 2000, 27 000 cases of Guinea worm were reported to the WHO compared to 892 000 that were reported for all of 1989, showing a reduction of 87%. ▪ The illness is endemic in 13 countries in Africa: Benin, Burkina Faso, Centrafrique, Cote d'Ivoire, Ghana, Ethiopia, Mali, Mauritania, Niger, Nigeria, Sudan, Togo and Uganda. In Sierra Leone the disease is targeted for eradication and it is under active surveillance.
Surveillance goal	▪ Active detection and investigation of each case at the community level. Monthly reporting of cases to the next level. ▪ In zones where Guinea worm has been eradicated, maintain active searches for additional cases. ▪ Report all imported cases to countries or areas of origin. ▪ Integrate into surveillance to confirm absence of transmission.
Recommended case definition	***Suspected case***: ▪ A person presenting a skin lesion with itching and a blister living in endemic area ***Confirmed case***: ▪ A person with the emergence of Guinea Worm as confirmed by knowledgeable health worker.
Respond to alert threshold for disease targeted for eradication	**If a single case is suspected:** ▪ Report the case according to national program guidelines for eradication of Dracunculiasis. ▪ Treat case with metronidazole to decrease disability associated with painful leg lesions. ▪ Conduct case investigation to confirm risk factors. ▪ Improve access to safe water according to national guidelines.
Analyze and interpret data	**Time:** Graph cases quarterly. **Place:** Plot distribution of households and work sites for cases from which cases have been reported. **Person**: Count quarterly cases, and analyze age distribution. Report monthly to next levels.
Reference	*Dracunculiasis or guinea-worm*, Geneva, World Health Organization, WHO/CDS/CEE/DRA/99.2, 1999

Hepatitis-B

Background	▪ Hepatitis B is one of the major diseases of mankind and is a serious global public health problem. It is preventable with safe and effective vaccines that have been available since 1982. Of the 2 billion people who have been infected with the hepatitis B virus (HBV), more than 350 million have chronic (lifelong) infections. These chronically infected persons are at high risk of death from cirrhosis of the liver and liver cancer, diseases that kill about one million persons each year. ▪ In much of the developing world, (sub-Saharan Africa, most of Asia, and the Pacific), most people become infected with HBV during childhood, and 8% to 10% of people in the general population become chronically infected. In these regions liver cancer caused by HBV figures among the first three causes death by cancer in men. ▪ Hepatitis B virus is transmitted by contact with blood or body fluids of an infected person in the same way as human immunodeficiency virus (HIV), the virus that causes AIDS. The main ways of getting infected with HBV are: • Perinatal (from mother to baby at the birth) • Child-to-child transmission • Unsafe injections and transfusions • Sexual contact ▪ Zero reporting required at all levels. When countrywide surveillance is not possible, surveillance in sentinel areas or hospitals may provide useful information on potential sources of infection. Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. ▪ All outbreaks should be investigated immediately and confirmed serologically.
Surveillance goal	▪ Detect Hepatitis B 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
Recommended case definitions	***Suspected case***: Any person with symptoms lasting several weeks including yellowing of the skin and eyes (jaundice); dark urine; extreme fatigue; nausea; vomiting and abdominal pain. ***Confirmed case***: A suspected case that is laboratory confirmed
Respond to alert threshold for epidemic-prone diseases and diseases targeted for elimination and eradication	**If Hepatitis B cases are suspected:** ▪ Apply universal precaution to prevent exposure to blood and body fluids ▪ Equipment contaminated with blood or body fluids must be disinfected as soon as possible ▪ Where available and affordable, post-exposure prophylaxis using hepatitis B vaccine and/or hepatitis B globulin is used after exposure ▪ Routine universal infant vaccination is the essential element of strategies to prevent hepatitis B infection Other measures are: • Testing all donated blood for HBsAg • Avoid and discouraging the use of paid donors • Reducing injection overuse and using safe injection practices Appropriate disinfection and sterilization practices for equipment and environmental surfaces
Respond to epidemic or outbreak thresholds	**If Hepatitis B cases are confirmed** ▪ Apply universal precaution to prevent exposure to blood and body fluids ▪ Equipment contaminated with blood or body fluids must be disinfected as soon as possible ▪ Where available and affordable, post-exposure prophylaxis using hepatitis B vaccine and/or hepatitis B globulin is used after exposure ▪ Routine universal infant vaccination is the essential element of strategies to prevent hepatitis B infection ▪ Other measures are: • Testing all donated blood for HBsAg by sensitive tests • Avoid and discouraging the use of paid donors • Reducing injection overuse and using safe injection practices • Appropriate disinfection and sterilization practices for equipment and environmental surfaces

Hepatitis-B	
Analyze and interpret data	**Time:** Analysis of suspected and confirmed cases by week. Graph cases and deaths weekly. Construct an epidemic curve during outbreaks. **Place:** Plot location of case households with precise mapping. **Person:** Analyze by age. Assess risk factors to improve prevention of outbreaks.
Reference	WHO Recommended Strategies for Prevention and Control of Communicable Diseases; WHO/CDS/CPE/SMT/2001.13

Influenza A (H5N1)	
Background	▪ An influenza pandemic occurs with the appearance of a new influenza virus against which none of us has any immunity. This results in several, simultaneous epidemics worldwide with high numbers of cases and deaths. With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics due to the new influenza virus are likely to be established quickly around the world. ▪ Influenza A and B are two of the three types of influenza viruses associated with annual outbreaks and epidemics of influenza. These epidemics are due to minor changes in the influenza viruses that enable them to evade the immunity we have developed after previous infections with the viruses, or in response to vaccinations. ▪ Only influenza A virus can cause pandemics. When a major change in either one or both of the influenza A virus surface proteins occurs spontaneously, no one will have immunity to this completely new virus. When the virus also has the capacity to spread from person-to-person, a pandemic can occur. Global pandemics have been reported since the Middle Ages. The most well documented pandemics occurred in 1918 (H1N1, the Spanish flu), 1957 (H2N2, the Asian flu) and 1968 (H3N2, Hong Kong flu) ▪ Currently there is evidence of rare human-to-human transmission but sustained transmission has not occurred. The large majority of cases for which risk factor data are available indicate that direct contact with live or recently dead poultry is the most important risk factor for infection. ▪ Most patients with influenza H5N1 virus present with symptoms of fever, cough, and shortness of breath and radiological evidence of pneumonia. Frequently occurring non-respiratory symptoms include diarrhea, vomiting, and abdominal pain. The first symptoms of influenza H5N1 virus develop 2 to 4 days after the last exposure to sick poultry, but longer incubation periods have been reported. ▪ The age of reported human H5N1 cases ranges from 3 months to 75 years, with a median age of 18 years. The case fatality rate is approximately 60% and is highest among persons between 10 and 19 years of age. ▪ The continuing geographical spread of highly pathogenic avian influenza (HPAI) H5N1 virus among birds in Asia, Europe, the Middle East and Africa has heightened concerns about the possibility of a global pandemic. ▪ As of February 2008, eight countries in the African Region have reported H5N1 in poultry and/or wild birds. One confirmed death from human infection with A (H5N1) was reported from Nigeria in January 2007. ▪ Immediate Notification to WHO is formally required by IHR.(: Annex 2,IHR)
Surveillance goal	▪ To detect, confirm and respond promptly and appropriately to cases and outbreaks of HPAI ▪ To monitor the spread of influenza A/H5 viruses in human and animal populations ▪ To assess the global trend of the disease, the public health risk it poses, and its pandemic potential, ▪ To trigger public health actions for pandemic preparedness as specified in the Influenza pandemic preparedness plan.

Influenza A (H5N1)

Recommended case definitions for human infections with influenza A (H5N1) virus[3]

Suspected H5N1 case

Any person presenting with unexplained acute lower respiratory illness with fever (>38 ºC) and cough, shortness of breath or difficulty breathing. **AND**
One or more of the following exposures in the 7 days prior to symptom onset:

a. Close contact (within 1 meter) with a person (e.g. caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5N1 case;
b. Exposure (e.g. handling, slaughtering, defeathering, butchering, preparation for consumption) to poultry or wild birds or their remains or to environments contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month;
c. Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month;
d. Close contact with a confirmed H5N1 infected animal other than poultry or wild birds;
e. Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting.

Probable case: definition 1: Any person meeting the criteria for a suspected case **AND** One of the following additional criteria:

a. infiltrates or evidence of an acute pneumonia on chest radiograph plus evidence of respiratory failure (hypoxemia, severe tachypnea) **OR**
b. positive laboratory confirmation of an influenza A infection but insufficient laboratory evidence for H5N1 infection.

Probable case definition 2: A person dying of an unexplained acute respiratory illness who is considered to be epidemiologically linked by time, place, and exposure to a probable or confirmed H5N1 case.

Confirmed H5N1 case: A person meeting the criteria for a suspected or probable case **AND** One of the following positive results conducted in a national, regional or international influenza laboratory whose H5N1 test results are accepted by WHO as confirmatory:

a. Isolation of an H5N1 virus;
b. Positive H5 PCR results from tests using two different PCR targets, e.g. primers specific for influenza A and H5 HA;
c. A fourfold or greater rise in neutralization antibody titer for H5N1 based on testing of an acute serum specimen (collected 7 days or less after symptom onset) and a convalescent serum specimen. The convalescent neutralizing antibody titer must also be 1:80 or higher;
d. A micro neutralization antibody titer for H5N1 of 1:80 or greater in a single serum specimen collected at day 14 or later after symptom onset and a positive result using a different serological assay, for example, a horse red blood cell haemagglutination inhibition titer of 1:160 or greater or an H5-specific western blot positive result.

Respond to a alert threshold for epidemic-prone diseases

Respond to a suspected case of human H5N1 or to an usual event of severe acute respiratory infection:

- Report case-based information immediately to the appropriate levels probable and confirmed cases .
- Begin avian influenza infection control precautions (e.g., Standard plus Contact plus Droplet Precautions[5]) 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[6,7].
- Review clinical and exposure history during 7days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Search for additional cases.
- Carry out epidemiological investigation. Based on this assessment, adjust preventive measures, and specific actions, like identification and prophylactic treatment of contacts and/ or vaccination of risk groups may be started

Respond to epidemic threshold

If a single human H5N1 case is confirmed or if another acute respiratory disease of epidemic or pandemic potential is confirmed:

- Maintain strict avian influenza infection control precautions and establish an isolation ward to manage additional cases who may present for care.
- Treat and manage the patient according to national guidelines.

