Technical guidelines for integrated disease surveillance and response in the African region

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Introduction

In September 1998, the 48th 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.

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 personnel 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.

Depending on the goal of the disease prevention programme, the surveillance activity objectives 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 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.

What is integrated disease surveillance?

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 action thresholds 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 IDS 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 regional 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 staff 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, regional and national levels collaborate with epidemic response committees at each level to plan relevant public health response actions and actively seek opportunities for combining resources.

Objectives of integrated disease surveillance

The general overall objective of the IDS strategy is to provide a rational basis for decision-making and implementing public health interventions that are efficacious in responding to priority communicable diseases. To implement IDS, 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 diseases.

The goal of IDS 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.

To that end, integrated disease surveillance seeks to:

- Strengthen the capacity of countries to conduct effective surveillance activities
- Integrate multiple 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 in the surveillance system.
- Emphasize community participation in detection and response to public health problems
- Strengthen the involvement of laboratory personnel in epidemiologic surveillance.

How does information flow in an integrated disease surveillance system?

An ill person presents to medical attention. Information about the patient is recorded in a register. The register is updated daily to include information for both inpatients and outpatients. At a minimum, the following data is collected: the patient's ID number, date of onset, date of presentation at the facility, date of discharge (inpatient only), village (location), age, gender, diagnosis, treatment, and 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 potential, the disease is reported immediately to the designated health staff in the health facility and at the district level. The health facility should 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 routinely reported IDS condition and reports the totals to the district. The health facility performs some analysis of the data such as keeping trend lines for selected priority diseases or conditions and observing whether certain thresholds are passed to alert staff to take action. One action that is taken if an outbreak is suspected is to obtain laboratory confirmation. Laboratory specimens are obtained and the following 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 IDS 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 either the regional level or the central level.

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

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

How can IDS 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 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 described 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 and include the following:

Step 1 - Identify cases. Using basic, standard case definitions, identify priority diseases and conditions.

Step 2 - Report suspected cases or conditions to the next level. If this is an epidemic prone disease, or a disease targeted for elimination or eradication, investigate and respond immediately.

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 outbreak or public health response.

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

Step 7 - Evaluate and improve the system. Assess the effectiveness of the surveillance system, 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, and village health workers or similar care providers.

Health facility: Defined by each country. For example, for surveillance purposes, all institutions with outpatient and in-patient facilities are defined as a "health facility"

District, region, or province: The intermediate administrative unit serving a population of between 100,000 and 300,000 people. Countries may have two intermediate levels, for example, the district and the region.

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

National level: In many countries this is the federal level where policies are set and resources are allocated.

Laboratory: In an integrated system, some laboratory services are available at each level guided by a national level system of quality assurance and linked to reference laboratories for specific diseases.

How can districts strengthen surveillance and response?

Most countries have completed an assessment of their surveillance system using an assessment tool developed by WHO/AFRO. Your country's national assessments may have already resulted in specific plans and activities being carried out. If this has not been done, a district may update the district's profile to decide where priority activities can take place to improve surveillance and response capacity. There is a checklist in Annex 1 at the end of this introduction that outlines what needs to be in place in order to conduct IDS.

Districts can also use a matrix of surveillance functions and skills to describe their role in the surveillance system. On 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 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

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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

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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.

The manual sets forth basic general guidance on surveillance and response. Guidelines can be adapted by each country to suit unique situations and public health objectives and specific information for diseases targeted by WHO/AFRO.

Who are the guidelines for?

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

- Surveillance officers
- Hospital outbreak coordinators
- National epidemiology unit staff
- National communicable disease program managers
- District health management teams
- Medical and nursing officers, sanitarians, EPI managers
- Health facility managers
- Public health officers and administrators
- Medical and nursing educators
- Public health educators
- Laboratory personnel
- Community

Which diseases are to be included?

The WHO-Regional Office suggests 19 communicable diseases and conditions for integrated disease surveillance to be implemented in the African region. The diseases are recommended because they fall into one or more of the following categories:

- Are top causes of high morbidity and mortality in the African Region (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, plague, yellow fever and cholera);
- Have available effective control and prevention interventions for addressing the public health problem they pose (for example, schistosomiasis, onchocerciasis, trypanosomiasis, and so on);
- Can easily be identified using simple case definitions; and
- Have intervention programmes supported by WHO for prevention and control, eradication or elimination of the diseases (for example, the Expanded Programme on Immunizations (EPI) and the Integrated Management of Childhood Illness Strategy (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.

Nineteen Recommended Diseases
Epidemic-Prone Diseases
Cholera
Diarrhoea with blood (Shigella)
Measles
Meningitis
Plague
Viral hemorrhagic fevers
Yellow Fever

Diseases Targeted for Eradication and Elimination
Acute flaccid paralysis (AFP)/polio
Dracunculiasis
Leprosy
Neonatal tetanus
Other Diseases of Public Health Importance
Pneumonia in children less than 5 years of age
New AIDS cases
Malaria
Onchocerciasis
Sexually transmitted infections (STIs)
Trypanosomiasis
Tuberculosis

How does WHO/AFRO support efforts to strengthen disease surveillance?

The World Health Organization's Regional Office for Africa (AFRO) provides IDS support for 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
- Advocacy for resources and resource mobilization, and
- Monitoring and detection of diseases across regions and the continent.

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

Most countries have assessed their 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.

IDS is not proposing a new system, but is providing guidance in how surveillance and response activities can be improved. National assessment results may already have resulted in specific plans and activities being carried out. If this has not been done, or 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 the list in Annex 6 of this section:

- **9** health facilities and hospitals
- **9** community health workers
- **9** traditional birth attendants
- **9** 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.)
- **9** public health officers
- **9** private sector practitioners
- **9** public safety officers such as fire, rescue or police departments
- **9** 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, 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:

- **9** Public, private or NGO district facilities with reliable laboratory services for confirming priority diseases.

- **9** 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:

   - **9** Meeting to routinely assess preparedness for response and discuss current problems or activities
   - **9** 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:
   - **9** Epidemic-prone diseases
   - **9** Diseases targeted for eradication and elimination
   - **9** 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:

    - **9** 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.
    - **9** State the diseases or conditions that require immediate reporting and communicate the list to health facilities in the district.
    - **9** 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?
    - **9** Define how often the required data should 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.

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 signaling a response to the priority integrated disease surveillance diseases?

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 staff in the implementation of integrated disease surveillance. For example:

- List the current opportunities for training health staff 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.

- **9** Define the training needs for each category of health staff for either initial training in surveillance and response skills or refresher training in 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:

- **9** Bulletins summarizing data reported by health facilities to the district
- **9** Periodic meetings to discuss public health problems and recent activities
- **9** 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 staff are able to document an increase in malaria cases, they know that an effective response is available with insecticide-treated bednets. The district surveillance officer used data to show the expected reduction in malaria cases if some of the community's bednet 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.

Section 1
Identify cases of priority diseases and conditions

This section describes how to:

- Use standard case definitions for reporting suspected priority diseases and conditions
- Improve district procedures for surveillance and response
- Use the laboratory network to confirm suspected outbreaks.

1.0 Identify cases of priority diseases and conditions

Cases and suspected outbreaks of priority diseases and 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.

- During active searches to find additional cases for a particular disease, the surveillance officer 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, the officer also looks for suspected cases of other vaccine-preventable diseases, such as measles, neonatal tetanus, meningitis and cholera.

- Radio, television or newspapers report rare or unexplained health events in the area.

- An individual health facility reports a cluster of deaths or an unusual increase 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) see 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 detection of 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 staff 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 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 1 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 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 2 of this section.

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 centers for undernourished children, and so on.

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

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 6 of this section 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 3 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 3.

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 confirming the disease or condition and reporting the results are clear and can be reliably carried out.

1.3.2 Identify a district laboratory focal point

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

- 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 WHO/AFRO recommended case definitions for reporting suspected priority diseases or conditions from the health facility to the district
- ANNEX 3 Simplified messages for use in community surveillance
- ANNEX 4 Recommended laboratory tests for confirming priority diseases and conditions
- ANNEX 5 List of laboratories for confirming priority diseases and conditions
- ANNEX 6 List of district reporting sites

ANNEX 2 WHO/AFRO recommended case definitions for reporting suspected priority diseases or conditions from the health facility to the district

WHO/AFRO recommends 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
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 (>38.5EC rectal or 38.0EC axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal signs.
Plague	Any person with sudden onset of fever, chills, headache, severe malaise, prostration, and very painful swelling of lymph nodes, or cough with blood-stained sputum, chest pain, and difficulty in breathing.
Viral hemorrhagic fevers	Any person with severe illness, fever, and at least one of the following signs: bloody stools, vomiting blood, or unexplained bleeding from gums, nose, vagina, skin or eyes.
Yellow fever	Any person with sudden onset of high fever (>39EC rectal or 38EC 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 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 case s	Any person who meets the AIDS case definition adopted by 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
Trypanosomiasis	***Early stage trypanosomiasis*** Any person with a painful chancre that originates as a papule and then evolves into a nodule at the fly bite site. There may be fever, intense headache, insomnia, painless lymphadenopathy, anaemia, local edema and rash. ***Late stage trypanosomiasis*** Cachexia, somnolence, and central nervous system signs
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.