Influenza A (H5N1)	
	• Implement active surveillance of case-patient contacts. • Conduct active searches for additional cases. • Distribute laboratory specimen collection kits to health care facilities. • Identify high risk populations. • Mobilize the community to enable rapid case detection and treatment. • Conduct community education on how avian influenza is transmitted and on how to implement infection measures in home and community settings.
Analyze and interpret data	**Time**: Graph weekly cases and deaths, construct an epidemic curve **Place:** Plot location of case households and work sites using precise mapping. **Person:** Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyze age and sex distribution. Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportion of cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation.
References	***1. WHO case definitions for human infections with influenza A (H5N1) virus, 2006*** *2. WHO guidelines for investigation of human cases of avian influenza A(H5N1), 2007* *3. Avian influenza, including influenza A (H5N1), in humans: WHO interim infection control guideline for health care facilities, Revised 10 May 2007* *4. Collecting, preserving and shipping specimens for the diagnosis of avian influenza A(H5N1) virus infection. Guide for field operations, October 2006* *5. WHO interim guidelines on infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care, June 2007* *6. WHO Rapid Advice Guidelines on pharmacological management of humans infected with avian influenza A (H5N1) virus, DATE* *7. WHO interim guidelines on clinical management of humans infected by influenza A(H5N1), DATE* *8. WHO Interim Protocol: Rapid operations to contain the initial emergence of pandemic influenza, Updated DATE* *9. Influenza Pandemic Risk Assessment and Preparedness in Africa, WHO AFRO,2005* *10..Responding to Avian Influenza Pandemic threat : Recommended strategic actions WHO/CDS/CSR/GIP/2005.8* *11. WHO guidelines for global surveillance of influenza A/H5 ,6 February 2004*

LASSA FEVER

DESCRIPTION

Infectious agent	**Lassa virus (Arenavirus family Arenaviridae)**
Case definition	While Lassa fever is mild or causes no observable symptoms in about 80% of people infected with the virus, the remaining 20% have a severe multi-system disease (15 – 20% in hospitalized patients). Lassa fever is also associated with occasional epidemics, during which the case fatality rate can reach 50%. Clinical case definition An illness of gradual onset with one or more of the following: - Malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhea, myalgia, chest pain, hearing loss and - A history of contact with excreta of rodents or with a probable or confirmed case of Lassa fever Laboratory criteria Isolation of Lassa virus from a clinical specimen (e.g. blood, throat swabs, urine and other tissues) by immunohistochemistry (post mortem diagnosis) or RT-PCR (reverse transcriptase-polymerase chain reaction) or Serological diagnosis. The most common diagnostic test is the enzyme-linked immunosorbent assay (ELISA), which can detect IgM antibody (acute infection) and I*gG* anti body (recent infection) as well as Lassa virus antigen. Case classification Suspected: A case compatible with the clinical description. Probable: A suspected case that is epidemiologically linked to a confirmed case. Confirmed: A suspected case that is laboratory confirmed. The most important differential diagnosis include falciparum malaria, typhoid, other viral haemorrhagic fevers, meniningococcaemia and septicaemia. In an endemic area of Sierra Leone, the combination of fever, exudative pharyngitis, retrostemal pain and poteinuria was able to distinguish Lassa fever from other febrile illness with a positive predictive value of 80%. Sensorineural deafness occurs as a late complications in 30% of patients, and is often permanent It is thought to be immune-mediated.

Mode of Transmission	Rodent to human The only known reservoir is wild rodents – in West Africa, the multimammate rat of the Mastomys genus. It is not certain which species of Mastomys are associated with Lassa, but the species M.

	huberti and M. erythroleucus, and M. natalensis are known to carry the virus in Sierra Leone. Infected rats continually shed virus in their excretia, transmission occurs primarily through virus-containing aerosol (inhalation of tiny airborne particles contaminated with rodent excretions), by direct contact of abraded skin and mucous membranes with urine or droppings deposited on surfaces such as floors or beds, or by ingestion of food and water contaminated with rodent excreta. Mastomys are common domestic rodents in West Africa, and highly commensal with humans, scavenging on food remains or poorly stored food. Their movement within a village is limited, usually near the house they occupy, and most virus transmission to humans takes place in and around homes. Rodent to human transmission is also associated with practices such as catching, cooking and eating rodents. Person to person Person to person transmission occurs when a person is exposed to blood tissue, secretions, or excreta of an individual infected with the Lassa virus. Person to person spread in households is common although less frequent than rodent to human spread. Risk of infection is usually associated with direct contact or sexual contact with, or nursing care of, someone infected (see 'period of communicability' below). Nosocomial and Laboratory-associated Spread in hospitals can occur through pharyngeal secretions or urine of a patient, through exposure to blood during surgery, or through contaminated medical equipment.
Incubation	Incubation period is usually 6 to 21 days
Period of communicability	Person to person spread may occur during the acute febrile phase when virus is present in the throat, or during the convalescent phase, when virus can be excreted in urine and semen of patients (3 - 12 weeks from onset of illness).

EPIDEMIOLOGY

Burden	Lassa fever is endemic in Sierra Leone and, before the declaration of the ongoing outbreak in 1996, only a few cases were recorded in the country annually. The number of Lassa virus infections per year in West Africa is estimated at approximately 300, with approximately 1.5% mortality (2001 data). Most of these cases occur in Sierra Leone. Unfortunately, such estimates are crude because surveillance is not uniformly performed. In Guinea, between October 1998 and March 2002 (42 months), 7 out of 24 detected cases were positive; no cases were diagnosed in Côte d'Ivoire in the same period (Survey/Research Project on VHF in West Africa, report by the International Co-operation

	with Developing countries (NCO-DC/Epicentre).
Geographical distribution	Lassa fever has been endemic in Eastern Sierra Leone since first diagnosed in 1971 as part of an epidemic originating in Panguma. The area of endemicity is a triangle defined by Kailahun, Tongo and Kenema, also known as the "Lassa belt". Most cases have been reported in this region, although in 2002 and 2003, some cases were reported from Bo district, West of this traditional endemic zone
Seasonality	Disease rates are expected to peak in the dry season (November to April)
Alert threshold	One probable case must lead to an alert
Recent epidemics in the country	Epidemics have been reported in recent years. Three outbreaks occurred between 1996 and 200 in Kenema district. In 1996, 470 cases with 110 deaths were reported (CFR = 23.4%). From January to April 1997, 353 cases with 43 deaths were reported (CFR = 12.2%). Between January and April 2003, a total of 133 cases of suspected Lassa fever with 11 deaths were recorded – more than 80% of these were in refugees in camps in South-Eastern Sierra Leon. Diagnosis of all cases was on the basis of clinical suspicion. Two of the camps, Jimi Bagbo and Gerihun, are located in Bo district, a region previously thought to be outside the Lassa fever endemic area. Reliable data on the number of cases are not available as laboratory confirmation of cases is difficult (requiring P4 level laboratory) and not done systemically.

RISK FACTORS FOR INCREASED TRANSMISSION

Population movement	Yes	Massive population movement with subsequent overcrowding is closely related to increased transmission of Lassa fever. Rates of seroconversion range from 5% to 20% in village population in Sierra Leone. The highest rates are in overcrowded, highly mobile populations.
Overcrowding	Yes	See above
Poor access to health services	Yes	Person to person transmission can easily be prevented by managing patients in isolation wards and applying appropriate infection control measures with barrier nursing. In conflict situations, isolation and protective measures are often compromised and can result in transmission to staff and other patients. Poor access to health services also leads to an increased exposure in the community as the disease is unrecognized and untreated.
Food shortages	No	
Lack of safe water and	Yes	Lack of hygiene increases the chances of contact with objects and/or food contaminated with rodent excreta.

poor sanitation		
Other	Yes	Increase in the reservoir population. Mastomys rodents breed very frequently, and produce large numbers of offspring Lassa virus can be transmitted horizontally between rodents, as well as vertically to their offspring. Poor environmental sanitation (attracts rodents) Unsafe food handling and storage practices (storing food, water in non-sealable containers where rats can access). Practices such as catching, cooking and eating rodents
Risk assessment conclusions		Lassa fever is a serious public health problem in Sierra Leone and outbreaks with high mortality have occurred regularly since 1996 in the traditional Lassa belt in Eastern Sierra Leone. Furthermore, there may be spread beyond the traditional endemic zone possibly due to: - environmental changes during the past 10 years that have changed the distribution of Lassa virus infected Mastomys natelensis, the natural host of Lassa virus in Sierra Leone.

Risk assessment (contd.)	- migration and displacement of populations of infected individual from the previously endemic region, which has resulted in cases of Lassa fever in new areas. Hospitals in Sierra Leone do not have access to advanced diagnostic technologies and, as clinical symptoms of Lassa fever are non specific, physicians rely on differential diagnosis to identify the disease. This, combined with poor access to health services and a poorly developed referral system, makes early diagnosis and treatment very difficult. The risk for further outbreaks is high given continuing population movements (returnees, resettlement), overcrowding in camps and communities, poor hygiene and sanitary conditions, poor environmental management and low access to health care in some areas.

PREVENTION AND CONTROL MEASURES

Case management	Ribavirin, an antiviral drug, has been used with success in Lassa fever patients. It has been shown to be most effective in decreasing viraemia and reducing the mortality rate when given intravenously early in the course of the illness, especially within the first 6 days of fever. Medication should be given orally or intravenously, intramuscular and subcutaneous injections are contraindicated because of the risk of haematomias. Evidence about the effectiveness of oral ribavirin in Lassa Fever treatment is not available, however oral ribavirin therapy may be attempted where IV therapy is not feasible. General supportive treatments, as well as treatment of any other complicating infection are also very important in the management of Lassa patients. Side-effects of ribavirin are largely restricted to reversible haemolysis. Plasma transfusion has not shown to be beneficial during Lassa fever convalescence and is not recommended, especially due to the potential for transmitting other viruses such as HIV and HBV. Intravenous ribavirin treatment The threshold number of cases at which intravenous therapy impossible depends on a variety of factors, including number of patients and local health care resurces. Adults 1. Loading dose ‘of 17mg/kg IV (max. 1g per dose). 2. Followed by 17 mg/kg IV (max 1g per dose) every 6 hours for 4 days. 3. Followed by 8 mg/kg IV (max 500 mg per dose) every 8 hours for 6 days. ‘If there is some delay in beginning the treatment a loading dose of 30 mg/kg IV (max 2g.) might be necessary.

Case management (contd.)	**Pregnant women** **Sa**me as fro adults. Ribavirin is contraindicated in pregnancy in the context of VHF, however, the benefit appears likely to outweigh any risk to the foetus of ribavirin therapy (the associated mortality of VHF tends to be higher in pregnancy), and ribavirin is therefore recommended. **Children** Same as for adults, dosed according to weight

	Oral ribavirin treatment **Adults** 1. Loading dose of 2000 mg orally once 2. Followed by 1000 mg orally every 6 hours for 4 days 3. Followed by 500 mg orally every 6 hours for 6 days. Pregnant women Same as for adults **Children** 1. Loading dose of 30mg/kg orally once 2. Followed by 15 mg/kg every 6 hours for 4 days 3. Followed by 7mg/kg every 6 hours for 9 days
	Supportive treatment All Lassa fever patients should receive supportive treatment, with careful maintenance of fluid and electrolyte balance, circulatory volume, blood pressure and oxygenation, as well as treatment of any other complicating infection. Mechanical ventilation, renal dialysis, and anti-seizure therapy may be required. Medication should be given orally or intravenously. Intramuscular and subcutaneous injections are contraindicated because of the risk of haematomas. Approximately 15-20% of patients hospitalized for Lassa fever die from the illness. Overall, however, only about 1% of infections with Lassa fever result in death. The death rates are particularly high for women in the third trimester of pregnancy, and for the fetuses of infected pregnant, about 95% of which die in utero.

	Protective measures Patients with probable or confirmed Lassa fever should be isolated and cared for using barrier nursing techniques. Isolation precautions, to reduce the risk of transmission of Lassa fever in the health care setting, should follow the guidelines developed by WHO/CDC. See: - "VHF outbreak control" in Guidelines for Outbreak Control, in this Tool kit. - Infection control for viral haemorrhagic fevers in the Africa health care setting Geneva, WHO, 1998 (WHO/EMC/ESR/96.2. available at http/www;who;int/emc-documents/haem fevers/whoemces982c,htm) Universal precautions must be observed when handling specimens of blood or tissues, and when disposing of waste material, needles, or other sharp instruments

	See: - "Prevention" in Section 8 "HIV/AIDS". - Annex 8 in Guidelines for Collection of Specimens for Laboratory Testing in this Tool kit
Prevention	**Rodent control** The key to prevention and control would be to eliminate contact with rodents. Rodent control should include adequate site planning, sanitation, facilities safe refuse disposal, environmental sanitation, development of local traps and use of cats to catch rats. Although studies that have involved trapping and destruction of rodents (trap-out studies) have been effective in Sierra Leone, controlling the rodent population as the only means to prevent Lassa fever is unrealistic and not sustainable.

Prevention (contd.)	Safe food storage personal hygiene and environmental sanitation - Safe water and food storage in solid, seated containers so those rats cannot contaminate them. - Personal hygiene, environmental sanitation and hand washing - Elimination of rat habitats and minimizing of activities that produce aerosols containing rodent excreta. Educational programmes on the above measures and transmission modes are essential in Lassa fever control. Prevention of nosocomial spread Basic barrier nursing methods (gloves, gowns and masks) are highly effective in preventing secondary spread of the infection. Strict isolation with rigorous barrier nursing should be combined with full medical care, including surgery. If indicated, to ensure the safety of the staff and survival of the patient. Extensive nosocomial epidemics may result from reuse of inadequately sterilized equipment (needles, syringes, gloves) during surgery or midwifery.

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 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 skins 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). Multiple drug therapy combining two or three drugs (rifampicin, clofaximine and dapsone) is very effective in curing leprosy. At the end of 1999, leprosy point prevalence in African countries was 1.6 cases per 10 000 population with about 70 000 registered cases. ▪ Incubation period is 6 months to 20 years or more. Infection is probably frequent but clinical disease is rare, even among the most close contacts of patients. Multibacillary patients are most contagious, but infectiousness is reduced rapidly as soon as multiple drug therapy begins. Leprosy can be complicated by neuritis and leprosy reactions, resulting in impairment and disabilities of hands, feet, and eyes. ▪ Leprosy has historically been associated with social isolation and psychosocial consequences. This social stigma still persists in some countries in Africa. ▪ Some skin diseases such as tinea versicolor, mycosis, vitiligo, Scleroderma, psoriasis, systemic lupus erythematosus and Von Recklinghausen disease may be mistaken for leprosy.
Surveillance goal	▪ Observe national trends towards the leprosy elimination target, defined as a reduction in prevalence to less than 1 case per 10 000 population. ▪ Monitor resistance of Hansen's bacillus to drugs used for multi-drug therapy (MDT) on an ongoing basis. ▪ As leprosy nears elimination, supplement routine surveillance with community-based surveillance.
Recommended case definition	***Suspected case***: A person showing one of three cardinal signs of leprosy: hypopigmented 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 MDT.
Respond to alert threshold for diseases targeted for elimination	**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). -- PB patients must be treated for 6 months with a two drugs MDT regimen (6 PB blister packs to be taken in a period of 9 months)

Respond to action threshold for diseases targeted for elimination	**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 accessability 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 case s during a period. Assess adequacy of surveillance in areas where under- or ever-reporting is suspected. Monitor distribution of MDT drugs.
Analyze 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). Analyze age and disability distribution and treatment outcomes (cases cured, defaulted, relapsed).
Reference	*A guide to eliminating leprosy as a public health problem, Second Edition 1997.* Action Programme for the Elimination of Leprosy, World Health Organization. WHO/CTD/LEP/94.2

Malaria

Background	▪ Malaria is a highly prevalent tropical illness with fever following the bite of infective female Anopheles mosquitoes which transmit a parasite, *Plasmodium falciparum*, *p. ovale, P. vivax*, or *P. malariae*. Serious malarial infections are usually due to *P. falciparum* which may result in severe anaemia and cerebral involvement. ▪ Malaria is one of the leading causes of illness and death in many African countries. There are 900 000 deaths per year in Africa mainly in children less than 5 years of age and pregnant women. ▪ Incubation period from the time of being bitten to onset of symptoms is 7 to 30 days. The incubation period may be longer, especially with non- *P. falciparum* species. ▪ Transmission of malaria is highly seasonal in some areas in African countries. ▪ *P. falciparum* is often resistant to chloroquine and is becoming resistant to sulfadoxine-pyrimethamine, and other drugs.
Surveillance goal	▪ Detect malaria cases promptly ▪ Improve percentage of malaria cases confirmed microscopically. ▪ Monitor anti-malarial resistance of sporadic cases . Use sentinel populations in selected sites for monitoring anti-microbial resistance.
Recommended case definition	***Uncomplicated malaria*** ▪ Any person with fever or history of fever within 24 hours; without signs of severe disease (vital organ dysfunction) is diagnosed clinically as malaria. ***Confirmed uncomplicated malaria*** ▪ Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites. ***Unconfirmed severe malaria*** ▪ Any patient hospitalised with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically ***Confirmed Severe malaria*** ▪ Any patient hospitalized with *P. falciparum* asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.
Recommended pubic health action	▪ **Early diagnosis and prompt treatment of malaria** ▪ **Use of LLINs** ▪ **Use of IPT** ▪ **Environmental control** ▪
Analyze and interpret data	**Time:** Graph the number of cases by month. **Place:** Plot location of households for new cases and deaths. **Person:** Count the number of new malaria cases and deaths by month and analyze age groups and time of onset.
Reference	*Malaria epidemics: Detection and control, forecasting and prevention*. Geneva. World Health Organization. WHO/MAL/98.1084

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. ▪ Risk factors include low vaccine coverage (<85 to 90%) which allows accumulation of susceptible persons at high risk for measles. Outbreaks can be explosive in areas of high population density. ▪ Other viral illnesses such as rubella may cause or contribute to similar outbreaks.
Surveillance goal	▪ Detect outbreaks of fever with rash illness promptly: *In countries with a measles elimination target*: immediate case-based reporting of suspected cases and deaths of fever with rash illness; confirm all suspected measles cases with laboratory test (usually serum IgM). *In countries with accelerated measles control programs*: Summary reporting of cases and deaths for routine surveillance and outbreaks; confirm the first five cases of suspected measles in a health facility per week with laboratory test (usually serum IgM)
Recommended 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 for epidemic-prone diseases	**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 superinfection. Use airborne isolation precautions where feasible. ▪ Investigate the case or outbreak to identify causes for outbreak.
Respond to action threshold for epidemic-prone diseases	**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.
Analyze 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 analyze by age group and immunization status.
Reference	*Using surveillance data and outbreak investigations to strengthen measles immunization programmes*, Geneva, World Health Organization. WHO/EPI/GEN/96.02

Meningitis

Background	▪ Acute infection of the central nervous system usually caused by *Neisserai meningitides*, *Haemophilus influenzae*, or *Streptococcus pneumoniae*, encapsulated bacteria transmitted human-to-human via airborne droplet spread. ▪ In meningitis outbreak countries, large outbreaks due to *N. meningitis* (incidence grreat than 1 case per 1000 population) may occur November through May. Outside the meningitis belt, smaller outbreaks may occur year-round. ▪ Incubation period is 2 to 10 days. ▪ Attack rates are highest among children aged less than 15 years. Case fatality rates are usually 10 to 20% among treated patients, and >70% among untreated cases. ▪ Antimicrobial resistance to chloramphenicol has not yet been detected in Africa. Resistance to sulfonamides is widespread. ▪ Viral or tuberculous meningitis and HIV-related opportunistic infections are among the conditions which may mimic this disease. Meningitis due to Haemophilus influenzae occurs principally in children less than 5 years of age.
Surveillance goal	▪ Promptly detect meningitis outbreaks and confirm aetiology of first 5 to 10 cases. Perform lumbar puncture and Gram stain of cerebro - spinal fluid (CSF) on all cases of suspected meningitis where feasible to confirm aetiology of meningitis for improved surveillance. ▪ Perform periodic serogrouping to determine if cause of outbreak is vaccine-preventable. ▪ Perform periodic susceptibility testing for penicillin and chloramphenicol.
Recommended case definition	***Suspected case***: Any person with sudden onset of fever (>38.5□C rectal or 38.0□C axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal sign. ***Confirmed case***: A suspected case confirmed by isolation of *N. meningitides* from CSF or blood.
Respond to alert threshold for epidemic-prone diseases	**If alert threshold is reached**: ▪ Population greater than 30 000, 5 cases per 100 000 inhabitants per week. ▪ Population less than 30 000, 2 cases in 1 week or an increase in the number compared to the same time in previous years. **Respond to alert threshold:** ▪ Inform next level of health system and investigate the cases ▪ Confirm the cases. ▪ Treat and manage cases appropriately with oily chloramphenicol. ▪ Intensify surveillance for additional cases in the area. ▪ Prepare to conduct a mass vaccination campaign.

Respond to action threshold for epidemic-prone diseases	**If action threshold is reached:** ▪ Population greater than 30 000: In one week, 15 cases per 100 000 inhabitants per week confirms epidemic in all situation. If no epidemic during last 3 years and vaccine coverage against meningococcal meningitis is <80%, action threshold is 10 cases per 100 000 inhabitants per week. ▪ Population less than 30 000: 5 cases in 1 week or doubling of the number of cases over a 3-week period. **Respond to action threshold:** ▪ Begin mass vaccination campaign ▪ Distribute treatment supplies to health centres ▪ Treat according to epidemic protocol ▪ Inform the public ▪ Define the age group at highest risk (usually persons age 1 through 30 years of age) and complete a mass vaccination campaign within 10 days of outbreak detection. ▪ Mobilize community to permit early case detection and treatment, and improve vaccine coverage during mass vaccination campaigns for outbreak control.
Analyze 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. Estimate distance to the nearest health facility. **Person:** Count total sporadic and outbreak cases. Analyze age distribution. **Target case fatality rate:** <10%
Reference	*Weekly Epidemiological Record N 38, September 2000* (http://www.who.int/wer/pdf/2000/wer7538.pdf)

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. As a result, tetanus is targeted for elimination in many African countries. ▪ Incubation period is 3 to 21 days, with an average of approximately 6 days. ▪ Risk factors: Unclean cord care practices during delivery for neonates. Lack of antibody protection in incompletely immunized mothers.
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.
Recommended case definition	***Suspected case***: Any newborn with a normal ability to suck and cry during the first two days of life, and who, between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both. ***Confirmed case***: No laboratory confirmation recommended.
Respond to alert threshold for diseases targeted for elimination	**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 alert threshold for diseases targeted for elimination	**If a case is confirmed through investigation:** ▪ Immunize the mother with at least 2 doses of tetanus toxoid and other pregnant women in the same locality as the case. ▪ Conduct a supplemental immunization activity for women of childbearing age in the locality. ▪ Improve routine vaccine coverage through EPI and maternal immunization programme 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.
Analyze and interpret data	**Time:** Graph cases and deaths monthly. Target should reflect elimination target for each district. **Place:** Plot location of case households and location of birth attendants. **Person:** Count monthly cases and deaths. Analyze each case of NNT by cord care practices.
Reference	*Field manual for neonatal tetanus elimination*. Geneva, World Health Organization. WHO/V&B/99.14

New 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). The virus is transmitted from human to human by sexual intercourse, needle injections, transfusions, transplacental or trans-vaginal routes, breast milk or other direct contact with infected human bodily fluids. ▪ 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. ▪ Twenty-four 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.
Recommended case definition	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.