ANNEX 3 Simplified messages 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 acute paralytic disease
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 high fever and a danger sign (*Danger signs are lethargy, unconsciousness, vomits everything, convulsions, and in children less than 5, unable to drink or breast-feed)*
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.
Plague	Any person with painful swelling under the arms or in the groin area. In an area known to have plague, any person with cough, chest pain and fever.
Pneumonia	Any child less than 5 years of age with cough and fast breathing or difficulty in breathing.
Tuberculosis	Any person with cough for 3 weeks or more
Viral hemorrhagic fevers	Any person who has an unexplained illness with fever and bleeding or who died after an unexplained severe illness with fever and bleeding
Yellow fever	Any person with fever and yellowing in the white past of the eyes or yellowing of the skin

ANNEX 4 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 serum specimen has been collected inappropriately and becomes hemolyzed.
- There has been a delay in transportation or refrigeration resulting in bacterial overgrowth in the collected specimen.
- The storage media is not adequate causing reduced viability of the suspected organism or 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, cerebral 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 ship it
- when to expect the results
- sources for additional information.

The chart is intended to be used 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	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.	C Place stool in clean, leak-proof container and label clearly. C Immediately place in refrigerator or cold box not used for storing vaccines or other medicines. C Ship specimens so they will arrive at designated polio laboratory within 72 hours of collection C 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: C onset within last 5 days, and C before antibiotics treatment has started **Do not delay treatment of dehydrated patients.** Specimens may be collected after rehydration (ORS or IV therapy) has begun.	C Place specimen (stool or rectal swab) in a clean, leakproof container and transport to lab within 2 hours. C 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: C Store at 4°C to 8°C C Do not allow specimen to dry. Add small amount of 0.85% NaCl if necessary. C To ship, transport in well marked, leakproof container C 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 2 to 4 days after specimen arrives at the laboratory. Cary-Blair transport medium is stable and usually good for at least one year after preparation. It does not require refrigeration if kept sterile and in properly sealed container. If 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 if a few places in southwest Asia. Serological determination of Ogawa or Inaba is not clinically required. It is also not required if polyvalent antisera results are clearly positive.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	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	olate *Shigella dysenteriae* type 1 (SD1) in culture to confirm shigella outbreak. If SD1 is confirmed, perform antibiotic sensitivity tests with appropriate drugs.	Stool or rectal swab.	ollect 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 not available, send sample to lab within 2 hours in a clean, dry container with a tightly-fitting cap. Specimens not preserved in Cary-Blair will have significant reduction of shigellae after 24 hours. • 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. C Let clot retract for 30 to 60 minutes at room temperature or centrifuge to separate serum from red blood cells. C Aseptically pour off serum into sterile, screw capped tubes. C Store serum at 4°C. 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	C Presence of malarial parasites in blood films for suspected cases admitted to inpatient facility C Hematocrit or hemoglobin for suspected malaria in children 2 months to 5 years in age.	Blood Usually finger-stick sample Finger stick 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 onto correctly cleaned and labeled microscope slides and prepare thick and thin smears. C Allow smears to dry thoroughly. C Stain using the appropriate stain and technique. C 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 can be available the same day as preparation. Microscopic examination of malarial slides may also reveal the presence of other blood-borne parasites.
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	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:* C Collect specimen from every suspected case of measles C Collect serum for antibody testing at first opportunity or first visit to the health facility.	C For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer. C Separate blood cells from serum: – Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. – If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. – If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle). Pour off serum into a clean tube. C Store serum at 4°C. C 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 our of 5 suspected measles cases are laboratory confirmed, the outbreak is confirmed. Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile, just clean. Transport the serum in an EPI hand vaccine carrier at 4EC to 8EC 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.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Meningitis **REFERENCE:** "Laboratory Methods for the Diagnosis of Meningitis Caused by *Neisseria meningitis, 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. meningitis* from CSF	Cerebral spinal fluid (CSF) **Note:** CSF is the specimen of choice for culture and microscopic exam. If CSF not available, collect blood (10 ml adults, 1-5 ml for children) for culture.	Collect specimens from 5 to 10 cases once the alert or action threshold (see "Meningitis" in Section 8) has been reached.	C Prepare the patient and aseptically collect CSF into sterile test tubes with tops. C Immediately place 1 ml of CSF into a pre-warmed bottle of trans-isolate medium. C Incubate at body temperature (36EC to 37EC). C Never refrigerate specimens that will be cultured. C 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 *Nausari meningitis*, a fastidious organism, is expensive, and difficult. It requires excellent techniques for specimen collection and handling and expensive media and antisera. Initial specimens in an outbreak or for singly occurring isolates of *N. meningitis* should be serotyped and an antibiogram performed to ensure appropriate treatment. Trans Isolate medium (TI) is stable. If properly stored at refrigerator temperature (4EC) 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
Plague **REFERENCE:** "Plague Manual: Epidemiology, Distribution, Surveillance and Control". WHO/CDS/EDC/99.2 WHO, Geneva, 1999 "Laboratory Manual of Plague Diagnostic tests". CDC/WHO publication, 2000, Atlanta, GA	Isolation of *Yersinia pest s* from bubo aspirate or from culture of blood, CSF or sputum. Identification of antibodies to the *Y. pestis* F1 antigen from serum.	Aspirate of buboes, blood, CSF, sputum, tracheal washes or autopsy materials for culture Blood for serological tests	C Collect specimen from the first suspected plague case. If more than one suspected case, collect until specimens have been collected on 5 to 10 suspected cases before the administration of antibiotics. C With buboes, a small amount of sterile saline (1-2 ml) may be injected into the bubo to obtain an adequate specimen C If antibiotics have been started, plague can be confirmed by seroconversion (4-fold or greater rise in titer) to the F1 antigen by passive hemaglutination using pared sera. Serum should be drawn within 5 days of onset then again after 2-3 weeks.	C Specimens should be collected using aseptic tec hniques. Materials for culture should be sent to the laboratory in Cary Blair transport media or frozen (preferably with dry ice (frozen CO_2). Unpreserved specimens should reach the laboratory the same day. C Liquid specimens (aspirates) should be absorbed with a sterile cotton swab and placed into Cary-Blair transport medium. Refrigerate. C If transport will require 24 or more hours and Cary Blair transport is not available, freeze the specimen and transport it frozen with cool packs.	Cultures should only be sent to a laboratory with known plague diagnostic capabilities or to a WHO Collaborating Center for Plague. Plague culture results will take a minimum of 3 to 5 working days from reception in the laboratory. Antibiotic treatment should be initiated before culture results are obtained. Plague patients seroconvert to the F1 *Y.pestis* antigen 7-10 days after onset.
Sexually transmitted infections (STIs)	***Routine laboratory confirmation for surveillance is not required.***				
Trypanosomiasis	***Routine laboratory co nfirmation 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 Neelsen (ZN) stained smears	Deep-chest sputum	Collect sputum (not saliva) for direct smear microscopy and examine at least two stained specimens taken on different days.	Smear should be examined at health facility where the specimen is taken.	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 Ebola, Marburg, CCHF, Lassa or Dengue fever *or* Presence of Ebola in post-mortum skin necropsy	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue *For immunohistochemistry:* Skin or tissue specimens from ***fatal*** cases.	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:* C Refrigerate serum or clot C Freeze (-20C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* C Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. C Store at room temperature C Formalin-fixed specimens may be shipped at room temperature.	Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.
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.	C Collect 10 ml of venous blood from adults, 1-5 ml from children. In a standard glass test tube, capillary tube or microtainer. C Separate blood cells from serum: – Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. – If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. – If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pour off serum into a clean tube. C Store serum at 4°C. C 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. Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile – just clean. Transport the serum in an EPI hand vaccine carrier at 4EC-8EC 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 5 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

ANNEX 6 List of district reporting sites

Record information for contacting the health staff who provide information to the district related to surveillance and outbreak detection. For example, include community health workers, trained birth attendants, village leaders and public safety officials.

Name of health facility or point of patient contact with health service	Address or location of facility or point of contact	Designated focal person for surveillance and response	Telephone or facsimile number (or other contact information such as e-mail)

Section 2
Report priority diseases and conditions

This section describes how to:

- Decide how often to report priority diseases and conditions
- Record information in clinic registers or patient charts
- Use standard methods for reporting diseases
- Improve routine reporting practices

2.0 Report priority diseases and conditions

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

- Identify problems and plan appropriate responses
- Take action in a timely way
- Monitor disease trends in the area

2.1 Know how often to report priority diseases and conditions

National policy determines whether the 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 in your country or district.

These guidelines recommend two kinds of reporting:

- ***Immediate reporting***: Report information about an individual case when an epidemic-prone disease 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 may have specific reporting requirements depending on national policy. For example, leprosy is reported quarterly. Meningitis cases and deaths should be reported weekly.

- ***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, a single suspected case is a suspected outbreak: Acute flaccid paralysis (AFP) Cholera Dracunculiasis Measles *(elimination)* Neonatal tetanus Plague Viral hemorrhagic fever Yellow fever	C Report case-based information immediately to the district as soon as an outbreak is suspected -- Make the initial report by fastest means possible (telephone, facsimile, E-mail, radiophone) -- Follow up with a written report of the case-based information recorded on a form C Report summary information monthly. Enter "zero" when no cases were suspected or confirmed during the reporting period.
For these diseases, report a suspected outbreak when the threshold is crossed: Measles *(non-elimination)* Meningitis	C Report suspected measles outbreak when 5 or more cases are suspected in one month. C Report suspected meningitis outbreak when the alert threshold is crossed. (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)	C Health facilities report summary totals to the district. District reports summary totals to the provincial, regional or central level. C 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 has its own 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 staff review 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 staff know the standard case definitions recommended by national policy. Establish or modify existing procedures so that all health staff 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 staff 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 the regional or national levels. 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.

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 to Section 1.

2.3 Use standard methods for reporting priority diseases

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, 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 because action can be taken to control the wider transmission of the disease and prevent additional cases from occurring.