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 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.
Analyze and interpret data	**Time:** Count new AIDS cases and report monthly. Analyze by number of cases confirmed with serology. At the end of the year, calculate the total number of cases and include trends for HIV serosurveillance, STI surveillance and results of any special studies (socio-behavioural studies, drug sensitivity to antimicrobial agents, and so on).
Reference	*Guidelines for Sexually Transmitted Infections Surveillance*. Geneva. UNAIDS and World Health Organizaiton. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E

Onchocerciasis

Background	▪ Filarial infection of the skin and eye caused by *Onchocerca volvulus* transmitted by the bite of female *Simulium* black flies. ▪ Nearly all of the worlds' estimated 18 million infected persons (of whom more than 250 000 are blind) live within 26 African countries. Onchocerciasis is the second leading infectious cause of blindness worldwide. It causes debilitating skin problems, leading to significant decreases in productivity in areas where it is endemic. Entire villages have relocated away from the fertile lands near rivers where black flies breed. ▪ Incubation period is years to decades since repeated infection is necessary for disease manifestations. Clinical illness is unusual in children even in endemic areas. ▪ Other filaria (for example, *Loa loa* and *Mansonella*) and other chronic skin and eye disease can produce similar clinical findings.
Surveillance goal	▪ Early detection with goal of reducing the recurrence of transmission of the parasite in areas where it has been eradicated (zones covered by the Onchocerciasis Programme). ▪ Conduct periodic surveillance in sentinel villages: screen using diethylcarbamzaine (DEC); in case of a positive reaction to DEC, confirm with a microscopic examination of a skin biopsy from each suspected case.
Recommended case definition	***Suspected case***: In an endemic area, any person with fibrous nodules in subcutaneous tissues. ***Confirmed case***: A suspected case that is laboratory confirmed by presence of one or more of the following: microfilariae in skin snips, adult worms in excised nodules, or typical ocular manifestations (such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body).
Respond to a suspected outbreak for other diseases of public health importance	**If a suspected case is detected:** ▪ Report the case according to national guidelines ▪ Collect specimen for confirming the case ▪ Investigate the case to determine the cause of the case ▪ Treat the case according to national guidelines.
Respond to a confirmed outbreak for other diseases of public health importance	**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.
Analyze and interpret data	**Time:** Graph cases quarterly. **Place:** Plot distribution of patients' household and workplaces **Person:** Count quarterly cases and analyze age distribution.
Reference	WHO Recommended Surveillance Standards. Second edition. WHO/CDS/CSR/ISR/99.2

Pneumonia

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, tremethoprim-sulfamethoxazole) and other antimicrobials is increasing. ▪ Viruses such as respiratory syncytial virus (RSV) may also cause ARI and pneumonia.
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.
Recommended 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 indrawing or stridor in a calm child. General danger signs for children 2 months to 5 years are: unable to drink or breast feed, vomits everything, convulsions, lethargy, or unconsciousness. **Confirmed case:** Radiographic or laboratory confirmation of pneumonia will not be feasible in most districts.
Respond to a suspected outbreak for other diseases of public health importance	**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 a confirmed outbreak of other disease of public health importance	**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.

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

Poliomyelitis (Acute flaccid paralysis)

Background	▪ Poliovirus (genus Enterovirus) serotypes 1, 2, and 3 are transmitted from person-to-person via fecal-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 immunocompromised 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. Globally, poliovirus type 2 appears to have been eliminated. Serotypes 1 and 3 poliovirus still circulate in several African countries, and surveillance is not yet adequate to assure eradication in many countries. ▪ Areas with low vaccine coverage may allow ongoing wild-type transmission. ▪ Other neurologic illnesses may cause AFP, for example, Guillain-Barré syndrome and transverse myelitis.
Surveillance goal	• This disease is targeted for eradication 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 AFP cases. Obtain tow or more stool specimens with 14 days of the onset of paralysis for viral isolation. ▪ Surveillance for AFP is used to capture all true cases of paralytic poliomyelitis. Target for surveillance performance to provide certification of polio eradications is 1 case of AFP per year per 100 000 population aged less than 15 years.
Recommended 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 for diseases targeted for eradication	**If a single case is suspected:** ▪ Report the suspected case immediately according to the national polio eradication programme 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 ship the specimen. ▪ Obtain virologic data from reference laboratory to confirm wild-type poliomyelitis or VAPP.

Respond to action threshold for diseases targeted for eradication	**If a case is confirmed:** ▪ If wild polio virus is isolated from stool specimen, refer to national polio eradication programme guidelines for recommended response actions. The national level will decide which actions to take and may include: -- 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 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. Consider use of house-to-house vaccination teams in selected areas.
Analyze and interpret data	**Time:** Graph monthly cases (which should be zero to very few cases per area per year), or weekly cases during an outbreak. Evaluate the percent of suspected cases reported within 48 hours and the percentage with adequate laboratory evaluation. **Place:** Plot location of case households. Investigate the circumstances of poliovirus transmission in each case thoroughly. Examine the possibility of other potential areas of transmission. **Person:** Count monthly routine and outbreak-related cases. Analyze age distribution. Assess risk factors for low vaccine coverage.
Reference	*Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication*. World Health Organization.

Schistosomiasis

Background

- Schistosomiasis has the second highest prevalence for tropical diseases (following malaria) and is a leading cause of severe morbidity in large parts of Africa, Asia and the Americas. At least 700 million persons are at risk worldwide, more than 208 million are infected, and 20 million have morbididty. An estimated 85% of those infected live in sub-Saharan Africa.
- Urinary schistosomiasis is endemic in the Middle East and most of Africa. Intestinal schistosomiasis currently occurs in the Caribbean (including Suriname and Venezuela), Brazil, in Africa and Asia.
- Because schistosomiasis is a chronic insidious disease, it is poorly recognized in the early stages. It is linked to water development schemes and becomes a threat to development as disease occurs in adulthood. The primary goal for
- WHO is to control the disease (morbidity control).

Causal agents:

The agents of schistosomiasis are blood flukes:

- *Schistosoma haematobium*, agent of urinary schistosomiasis worldwide
- *Schistosoma mansoni*, agent of intestinal schistosomiasis worldwide
- *Schistosoma intercalatum*, agent of intestinal schistosomiasis encountered in West Africa
- *Schistosoma japonicum*, agent of intestinal schistosomiasis endemic in China, Indonesia, Philippines
- *Schistosoma mekongi*, agent of intestinal schistosomiasis in Cambodia and Laos.

Main modes of transmission:

- The eggs of schistosomes leave the human body in excreta, according to species, hatch in water and liberate larvae (miracidia) that penetrate into freshwater snail hosts (genus *Biomphalaria* for *S. mansoni*, *Bulinus* for *S. haematobium* and *S. intercalatum*, *Oncomelania* for *S. japonicum,* and *Neotricula* for *S. mekongi*). After several weeks, cercariae emerge from the snails and penetrate the human skin (during wading, swimming, washing).
- Within the body, cercariae develop to maturity and subsequently migrate to the lungs, the liver, and the veins of the abdominal cavity or the bladder plexus. Eggs escape through the bowel or urinary bladder. Human discharge of eggs may last more than 20 years; infected snails release cercariae throughout their lifetime (3 weeks to 3 months).

Clinical description

- In an area endemic for *Schistosoma haematobium,* the pathognomonic sign of urinary schistosomiasis is haematuria.
- Intestinal schistosomiasis has a non-specific clinical picture of abdominal pain, diarrhoea, blood in stool, with possible hepato(spleno)megaly.

Surveillance:

- Data from general health statistics will underestimate the prevalence but may indicate a relatively high prevalence in a particular area. Surveillance of schistosomiasis has to take into account the geographical distribution of the disease, which is focal, and adjacent areas may have very different patterns and rates. Surveillance should be incorporated in the primary health care system.
- Routine monthly reporting of aggregated suspected or confirmed cases from peripheral level to intermediate and central level. In zones endemic for intestinal schistosomiasis, where surveillance through the primary health care system has less epidemiological value, surveys to evaluate the prevalence and intensity of infection in the community are useful. Children of school age are good indicators of the endemic level in the general population and as an appropriate group for investigation.
- Yearly reporting of aggregated data from peripheral level to intermediate and central levels.
- **International:** Yearly reporting from the central level to WHO.

Surveillance goal

To decet, confirm case and aetiology and respond promptly to communities affected (mass treatment).

Schistosomiasis

Recommended case definitions	**URINARY SCHISTOSOMIASIS** • ***Suspected:*** Not applicable • ***Probable:*** Not applicable • ***Confirmed:*** A person with visible haematuria, **or** with positive reagent strip for haematuria, **or** with characteristic parasite eggs urine (microscope). **– INTESTINAL SCHISTOSOMIASIS:** • ***Suspected:*** A person with non-specific abdominal symptoms, blood in stool, hepato (spleno)megaly • ***Probable:*** Not applicable • ***Confirmed:*** A person with eggs of *S. mansoni*, *S. japonicum, S. mekongi* or *S. intercalatum* in stools (microscope).
Recommended public health action	Confirm community prevalence of infection by surveys in school children. **Case management** • Praziquantel is the drug of choice against all schistosome species. A single oral dose of 40 mg/kg will give cure rates of between 80% and 90% and dramatic reductions in the intensity of infection. **Prevention** • Provision of potable water to reduce infective water contact • Proper disposal of excreta to prevent eggs from contaminating water bodies containing snail hosts • Health education to promote early care-seeking behaviour, use of safe water and proper disposal of excreta
Analyze and interpret data	**Time**: Analyse the treatment coverage in targeted areas **Place:** Map the distribution of schistosomiasis to identify areas requiring interventions. **Person**: Assess the prevalence and intensity of infection in school children periodically
Reference	WHO. 2006. Preventive chemotherapy in human helminthiasis. WHO, Geneva, April 2006 *Weekly Epidemiological Record*, 2006, 81:145–164 WHO. 2002. Prevention and Control of Schistosomiasis and STH Report of a WHO Expert Committee. WHO Technical Report Series 912. Gryseels B, Polman K, Clerinx J, Kestens L. Human schistosomiasis. Lancet. 2006 Sep 23;368(9541):1106-18. Steinmann P, Keiser J, Bos R, Tanner M, Utzinger J. Schistosomiasis and water resources development: systematic review, meta-analysis, and estimates of people at risk. Lancet Infect Dis. 2006 Jul;6(7):411-25.

Severe Acute Respiratory Infections

Background	• Severe acute respiratory infections (SARIs) are a significant cause of infectious disease morbidity and mortality in Africa. The mortality rates are particularly high among infants, children and the elderly. • 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[1] include severe acute respiratory syndrome (SARS); human influenza caused by a new subtype, including human episodes of avian influenza; pneumonic plague; 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.
Recommended case definitions for severe acute respiratory infection	**Severe acute respiratory infection (persons ≥ 5 years old)** Any person presenting with manifestations of acute lower respiratory infection with: • Sudden onset of fever (>38ºC) AND • Cough or sore throat AND • Shortness of breath, or difficulty breathing • With or without Clinical or radiographic findings of pneumonia OR Any person who died of an unexplained respiratory illness. **Person under investigation**[3]: A person whom public health authorities have decided to investigate for possible H5N1 infection.
Respond to a alert threshold for epidemic-prone diseases	**If a single case of an epidemic- or pandemic-prone acute respiratory disease is suspected OR If there is an unusual event (deaths, outbreak) of severe acute respiratory infection:** • Atypical cases of influenza-like illness (ILI) or severe acute respiratory infection (SARI). • Two or more persons presenting with a SARI or who died from a SARI are detected with onset of illness in a two-week period and in the same geographical area and/or are epidemiologically linked. • Health-care workers with only occupational exposure risks develop SARI after providing care to patients with SARI. • Persons who have contact with birds/animals present with SARI; • Any rumor of clusters of severe acute respiratory infections or of atypical respiratory infections **Respond to a suspected case of an epidemic- or pandemic-prone acute respiratory disease or to an usual event of severe acute respiratory infections:** • Report case-based information immediately to the appropriate levels. • Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential[4] (e.g., Standard plus Contact plus Droplet Precautions) 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 [5,6]. • Review clinical history and exposure history during 7days before disease onset. • Identify and follow-up close contacts of case-patient. • Conduct active searches for additional cases.
Analyze and interpret data	**Time**: Estimate incubation period; describe transmission patterns. **Person:** Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportion of cases requiring hospitalization, clinical outcomes,

Severe Acute Respiratory Infections	
	case fatality ratio, attack rates by age/occupation/blood relation. **Place:** Describe risk factors, possible exposures. Ascertain whether any evidence exists that the virus may have increased it ability to cause human disease or improved its transmissibility.
References	[1] From the International Health Regulations, IHR (2005) [2] AFRO Technical Guidelines for Integrated Disease Surveillance in the African Region, May 2002 [3] WHO guidelines for investigation of human cases of avian influenza A(H5N1), January 2007. [4] WHO interim guidelines on infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care, June 2007 **[5] WHO guidelines for the collection of human specimens for laboratory diagnosis of avian influenza infection, 12 January 2005** [6] Collecting, preserving and shipping specimens for the diagnosis of avian influenza A(H5N1) virus infection. Guide for field operations, October 2006.

Severe Acute Respiratory Syndrome (SARS)	
Background	▪ Severe acute respiratory syndrome (SARS) was first recognized as a global threat in mid-March 2003. The first known cases of SARS occurred in Guangdong province, China, in November 2002 and WHO reported that the last human chain of transmission of SARS in that epidemic had been broken on 5 July 2003. ▪ The etiological agent, the SARS coronavirus (SARSCoV) is believed to be an animal virus that crossed the species barrier to humans recently when ecological or human behaviour changes in increased opportunities for human exposure and virus adaptation, enabling human-to-human transmission ▪ By July 2003, the international spread of SARS-CoV resulted in 8098 SARS cases in 26 countries, with 774 deaths. The outbreak caused significant social and economic disruption in areas with sustained local transmission of SARS and on the travel industry internationally in addition to the impact on health services directly. While much has been learnt about this syndrome, our knowledge about the epidemiology and ecology of SARSCoV infection and the disease remains incomplete. ▪ The natural reservoir of SARS-CoV has not been identified but a number of wildlife species – the Himalayan masked palm civet (*Paguma larvata*), the Chinese ferret badger (*Melogale moschata*), and the raccoon dog (*Nyctereutes procyonoides*) shown laboratory evidence of infection with a related coronavirus. Domestic cats were also found to be infected with the virus ▪ It remains very difficult to predict when or whether SARS will reemerge in epidemic form. Since July 2003, there have been four occasions when SARS has reappeared. Three of these incidents were attributed to breaches in laboratory biosafety and resulted in one or more cases of SARS (Singapore, Taipei and Beijing). Only one of these incidents resulted in secondary transmission outside of the laboratory. The most recent incident was a cluster of nine cases, one of whom died, in three generations of transmission affecting family and hospital contacts of a laboratory worker. ▪ In the inter-epidemic period, all countries must remain vigilant for the recurrence of SARS and maintain their capacity to detect and respond to the possible re-emergence of SARS. ▪ Immediate Notification to WHO is formally required by IHR.(Annex 2,IHR)
Surveillance goal	▪ Detect, confirm and respond promptly and appropriately to cases and outbreaks of SARS-CoV ▪ Monitor the spread of SARS-CoV in human and animal populations in order to assess the global trend of the disease, the public health risk it poses, and its pandemic potential, and to trigger public health actions for pandemic preparedness.

Severe Acute Respiratory Syndrome (SARS)

Recommended case definition

Suspected case

Any person with a history of fever, or documented fever ≥ 38 °C **AND**

- one or more symptoms of lower respiratory tract illness (cough, difficulty of breathing, shortness of breath) **AND**
- Radiographic evidence of lung infiltrates consistent with pneumonia or or autopsy findings consistent with the pathology of pneumonia or ARDS without an identifiable cause **AND** No alternative diagnosis can fully explain the illness.

Confirmed cases:

Any person who tests positive for SARS-CoV by the recommended testing procedures described in section 2

Definition of the SARS Alert

1 Any person with clinical evidence of SARS **AND** with one or more of the following epidemiological risk factors for SARS-CoV infection in the 10 days before the onset of symptoms: :

- Employed in an occupation associated with an increased risk of SARS-CoV exposure (e.g. staff in a laboratory working with live SARS-CoV/SARS-CoV-like viruses or storing, clinical specimens infected with SARS-CoV; persons with exposure to wildlife or other animals considered a reservoir of SARS-CoV, their excretions or secretions, etc.).
- Close contact (having cared for, lived with, or had direct contact with the respiratory secretions or body fluids) of a person under investigation for SARS.
- History of travel to, or residence in, an area experiencing SARS outbreak

OR

2 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.

Severe Acute Respiratory Syndrome (SARS)

Respond to alert threshold for epidemic-prone diseases	**Public health actions when a SARS Alert is raised** ▪ Isolate patient(s) immediately and transmission-based precautions instituted, if not already in place (*35*). ▪ Expedite the diagnosis.*(WHO will assist in the investigation of SARS alerts as appropriate, including facilitating access to laboratory services)* ▪ Trace contacts of persons under investigation for SARS and monitor fever twice daily until SARS has been ruled out (*all contacts should ideally be given written information on the clinical picture, transmission and other features associated with SARS, as well as written information on respiratory hygiene and contact precautions)*. **Reporting to WHO** ▪ National public health authorities should report every laboratory-confirmed case of SARS to WHO. ▪ *However, in view of the global attention given to SARS rumours, informing WHO of clusters of acute respiratory disease and/or high-risk individuals under investigation for SARS will facilitate rapid verification and the accurate dissemination of information to other governments, the media and the public.* **Management of contacts within a health-care setting following SARS Alert** ▪ Inpatient contacts should be isolated or cohorted away from unexposed patients and transmission-based precautions instituted. They should be placed on active fever surveillance. ▪ Exposed staff should be placed on active fever surveillance, and either cohorted to care for exposed patients ("work quarantine") or redeployed to non-clinical duties depending on local circumstances. **Management of community contacts following a SARS Alert** Community contacts should: ▪ Be informed that the most consistent first symptom that is likely to appear is fever and instructed on how to self-monitor for fever. Fever monitoring should be performed twice daily for 10 days from the last contact with a person under investigation for SARS. ▪ Should report the onset of fever and/or other symptoms to health authorities immediately and place themselves in isolation pending medical care. ▪ Be visited or telephoned daily by a member of the public health-care team to ascertain their clinical status. ▪ Be investigated locally at an appropriate health-care facility if they develop symptoms. Informing the health-care facility before presenting for medical care will minimize the risk of nosocomial transmission.
Respond to epidemic threshold for epidemic-prone diseases	**If the suspected case is confirmed:** ▪ Isolate patients and contacts of SARS with precautions against airborne spread (wear masks, for example) until at least after 48 hours of appropriate antibiotic therapy. ▪ Laboratory-based reporting required ▪ Mobilize community to enable rapid case detection and treatment, and to recognize mass rodent die-off as a sign of possible impending epidemic. ▪ Identify high risk population groups through person, place, and time analysis. ▪ Reduce sporadic and outbreak-related cases via improved control or rodent populations (remove trash, food sources, and rat harbourages) and protect against fleas with insect repellent on skin and clothing and environmental flea control (especially in homes and seaports and airports). ▪ Community education

Severe Acute Respiratory Syndrome (SARS)	
Analyze and interpret data	**Time**: Graph cases and deaths monthly. Construct an epidemic curve during the outbreak. **Place:** Plot location of case households and work sites using precise mapping. **Person:** Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyze age and sex distribution. Assess risk factors immediately.
Reference	WHO Guidelines for the Global Surveillance of SARS Updated Recommendations October 2004

Sexually transmitted infections
(Urethral discharge. Male and female genital ulcer)

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 *Nausari gonorrheaea* 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, gonorrhea 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 gonorrhea 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. ▪ Compare surveillance data for both STIs and HIV/AIDS since STIs may reflect co-presence of HIV.

Recommended case definition	***Suspected case***: ▪ *Genital ulcer syndrome (non-vesicular*): 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. ▪ *Urethral discharge syndrome*: Any male with urethral discharge with or without dysuria. ***Confirmed case***: ▪ *Genital ulcer syndrome (non-vesicular):* Any suspected case confirmed by a laboratory method. ▪ *Urethral discharge syndrome*: A suspected case confirmed by a laboratory method (for example Gram stain showing intracellular Gram-negative diplococci).
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.
Analyze and interpret data	**Time:** Graph cases each quarter. **Place:** No recommendation for analysis of place. **Person:** Count quarterly cases and analyze age distribution.
Reference	*Guidelines for Sexually Transmitted Infections Surveillance*. Geneva. UNAIDS and World Health Organizaiton. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E

Soil-transmitted helminthiasis (STH)

Background

- More than 2000 million people worldwide (1 in 3) are infected by intestinal helminths, some of which can lead to severe diseases (hookworm anaemia). Worm infestations have proven to affect school and work performance and are therefore of economic importance.

Causal agents: *Ascaris lumbricoides, Hookworm, Trichiuris trichiura*

Main modes of transmission**: I**nfection occurs through the ingestion of eggs (ascariasis and trichiuriasis) or through active penetration of larvae in the soil (hookworm). Incubation is 4 to 8 weeks for *A. lumbricoides* and a few weeks to many months for hookworm disease; it is unspecified for *Trichiuris.*

Clinical description
Hookworm:

- Anaemia induced by intestinal blood loss.

Other intestinal helminths: Symptoms are often mild and may go unrecognized in individuals. The symptoms include:

- Intestinal manifestations (diarrhoea, abdominal pain)
- Non-specific chronic symptoms
- General malaise and weakness that may affect working and learning capacities
- Long-term impact on physical growth

- Data from general health statistics will underestimate the prevalence but may indicate a relatively high prevalence in a particular area. Surveillance of schistosomiasis has to take into account the geographical distribution of the disease, which is focal, and adjacent areas may have very different patterns and rates. Surveillance should be incorporated in the primary health care system.
- Routine monthly reporting of aggregated suspected or confirmed cases from peripheral level to district and national level.
- In zones endemic for intestinal schistosomiasis, where surveillance through the primary health care system has less epidemiological value, surveys to evaluate the prevalence and intensity of infection in the community are useful. Children of school age are good indicators of the endemic level in the general population and as an appropriate group for investigation.
- Yearly reporting of aggregated data from peripheral level to intermediate and central levels.
- **International:** Yearly reporting from the central level to WHO

Surveillance goal

To detect, seek laboratory confirmation, treat, and improve prevention of the disease by taking appropriate hygienic measures.

Soil-transmitted helminthiasis (STH)

Recommended case definitions	**Ascariasis:** **Suspected:** Abdominal or respiratory symptoms with history of passing worms. **Confirmed:** suspected case, **and p**assage of Ascaris lumbricoides (anus, mouth, nose), **or p**resence of Ascaris lumbricoides eggs in stools **Hookworm infection** **Suspected:** Severe anaemia for which there is no other obvious cause. **Confirmed :** suspected case and presence of hookworm ova in stools. **Trichuriasis** **Suspected:** Bloody, mucoid stools. **Confirmed:** suspected case, **and p**resence of T. trichiura eggs in stools.
Recommended public health action	Conduct school children surveys to determine cmmunity prevalence of infection in suspected communities **Case management** For treatment, WHO recommends the following 2 drugs: • 400 mg albendazole, **or** • 500 mg mebendazole, **or** **Prevention** ***Overall:*** Personal hygiene, disposal of faeces, hand-washing, and clean food; Improvements in sanitation standards Community treatment for high-risk groups (children, pregnant women) as for individual treatment. • 400 mg albendazole (to be chewed before swallowing), **or** • 500 mg mebendazole (to be chewed before swallowing), ***Hookworm infection (suspected or confirmed) in addition:*** In highly endemic areas, wear shoes; consider drug treatment and iron supplementation in women of childbearing age.
Analyze and interpret data	**Place:** Analyse the treatment coverage in targeted areas **Time:** Map the distribution of soil-transmitted helminthiasis to identify areas requiring intervention. **Person:** Assess the prevalence and intensity of infection in school children periodically
Reference	• WHO. 2006. Preventive chemotherapy in human helminthiasis. • WHO, Geneva, April 2006 *Weekly Epidemiological Record*, 2006, 81:145–164 • WHO. 2002. Prevention and Control of Schistosomiasis and STH Report of a WHO Expert Committee. WHO Technical Report Series 912.