2.3.2 Report case-based information on a 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 8 at the end of this section. Adapt the generic case reporting form provided at the end of this section, or compare these criteria to the form you already use to ensure that there are places for recording important information about the case including:

- 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, neighborhood)
- 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 staff person 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 4 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 who reported and reports district summary totals to the provincial, regional or central 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 hospitalized 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 staff 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.

- Records clerks know how to complete the summary forms.

- Health staff review the monthly totals and provide comments on the forms about results seen in monthly analysis. (See Section 3.0).

- Health staff 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

professionals 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 who receive 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 lists 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.

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 Maintaining clinic registers for recording priority diseases and conditions
- ANNEX 8 Case-based surveillance reporting form (sample)
- ANNEX 9 Line list for reporting case-based information when several cases occur during a short period: health facility to districts
- ANNEX 10 Monthly summary reporting form for in-patient cases and deaths: health facility to district
- ANNEX 11 Monthly summary reporting form for district out-patient and in-patient cases and deaths: district to next level
- ANNEX 12 Leprosy quarterly report form
- ANNEX 13 Tuberculosis quarterly report form
- ANNEX 14 Managing public health surveillance data

ANNEX 7 Maintaining clinic registers for recording priority diseases and conditions

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

- The patient's name and age
- 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 inpatient
- 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.

ANNEX 8 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, plague, viral hemorrhagic fevers 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 or elimination (polio (AFP), Dracunculiasis, and neonatal tetanus.) Leprosy is reported quarterly.

- Other diseases recommended by national policy for case-based surveillance.

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 top half is where information is recorded about the individual case. It provides information that can be used to plan a more detailed case investigation. The bottom half of the 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 top part of the 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 Health Facility

_____ Reporting District

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

☐ AFP ☐ Cholera ☐ Diarrhea with Blood/Shigella ☐ Dracunculiasis ☐ Neonatal Tetanus ☐ Measles ☐ Meningitis ☐ Plague ☐ Viral Hemorrhagic Fever ☐ Yellow Fever _____ Other

_____/_____/_____
Received form at national level

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

Patient's Residence: Village/Neighborhood _____ **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 Sent Form to District: _____/_____/_____

If Lab Specimen Collected

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: _____/_____/_____ Other

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

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

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	
Meningitis			Rubella	IgM	+ - P	**Virus Detection**
N. meningitidis	Culture	+ - P	RVF	IgM	+ - P	+ - P
S. pneumonia	Culture	+ - P	Ebola	IgM	+ - P	+ - P
H. influenza	Culture	+ - P	CCHF	IgM	+ - P	+ - P
N. meningitidis	Latex	+ - P	Lassa	IgM	+ - P	+ - P
S. pneumonia	Latex	+ - P	Marburg	IgM	+ - P	+ - P
H. influenza	Latex	+ - P				
Shigella Dysenteriae	Culture	SD type 1 Other shig No shig				
Plague	Culture	+ - P				
	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. Failure to do so will undermine cooperation with clinicians on reporting of cases in the future

Instructions for completing the Generic 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 (ID number) in the blank for "ID 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 labeled "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 9 Generic Line List – for Reporting from Health Facility to District and for Use During Outbreaks

Health Facility: _____ Date received at District: _____
District: _____ Disease/Condition: _____

	ID Number (Assigned at the district level only) 001,002, etc.	(O)ut / (I)n Patient	Name	Village or Town and Neighborhood	Sex	Age **	Date seen at health facility	Date of onset of disease
(1)								
(2)								
(3)								
(4)								
(5)								
(6)								
(7)								

- If district sends specimen to the lab, use ID 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)

Generic Line List (Continued)

	Number of doses of vaccine (Exclude doses given within 14d of onset)	Blank variable	Blank variable	Lab Tests		Outcome (A)live (D)ead	Comments
				Specimen taken (Yes/No) If yes, date collected	Lab results		
(1)							
(2)							
(3)							
(4)							
(5)							
(6)							
(7)							

ANNEX 10 Monthly surveillance report form for out-patient cases and in-patient cases and deaths (health facility to district level)

Health Facility _____ District _____ Province _____

Year _____ Month _____ Record below the total number of cases and total number of deaths for each disease/condition. Report these totals to the next level. Complete the column for the current month for all disease/conditions.

		Out-Patient	In-Patient	
		Cases	Cases	Deaths
Malaria <5 years	Uncomplicated			
	Severe			
Malaria >5 years	Uncomplicated			
	Severe			
In-Patient Malaria with severe anemia (<5 years)				
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 the 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		Plague	
Cholera		Meningitis		Yellow Fever	
Dracunculiasis		Neonatal Tetanus		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 11 Monthly surveillance summary report form for out-patient cases and in-patient cases and deaths (district to next level)

Year _____ Month _____ District _____ Province _____

Record below the total number of cases and total number of deaths for each disease/condition. Report these totals to the next level. Complete the column for the current month for all disease/conditions

		Out-Patient	In-Patient	
		Cases	Cases	Deaths
Malaria <5 years	Uncomplicated			
	Severe			
Malaria >5 years	Uncomplicated			
	Severe			
In-Patient Malaria with severe anemia (<5 years)				
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 the 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		Plague	
Cholera		Meningitis		Yellow Fever	
Dracunculiasis		Neonatal Tetanus		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. Update District Analysis Book if receive late reports from health facilities. If late reports are received from health facilities from previous months, send a separate sheet to the next level updating numbers.

ANNEX 12 Tuberculosis quarterly report form

Year _____ Quarter _____

Health Facility _____ District _____ Province_____

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-rx 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-rx smear+
Total registered		
Total evaluated		
Smear negative a tend 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 13 Leprosy quarterly report form

Year _____ Quarter _____

Health Facility _____ District _____
Province_____

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 14 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
Analyze data

This section describes how to:

- Receive, handle and store data reported from other levels
- Analyze data by time, place and person
- Draw conclusions based on the analysis results
- Compare analysis results with thresholds for public health action.

3.0 Analyze data

Analyzing trends of disease cases 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.

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 meningitis-belt countries, weekly reporting of immediately reportable meningitis cases is recommended.

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 staff who record, report or store data understand the need for privacy and confidentiality. Please see Annex 14 for guidance in managing public health surveillance data.

3.2 Prepare to analyze data by time, place, and person

In order to detect outbreaks, follow their course, and monitor public health activities, health staff 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 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 analyzed every month is to maintain an "analysis book" at the health facility and district levels. Recommended graphs, tables and maps for analyzing 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 public health team or district response team 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 16 at the end of this section.

The chart on the following page lists recommended methods and tools for analyzing surveillance data so that health staff 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 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

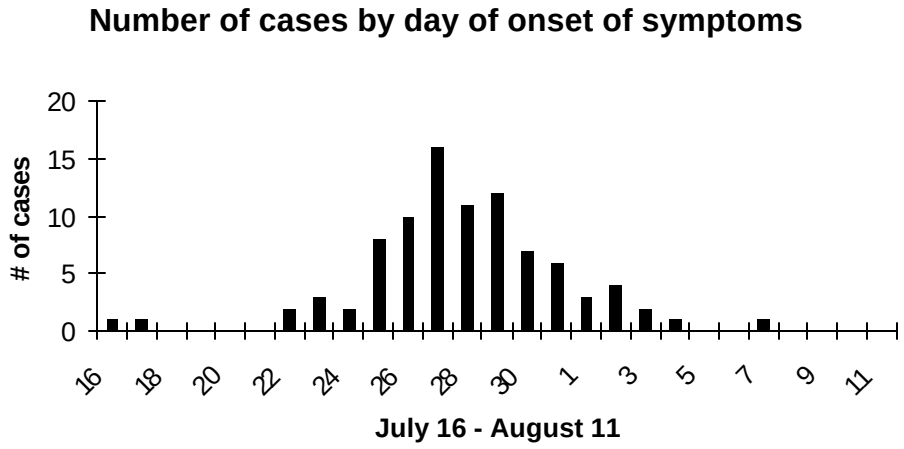
Analyzing data to detect changes in the numbers of cases and deaths over time is the purpose of "time" analysis. Observing disease trends over time helps to show when regular changes occur and can be predicted. Other disease rates make unpredictable changes. By examining events that occur before a disease 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 place along the horizontal or x-axis. Events that occurred that might affect the particular disease being analyzed 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.

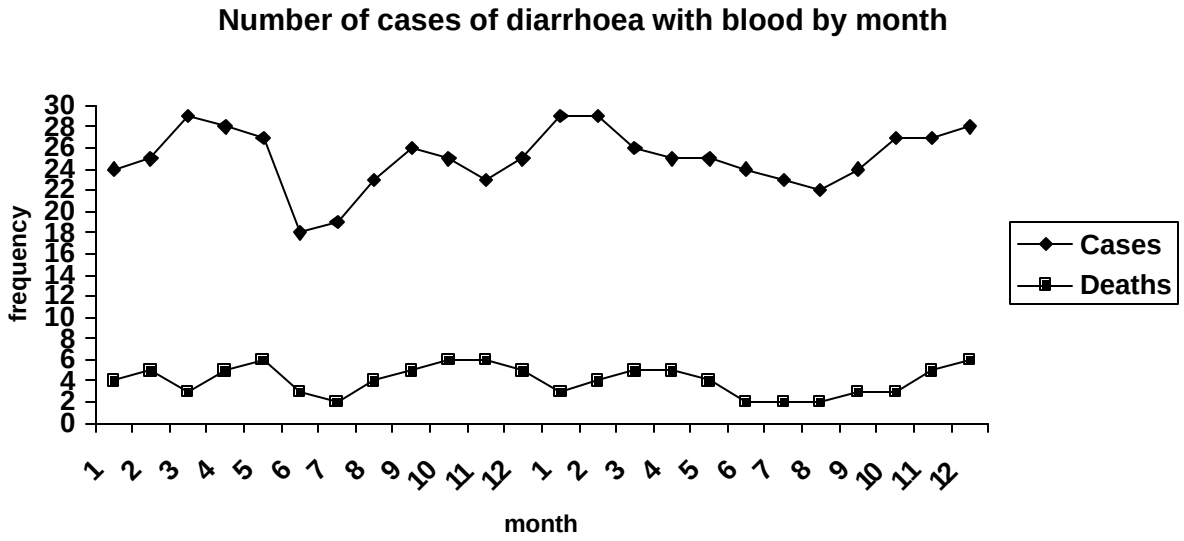
Graphs can show how many cases and deaths have occurred in a given time. It is easier to see changes in the number of cases and deaths by using a graph, especially for large numbers of cases or showing cases over a period of time.

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

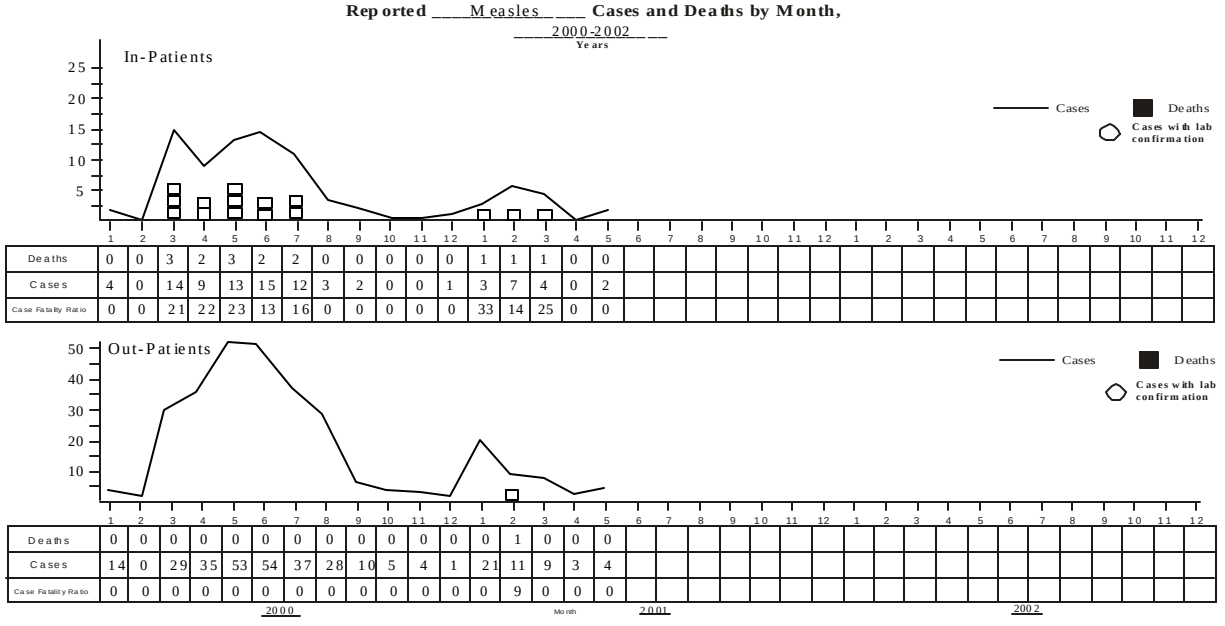
This is an example of a bar graph.



This is 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 analyze 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.



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 color. 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

Analyzing 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 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 kilometers)
- 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.

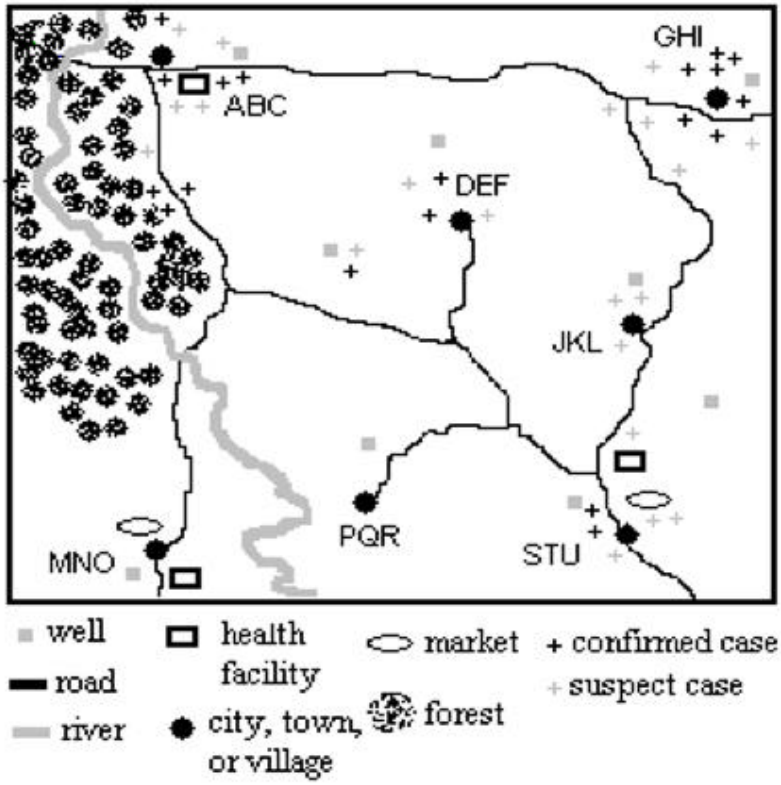
- Obtain a local map from the local government office or land department. Trace the main features needed for health work onto transparent paper and then to a large card that can be hung on a wall for easy use. If no official map is available, sketch the whole district area.

- 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, 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 analyzing 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:

Health facility	Number of measles cases this year in children less than 5 years of age
A	42
B	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.

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 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.

Health facility	Percentage of cases of Guinea worm 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 times 100 to calculate the percent. (Multiply 0.8 X 100. The answer is 80%.)

Age group	Number of reported cases	% of reported cases in each age group
0-4 years	40	80%
5-14 years	9	18%
15 years and older	1	2%
Age unknown	28	0%
Total	78	5

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

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

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

3.6 Draw conclusions 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 current 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 are the 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 staff 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 staff 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 staff 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 action 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 centers, 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 staff 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 staff 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 staff 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.

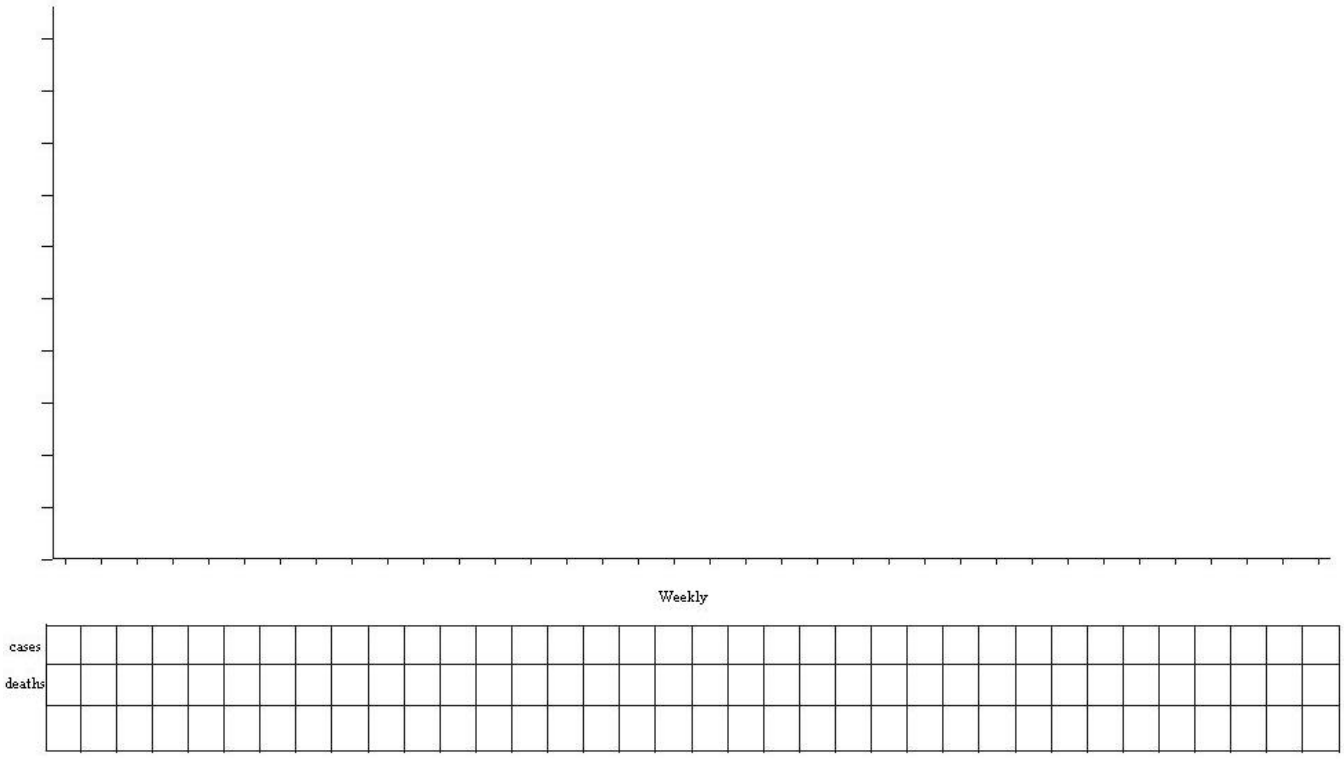
How to investigate public health problems is in Section 4.0.