Trypanosomiasis

Background	▪ Trypanosomiasis is an infection of blood, lymphatics and central nervous system. In Africa it is caused by the protozoan *Trypanosoma burcei 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). ▪ Tuberculosis, malaria, bacterial meningitis, HIV/AIDS, and other central nervous system or systemic infections can produce similar clinical findings.
Surveillance goal	▪ Early detection by population-base surveys, including serologic screening for active case finding in *T. b. gambiense* endemic areas I. ▪ Conduct human and cattle screening in trypanosomiasis-suspected (free) areas. ▪ Increase percentage of confirmed cases by laboratory methods
Recommended 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 isolation of trypanosomes in blood lymph nodes or cerebrospinal fluid.
Respond to a suspected outbreak for other diseases of public health importance	**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.
Respond to a confirmed outbreak for other diseases of public health importance	**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.

Analyze and interpret data	**Time:**	Graph quarterly cases.
	Place:	Plot the distribution of case households.
	Person:	Count monthly cases, and analyze age distribution.
Reference	*Control and Surveillance of African Trypanosomiasis*. Report of a WHO Expert Committee, Geneva,World Health Organization, 1998 (WHO Technical Report Series, No. 881).	

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 extrapulmonary sites of infection may occur after ingestion of unpasteurized cows/ 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 microscopy

Recommended case definition	***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 fulfills 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 fulfills 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 a suspected outbreak for other diseases of public health importance	**If you observe that the number of cases or deaths is increasing over a period of time:** ▪ Report problem 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. ▪ Investigate cause of increase, including performance of DOTS programme in your area.
Respond to a suspected outbreak for other diseases of public health importance	**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.
Analyze and interpret data	**Time:** Graph cases and deaths monthly. **Place**: Plot distribution of case households and workplaces. **Person:** Count monthly cases and deaths. Analyze age and sex distribution quarterly.
Reference	*Treatment of Tuberculosis: Guidelines for National Programmes.* WHO/TB/97.230 *Policy Statement of Prevention Therapy Against TB in People Living with HIV,* WHO/TB/98.255

Typhoid Fever

Background	▪ Typhoid fever is a bacterial disease, caused by *Salmonella typhi*. Symptoms usually develop 1–3 weeks after exposure, and may be mild or severe. They include high fever, malaise, headache, constipation or diarrhoea, rose-coloured spots on the chest, and enlarged spleen and liver. Healthy carrier state may follow acute illness. ▪ Typhoid fever remains a serious public health problem throughout the world, with an estimated 16–33 million cases and 500 000 to 600 000 deaths annually. In the last outbreak in the Democratic Republic of Congo, between 27 September 2004 and early January 2005, no less than 42 564 cases of typhoid fever were reported, including 214 deaths and 696 cases of peritonitis and intestinal perforations. ▪ 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 discharge bacteria for up to 3 months. In addition, 2–5% of untreated patients will become permanent, lifelong carriers of the bacteria in their gall-bladder. ▪ Typhoid fever can be treated with antibiotics. However, resistance to common antimicrobials is widespread. Healthy carriers should be excluded from handling food.
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
Recommended 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 diarrhea. ***Confirmed case:*** Suspected case confirmed by isolation of *Salmonella Typhi* from blood, bone marrow, bowel fluid or stool.

Typhoid Fever	
Respond to alert threshold for epidemic-prone diseases and diseases targeted for elimination and eradication	**If Typhoid fever cases are suspected:** Supportive measures are important in the management of typhoid fever, such as oral or intravenous hydration, the use of antipyretics, and appropriate nutrition
Respond to epidemic thresholds for epidemic-prone diseases and diseases targeted for elimination and eradication	**If Typhoid Fever cases are confirmed** 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. However, patients with persistent vomiting, severe diarrhoea and abdominal distension may require hospitalization and parenteral antibiotic therapy. Prevention is based on ensuring access to safe water and by promoting safe food handling practices. Health education is paramount to raise public awareness and induce behaviour change.
Analyze 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. Analyze by age. Assess risk factors to improve prevention of outbreaks.
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

Viral hemorrhagic fevers

Background	▪ This is a hemorrhagic disease syndrome caused by the following viruses: Ebola-Marburg (filoviruses), Lassa fever, Rift Valley fever (RVF), Congo-Crimean hemorrhagic fever (CCHF), and dengue hemorrhagic fever (DHF). No DHF has been reported in Africa. ▪ The disease is transmitted from person-to-person (Ebola, Marburg, Lassa, CCHF), or via mosquitos (RVF, dengue), ticks (CCHF), rodents (Lassa), or contact with infected animals (RVF, CCHF). Ebola and Marburg may be transmitted via sexual contact. ▪ Some viral hemorrhagic fevers (VHF) have explosive outbreak potential: international reporting to WHO is required within 24 hours. ▪ Incubation period is variable, from 3 to 21 day depending on etiology. ▪ The minority of cases have hemorrhagic symptoms, but among those with these symptoms, the case fatality rate is high (15% to 90%). ▪ Risk factors: In the health care setting, outbreaks may be amplified when standard barrier precautions are not taken, or in ceremonies involving touching ill or deceased infected persons or their secretions. Sporadic cases may arise from sexual contact or via sylvatic exposures (for example, occupation), or possibly following direct contact with infected animals. ▪ Other hemorrhagic conditions that may mimic VHF include yellow fever, dengue, anthrax, leptospirosis, rickettsial infections, relapsing fever, and other infectious agents and toxic exposures.
Surveillance goal	▪ Detect hemorrhagic fever cases and outbreaks promptly and seek laboratory verification of the etiology of all cases of suspected VHF. ▪ In outbreak settings, the disease spectrum of VHF agents may include non-hemorrhagic febrile syndromes, and laboratory testing should be considered among persons with milder symptoms suggestive of viral illness.
Recommended case definition	***Suspected case***: Illness with onset of fever and no response to usual causes of fever in the area, and at least one of the following signs: bloody diarrhoea, bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine. ***Confirmed case***: A suspected case with laboratory confirmation (positive IgM antibody or viral isolation), or epidemiologic link to confirmed cases or outbreak.
Respond to alert threshold for epidemic-prone diseases	**If a single case is suspected:** ▪ Report case-based information immediately to the appropriate levels. ▪ Begin VHF isolation precautions immediately and enhance standard precautions throughout the health care setting. Use protective clothing, disinfection of surfaces and spills, safe disposal of materials used for patient care and safe disposal of patient waste. ▪ Treat and manage the patient with supportive care. ▪ Collect specimen safely to confirm the case.

Respond to action threshold for epidemic-prone diseases	**If a single case is confirmed:** ▪ Maintain strict VHF infection control 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 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. ▪ Establish isolated ward to handle additional cases that may come to the health center.
Analyze and interpret data	**Time**: Graph cases and deaths monthly. Construct an epidemic curve during the outbreak. **Place:** Plot location of case households and work sites using precise mapping. **Person:** Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyze age and sex distribution. Assess risk factors immediately and consider request for assistance to improve outbreak control.
Reference	*Infection control for VHF in the African health care setting*, WHO, 1998. WHO/EMC

YAWS

DESCRIPTION

Infectious agent	Treponema palidum subspecies pertenue a spirochaete
Case definition	A chronic relapsing non-venereal treponematosis, characterized by contagious early cutaneous lesions (papiloma/ulcers on the face or extremities) and non-contageous late destructive lesions(skin and bones.). **Clinical description** Primary lesion is typically a painless papiloma on the face or extremeties (usuallt the leg) that persists for several weeks or months (mother yaw) It is usually painless unless there secondary infection. This proliferates and slowly may form raspberry lesion or undergo ulceration(ulceropapiloma) Secondary disseminated or satellite papilomata appear before or shortly after the initial lesion heals. Secondary lesions occur in successive crops are often accompanied by mild constitutional symptoms, pertostitis of the long bones (saber shin) and fingers (polydactylitis). Papilomata and hypekeratosis may appear on palms and soles. These lesions are very painful and usually disabling. The lesions heal spontaneously, but relapses may occur at other sites. Tertiary or late stages occur 5 or more years after the primary infection occurs in about 10-20%d of untreated patients. This stage is characterized by destructive lesions of skin and bone. Painful papilomata and hyperkeratosis on palms and soles may appear in this stage as well. The infection is rarely fatal, but can be very disfiguring and disabling Laboratory diagnosis Diagnosis confirmed by dark-field or direct fluorescent antibody microscopic examination of exudates from lesions. Non treponemal serological tests for syphilis (e.g. VDRL) are reactive in the initial phases, and become non reactive after many years of latency. Treponemal serological tests (e.g. fluorescent treponemal antibody absorbed (FTA-ABS) , microhemagglutination assay for antibody to T. pallidum (MHA-TP) usually remain reactive through life.

YAWS (contd)

Mode of Transmission	Direct contact with exudates of early skin lesions of infected persons. Indirect transmission, through skin contamination from scratching, skin piercing articles and flies on open wounds is probable.
Incubation	From 2 weeks to 3 months
Period of communicability	Variable may extend intermittently over several years while moist lesions are present. The infectious agent is not usually present in alt ulcerative lesions.

EPIDEMIOLOGY

Burden	93 cases reported between January and June 2003
Geographical distribution	Remote rural communities of Bombali and Port Loko districts in the Northern Region
Seasonality	Not determined
Alert threshold	Every case should be notified to local health authorities
Recent epidemics	Re-emergence of cases in late 1990s at the height of the conflict after elimination of the disease in the 1980s

RISK FACTORS FOR INCREASED TRANSMISSION

Population movement	Yes	Previously unexposed people moving into established foci of the disease
Overcrowding	Yes	Many household members and siblings sharing the same sleeping space
Poor access to health services	Yes	Poor surveillance, lack of health education, and untimely intervention. Lack of proximal water sources for bathing and washing of clothes.
Lack of safe water and poor sanitation	Yes	Poor personal hygiene due to lack of water for bathing, poverty and lack of health education to promote bathing
Poverty and illiteracy	Yes	Ignorance about the disease and inability to access health care facility in times of need

YAWS
PREVENTION AND CONTROL MEASURES

	Specific treatment is with benzathine benzyl penicillin for patients aged 10 years or more with active disease and contacts, a single injection of benzathine benzylpencillin, 1.2 million units IM: for patients under 10 years of age, a single injection of benzathine benzyl penicillin. 0.6 million units. Concurrent disinfection, careful disposal of discharges and contaminated articles. Avoid intimate contact and contamination of the environment unless lesions are healed. Treat disfiguring and incapacitating late manifestations with appropriate topical and surgical care. All familiar contacts should be treated: those with no active disease should be regarded as alert cases.
Prevention	General health education of population about heponematosis, with emphasis on the value of better sanitation, and liberal use of soap. All cases should be reported to local health authorities, Intensive control activities should be organized at the community level, suited to the local problem. In areas of low prevalence, all active cases, all children and close contacts of infectious. Cases should be treated. Periodic clinical and serological surveys for latent cases, especially in children, should be conducted to prevent relapses and development of infective lesions that maintain the disease in the community. Continuous surveillance is essential for success. Treatment of the entire population should be considered when the prevalence of active disease exceeds 10%. As part of the national plan for mass control, health facilities should have the capacity for early diagnosis and treatment.
Epidemic control	Institute active mass treatment programmes in areas of high prevalence. Examine a high percentage of the population through field

	surveys. Conduct surveys at intervals of 1-3 years as part of national rural public health activities. Treat all active cases, including family contacts and community contacts. Displaced populations in endemic areas without hygienic facilities are potentially at greater risk. Where active mass treatment programmes are in place, protect countries or communities at risk of reinfection by instituting suitable public health and supervision measures against yaws in adjacent countries.