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

Annexes to Section 3

- ANNEX 15 Sample grid for time analysis
- ANNEX 16 Sample tables for person analysis

Annex 15 Sample Grid for Time Analysis



Annex 16 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 up through 4 years		
5 years up through 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

This section describes how to:

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

4.0 Investigate suspected outbreaks and other public health problems

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 use 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 of activities to prevent future recurrence of the outbreak.

In most countries, 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

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 staff should promptly investigate the problem and respond to the immediate cases. Preparations for taking a wider public health response should be made. Alert and action thresholds are described in Section 3.6.3.

Some health events require investigations to be started as soon as possible. Districts should aim to 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 action thresholds have been reached for specific priority diseases.
- Communities report rumors 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).

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.

To establish health facility thresholds for notifying the district about other diseases such as shigella, malaria, measles in non-elimination countries, 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 is 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 malaria or cholera with seasonal increases.

3. State the threshold clearly as a number of cases per month or week, so that health staff 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 can be adapted to meet your national policies, priorities, and capacity to respond.

4.2 Record reported outbreaks and rumors

Prepare a method for tracking the reporting of and response to outbreaks and rumors reported to the district. A sample form for tracking reports of outbreaks is in Annex 18 of this section. If the district is using a district analysis workbook, include this form in the workbook.

The purpose for tracking reported outbreaks is to ensure that the report of each suspected outbreak or rumor 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 the reported outbreak

Promptly verify reported outbreaks from health facilities or community rumors. 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 rumor 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
- 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 hemorrhagic 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 person in the district 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 work health staff is expected to do

Inform health staff 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 lines

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. For example, define who will communicate with the Ministry of Health, 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 person on the team. Define the role of non-health staff 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 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, 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.

4.4.5 Finalize 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
- 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 transportation

Make travel arrangements for getting to and from the site of the investigation and for traveling 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

In some districts, there is a rapid response kit that contains supplies and equipment for carrying out the investigation.

If a kit is not available in your 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.

Refer to the laboratory chart in Section 1.0 and to the disease specific guidelines in Section 8.

4.5 Confirm the diagnosis

4.5.1 Review the clinical history

Examine the patient or patients 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, neighborhood)
- Where have you traveled 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 ship 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 persons 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.

4.6 Isolate cases as needed and treat them

Strengthen case management at the health facility (or where the patients are being seen). 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.

4.7 Search for additional cases

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

4.7.1 Search for cases in the health facility records

In the health facilities where cases have been reported, search for additional cases 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 and hospital staff to search for similar cases in the registers of neighboring health facilities.

See Annex 18 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.

4.7.2 Search for cases in the community

Identify areas of likely risk where the patients have lived, worked, or traveled. Also talk to other informants in the community such as pharmacists or school teachers.

The areas for the search may be influenced by the disease, its mode of transmission, and factors of risk 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.

4.8 Record information about the additional cases

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.

4.8.1 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 neighborhood 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 and gender. 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 immunization 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 8).

Some diseases have their own more detailed case investigation form. A copy of the more detailed forms for neonatal tetanus and AFP case investigation forms are in Annexes 20 and 21 of this section.

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

4.8.2 Record information about additional cases on a 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 shipped off to the lab in a batch.

4.9 Analyze data about the outbreak

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 and look for clues about where the outbreak 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.

4.9.1 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 case 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 were patients 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 rumors 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 highlighting these events with arrows is to evaluate whether detection, investigation and response to the outbreak was timely. 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.

4.9.2 Analyze data by place

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

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

- 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, neighborhood, 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.

4.9.3 Analyze data by person

Review the case 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
- Immunization status

- Inpatient and outpatient status
- Risk factors
- 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 malaria outbreak, specify the age groupings that are targeted by the National Malaria 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.

4.10 Interpret analysis results

Review the analysis 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?

4.10.1 Interpret the 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 periods of incubation.

4.10.2 Interpret the 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.

4.10.3 Interpret the 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.

4.10.4 Calculate case fatality rates

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

Annexes to Section 4

- ANNEX 17 Log of suspected outbreaks and rumors
- ANNEX 18 How to conduct a register review
- ANNEX 19 Checklist of laboratory supplies for use in an outbreak investigation
- ANNEX 20 Neonatal tetanus case investigation form
- ANNEX 21 AFP case investigation form

ANNEX 17 District log of Suspected Outbreaks and Rumors

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.

Condition or Disease (1)	Number of cases initially reported (2)	Location (Health Center, village, etc) (3)	Date district was notified (4)	Date suspected outbreak was investigated by the district (5)	Result of District investigation (Confirmed, Ruled Out, or Unknown) (6)

District log of Suspected Outbreaks and Rumors (CONTINUED)

Date Outbreak Began Date onset 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 18 How to conduct a 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. Give priority to government health facilities.
- Large reference or teaching hospitals with pediatric 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 pediatric and infectious disease wards. The inpatient register for the pediatric 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 suspect case is available. At a minimum, the register should include:

-- the patient’s name and where it was born
-- the signs and symptoms
-- date of onset of symptoms and outcome (for example, date of death, if relevant)

-- immunization 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 of NT. 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 list the suspected cases that are found.

Record information about the suspect 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 19 Checklist of laboratory supplies for use in an outbreak investigation

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

_____ Pieces of bar soap and bleach for setting up handwashing stations
_____ Supply of gloves
_____ Safety boxes for collecting and disposing of contaminated supplies and equipment

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- For collecting laboratory specimens:

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

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 and cover slips
_____ Slide box

Stool
_____ Rectal swabs
_____ Cary-Blair transport media

- If health facility has a centrifuge:

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

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- 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 20 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/ Neighborhood:** _____ **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? **	

1st _____/_____/_____ **4th** _____/_____/_____

2nd _____/_____/_____ **5th** _____/_____/_____

3rd _____/_____/_____ **If >5, last dose**_____/_____/_____

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

BIRTH OF INFANT

Date of birth: _____/_____/_____ Please use the following key, 1=Y, 2=N, 9=U, 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?		Describe treatment of cord: Where?	

*** 1=Hospital, 2=Health center, 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?	
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=Y, 2=N, 9=U, 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 21 INVESTIGATION CASE 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/ Neighborhood:** _____ **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 hospital? ☐ 1= Y, 2= N 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= Y, 2= N 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=Inconnu

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

SPECIMEN COLLECTER DE SELLES

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 regional lab
_____/_____/_____ Date differentiation result sent by regional 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? Findings at Follow-up: ☐

LA			RA
LL			RL

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: _____
Unit: _____ Address: _____ Phone: _____

Section 5
Respond to outbreaks and other public heath problems

This section describes how to:

- Work with the district epidemic team to improve preparedness for responding to epidemics and other public health problems
- Select appropriate public health responses based on investigation and analysis results and disease-specific recommendations for:

  -- Strengthening case management of priority diseases and conditions
  -- Updating health staff's skills
  -- 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
- Prepare in advance to obtain the necessary resources for responding to epidemics and other public health problems

5.0 Respond to outbreaks and other public health problems

This section describes steps for responding to:

- A confirmed outbreak of a priority disease (for example, a confirmed outbreak of cholera) and

- Trends seen in routine analysis (for example, a persistent increase in the number of deaths in children under 5 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 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. Measures to treat and control the disease and prevent unnecessary deaths or disabilities can be taken in a timely way.

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.

For 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 staff 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
   - Treatment 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 Regularly meet with the epidemic response committee

Periodically meet with the epidemic response team whether or not there is an outbreak. During an epidemic, meet as soon as the epidemic is recognized. Then meet as often as needed to plan, implement, monitor and report on the epidemic response.

5.1.1 Specify who should be on the epidemic response team

If a national epidemic response committee exists in your country, pattern the local committee after the national epidemic response committee. Emphasize a multisectoral approach. Include the following:

From the public sector:

- the district medical officer
- district or provincial manager for the Expanded Programme on Immunization (EPI)
- disease control officers for specific priority diseases or conditions
- district sanitarian or public health officer
- clinicians
- laboratorian from the district or reference laboratory
- district supervisor of community health workers
- vector control officer
- politicians, administrators, an other officials and community representatives
- police or other public safety officers

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

- community health programmes
- manager of outreach program to special populations
- Red Cross or Red Crescent

From the private sector:

- principal clinical or nursing officer from private hospital , clinic or laboratory
- pharmacist

5.1.2 Prepare to respond to an epidemic

You may have already prepared for epidemic response in your district. If not, assess the supplies, equipment and resources currently available. Take action to set aside a set of supplies that can be used in an emergency response activity. Each level should be prepared for some response action. It will be necessary to have the necessary resources available.

5.2 Select a response for the outbreak or public health problem

When an outbreak is confirmed, or a need for public health action is identified, review the investigation results and data analysis conclusions. Refer to the disease specific guidelines and select response activities that 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 prevention activities.

- Participation from the community, health care facilities and the district personnel.

Refer to Section 8 for disease specific epidemic response activities.

5.3 Plan outbreak response activities

Responding to problems identified during analysis of summary data reported monthly is in Section 7.0.

Consider the following factors when planning the response activity:

1. If emergency response funds will be needed, set up procedures for obtaining them. For example, ask the regional or national level how to request funds and provide the required information as needed.

2. If laboratory specimens will be collected from a remote location, set up a procedure for shipping specimens. Make sure the shipping procedure allows for the specimens to:

    - Be kept at the recommended temperature

- Arrive at the laboratory as quickly as possible.

3. Identify areas or populations at high risk for the disease or condition. Review the analysis data to refine the description of the outbreak characteristics. Review at least the:

   - Incidence rate for the outbreak disease
   - Extent of risk factors for the outbreak disease. For example, look at the case investigation results for information about the extent of unsafe delivery practices in a neonatal tetanus outbreak, unsafe food practices for diarrhea, and the number of people who have forest-related occupations during a yellow fever outbreak.
   - Rate of immunization coverage for the outbreak disease.

4. Alert nearby districts or catchment areas about the outbreak. If they are having a similar outbreak, coordinate response efforts. For example, combine efforts to:

   - Obtain supplies and resources
   - Develop health education messages and materials
   - Conduct emergency immunization activities
   - Ship specimens to reference laboratory for confirmation

5. Review the lists of supplies and resources made by the epidemic response team. Obtain the emergency supplies and set them aside at the district and local levels for emergency use

6. If supplies are not available locally:

   - Contact the regional office 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

7. Assign clear responsibilities to individuals or units for specific response activities.

8. Provide training and supplies so that health staff will be able to:

    - Keep detailed records on the response activities. For example, keep a tally sheet of individuals immunized; a list of the community education messages, communication channels, and dates of community education activities; a list of individuals receiving bed nets.

    - Throughout the response activity, review data on cases, laboratory confirmation, and treatment.

    - Identify problems in implementing the activities and modify activities, as necessary.

5.4 Implement response activities

Refer to disease-specific guidelines for recommended responses. The response activities include the following:

- Strengthen case management
- Update health staff's skills
- Conduct emergency immunization campaigns
- Enhance surveillance during the response activity
- Inform and educate the community
- Improve access to clean water
- Improve safe disposal of human waste
- Improve food handling practices
- Reduce exposure to mosquitoes
- Control vectors
- Disseminate the technical recommendations appropriate for the outbreak.

5.4.1 Strengthen case management

Take steps to support improved clinical practices. Review the recommendations in Annex 22 for treating cases during an outbreak. Prepare health staff 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.

- Make the necessary drugs and treatment supplies available.

5.4.2 Update health staff skills

1. **Give clear and concise directions** to health staff taking part in the response.

2. **Select training topics.** 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 clean water, hand washing and safe sharps disposal)
    - Barrier nursing and use of protective clothing
    - Isolation precautions
    - Treatment protocols such as delivering oral rehydration salts (ORS) and using intravenous fluids
    - Disinfecting surfaces, clothing and equipment
    - Disposing of bodies safely

3. **Implement training.** In an urgent situation, there often is not time for formal training. Provide on-the-job or one-on-one training as needed. For example, ask a skilled clinician to do one-on-one demonstrations on the wards. Make sure there is an opportunity for the training physician or nursing staff to observe the trainees using the updated or new skill.

5.4.3 Conduct an emergency immunization activity

Collaborate with the district or national EPI and disease control programme manager to conduct an emergency immunization activity, if indicated. Begin planning the emergency immunization activity as soon as possible. Speed is essential in an emergency immunization because time is needed to obtain and distribute vaccine. ***Establish a plan for acquiring an emergency stock of vaccine before an epidemic occurs.***

1. Determine the target population for the activity based on the case and outbreak investigation results

2. Refer to the EPI programme guidelines for specific recommendations about delivery of the indicated vaccine.

A worksheet called “Planning an emergency immunization activity” is in Annex 24 at the end of this section.

A worksheet called “Estimating vaccine supplies for immunization activities in Annex 25 at the end of this section.

5.4.4 Enhance surveillance during the response activities

During a response to an outbreak, encourage health staff at all health facilities to be vigilant in surveillance of the disease or condition. Make sure that health staff:

- Search for additional persons who have the specific disease and refer them to the health facility or treatment centers for treatment (cholera, for example), or quarantine the household (plague, for example) and manage the patient.

- Update line lists and monitor the effectiveness of the outbreak or response activity.

5.4.5 Inform and educate the community

Keep the public informed to calm fear and to encourage cooperation with the outbreak response. Develop community education messages to provide the community 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. Make sure to include:

    - Signs and symptoms of the disease
    - How to treat the disease at home, if home treatment is recommended.
    - Prevention behaviors that are feasible and that have a high likelihood of preventing disease transmission
    - When to come to the health facility for evaluation and treatment
    - Immunization recommendations, if any.

2. Decide **how to state the** message. Make sure that the messages:

    - Use local terminology
    - Are culturally sensitive
    - Are clear and concise
    - Work with local traditions
    - Address beliefs about the disease.

Sample community education messages are in Annex 25 at the end of this section.

3. Select appropriate communication methods that are present in your district. For example:

- Radio
- Television
- Newspapers
- Meetings with health personnel, community, religious and political leaders
- Posters
- Fliers
- Presentations at markets, health centers, schools, women's & other community groups, service organizations, religious centers.

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 staff 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 by the Epidemic Response Committee.

5.4.6 Improve access to safe water

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 liters per day	50 liters
Health care setting	40 to 60 liters per day	50 liters in wards 100 liters in surgery 10 liters in kitchen

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

Safe sources of drinking water include:

- Piped chlorinated water

- Exposed water sources (a river, pond, or open well), if protected from contamination by people or animals. For example, make sure that the water source is at least 30 meters away, upstream from areas where people or animals defecate.

- Protected water sources (for example, closed wells with a cover).

- Boiled water from any reliable source.

If no local 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*** provide:

- Community education on how to keep home drinking water safe.

- 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 meters or more from sources of water.

5.4.7 Ensure safe disposal of human waste

To make sure that human feces are disposed of safely:

- Assign teams to inspect local areas for human waste disposal. Safe practices include disposing of feces in a latrine or burying them in the ground more than 10 meters from a 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.

5.4.8 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.

5.4.9 Reduce exposures to mosquitoes

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 programme in your district to:

- Implement a bednet programme.
- Conduct community education on the proper use of bednets and how to avoid dawn-to-dusk mosquito bites.

5.4.10 Control vectors

Encourage prevention of diseases carried by rodents animals 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

5.5 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 “epi” 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 might recommend changes in the immunization strategy and programme to make the immunization activity more effective. You might recommend changes in the shipping procedure for laboratory specimens to allow specimens to reach the reference laboratory in good condition or more quickly.

- Disseminate a report on the outbreak.

Annexes to Section 5

- ANNEX 22 Treat cases during an outbreak
- ANNEX 23 Prepare disinfectant solutions by using other chlorine products
- ANNEX 24 Planning an emergency immunization campaign
- ANNEX 25 Estimating vaccine supplies for immunization activities
- ANNEX 26 Recommended immunization practices
- ANNEX 27 Sample messages for community education
    - Handwashing
    - Safe handling of food
    - Safe disposal of human waste
    - Clean drinking water and storage
    - Safe burial of bodies
    - Reducing exposure to mosquitoes

Annex 22 Treat cases during an outbreak

Use appropriate drugs and treatments 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*	12.5 mg per kg	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.

[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 pediatric 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.

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:

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 to 12 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 clean 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:		
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*

	NALIDIXICACID < 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 sulphamethoxazole	**PEDIATRIC TABLET** 20 mg trimethoprim + 100 mg sulphamethoxazole	**SYRUP** 40 mg trimethoprim + 200 mg sulphamethoxazole per 5 ml
Children's dose					
3 - 5 kg	1/4	*1/4*	1/4	*2*	*5.0 ml*
6 - 9 kg	*1/2*	*1/2*	1/2		
10 - 14 kg	*1*	*1*	1	3	7.5
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

Source: *WHO guidelines for epidemic preparedness and response to measles outbreaks, WHO/CDS/CSR/ISR/99.1*

- Give the first dose in the health facility or clinic.
- Give the mother one dose to give at home the next day.

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 capsule
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. If injectable treatment is not possible, give oral amoxicillin or cotrimoxazole or 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 milliliters**
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

See next table for other recommended antibiotics.

< 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 per kg	4 days
Ampicillin or Amoxicillin	IV	2-3 g daily every 6 hours	250 mg per kg	4 days
Amoxicillin	Oral	2-3 g every 6 hours	250 mg per kg	4 days
Chloramphenicol	IV	1 g every 8-12 hours	100 mg per kg	4 days
Chloramphenicol (oily)	IM	single dose 3 g	single dose - 100 mg per kg	1-2 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 23 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 liter bleach per 10 liters of water	100 ml per 10 liters of water, or 1 liter of 1:10 bleach solution per 9 liters of water
Calcium hypochlorite powder or granules 70% (HTH)	7 grams or ½ tablespoon per l liter of water	7 grams or ½ tablespoon per 10 liters of water
Household bleach 30% active chlorine	16 grams or 1 tablespoon per l liter of water	16 grams or 1 tablespoon per 10 liters of water

To disinfect clothing:

C 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

C 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 24 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 programme 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 programme 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 followed 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 you 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.

ANNEX 25 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
___ children and adults age 0 up to 30 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. If you do not know the exact age distribution rates in your area, use recommended estimates such as the following:

--	children age 0 up to 5 years	20%
--	children age 9 months up to 14 years	45%
--	children and adults age 1 up to 30 years	70%
--	women of childbearing age 15-45 years	20%

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	1.20 =	_____
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 milliliters 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 26 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 diluent to reconstitute the freeze-dried vaccine.
   -- Use a sterile syringe and sterile needle.
   -- Draw up and expel the diluent 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 diluent 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, if it is national policy to require vaccinated persons to have a card.