Yellow fever

Background	▪ Viral hemorrhagic disease caused by a flavivirus transmitted human-to-human via *Aedes* mosquitos (urban epidemics) or via forest mosquito species and forest primate reservoirs (jungle cycle). ▪ Large scale outbreaks every 3 to 10 years in villages or cities. 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. ▪ 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. ▪ VHF and other infections causing haemorrhage may mimic yellow fever.
Surveillance goal	▪ Detect hemorrhagic fever cases and outbreaks promptly, and seek laboratory verification of the aetiology of all cases of suspected yellow fever. (Other viral hemorrhagic fevers, dengue, anthrax, leptospirosis, rickettsial diseases, malaria, and other infectious agents and toxic exposures may cause similar epidemics.)
Recommended case definition	***Suspected case***: A person with acute onset of fever followed by jaundice within two weeks of onset of first symptoms. Hemorrhagic manifestations and renal failure may occur. ***Confirmed case***: A suspected case with laboratory confirmation (positive IgM antibody or viral isolation) or epidemiologic link to confirmed cases or outbreaks.
Respond to alert threshold for epidemic-prone diseases	**If a single case is suspected:** ▪ Report case-based information immediately to the next level. ▪ Treat and manage the patient with supportive care administered under a bednet (ORS, paracetamol for dehydration, fever) and strict isolation procedures. ▪ Collect specimen for laboratory confirmation. ▪ Investigate the case to determine how transmission occurred. ▪ Plan for an immunization activity.
Action threshold for responding to epidemic-prone diseases	**If a single case is confirmed:** ▪ Mobilize community early to enable rapid case detection and treatment. ▪ Conduct a mass campaign in appropriate age group in the area (ages 6 months and older) and in areas with low vaccine coverage. ▪ Identify high risk population groups and take steps to reduce exposure to mosquitos. ▪ Improve routine and mass vaccination campaigns to include yellow fever in high risk areas.

Analyze and interpret data	**Time:**	Graph cases and deaths monthly. During an outbreak, graph cases and deaths weekly. Construct an epidemic curve during outbreaks.
	Place:	Plot location of case households and occupation with precise mapping.
	Person:	Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of sporadic outbreaks.
Reference	*District guidelines for yellow fever surveillance.* WHO 1998	

Non-Communicable Diseases and Conditions

Asthma	
Background	• Asthma is a chronic disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. Symptoms may occur several times in a day or week in affected individuals, and for some people become worse during physical activity or at night. • According to WHO estimates, 300 million people suffer from asthma and 255 000 people died of asthma in 2005. Asthma is the most common chronic disease among children. It is not just a public health problem for high income countries as it occurs in all countries regardless of level of development. Over 80% of asthma deaths occur in low and lower-middle income countries. • Asthma is under-diagnosed and under-treated, creating a substantial burden to individuals and families and possibly restricting individuals' activities for a lifetime. Asthma deaths will increase by almost 20% in the next 10 years if urgent action is not taken. • Although the fundamental causes of asthma are not completely understood, the strongest risk factors for developing asthma are inhaled asthma triggers. These include: - indoor allergens (for example house dust mites in bedding, carpets and stuffed furniture, pollution and pet dander) - outdoor allergens (such as pollens and moulds) - tobacco smoke - chemical irritants in the workplace • Other triggers can include cold air; extreme emotional arousal such as anger or fear, and physical exercise. Even certain medications such as aspirin and other non-steroid anti-inflammatory drugs, and beta-blockers (which are used to treat high blood pressure, heart conditions and migraine) can trigger asthma. Urbanization has also been associated with an increase in asthma, however the exact nature of this relationship is unclear
Surveillance goal	Secondary prevention by early detection and standardized treatment
Recommended case definition	• Any person who presents with chest symptoms (including cough, breathlessness and/or wheezing, often at night) that come and go, vary from day to day, and especially if they cause the patient to wake and even to rise at night, should be suspected of having asthma. If after careful examination no other cause is found and the symptoms persist for some period of time, asthma should be considered.
Recommended Public Health Action	• Most countries that have achieved dramatic reductions in chronic disease have implemented comprehensive, integrated approaches that encompass both prevention and control. A comprehensive, integrated approach combines population-wide interventions, which are focused on reducing levels of risk in entire populations, with interventions for individuals, which are focused on helping people at high risk and those with established chronic disease. • For asthma: Inhaled corticosteroids can be combined with long-acting beta agonists to provide safe and effective asthma control. Education addressing the appropriate use of medication is extremely important, particularly in low and middle income countries, where timely emergency care for exacerbations might not be readily available

Asthma	
Analyze and interpret data	**Time:** Graph quarterly cases. **Place:** Plot the distribution of case area of live **Person:** analyze sex and age distribution.(by age group : 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65+)
Reference	• http://www.who.int/respiratory/asthma/en/index.html • Global surveillance, prevention and control of chronic respiratory diseases : a comprehensive approach - World Health Organization 2007 • Management of Asthma: A Guide to the Essentials of Good Clinical Practice Second Edition – 2005 - International Union Against Tuberculosis and Lung Disease

Diabetes mellitus

Background	▪ Diabetes mellitus (DM) is a chronic disease with of a pandemic. The most frequent form is Type 2 diabetes which represents more than 85% of the cases. Other forms are Type 1 (10%), specific diabetes and gestational diabetes (5%). ▪ The factors that affect the onset of diabetes are well-known. They comprise non-modifiable factors like old age (over 45 years of age), heredity (direct collateral) and the causes of diabetes in pregnancy. The modifiable factors are obesity, physical inactivity and excessive alcohol consumption. ▪ DM is serious due to its complications, namely: cardiovascular ailments, cerebrovascular accidents, renal insufficiency, blindness, sexual impotence and gangrene of the feet leading to amputation. ▪ The global prevalence was estimated at 2.8% in 2000, with projections of 4.8% in 2030. The total number of persons affected would rise from 171 million in 2000 to 366 million in 2030 if no action is taken. The disease burden is very high. Annual mortality linked to diabetes worldwide is estimated at more than one million. ▪ DM is no longer considered rare in Africa. Meta-analytic estimates and recent investigations based on the STEPwise approach for monitoring the risk factors of non-communicable diseases indicate prevalence of between 1% and 20%. In some countries like Mauritius, it reaches 20%. Unknown diabetes in Africa is in the order of 60% to 80% in cases diagnosed in Cameroon, Ghana and Tanzania. ▪ The rate of limb amputations varies from 1.4% to 6.7% of diabetic foot cases. In some countries of the Region, the mortality rate is higher than 40 per 10 000 inhabitants. ▪ In the African Region, efforts made to create an environment that enhances the fight against diabetes include adoption of resolutions on non communicable diseases in 2000, cardiovascular diseases strategy in 2005, and diabetes mellitus strategy in 2007. The World Health Organization and the International Diabetes Federation (IDF) jointly carried out other actions to contribute to it.
Surveillance goal	Secondary prevention by early detection and standardized treatment
Recommended case definition	**Suspected case**: • Increased thirst • Increased hunger • Frequent urination **Confirmed case**: **Fasting**: • Venous plasma ≥ 7 mmol/L (126 mg/dl) • Capillary ≥ 6.1 mmol/L (110 mg/dl) **Non Fasting**: • Venous plasma ≥ 11.1mmol/L (200 mg/dl) • Capillary ≥ 11.1 mmol/L (200 mg/dl)
Recommended public health action	▪ National integrated prevention and control programmes for non-communicable diseases focusing on DM established, including community-based demonstration projects, health promotion, health services and national policy development, and linked by strengthened regional networks and the global forum for prevention and control of such diseases. ▪ Multisectoral strategies and plans of action on diet, overweight and physical activity adopted. ▪ Comprehensive policies and strategies adopted by countries in order to strengthen the capability of health systems to deal with DM, to enhance

Diabetes mellitus	
	adherence to therapies and behaviors and to reinforce long-term care. ▪ Secondary prevention and clinical preventive and treatment interventions identified through evidence-based guidelines
Analyze and interpret data	**Time:** Graph quarterly cases. **Place:** Plot the distribution of case area of live **Person:** analyse sex and age distribution.(by age group : 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65+)
References	▪ Non communicable Diseases: A strategy for the African Region, AFR/RC50/10 ▪ Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12 ▪ Diabetes prevention and control: a strategy for the African Region, AFR/RC57/7 ▪ Steps manual: http://www.who.int/chp/steps/en/ ▪ http://www.afro.who.int/dnc/databases/afro_infobase/index.html ▪ Gojka R et al, Global prevalence of diabetes, *Diabetes care* 27(5): 1047–1053, 2004. ▪ IDF, *Diabetes Atlas,* 2nd Edition, Brussels, International Diabetes Federation, 2003. ▪ WHO, *Preventing chronic diseases: A vital investment,* Geneva, World Health Organization, 2005. ▪ WHO, *The burden of mortality attributable to diabetes,* Geneva, World Health Organization, 2004.

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-behavioral. 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. 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), non communicable 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.
Surveillance goal	• Early detection and immediate intervention to prevent morbidity and mortality rates associated with epilepsy • Register and monitor epilepsy cases
Recommended case definition	**Suspected case:** Any person with one epileptic seizure **Confirmed case:** Any person with recurrence of, at least, two epileptic seizures. A positive response to treatment with any AED strengthens the hypothesis of a confirmed case. Epileptic seizures can last for 30 seconds to 3 minutes. When they are intricate without a pause, they can lead to *status epilepticus*.
Recommended Public Health	**Suspected cases** • All Health Workers should check for early signs of epilepsy. Diagnosis should include good interviews (describing as precisely as possible the

Epilepsy	
Action	seizure type) and clinical examination. • Once diagnosed, search for underlying and associated causes. Check for abnormal increases on number of cases and propose appropriate environmental measures if needed. **Confirmed cases** • Immediate treatment should be ensured, starting with low doses of any AED and then increasing progressively until an effective steady state. In case of poor seizure control management strategies must be: increase the dose or try an alternative drug, refer to an upper level health structure. • Referral to higher level health structure should be done if seizures continue regardless of pharmacological treatment or if first seizure occurs in an adult aged 30 or +. **All cases:** • Information and education measures on epilepsy and risk factors at community level
Analyze and interpret data	**Time:** Graph cases quarterly **Place**: Area of live **Person**: Proportion of new epilepsy cases, death rate, underlying or associated causes, consequences Analyse sex, age distribution (0-4 mts; 4 mts-2 yrs; 2-10; 10-20; 20-40; 40-60; 60 +)
References	▪ WHO, Epilepsy in the WHO African Region: Bridging the Gap, WHO Regional Office for Africa,Congo, 2004. ▪ WHO, Epilepsy: a manual for medical and clinical officers in Africa, World health Organization, Geneva, 2002