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 staff the need to plan vaccination campaigns.

11. Follow national policy for use of opened vials.

ANNEX 27 Sample messages for community education

Improve handwashing:

Hand washing with soap may be the most effective way to prevent transmission of some organisms causing infectious diseases. For that reason, promote handwashing 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
- 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 diarrhea. 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 feces. 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

Clean drinking water and storage

C **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. *Exposed water source* (a river, pond, or open well). If these sources are used for drinking water, fence around them to protect from contamination by people and animals. Dig drainage ditches to prevent storm water and other surface water from flowing into the drinking water source. Do not allow defecation within 10 meters of the water source, and should be downhill, or downstream, from it.

3. *Closed wells*. Equip with a well-head drainage apron, and with a pulley, windlass, or pump.

4. *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.

C **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 specially 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 and close to the place of death.
- Discourage washing of dead bodies
- Discourage distribution of food during funerals

Reducing exposure to mosquitoes

Personal Protection:

- Use insect repellents
- Use bednets, impregnated with insecticide
- Tuck the lower edge of the bednet under the bedding

Section 6
Provide feedback

This section describes how to:

- Write an outbreak response report
- Develop information sheets summarizing data and its interpretation
- Develop and distribute a public health bulletin
- 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 staff may think that their reporting is not important. As a result, future reporting may not be as reliable because health staff 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 staff efforts to participate in the surveillance system. Another purpose is to raise awareness about certain diseases and any achievements of disease control and prevention projects 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 response 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 to 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 staff 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 public health bulletin

In many countries or international regions, the national level or region publishes a national public health bulletin on a regular basis. These bulletins have a wider audience than just the health staff in a particular district or health facility. The bulletins are usually brief (2 to 8 pages).

The bulletins contain at least:

- a summary table showing the number of reported cases and deaths to date for each priority disease
- a commentary or message on a given disease or topic.

If a national public health bulletin is sent to the district office, display it where others can see it. Make copies to distribute to health facility staff. Take a copy of the bulletin with you on your next supervisory visit to show health staff how data they report contributes to public health.

6.4 Develop a district newsletter

The purpose of a public health bulletin is to present facts in a limited format and time frame. The newsletter cannot describe detailed lessons learned during an outbreak, or specific examples of a malaria campaign. On the other hand, the newsletter can be used to inform and motivate health workers.

The target audience for a newsletter could be health staff in the district or region. The newsletter can be 2 to 4 pages long and produced simply with a computer-entered or typewritten text.

Examples of articles summary of article that could occur in a newsletter are:

- 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).

6.5 Develop fact sheets

Fact sheets are brief summaries of 1 to 2 pages. They are prepared by health staff 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 shigella 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
- Oral reports.

Annexes to Section 6

- ANNEX 28 Sample district outbreak report framework

ANNEX 28 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 outbreak detection, investigation, and response

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: _____

Section 7
Evaluate and improve 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 surveillance and response activities
- Take action to improve surveillance in next year's plan.

7.0 Evaluate and improve surveillance and response

Section 3 of these guidelines describes how each month, the health staff 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-reportable diseases, 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 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 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 reportable diseases

Monitor and evaluate the interval between the onset of the first known case and when the first case was seen in the health facility. This delay in the use of health services is one of the factors in the evolution of the illness, and, therefore, its prognosis.

Other intervals to monitor for detection of immediately reportable diseases include monitoring reporting from the community to the health facility (within 48 hours of onset of illness), from the health facility to the district (within 24 hours) and from the time the threshold is reached to a concrete response.

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 30 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 action

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 staff 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 staff 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 staff 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 to other levels

When routine reports of the number of cases are sent to the provincial, regional or 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 central 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 indicators to measure in the district. These may be indicators that relate to national goals and indicators, or to specific plans for improving integrated 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 surveillance and response at the health facility

Domain or function of surveillance	***Indicator: Regularly monitor the number of health facilities that:***
Identify and record suspected cases	C Have a clinical register C Correctly record information in the register
Confirm suspected cases	C Have access to a functioning laboratory that can reliably process specimens (sputum, stool, blood, serum, cerebral spinal fluid, for example) for confirmation of priority diseases. C Safely collect and properly package specimens for transport to higher level laboratory C Submit specimens of priority diseases for confirmation in a timely way
Review and analyze data	C Keep up-to-date trend lines for each selected priority diseases C Have detected a new epidemic C Have an action threshold for each priority disease
Report data	C Report case-based information for immediately reportable diseases C Have a reliable supply of reporting forms C Accurately record case register data on summary report forms C Submitted reports on time to the district during last 3 months C Submitted required number of reports during last 3 months
Respond to outbreak thresholds and analysis results	C Used local information to conduct a community disease prevention and control activity during the last 12 months. C Implemented prevention and control measures based on local data for at least one epidemic-prone disease
Provide feedback	C Received a bulletin or report from district or other level about data health facility reported to other levels during the year C Met with community members to discuss investigation results during last 6 months.
Maintain readiness for epidemic response	C Use standard case management protocols for priority diseases C Use a minimum level of standard precautions with all febrile patients regardless of infection status C Maintain an emergency stock of urgent drugs and treatment supplies for responding to epidemic-prone diseases seen previously in the area.
Supervision	C Used a supervision checklist for surveillance during supervisory visit at least once in last 6 months
Training	C Conducted training for health staff on one or more of following topics in last 12 months: using case definitions, handling specimens safely, collecting and reporting data, analyzing and interpreting trends, using thresholds for action, supervisory skills

Resources	C Have reliable transportation methods, with fuel source as needed (bicycles, motorcycle, vehicle, fuel) C Have access to reliable communication methods (telephone, facsimile, radiophone, electronic mail, others) C Have supplies for carrying out outbreak investigations C 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.

7.2 Conduct supervision

Supervision is a process of helping health staff to improve their work performance. Supervision is not an inspection. Rather, good supervision aims to sustain good quality services rather than finding things that are wrong.

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 descriptions to include surveillance tasks relevant to each category of health staff

Job descriptions are the basis for conducting supervision and assessing performance. Review the job descriptions of health staff 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 staff should perform
- To whom the health staff person reports
- Other health staff that are supervised by the specific category or person.

7.2.2 Prepare a supervision plan

Include surveillance and response targets in the overall plan for supervision in your district. For example:

- Decide how often to monitor health staff performance . Fore example, a district may decide to conduct a supervisory visit at least 2 times a year for each health facility. In some countries, depending on resources, supervisory visits take place more often (monthly, for example).

- 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 clinics, medical centers and community reporting sites in the overall plan. Include private health centers 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.

- 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 to:

1. Provide feedback to health staff during each visit. Let the health staff know what is working well. Also give feedback on how the data reported previously was used to detect outbreaks and take action to reduce illness, 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 staff 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 a 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 a graduated checklist to guide the supervisory visit. The items listed in a graduated 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 staff monitor their activities and progress towards an improved system.

During the visit, use a checklist to monitor how well health staff 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 malaria slides with the reported number of hospitalized malaria 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 29 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 visit

Provide in the report achievements that were recognized during the visit. Also state the actions that were planned with the health staff 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 regional or provincial disease control programmes are good opportunities to discuss and improve disease control in your district. For example, if a national malaria control person visits the district, you can discuss why the inpatient malaria deaths have not been declining. You can ask about additional ideas or resources that the malaria control programme can provide.

7.4 Annually evaluate quality of surveillance and response

7.4.1 Determine indicators and program 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 on time.

- Indicators for measuring quality of surveillance for specific diseases (for example, to monitor response to surveillance data about meningitis, select as an indicator the percentage of health facilities where meningitis outbreaks were detected -- that is, the rate was more than 15 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 staff.

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 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 staff requests or suggestions about services or surveillance?

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 Prioritize plans for improvements to surveillance and response 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 personnel who will carry out the activity.
3. Estimate the cost of the activity
4. Develop a timetable for the activity. Define the sequence of activities in logical order.
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 29 Sample form for recording timeliness and completeness of monthly reporting from the health facility to the district level
- ANNEX 30 Sample indicators for monitoring by the provincial or national level of district-level surveillance activities
- ANNEX 31 Sample supervisory checklist for surveillance and response activities at the health facility level

ANNEX 29 Sample form for recording timeliness and completeness of monthly reporting from the health facility to the district.

Nota bene: legend
T = arrived on time
L = arrived late
W = report not received

Country _____ District _____ 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 (W)												
Timeliness of the reports = 100 * T / N												
Completeness of reporting = 100 * (N-W) / 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 for each health facility in the district.