High Blood Pressure

Background	▪ Cardiovascular diseases (CVDs) are the main non-communicable diseases and are major public health concerns worldwide. According to The World health report 2001, cardiovascular diseases accounted for 9.2% of the total deaths in the African Region in 2000 compared with 8.15% in 1990. The most important CVDs are hypertension, stroke, cardiomyopathies (especially the dilated form) and rheumatic heart disease. Coronary heart disease is on the rise especially in urban areas. ▪ CVDs are rapidly increasing in Africa, and poverty plays a major role in the impact of these diseases on communities. High Blood Pressure (HBP) or hypertension is the leading cause of avoidable mortality and morbidity in all world regions and a main physiological risk factor for other CVDs. It is estimated that more than 20 million people are affected in the African Region, mainly in urban areas. Prevalence ranges from 25% to 35% in adults aged 25 to 64 years. Some studies reveal a clear relationship between level of blood pressure, salt and fat consumption, and body weight. Studies in Ghana, Mauritius, South Africa and Zimbabwe show an increase in stroke mortality that could be related to increasing levels of hypertension, obesity, tobacco use and diabetes. Prevention and control of hypertension could avoid at least 250,000 deaths per year. ▪ The underlying pathology is atherosclerosis, which develops over many years and is usually advanced by the time symptoms occur, generally in middle age. Other major risk factors are: diabetes, tobacco use, high blood lipids, physical inactivity, and harmful use of alcohol, overweight, dietary changes (low vegetables intakes, excess in fat and salt consumption) and increase in age of the population. ▪ Acute coronary events (heart attacks) and cerebrovascular events (strokes) frequently occur suddenly, and are often fatal before medical care can be given. ▪ Risk factor modification can reduce clinical events and premature death in people with established cardiovascular disease as well as in those who are at high cardiovascular risk due to one or more risk factors. The most important activities for controlling risk factors are related to the Tobacco Free Initiative. ▪ WHO/AFRO proposed specific interventions to curb the emerging epidemic of CVDs, in a Regional strategy in Maputo in 2005.
Surveillance goal	Secondary prevention by early detection and standardized treatment
Recommended case definition	**Suspected case:** Position seated with 10 min rest: 3 measures at 5 min interval HBP if mean of the 2nd & 3rd measures ≥ 140 and or 90 ** Report only the first diagnostic of the case in the health*
Recommended public health action	• National integrated prevention and control programmes for non-communicable diseases focusing on HBP established, including community-based demonstration projects, health promotion, health services and national policy development, and linked by strengthened regional networks and the global forum for prevention and control of such diseases. • Multisectoral strategies and plans of action on diet, overweight and physical activity adopted. • Comprehensive policies and strategies adopted by countries in order to strengthen the capability of health systems to deal with CVDs, to enhance adherence to therapies and behaviors and to reinforce long-term care. • Secondary prevention and clinical preventive and treatment interventions through evidence-based guidelines

High Blood Pressure	
Analyze and interpret data	**Time:** Graph quarterly cases. **Place:** Plot the distribution of case area of live **Person:** analyse sex and age distribution.(by age group : 0-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65+)
References	• WHO, Atlas of heart disease and stroke, Geneva, World Health Organization, 2004. • Non communicable Diseases: A strategy for the African Region, AFR/RC50/10 • Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12 • http://www.who.int/chp/steps/en/ • http://www.afro.who.int/dnc/databases/afro_infobase/index.html • WHO CVD-risk management package for low-and medium resource settings.

Malnutrition

Background	▪ 20 million children under-five in the world are suffering from severe malnutrition*(1). Severe malnutrition may act as a direct or an indirect cause of death by increasing dramatically the case fatality in children suffering from common childhood illnesses such as diarrhea and pneumonia. ▪ Current estimates suggest that severely malnourished children have a 5 to 20 times higher risk of dying than well nourished children (2). ▪ 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 (3). ▪ Children under five and pregnant and lactating women are the most vulnerable ▪ Socio-economic conditions, poor water and sanitation, mother's nutritional education on how to feed babies and young children, repeated infections are the main causes of malnutrition. ▪ Food security, water and sanitation, promotion of infant and young children feeding practices, micronutrient supplementation, management of severe cases of malnutrition in the communities and in the health facilities, management of infections mainly diarrhoeal disease are among the programmes elaborated to eradicate malnutrition ▪ Nutrition surveillance is currently poorly implemented and does not allow interventions related to prevention and management of malnutrition. ▪ Nutrition surveillance data could be used to: • identify infants/children with poor health and nutrition for interventions tailored to causes of poor growth; • breastfeeding support; • nutrition education; • supplementation of child and mother; • prevention and treatment of diarrhea; • identification and treatment of infants/children who need therapeutic feeding & treatment for disease (e.g. diarrhea) ▪ **For pregnant women**: Target interventions (supplementary feeding vouchers, new-born care facilities, etc.) to those at risk of poor pregnancy outcomes; Prevent Intra-Uterine Growth Retardation or treat new born to prevent morbidity, death (target: population at risk of IUGR) ** Defined as wasting (Weight for Height < -3 ZScore)*
Surveillance goal	▪ Early warning system and problem identification, policy-making and planning, and programme management and evaluation.
Recommended case definition	**Malnutrition in children:** ▪ Children under five who are underweight (indicator: weight for age<-2 ZScore) ▪ Children 6 to 59 months with MUAC<11 cm (high risk of mortality) (5) **Malnutrition in pregnant women:** ▪ Pregnant women given birth to low birth weight babies (birth weight < 2.5 Kg) (poor nutritional and health status of the women, can predict which population groups may benefit from improved antenatal care of women and neonatal care for infants) (4)

Malnutrition	
Recommended Public Health Action	▪ If more than 20% (4) (or 28% which is the average %underweight for the sub-Saharan Africa) of children are underweight, programme emphasis is on: • Breastfeeding support • Nutrition education • Supplementation of child and mother • Prevention and treatment of diarrhoea • Prevention and treatment of severe malnutrition • Socio-economic support ▪ As soon as one case with MUAC less than 11 cm is detected or presence of bilateral oedema identified, further investigation should be conducted and the child should be referred to a therapeutic feeding programme (5). ▪ If more than 15% of low birth weight are less than 2.5 Kg; interventions should target 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, malaria prophylaxis, new-born care facilities, etc.) to those at risk of poor pregnancy outcomes and treat new born to prevent morbidity and death (4) ▪ Rq: LBW alone does not indicate the relative contribution made by pre-maturity and Small Gestational Age; both have different causes and will respond differently to various interventions.(4)
Analyze and interpret data	**Time**: Conduct monthly analysis at district level, alert central level if cut-off points for alert identified; if no alert, quarterly report to Central level. Place: Primary by district Person:
References	1. Physical status: the use and interpretation of anthropometry.Report of a WHO Expert Committee. WHO Technical Report Series, 1995, No 854: 81, 128-130, 198-208. 2. WHO, UNICEF and SCN Informal Consultation on Community-Based Management of Severe Malnutrition in Children. Food and Nutrition Bulletin, Supplement SCN Nutrition Policy paper N° 21: S99-S104

NOMA	
Background	▪ Noma or cancrum oris is an infectious disease of unknown aetiology which starts as gingival ulceration and spreads rapidly through the orofacial tissues establishing itself with a well-demarcated perimeter surrounding a blackened necrotic center. The gangrene can involve not only the mandible and maxilla but also the nose and infra-orbital margins. ▪ Noma exists worldwide, but the African continent is the most affected. WHO estimates that there are about 140 000 new cases of noma every year with a mortality rate of approximately 70% in the absence of treatment. ▪ Noma is a child disease seen predominantly in children aged 1-4 years. It is a silent killer, survivors are leaving with horrible oro-facial mutilations .More recently, countries in Southern and Eastern Africa have reported an increase in noma cases associated with HIV/AIDS. ▪ Risks factors of Noma are poverty, malnutrition, poor sanitation, infectious diseases such as measles, HIV/AIDS, malaria. ▪ The key points of management during the acute phases of noma are: prompt admission to hospital, correction of dehydration and electrolyte imbalance, nutritional rehabilitation, treatment with antibiotics, daily dressing of the lesion with gauze soaked in oral antiseptic and treatment of associated systemic diseases. Oral hygiene measures are indicated. In case of oro-facial mutilations, reconstructive surgical is necessary.
Surveillance goal	Early detection of cases for prevention of sequelae and treatment.
Recommended case definition	**Suspected case**: Any child with a mouth ulcer living in poor circumstances, such as one who is malnourished, immuno-compromised, recovering from measles and living under poor sanitation should be regarded as a potential noma case. **Confirmed case**: Any person with a gangrenous disease starting as gingival ulceration and spreads rapidly through the orofacial tissues, destroying the soft and hard tissues of the face.
Recommended public health action	**Suspected case**: ▪ all Health Workers should routinely screen at risk-children for early signs of noma and suspected case should be promptly referred to appropriate facilities ▪ Information campaigns are needed among Health Workers and parents. ▪ Training of public Health Workers on recognition of early lesions is essential. Prevention of risk factors of noma
Analyze and interpret data	**Time**: Analyse cases and deaths by month **Place**: Location: area of live **Person:** analyze data by age, sex, living-conditions and risk factors.
References	AFRO-Practical guide of Noma for the African Region(in progress for publication) The Lancet Infectious Diseases,Vol3,July 2003: Noma: an infectious disease of unknown aetiology The Lancet Infectious Disease, Vol 368, July 8,2006: Noma (cancrum oris)

Sickle Cell Disease (SCD)

Background	• Sickle-cell disease or hemoglobinipathy is an autosomic genetic blood disorder that affects the haemoglobin within the red blood cells containing an abnormal form of the oxygen-carrying protein *haemoglobin S*. • Children who inherit sickle-cell genes from both parents (homozygous) will develop sickle-cell disease with clinical presentation, while those who inherit the gene from only one parent (heterozygous) will have the sickle-cell trait with no clinical presentation. • There are different subtypes of haemoglobin S, and other types of abnormal haemoglobin such as *thallasaemia, haemoglobin C and haemoglobin D* which may coexist with *haemoglobin S.* • Recognized since early 20th century, SCD is the more widely observed genetic disease in the world and afflicts particularly Sub-Saharan Africa where the prevalence of the trait varies from 20 to 40 % of the populations; in countries where the trait prevalence is above 20%, the disease affects about 2% of the population. • SCD results in a chronic slow deterioration of multiple organ systems resulting in recurrent episodes of severe pain, anaemia, serious infections and damage to vital organs and complications such as stroke, kidney damage and respiratory problems. It interfers with many aspects of the patient's life, including education, employment and psychosocial development and death. Thus, sickle-cell disease has major social and economic implications for the affected child, the family as well as the community. • Neonatal screening for the sickle-cell trait, when linked to timely diagnostic testing, parental education and comprehensive care, can markedly reduce morbidity and mortality from the disease in infancy and early childhood. Presently, there is no cure for sickle-cell disease and counseling and prevention of causes and infections are simple and very cost effective measures.
Surveillance goal	To provide genetic counseling, prenatal screening, newborn and infant interventions as well as better adulthood clinical management.
Recommended case definition	**Suspected case:** Any person, specially infants and children who present to the health services with typical painful **hand and foot syndrome,** joint pain with and without fever should be suspected of having SCD. Such patients should be examined with care and if no other cause is found emmel test should be performed in case of known or unknown parental SCD traits. **Confirmed case:** SCD is confirmed if test positive or any Haemoglobin electrophoresis with high Haemoglin S or C percentages. *Note: Report only the first diagnosis of the case (new case) in the health*
Recommended Public Health Action	SCD clinical manifestations are always delayed after birth but early diagnostic helps to adapt to local realities in term of new born clinical management. • Intervention strategies based on need assessment are integrated in national integrated prevention and control programmes for non-communicable diseases with focus on prenatal screening and SCD early diagnosis including community-based demonstration projects, health promotion, health services and national SCD programmes development. • Comprehensive policies and strategies adopted by countries in order to strengthen the capability of health systems to deal with SCD, to increase SCD prenatal screening and early diagnosis in order to start clinical management right after birth. • Community based strategies and plans for SCD genetic counseling activities implemented.

Sickle Cell Disease (SCD)	
Analyze and interpret data	**Time**: Plot cases charts and graphs quarterly **Place**: Map cases by specific geographic area **Person**: Analyse cases by sex and age distribution
References	*Sickle-cell disease is the most prevalent genetic disease in the African Region. In spite of the serious impact it has on children, it is still a neglected disease.* *Cook GC, Zumla AI (eds), Manson's tropical diseases, 21st edition, London, WL Saunders, 2003.* *http://www.medicinenet.com/sickle_cell/article.htm*