ANNEX 30 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 this surveillance function:	***Regularly monitor the number of districts that :***
Maintain readiness for epidemic response	C Have a plan for outbreak response C Have access to emergency stocks of drugs and supplies at all times during the last 12 months C Have access to funds for outbreak response C Have a team trained to conduct an outbreak investigation
Identify suspected cases	C Have a surveillance coordinating focal point at the district level C Review case registers and logs
Investigate and confirm reported outbreaks	C Investigated at least one reported outbreak during the last 12 months C Have laboratory capacity within the district that can confirm suspected cases of priority diseases C Confirm priority diseases in a timely way C Are able to demonstrate safe handling, packaging, storing, and transport of specimens to higher level laboratory
Report data	C Have a reliable supply of recommended forms at all times over the last 6 months C Submitted all required reports to the next highest level on time during the last 6 months
Analyze data	C Describe outbreak data by time, place and person C Perform trend analysis by health facility C Have an action threshold for each priority disease and appropriate denominators and a defined response action C Compare quarterly data
Response	C Responded within 48 hours of reaching the threshold for action. C Meet with community about a health problem at least once every 6 months C Achieved acceptable case fatality rates during the most recent outbreak (for example, no more than 10% for meningitis, no more than 1% for cholera) C Have management committees that evaluated their preparedness and response activities during the last 12 months

Provide feedback	C Prepare and disseminate a written report of surveillance information at least quarterly during the last year C Received a written report or bulletin containing information district reported from a higher level during the last year C Provide feedback to the community
Supervision	C Number of health facilities that received a supervisory visit from the district surveillance focal point during the last 6 months
Training	C 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: C transportation or logistical supports (vehicles with fuel, motor cycles) C supplies for carrying out data management (computers, statistical program package) C communication methods (reliable telephone service, facsimile, radiophone, electronic mail) C information and education materials (VCR and monitor, portable generator, screen, projector (slides or film) C human resources (trained epidemiologist, laboratory technologists, data managers

ANNEX 31 Checklist for supervising surveillance and response activities at the health facility

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?	**G**_____	
Register cases	1. Are diagnoses of cases of priority diseases recorded in the clinic register according to the standard case definition?	**G**Yes **G**No	
Report	1. Do health staff use a standard case definition to report the suspected cases and outbreaks? 2. Do you record information about immediately notifiable diseases on a case form or line list?	**G**Yes **G**No **G**Yes **G**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?	**G**Yes **G**No **G**Yes **G**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 and show me the supply?	**G**Yes **G**No Number of results obtained:_____ Number of expected cases seen:_____ **G**Yes **G**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 and vaccine, ORS, antibiotics, and so on*)?	**G**Yes **G**No	
	1. Please show me the supplies for carrying out a recommended response.	**G**Yes **G**No	
	3. Who is the outbreak coordinator for this facility?	Name:_____ Designation:_____	
	4. How often do you provide information and training in outbreak response to the staff of this facility?	Training is done _____	
Provide Feedback	1. How often do you report information to the community?	Report it _____	
	2. Do you receive the latest bulletin from the *(central, subnational*) level?		
Evaluate and Improve the System	1. Were the last 3 routine monthly reports sent to the district office?	**G**Yes **G**No	
	2. Were the last 3 routine monthly reports sent on time?	**G**Yes **G**No	
Epidemic Preparedness	1. What precautions do health staff (including laboratory staff) take routinely with all patients regardless of the patients' infection status?	Minimum level of standard precautions: _____	
	2. How do you estimate the number of supplies to set aside for use during an emergency situation?	How supplies are estimated: _____	

Section 8
Summary guidelines for specific priority diseases and conditions

- Take action to respond to alert and action 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/AFRO or your national program manager or disease control officer.

Name of priority disease for integrated disease surveillance

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 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 ***or*** **Respond to a suspected outbreak for other diseases of public health importance**	*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. Some diseases have specified thresholds for alerting the health facility or district to a problem. *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 action threshold for epidemic-prone diseases ***or*** **Respond to a suspected outbreak for other diseases of public health importance**	*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). Additional guidelines about analyzing and interpreting data for specific diseases are in the District Analysis Book, which may accompany these guidelines.
Reference	Appropriate references for further information are available from WHO. The most relevant to the district level is stated for each disease.

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 fecal-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 center in locality where cases occur. Treat cases onsite rather than asking patients to go to standing treatment centers 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.
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

Diarrhoea with blood (dysentery)

Background	▪ *Shigella dysenteriae* is the most common cause of enteric infections and is transmitted from person-to-person through fecal-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 suspected case 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 case. ▪ Strengthen case management and treatment. ▪ Mobilize community to enable rapid case detection and treatment. ▪ Identify high risk populations using person, place, time data. ▪ Reduce sporadic and outbreak-related cases by promoting handwashing 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.

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. Centers 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 disease are transmitted through eating contaminated food or water, or through fecal-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.

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.
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 or having presented in the last 12 months with a skin lesion and emergence of Guinea worm. ***Confirmed case***: No confirmation required.
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

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 (MTD) 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 MCD.

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 center, 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 center 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 epidemics promptly, especially in areas with seasonal epidemic transmission or with a large population at risk. ▪ Improve percentage of malaria cases confirmed microscopically. ▪ Monitor anti-malarial resistance of sporadic cases and outbreak-related cases. Use sentinel populations in selected sites for monitoring anti-microbial resistance.
Recommended case definition	**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. **Severe malaria** Any person hospitalized with a primary diagnosis of malaria and confirmed by a positive blood smear or other diagnostic test for malaria. **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. *(Note: Young infants less than 2 months are usually classified as serious bacterial infection and are referred for further evaluation.)*
Respond to a suspected outbreak for other diseases of public health importance	**If there is an unusual increase in the number of new malaria cases or deaths as compared to the same period in previous non-epidemic years:** ▪ Report suspected epidemic to the next level ▪ Treat with appropriate anti-malarial drugs according to national programme recommendations ▪ Investigate the cause for the increase in new cases ▪ Make sure new cases in children age 2 months up to 5 years are managed according to IMCI guidelines. ▪ Conduct community education for prompt detection of cases and access to health facilities.

Respond to a confirmed outbreak for other diseases of public health importance	**If the number of new cases exceeds the upper limit of cases seen in a previous non-epidemic period in previous years:** ▪ Evaluate and improve, as needed, prevention strategies, such as use of permithirin-impregnated bed nets, especially for young children, pregnant women, and other high risk populations.
Analyze and interpret data	**Time:** Graph the number of cases by month. Construct an epidemic curve during epidemics. **Place:** Plot location of households for new cases and deaths. **Person:** Count the number of new malaria cases and deaths by month and analyze age groups and time of onset.
Reference	*Malaria epidemics: Detection and control, forecasting and prevention.* Geneva. World Health Organization. WHO/MAL/98.1084

Note: Setting an epidemic threshold:

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

1. Look at the number of malaria cases at a specific health facility or district by month for the past 5 years.

2. Determine the median for each month (for example, each January for the last 5 years). Rank the monthly data for each month for the five years in ascending order. Identify the number in the middle of each month's series (for example, the series of data for January) for the five years. This is the median. Repeat this process for each month in the five years.

3. Determine the 3rd Quartile for the monthly series by identifying the 4th highest number from the bottom in each data series (since data is ranked in ascending order). This is the 3rd Quartile representing the upper limit of the expected normal number of malaria cases.

4. Plot the 3rd Quartile for each data series by months for the five year period and join the points with a line. The line represents the upper limit of the expected number of cases.

5. Plot the median for each data series by month for the five year period and join the points with a line. This line represents the lowest limit of expected number of cases.

6. The area between the two lines (the median and the 3rd Quartile) represents the "normal channel". If the number of currently observed cases of malaria falls between the two lines, the number of new cases for that month is assumed to be "normal". If the number is above the 3rd Quartile (upper limit), this is an indication of a possible malaria epidemic.

Source: WHO/AFRO Regional Malaria Programme

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 elimination 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 cases 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 *Nausari meningitis*, *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 great 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 etiology of first 5 to 10 cases. Perform lumbar puncture and Gram stain of cerebral spinal fluid (CSF) on all cases of suspected meningitis where feasible to confirm etiology 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. meningitis* 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 centers ▪ 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 counseling 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

Plague

Background	▪ Zoonotic systemic bacterial infection caused by *Yersinia pestis* (plague bacillus) usually transmitted to humans by rodents and their fleas. ▪ Main disease forms: bubonic, pneumonic, and septicemic; large-scale epidemics may occur in urban or rural settings. ▪ Incubation period is 1 to 7 days. ▪ Case fatality rate (CFR) may exceed 50-60% in untreated bubonic plague and approaches 100% in untreated pneumonic or septicemic plague, but is usually <1% with appropriate treatment. ▪ Risk factor: rural residence. Exposure to infected populations of wild or domesticated rodents and their fleas.
Surveillance goal	▪ Detect outbreaks of plague promptly. Verify etiology of all suspected non-outbreak-related cases and the first 5 to 10 outbreak-related cases.
Recommended case definition	***Suspected case***: Any person with sudden onset of fever, chills, headache, severe malaise, prostration and very painful swelling of lymph nodes, or cough with blood stained sputum, chest pain, and difficulty in breathing. ***Confirmed case***: Suspected case confirmed by isolation of *Yersinia pestis* from blood or aspiration of buboes, 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 to the next level. ▪ Collect specimen for confirming the case. ▪ Investigate the case. ▪ Treat the patient with streptomycin, gentamicin or chloramphenicol, and administer chemoprophylaxis of close contacts with tetracycline for seven days from time of last exposure.
Respond to action threshold for epidemic-prone diseases	**If the suspected case is confirmed:** ▪ Isolate patients and contacts of pneumonic plague with precautions against airborne spread (wear masks, for example) until at least after 48 hours of appropriate antibiotic therapy. ▪ 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 harborages) and protect against fleas with insect repellent on skin and clothing and environmental flea control (especially in homes and seaports and airports).

Analyze and interpret data	**Time:**	Graph monthly trends in cases and deaths. Construct epidemic curve for outbreak cases.
	Place:	Plot the location of case households.
	Person:	Immediate case-based reporting of cases and deaths for routine surveillance. Count weekly cases and deaths for outbreaks. Analyze age distribution and assess risk factors to improve control of sporadic disease and outbreaks.
Reference	*Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte.* WHO/CDS/CSR/EDC/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 etiology. ▪ 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	▪ 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 etiology 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.

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

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

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

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 hemorrhage, 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 hemorrhage may mimic yellow fever.
Surveillance goal	▪ Detect hemorrhagic fever cases and outbreaks promptly, and seek laboratory verification of the etiology 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	